

THE IMPLICATIONS OF LOCAL VIEWS AND INSTITUTIONS FOR THE OUTCOMES OF COMMUNITY-BASED CONSERVATION

by

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ABSTRACT

Conservation is increasingly concerned with ‘how’ to conserve rather than ‘what’ to conserve. Efforts to improve outcomes through greater local involvement – community-based conservation – have been popular but problematic. Perspectives from the social sciences suggest that simplistic conceptions of the communities involved may be to blame. This work uses a range of methods from across the social sciences to probe the implications of various aspects of local social context – including individual views, institutions and culture – on conservation outcomes.

A systematic review and meta-analysis demonstrate a significant influence of local social context on conservation outcomes. Project success was more likely where there were supportive pre-existing institutions and culture, and also when interventions attempted capacity building and positively engaged with local culture and institutions (both governmental and non-governmental). Support for these findings was stronger than that for factors previously found important, such as the provision of local benefits or market integration.

The effect of a specific intervention linked to religion was investigated using a case study of ecological teachings by a Buddhist centre in the Republic of Kalmykia, Russia. Since perestroika, interest in Buddhism has grown, but several environmental problems have also emerged, including poaching of the critically endangered saiga antelope *Saiga tatarica*. Qualitative analysis of semi-structured interviews showed that Buddhist teachings had the potential to change relevant views, and were particularly important in fostering a sense of individual capability and responsibility.

A case study in Nepal focused on individuals in communities whose hunting, wild plant collection and grazing are thought to pose threats to an area of conservation importance. A mix of qualitative (rapid rural appraisal) and quantitative (questionnaire survey) methods probed local uses and views of natural resources. Drivers of resource use varied between households, linked to the institution of caste, with low status individuals driven by need but some others driven by cultural preference. Elite capture by higher castes also influenced lower caste involvement in and attitudes to conservation interventions. This highlights the need to look beyond community-level impacts to understand behaviours of conservation concern.

Understanding potential conservation behaviour in Nepal also required an understanding of individual views and perceptions of nature, which did not correspond to other attributes such as caste. Structural equation modelling was used to examine individual intentions to help conserve one plant used practically, and another plant valued aesthetically. Willingness to give time for the two plants was similar, and explained by both socio-demographic factors (such as education) as well as individual views of nature. In addition, low caste individuals gave more time for the practically valued plant (probably as they had less access to substitutes). This study suggests that gauging individual perceptions and views is important for understanding conservation behaviours, in tandem with the more usually measured socio-demographic factors.

This thesis argues that recognition of and engagement with individual views in the context of local culture and institutions is crucial to conservation success. The studies together provide evidence that many aspects of local social context matter (including non-governmental institutions and aspects of culture which may not appear directly relevant to conservation outcomes). However, it is also necessary to engage with individuals' views and perceptions of nature. The social context of conservation should not be stereotyped or oversimplified.

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“No man can be a pure specialist
without being in the strict sense an idiot”

George Bernard Shaw, 1903

Declaration

This dissertation is the result of my own work and includes nothing which is the outcome of work done in collaboration except where specifically indicated in the text and acknowledgements

Kerry Waylen, March 2010

Abbreviations and Acronyms

ACA(P)	Annapurna Conservation Area (Project)
AIC	Akaike Information Criterion
CBC	Community-Based Conservation
CF	Community Forest, Nepal
CFI	Comparative Fit Index
CV(M)	Contingent Valuation (Method)
EFA	Exploratory Factor Analysis
FUG	Forest User Group, Nepal
GDP	Gross Domestic Product
IAD	Institutional Analysis and Development
ICDP	Integrated Conservation and Development Projects
LMM	Linear Mixed Modelling
ML	Maximum Likelihood
NGO	Non-Governmental Organisation
NTFP	Non-Timber Forest Products
NPR	Nepalese Rupee (approx 125 NPR=GBP1)
PC(A)	Principal Component (Analysis)
PRA	Participatory Rural Appraisal
REML	Restricted Maximum Likelihood
RRA	Rapid Rural Appraisal
Rb	Russian Rouble (approx 50 Rb=GBP1)
SEM	Structural Equation Modelling
SR	Systematic Review
VDC	Village Development Committee, Nepal
WOM	White Old Man
WTP	Willingness to Pay
WTT	Willingness To give Time
WPA	World Pheasant Association
WVO	Wildlife Value Orientation

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1. INTRODUCTION

Conservation is a discipline which aims to tackle the widespread and accelerating loss of biodiversity (Sutherland, 2000). It is currently a global priority, not only for its own sake but for the support and protection of human well-being (Millennium Ecosystem Assessment, 2005). Over the last century there has been increasing scientific understanding of the myriad ways in which biodiversity (the diversity of nature) provides goods and services essential for physical survival and cultural well-being (Díaz et al., 2006). However, as time has progressed it has also become evident that natural resources are not boundless, and many human activities can degrade and destroy it (Wilson & Peter, 1988).

Today an array of policies and projects aim to safeguard nature, with conservation principles enshrined in both international conventions and national laws (Snape, 1996). As a result, some habitats have been successfully conserved (e.g. WWF, 2004) and the extinction rates of some species have been slowed (Brooke et al., 2008). A few species have even been successfully reintroduced (e.g. Spalton et al., 1999) and habitats restored (e.g. Bosire et al., 2008). However, as we enter the 21st century, it is clear that our efforts so far have had mixed outcomes (Balmford et al., 2002). The risk of precipitating a sixth great extinction episode remains (Leakey & Lewin, 1995).

The greatest levels of biodiversity, and the most direct links between natural resources and human well-being, are in the poor developing countries (Fisher & Christopher, 2007). Natural resources often directly support livelihoods of local peoples, but where over-use of resources is seen as a potential threat to habitats and species, it is necessary to reduce use to sustainable levels, or adopt new pro-environmental behaviours. Promoting conservation in these situations is challenging. However, promise has been shown by conservation strategies that are implemented in collaboration with communities local to conservation problems (Western et al., 1994). These strategies dovetail with more general arguments for increased public participation in decision-making (Lane, 2003).

The basic rationale for inclusive community-based approaches is that conservation outcomes will improve when projects reflect the needs and views of people local to threatened resources. Early support for these approaches in developing countries was received from the apparent success of projects in Africa. These community-based conservation (CBC) projects demonstrated that giving local people a stake in their local

wildlife could generate local support for sustainable levels of wildlife harvesting as well as generate economic benefits (Matzke & Nabane, 1996). This idea has therefore been extremely influential and the across the world the broad idea of working with or for local people now influences nearly all projects, plans and policies for conservation. However, there have been subsequent reports of cases where these community-based approaches have had mixed or poor outcomes (e.g. Friis & Treue, 2008).

In the last 15 years there has been some disillusionment with community-based approaches, but is unclear what the problem is, or how conservation practice can be improved. Why have some projects succeeded where others failed? Why are some management actions sustained, whilst others break down with time? Why are some communities apparently enthusiastic, whilst others resist engaging with conservation? There is an urgent need to evaluate these existing conservation efforts, to understand their effects and improve future outcomes (Balmford & Cowling, 2006).

Evaluating conservation interventions is challenging, not least because of a notorious inadequacy of conservation evidence on which to base analyses (Nichols & Williams, 2006). Furthermore, approaches are variable; anything from educating local people about conservation issues, through to devolving ownership of resources has been labelled as a community-based approach (Western, 2001). The context of interventions, including drivers of threats, is equally variable.

However one criticism from the social sciences is becoming increasingly common, and applies to all these approaches. The general suggestion is that local people's understanding of and involvement in conservation interventions is often unsatisfactory and needs more attention (e.g. Brechin et al., 2002). This is perhaps, surprising; on the face of it, local community involvement is *the* central principle underlying contemporary conservation approaches (UN, 1992). However, there have been numerous reports of projects where local people's needs and views have been inadequately appreciated (e.g. Goldman, 2003) or where project structures were inappropriate to local culture and institutions (e.g. Brown, 2003). Authors from different backgrounds have highlighted the need to better attend to everything from the form traditional governing bodies (e.g. Chapman, 1987) to the minutiae of individual views (e.g. Schultz & Zelezny, 1999). It seems the rhetoric of policy and project proposals has not always been matched by conservation practice (Kellert et al., 2000). Inadequate local participation has been identified as a particularly common problem

(e.g. Larson et al., 1998) and this may contribute to stereotyping and misunderstanding of communities by outsiders (Campbell & Vainio-Mattila, 2003).

If these criticisms are true, it suggests better understanding and engagement with local views and institutions may improve future CBC efforts. However, empirical support for these arguments is needed, framed in a manner which is broadly accessible to conservationists, rather than derived from and oriented to the concerns of specific social science disciplines.

1.1. Thesis aims and structure

The aim of this thesis is to investigate the role of multiple aspects of local social context – from institutions to individual views – as influences on conservation outcomes.

Specific objectives are to:

1. Identify if outcomes of CBC are positively influenced by a supportive social context (particularly local institutions), and project engagement with this context
2. Understand how a CBC project may influence individuals through engagement with local institutions and culture
3. Understand social heterogeneity within communities at the scale of a CBC project, and links to natural resource use and conservation behaviours
4. Investigate how individual views can influence intended conservation behaviours

These four objectives will be addressed through four data chapters (Chapters 3 to 6), prefaced by a conceptual framework (Chapter 2) and finishing with a discussion chapter (Chapter 7). The structure of thesis moves from the broad level through to the more specific, starting by identifying existing evidence of conservation outcomes being influenced by local social context, before exploring relevant aspects of social context in two case studies, and finally focusing on the level of individual views.

Chapter 2 provides a more detailed exploration of the critiques of CBC projects. Based on the issues identified, a conceptual model is suggested to guide research into key aspects of local social context. The methodology justifying the use of mixed methods in this thesis is also presented here.

Chapter 3 tests the role of social context, particularly local institutions, in determining conservation outcomes across multiple CBC projects. This is achieved through the use of a systematic review and meta-analysis of past published case studies. The effect of

factors previously found important, such as local participation, the provision of local benefits or market integration is also controlled for.

Chapter 4 examines the effect of a specific intervention promoting pro-environmental behaviours through a non-governmental institution. This uses the case study of ecological teachings by a Buddhist centre in the Republic of Kalmykia, Russia. Semi-structured interviews with those who have and have not experienced its teachings are used to understand and contextualise the effects of these teachings on environmental attitudes and behaviours.

Chapter 5 investigates implications for resource use and conservation of social heterogeneity at a relatively small scale. As with the previous chapter this is focused at the scale of a single CBC conservation intervention; in the Seti Khola valley, Nepal. A mix of qualitative (rapid rural appraisal) and quantitative (questionnaire survey) methods are used to probe the diversity of local ways of life, and links with resource use and conservation.

Chapter 6 focuses on individuals at the same site in Nepal, using a questionnaire survey to understand if practical constraints are the sole determinants of resource use and conservation practices, or if local views of nature can also have significant implications for potential conservation behaviours.

Chapter 7 concludes with a discussion of the main findings of this thesis, their implications for conservation policy and practice, and recommendations for further research.

2. DECONSTRUCTING THE TREATMENT OF ‘COMMUNITY’ IN COMMUNITY-BASED CONSERVATION

This chapter begins by discussing some problems with the treatment of community by existing CBC approaches, as identified by existing literature. Then, a conceptual framework is presented to illustrate the key issues, followed by discussion of appropriate methodology to address these.

2.1. Identifying problems with existing CBC approaches

As noted in the introduction, the inclusion of local people in developing country conservation efforts has not been without problems. The 1980s saw the emergence of a conservation approach that was less hostile to local people than classic ‘protectionist’ efforts, which had aimed to exclude communities and prohibit use of land and resources (Ghimire & Pimbert, 1997). The new approach did not assume nature should be ‘protected’ from people: instead, local control over resources could enable interest in their conservation, whilst local participation could enable better local understanding and support for conservation. The rationale was that if local people are involved and engaged with conservation interventions, their positive pro-conservation attitudes and behaviours will support the desired ecological outcomes (Western et al., 1994). Developing-country conservation projects which promote local control and participation are defined as ‘Community-Based Conservation’ (CBC) projects. Because communities local to conservation targets are often very poor, many CBC interventions aim for local sustainable use of the natural resources, with a sub-set of Integrated Conservation and Development Projects (ICDPs) equally prioritising improvements to local livelihoods (Alpert, 1996). Of course, community-based approaches can not address all conservation problems – for example, deciding where to allocate scarce resources remains challenging (Possingham et al., 2001) – but at any one site it is generally thought that a community-based approach will offer the best chance of acceptable and successful conservation outcomes.

The two ‘classic’ examples of CBC projects, CAMPFIRE in Zimbabwe (Gibson & Marks, 1995) and ADMADE in Zambia (Matzke & Nabane, 1996) were initially reported to be successful, and are now often cited to show that inclusion of local people can support successful conservation outcomes. However, subsequent reports have cast doubt on these successes (e.g. Alexander & McGregor, 2003) and plenty of reports on other projects have reached more ambiguous conclusions about CBC’s effects.

Sometimes ecological outcomes are not achieved (e.g. Daniels & Bassett, 2002) and other times ecological success comes but with social costs. For example, in a study of Tanzanian forestry, decentralised village management resulted in sustainable forest practices, but there was also evidence of elite capture and reinforcement of inequity, with village leaders using coercion to extract extralegal payments from the poorest forest users (Friis & Treue, 2008).

The analysis and critique of CBC approaches has attracted a lot of attention. Some question whether promoting conservation can ever be legitimate and widely accepted, as it can be viewed as an externally constructed goal that does not fit with the views and needs of local communities (Bauer, 2006). However, within the conservation sector where the goal is taken for granted, most authors have been keen to defend CBC, albeit whilst recommending improvements (e.g. Greenberg & Brown, 2005), although a few have advocated a return to protectionism (Terborgh, 2004). Since protectionism is morally as well as practically problematic (Brechtin et al., 2002), and improving the condition of natural resources is a matter of some urgency (Wilson & Peter, 1988), there is a pressing need to improve CBC practice and hence conservation outcomes.

2.1.1. Poor appreciation of ‘community’ in CBC practice

As CBC interventions have taken many diverse forms (Adams & Hulme, 2001), there has been much scope for discussion over what aspects should be encouraged or changed. For example, some projects have focused on providing payments in return for pro-environmental behaviour (e.g. Wunder, 2005), others promote the importance of conservation education (e.g. Jacobson et al., 2006) and some try to reduce resource use by encouraging alternative livelihood activities (e.g. Haque et al., 2009). Disentangling these complex issues is challenging, not least because reporting about conservation activities and outcomes is often inadequate (Sutherland et al., 2004).

However, critiques from the social sciences have been fairly unanimous in suggesting that CBC projects have often not understood and engaged with the local people who are supposed to be involved in such projects (e.g. Songorwa, 1999). They suggest that the participation of local people is often inadequate and more at the level of consultation (Stevens, 1997). Local people themselves, when asked, express dissatisfaction with the supposed ‘engagement’ offered by CBC projects (Tapela et al., 2007).

Upon reflection it is not surprising that this problem might exist. Indeed, a similar problem has been recognised in the development sector, even though its remit is

explicitly people-focused, and it has spent longer trying to promote local engagement (Campbell & Vainio-Mattila, 2003). Although some CBC projects are completely community-led (e.g. Tai, 2007), most CBC projects are instigated by outside conservationists, who are usually but not always educated in the natural sciences. Conservationists therefore may not be well prepared to recognise how local social systems may influence conservation outcomes, nor well equipped to probe these issues (Fazey et al., 2005). Language differences and translation interpretations compound these problems (Hanson, 2007). Conservation is a ‘mission-driven’ discipline (Meine et al., 2006) where it is common to operate under severe time and resource constraints (Newmark & Hough, 2000). In these situations it can seem unfeasible to spend time talking to people about non-conservation topics, let alone bringing in social research expertise to make detailed social assessments and facilitate community engagement.

In this situation, the design of interventions may be unwittingly influenced by the views and assumptions of the conservationists, which may include positive or negative ideas about exotic or remote communities (Alcorn, 1994). If information is sought, it may be easiest to focus on those aspects of life that are immediately obvious. In particular it may be common to characterise poor people as entirely preoccupied with meeting immediate physical needs; for example, when Agrawal & Redford (2006) reviewed ICDPs, they felt that their implementation, plans and programmes were typically based on a “relatively simplified” concept of poverty. Such simplistic views of the drivers of behaviour were once popular (see for example, the hierarchy of needs by Maslow, 1970) but it is now widely recognised that even very poor people’s decisions cannot be characterised so simply. For example, even poor consumers in Guatemala are willing to pay a premium for sustainably and ethically sourced firewood (van Kempen et al., 2009). Although physical need is important, multiple factors act as constraints and motivations to influence behaviour (Carney, 1999). Conservation outcomes may suffer if implementation of projects is based on simplifications of these complex issues.

2.1.2. Implications for CBC outcomes

Local people, their diverse views and local social structures have typically been bundled together under the label of ‘communities’ (Macdonald, 2003). This can be a convenient shorthand for referring to the people local to conservation targets (as it used in this work). However, it is often used to refer to a simplistic stereotype of a small, spatially discrete, homogenous cooperative unit, without considering local social structures and

interests (Kumar, 2005). This is at least patronising, and at worst overlooks aspects of community heterogeneity that can reinforce inequalities, influence resource use strategies, and shape responses to conservation interventions (Brown, 2002). There may be many attitudes, ideologies and interests within one community (King, 2007).

These simplifications and assumptions matter because they result in projects that are not designed to 'fit' with the communities they are supposed to work with and for (Klein et al., 2007). For example, a community-based ecotourism project in Belize produced only limited local action and support for conservation because issues of class, gender and patronage were not addressed by the project design (Belsky, 2003; 1999).

Many CBC projects aim to encourage some kind of cooperation or restrained resource use behaviours, but because societies can be heterogeneous, where there are not traditions of cooperative behaviour or supportive institutions the desired outcomes may not occur (Vatn, 2007). Without a nuanced understanding of why people behave as they do, in the context of local culture and institutions, simplistic conceptions of communities can lead to inappropriate conservation interventions. For example, western stereotypes of Maasai values and their pastoralist way of life have led to unsuitable management actions that have helped neither them nor the conservation of their rangelands (McCabe et al., 1992). Poor appreciation of the complexity of local communities, and the ramifications of local views and culture for project outcomes, at worst leads to conflict and worsening social and ecological situations. For example, various assumptions about simple homogenous communities – including failing to recognise a history of armed conflict and competing forest tenure claims by different local groups – directly contributed to the failure of the Korup Project in Cameroon, reinforced social tensions and wasted resources introducing new technologies for alternative livelihoods that were locally rejected and met no market demand (Malleon, 2002). Simplistic assumptions of homogeneity are particularly likely to lead to economically inequitable outcomes (Agrawal & Gibson, 1999). This is well illustrated by an examination of two CBC projects in Botswana and Malawi by Blaikie (2006), where in both cases conflicts between local groups, and standardised national policies, led to local strategies of non-compliance with conservation rules.

By contrast, recommendations for sustainable natural resource use and conservation will be more likely to be followed if embedded in local traditions and governance systems, rather than imposed top-down, perhaps through national laws (e.g. Goldman, 2003).

For example, on Oceanic islands, supporting traditional leadership and customs for conservation, may be a more efficient way to promote conservation than by imposing new management systems (Muehlig-Hofmann, 2007). Similarly, Campbell (2007) attributed the relative success of a turtle-egg harvesting scheme in Costa Rica to a system of incentives, laws and administrative structures for sustainable egg harvesting, and she argued that locally-tailoring these had been critical to success.

It would be false to say that all CBC projects neglect to understand and attend to the communities they work with. In fact there are many new initiatives which aim to emphasise particular aspects of local people's views and communities, to enable the conservation practice that is socially equitable and achieves desired ecological outcomes. For example, recent sacred natural site guidelines highlight the potential of the spiritual associations of some natural places for the management of those habitats (Wild & McLeod, 2008). Similarly, some efforts to promote species and habitat protection have succeeded by incorporating non-tangible cultural values of nature (e.g. Pathak & Kothari, 2003). In general, local or traditional ecological knowledge is seen as a potential resource to inform conservation (Berkes, 1999) and faith-based approaches are currently receiving considerable attention (Religion Science & the Environment, 2007). However, apart from the danger of romanticising traditional peoples as innate conservationists (Pandey, 2003) there is also a danger that these efforts, which are focused on particular issues, do not properly identify and attend to all key features of the local social context. Scientific approaches are needed to efficiently and effectively identify key aspects of local communities that should be prioritised for future conservation policy and practice.

2.1.3. Insights from social sciences

Fortunately, there is a wealth of social science research to draw on. Each different social science discipline emphasises different aspects of local communities and social systems for CBC practitioners to attend to. According to their core concerns and conceptual frameworks, their focus has ranged from local management institutions (e.g. Acheson, 2006), to discussing the importance of individual views (e.g. de Groot & Steg, 2009). However, whilst all of these insights are valuable, it is not always easy to understand them, or combine them, to get an overall picture of the key issues. This is a crucial issue if future research findings are to usefully influence conservation practice. For example, anthropological authors have long been critics of the social aspects of

conservation practice, but their criticisms have sometimes felt inaccessible and unconstructive (Brosius, 2006). Therefore key insights from several fields are presented here, and then combined in one conceptual model.

Microeconomists' positivist focus on the decision-making of individual actors (Begg et al., 2000) has been quite accessible to conservationists. There are, for example, many valuations of natural resources in the conservation literature (e.g. Tisdell et al., 2005). Linked to this, the clear delineation of nature's values made by the Total Economic Value framework (Pearce & Mora, 1994) has been well-accepted as a guide to the range of nature's roles, from meeting practical needs through to providing goods and services with cultural value. However, its classical models of rational actors who decide on behaviours by trading-off quantifiable preferences are rather simple (Van den Bergh et al., 2000). Furthermore, economic approaches are often interpreted to encourage focus only on more tangible properties of the natural resources (Van Houtan, 2006).

By comparison, environmental psychology considers a wider range of motives and influences over individual behaviour. Psychological perspectives are often recommended to conservationists as a useful perspective for understanding conservation behaviours (e.g. Saunders et al., 2006). Psychology not only highlights the potential influence of a wide range of views, from moral positions (Diessner et al., 1993) or feelings about nature (Schultz et al., 2004). It also offers theories about how specific attitudes and behaviours are formed (e.g. Nordlund & Garvill, 2002). Both these models and concepts may be fiercely contested, particularly within the sub-field of environmental psychology, but the message about the complexity of decision making is constant. Unlike classical economic models, these highlight that both external and intrinsic factors influence decision making, and decision-making heuristics may be complex and vary in different situations (Hastie, 2001). Some of these models have had success in predicting specific environmental behaviours and intentions (Bamberg & Moser, 2007) but are often less useful in offering general insights about conservation behaviours, perhaps because they lack the insight into community-level processes.

Recognising the limitations of focusing on individuals, many of the critiques of existing conservation practice have been rooted in the field of political ecology. This field is concerned with the differences in interests between individuals, and how these connect with socio-ecological systems (Robbins, 2003). The broad scope of the field, its diverse academic antecedents (including everything from anthropology to forestry and

environmental history) and its tendency to focusing on developing country issues mean that political ecology is particularly relevant to this thesis. Political ecological writing highlights the need to appreciate community heterogeneity – such as differences in caste, gender and class – which affect interactions between community members, responses to authority and to externally-driven CBC interventions (Robbins, 1998). Multiple important concepts are raised, from local conflict to the influence of national agencies to politicization of resource control. However it is challenging to tie these insights together in an accessible framework. For example, Nygren (2005) argues that understanding the effects of decentralised forest management in Honduras requires an understanding of “the entire spectrum” of actors and their interests, but also the processes through which individuals relate to each other, in the context of institutional mechanisms. Whilst this is true, such a broad perspective can feel unapproachable, and when faced with extensive critiques it can feel difficult to extract focused insights needed to hone conservation practice.

Specific fields of resource management (e.g. forestry and marine resources), and the managers of other types of projects have found visual models derived from institutional approaches accessible and useful ways to capture some of these messages. Institutions are defined as the humanly devised constraints that structure political, economic, and social interactions. They consist of both informal constraints (sanctions, taboos, customs, traditions and codes of conduct), and formal rules (constitutions, laws, codified property rights; North, 1991). Institutional Analysis and Development (IAD) attempts to understand the incentives which motivate human behaviour in a particular context, by analysing incentives, choices and outcomes (Ostrom, 1992). IAD has been used to analyse and recommend solutions to many natural resource management problems. For example, the failure of many ICDPs to reduce forest clearance rates has been linked to unsupportive local institutions, and particularly tenure (property rights) not being locally controlled (Linkie et al., 2008).

The perspectives of many single social science disciplines, while useful, may be perceived as too narrowly focused and difficult to access for those outside the respective fields. Furthermore, focusing on recommendations from some disciplines can neglect the links between different aspects of community, from individual views to institutions, and interactions with a project (Berkes, 2007). However conservationists from natural science or policy backgrounds must be convinced of the importance of better

understanding and engagement with community (e.g. West, 2006). Therefore, there is a need for an accessible and empirically supported conceptual framework to highlight how CBC outcomes may be influenced by multiple aspects of local social context, linking together both individual and higher-level aspects of community. This may provide a powerful message to conservationists to whom consideration of social issues may not be familiar.

2.2. Conceptual framework used by this study

A simple conceptual framework is proposed for this study, which graphically highlights how individuals within a local community may be motivated to conserve, and influenced by a CBC intervention.

The framework is strongly influenced by, and adapted from, a model proposed to aid analysis of community forestry management outcomes (figure 2.1). The model was developed to help the FAO understand why many forestry activities were rather unsuccessful (Thomson, 1992). Both the characteristics of the natural resource and the local social context are considered to produce incentives which are processed by individuals choosing behaviour of relevance to resource management outcomes.

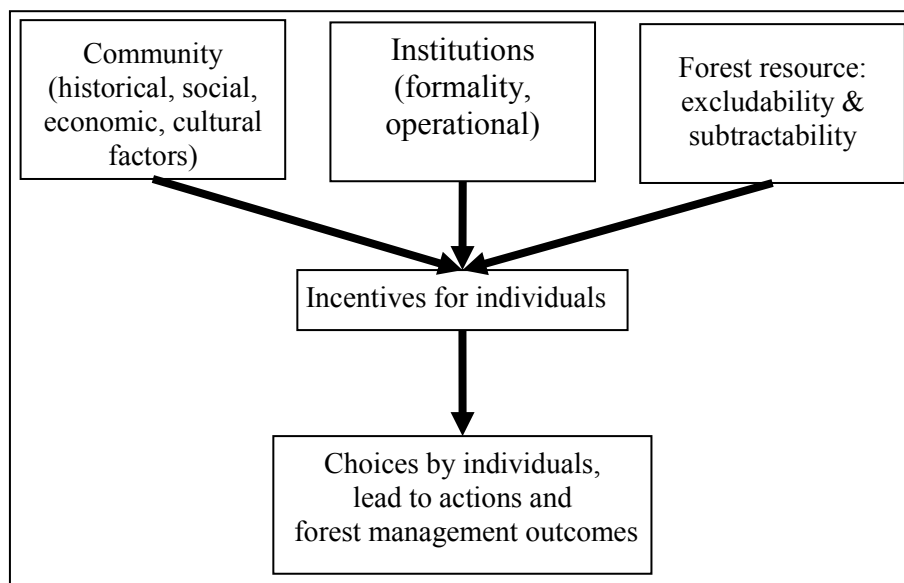


Figure 2.1 The model of Institutional Analysis and Development developed for forestry by Thomson (1992). For consistency with the thesis the word “institutions” is used where Thomson used the word “rules” with similar meaning. The conceptual model used by this study is derived from this model.

The model has its origins in the perspective of the Ostrom’s Institutional Analysis and Development (IAD) model (Ostrom, 1990). In addition to institutions, the model also points out the role of other aspects of local social context, in the box labelled “community”. Diverse characteristics of local life may influence community evaluation

of natural resources and their conservation, with the four aspects – historical, economic, cultural and social factors – to be used as a useful prompt for considering diverse influences on local decision-making, rather than discrete categories. It should be noted that by some definitions (e.g. Agrawal & Gibson, 1999), local institutions can be seen as part of local community. Similar to Thomson, this study chooses to treat these terms as related but separate parts of local social context.

Thomson's model has been considered both accessible and useful for organizations that have wished to understand decisions by local individuals for resource management, and the rules and norms that guide those decisions. For specific needs and situations it is flexible enough to focus or elaborate upon certain aspects of the model (Thomson & Schoonmaker Freudenberger, 1997). Polski & Ostrom (1999) elaborate on how different types of rules can affect different types of choices made over resource, and give many examples of studies where the IAD framework has provided useful insight into situations that seemed otherwise chaotic or unmanageable.

Since the components of the model need not be specific to forestry, it has obvious relevance to many problems in community-based conservation. Thomson's model is particularly relevant for this study because it explicitly considers various aspects of local communities. These aspects encompass anything from history to cultural and economic features of the community, including whether the natural resource in question has cultural values and/or a practical role, with these seen as useful for understanding the key issues of community cohesion and homogeneity (Thomson & Schoonmaker Freudenberger, 1997). All these incentives can combine to influence individual actions.

Thomson's model does not lose the role of individual agents. This is important as conceptual models often focus either on individual or higher-level factors. For example, the approach to understanding and predicting environmental behaviours used by the UK Department of Forestry and Rural Affairs (DEFRA, 2008) is focused on individuals and considers only two main axes: ability to act (constraints) and willingness to act (motivators). Whilst relevant, this greatly simplifies the principles of models developed by psychologists, which at the very least have specific attitudes towards behaviour influenced by more abstract and general values (e.g. Heath & Gifford, 2002) and more often favour multi-stage models incorporating emotions and other variables (e.g. Montada et al., 2007). More comprehensive is the influential Sustainable Livelihoods Framework developed by the UK Department for International Development (DFID,

2001). However this is focused on development needs, and has been criticised for being too focused on households, making difficult to link with higher institutions (Clark & Carney, 2008). Thomson's model best captures the multiple aspects and levels of community which are the focus of this study.

Thomson's model is modified for use by this study (figure 2.2). Three changes better suit it for analysis of CBC projects: (1) removing the term for natural resource properties, (2) adding a term for conservation projects, and (3) adding a term for the influence of individual views. The resulting model highlights how multiple aspects of local community, from institutions to individuals, influence conservation behaviours. Conservation projects, ideally influenced by this pre-existing situation, interact with the local social context to influence local motivations for behaviour.

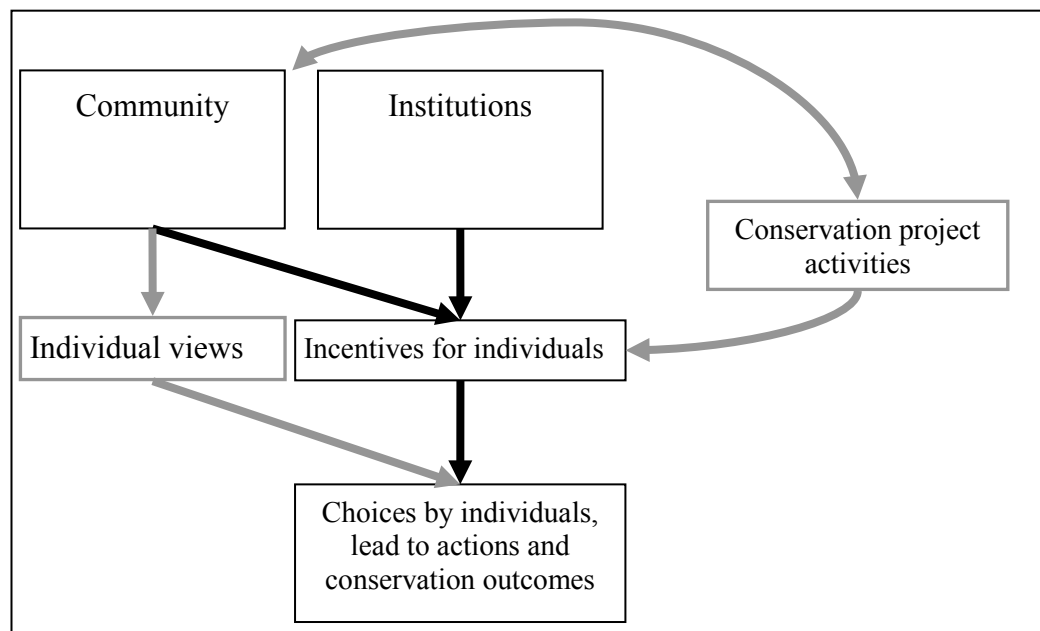


Figure 2.2 The conceptual model of how local social context interacts with CBC projects to produce conservation outcomes. The model is derived from the forestry management model of Thomson (1992) shown in figure 2.1. The two new terms are shown in dark grey: (1) conservation project activities; and (2) the role of individual views, which cannot be entirely predicted from the social context. The natural resource to be conserved is assumed to have common pool characteristics, and so is not shown.

The first change is simply the removal of the top right-hand term in the original model, because conservation issues generally concern natural resources with common pool character. Common pool resources are poorly excludable and subtractable, which presents common challenges for resource governance aiming to maximise long-term community benefit (Ostrom, 1990). This is also the case in the specific case-studies presented later in this thesis (chapters 4, 5 & 6). Therefore these characteristics of natural resources are assumed fixed for this study.

The second change is an addition of a term on the middle right-hand side of the model. Since the original model considered only the processes shaping the (mis)management of forests by an existing system, it did not explicitly show how interventions for resource management and conservation acted. The modification of institutional incentives for more effective resource governance was considered rather “casually” (Fischer & Petersen, 2004). For the purposes of understanding how interventions interact with local communities, it is useful to make this explicit. For example, Fischer et al. (2007) modified the framework to better demonstrate how incentive changes for development could be implemented in interventions by the German development agency (GTZ). In this model, the conservation project is considered to directly influence conservation outcomes and the choices of individuals, but is also considered to influence the local social context (for example, by capacity building) and vice versa (for example, adapting project approach in response to local taboos).

The third change is the addition of a term, on the middle left-hand side of the model. This term explicitly shows a role for individual views; intrinsic motivations and other influences which cannot be predicted by their social context. As Thompson’s model of incentives considered only those external to the individual, so variability between individual choices in the same context would apparently be random and unpredictable. Allowing a role for the effect of individual views potentially improves our understanding of the decisions made by individuals over conservation behaviours. Individual views are of course influenced by our upbringing and social context, but cannot be entirely determined by it. For example, across the world individuals demonstrate a predisposition for altruism or helping others (Schwartz & Sagiv, 1995), and it is often thought that individuals who strongly hold those views are more likely to express pro-conservation behaviours (Dietz et al., 2005).

Not every possible relationship is represented in the model. For example, this study does not focus on the close and complex relationship between local institutions and culture. This model does not consider any biophysical influences on the system (for example, biological limits to harvesting sustaining of a certain species), nor the effect of external socio-political context. These issues are important but beyond the scope of this study.

The empirically-based chapters of this thesis (chapters 3-6) relate to different aspects of the model, generally moving from the higher to lower levels. The relation of these

chapters to different parts of the model is shown in figure 2.3. Each chapter further details relevant aspects of the model. Chapter 3 particularly focuses on the role of local institutions on project outcomes, and by contrast chapter 6 deconstructs aspects of individual views that may influence conservation.

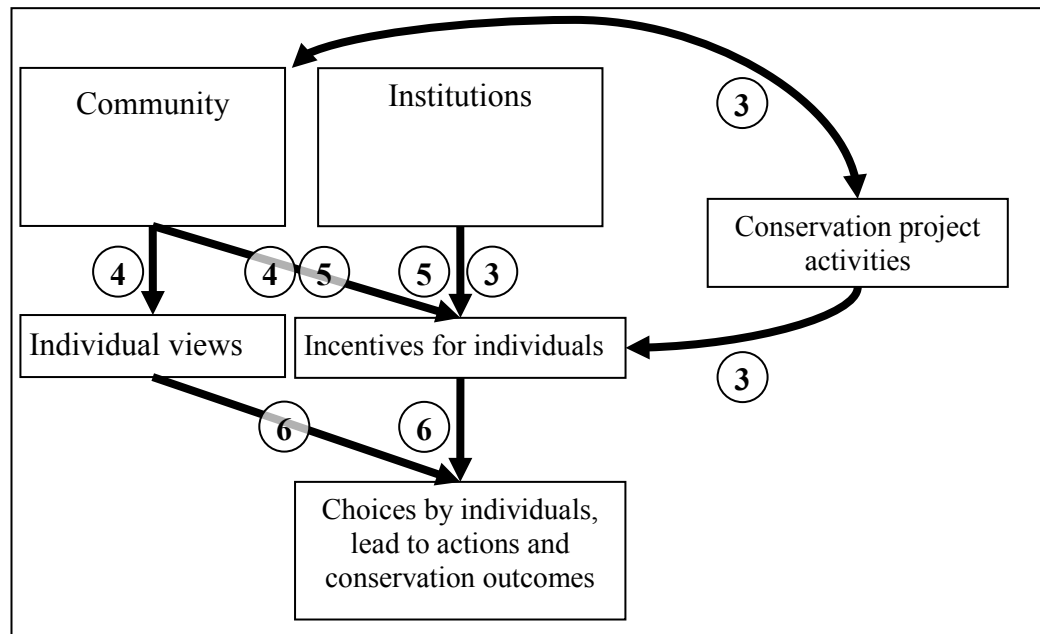


Figure 2.3 How the data chapters (chapters 3-6) map onto the conceptual model of this thesis. All data chapters are relevant to multiple parts of the model, but the numbered circles represent the main relevance of each chapter.

2.3. Methodology used by this study

Since the research objectives of the thesis encompass multiple levels and are tested at different sites, mixed methods are used. This section explains why it is appropriate to use a mixture of quantitative and qualitative methods, despite potentially conflicting epistemologies.

Both methods are rooted in use of data and observation to answer research questions, and both share the norms of the general scientific community (Neumann, 2002). Most simply, qualitative and quantitative research approaches can be taken to mean research that generates, respectively, textual data and numerical data. Some advocates for mixed methods claim that combining these approaches is relatively easy, and even preferable to single method studies (Creswell, 2005).

It is certainly true that both approaches have strengths and weaknesses that complement each other (Ritchie, 2003). Quantitative research prioritises descriptive, analytical breadth and has the advantage of being able to predict relationships that can be generalised to large populations. By contrast, qualitative research is valuable for its

explanatory power and the richness and depth of information it covers. It is particularly suitable for probing poorly understood or complex processes (Holland & Campbell, 2005). Viewing the methods in this way, as complementary, is the ‘toolkit approach’ to research (Seale, 1999). Useful properties of each approach are compared in table 2.1.

Table 2.1 Desirable attributes for social science research, and their applicability to quantitative versus qualitative sciences. X=Not applicable, *=Somewhat applicable, ***=Very applicable. Adapted from Kapila & Lyon (1994) and Waylen (2005).

Desirable attribute	Quantitative research (e.g. questionnaires)	Qualitative research (e.g. focus group discussions)
Suitable for poorly understood situations?	X	***
Methods flexible and adaptable?	X	***
Suitable for sensitive issues?	*	*
Participation encouraged?	X	***
Awareness of issue encouraged?	*	***
Data with context and breadth?	*	***
Data focused on issue?	***	*
Data collection internally triangulated?	*	***
Representative sampling?	***	X
Low level of expertise required?	*	***
Data collection quick?	*	*

Although combining different methods can be complementary, different research strategies are implicitly guided by different sets of philosophical beliefs or assumptions (table 2.2). They vary in how knowledge is thought to be constructed and represented, and how it can be used. This means there can be tensions in the use of mixed methods (Papineau, 1997), which should be addressed. This chapter does not aim to discuss the entire philosophy of science, but clarifies the position of this study with respect to two main issues.

Table 2.2. Some generalised differences in the assumptions and approaches of quantitative and qualitative scientific research. Adapted from Kanbur (2003) in Holland & Campbell (2005).

	Quantitative sciences	Qualitative sciences
Method:	Deductive inference	Inductive inference
Philosophy:	Usually positivist: objective reality can be known through observation	Variable, but frequently view reality as subjective, knowledge as socially constructed; therefore objective reality unknowable or even non-existent
Disciplines:	All natural sciences, some social sciences (e.g. economics)	Many social sciences (e.g. anthropology, sociology, some psychology)
Information:	Numerical	Non-numerical
Findings:	Generalisable to wider population	Specific contextual population coverage

This study uses ideas from theory to inform data collection and analysis, and data analysis is then used to refine and inform the underlying concepts. This combines aspects of a logical deductive approach (usually linked to quantitative research), with inductive approach (usually linked with qualitative approaches) (Tashakkori & Teddlie, 2003). With a 'pure' deductive approach, data are used to test theory, whilst a 'pure' inductive approach uses the data to create a theoretical position. The latter position is more likely to encourage active involvement of the population, with feedback and discovery of relationships. In reality, the lines between deductive and inductive research are blurred, and it is never possible to take entirely one approach. Most projects combine the strengths of both, and though there are potential problems (Appleton & Booth, 2005) they are often thought to be complementary (Holland & Campbell, 2005).

Quantitative research is usually based in positivism (the belief in an objective reality that can be revealed by data collected through the scientific method), whilst qualitative researchers are more likely to consider that realities are socially constructed (so the data cannot be collected or interpreted independent of the researcher) (Ritchie & Lewis, 2003). This study takes a pragmatic approach, which tends to positivism with an underlying assumption of an objective reality (Creswell, 2005), whilst acknowledging that the researcher plays an active role, and cannot be completely independent of the data collected (similar to the "subtle realism" of Hammersley, 1998).

Each chapter separately describes the details of the methods it employs. A purely quantitative approach is used in a meta-analysis of the cultural determinants of past project success (chapter 3). In chapter 4, a qualitative approach is taken to probe the links between Buddhism, ecological teaching and environmental concern. In chapters 5 and 6, mixed methods are used within one site, with participatory qualitative approaches derived from development studies used to inform later quantitative methods (a questionnaire survey). Chapter 5 describes social heterogeneity and resource use within the site, primarily drawing on data from qualitative research, but also household data from the questionnaire survey. Finally, chapter 6 returns to the quantitative approach, influenced by environmental psychology. It is based entirely on questionnaire data about how various values and mental constructs can influence individuals' environmental concern. The more exploratory chapters based on qualitative data (4&5),

are structured by research objectives, whilst those based on quantitative research (3&6) are based on research hypotheses.

2.3.1. Positionality

Any research into social issues must consider and account for the role of the researcher. This is particularly true for studies such as this one, where the researcher interacts directly with individuals to generate data. Even without an anthropological focus on reflexivity (Wyn Davies & Piero, 2002), all researchers must be aware of how the research process can be influenced both by their own views, and how they are perceived by others (Twyman et al., 1999).

As regards positionality in this study, the author is motivated by a concern for conservation but otherwise considers herself neutral to the issues considered in this thesis: for example in chapter 4, describing the Kalmykia case study, she is not prejudiced for or against the role of Buddhism as a tool for conservation. However, the perception of the researcher's interests, as well as real or imagined links with local and state institutions, may well have affected who chose to participate in the research, as well as the responses given. For example, in Kalmykia some respondents were probably reluctant to talk about saiga hunting because they did not want to discuss illegal activities with an outsider who could be linked to or inform official state bodies. To combat this, the researcher made her interests clear and explicit, and actively encouraged participants or host communities to raise concerns or ask questions. However, this inevitably had an incomplete effect, and data collection was designed accordingly. For example, in Nepal, questionnaire topics on hunting and gathering non-timber forest product (NTFP) were avoided, since these are illegal activities, and focus group discussions indicated that they would not be honestly reported and could even provoke hostility. In Kalmykia the sensitive topic of hunting was often broached, but discussed at length only where the participant showed interest, and never insisted upon. Triangulation of evidence reveals that some respondents lied or avoided discussing their direct involvement in the saiga trade, but this is accounted for and discussed in the analysis.

2.3.2. Ethical note

All research carried out for this thesis was carried out with the informed consent of participants, making clear that the participation was completely voluntary. Parental permission was sought before working with children. The broad objectives and content

of work were described beforehand, whilst the anonymity of all data collected was emphasised both before and after every interaction. Participants, and indeed anyone local to the work, were encouraged to ask questions about the research. By spending time living with families in each location visited, this gave greater opportunity for local people to explore and feel comfortable with the research topic, somewhat ameliorating the researcher's 'outsider' status.

Introductions usually emphasised that this was a student project, to minimise possible expectations or biases resulting from perceived links with official bodies. This was particularly important for research conducted in Nepal, where outside agencies and westerners are associated with expectations of aid. In Nepal, imaginary scenarios were described to questionnaire participants, and particular care was also taken to emphasise the imaginary nature of these scenarios, to avoid creating concern and raising expectations that the projects were planned in reality.

Each literate participant received an information sheet that described the work and its intended outputs. In Nepal, copies of data collected during group work (such as maps and rankings charts) were given to the village. In Kalmykia, participation in interviews was rewarded by the gift of a UK commemorative dish cloth. Similarly, in Nepal, participation in the questionnaire survey was rewarded by a small present of gift-wrapped sweets, but no payments were given.

3. THE EFFECT OF LOCAL SOCIAL CONTEXT ON THE SUCCESS OF COMMUNITY-BASED CONSERVATION INTERVENTIONS

This chapter uses a systematic review and meta-analysis to objectively select and analyse past published data on CBC interventions. The analysis focuses on how project success is linked with two key factors: local social context and project engagement with social context.

3.1. Introduction

The review of the literature in Chapter 2 suggested that more attention was needed to several aspects of the social context of CBC projects. Academic reasoning has suggested multiple ways in which local social context could influence and interact with conservation projects (e.g. Berkes, 2004) and several case studies have demonstrated an influence of local culture or institutions on local people's behaviour for conservation. These influences can be either 'good' or 'bad' for conservation (compare, for example, the effect of traditional land use practices (Hume, 2006) versus strict harvesting taboos (Jones et al., 2008) in Madagascar). It has also been suggested that since conservationists often employ simplified assumptions about communities (Agrawal & Gibson, 1999) these kinds of issues are likely to be overlooked, causing at least some conservation projects to be inappropriately designed and implemented (Li, 1996). Therefore, it has been widely recommended that interventions should pay greater attention to understanding and adapting to the local social context of conservation (e.g. Brechin et al., 2002). The conceptual model presented in chapter 2 suggested some broad aspects of local social context that should be considered by planning and evaluation of conservation projects.

Although the arguments for attending to social context are persuasive, there are many other competing suggestions about how to improve CBC practice, and which approach, or package of activities, best promotes success (e.g. Adams & Hulme, 2001; McShane & Wells, 2004). These suggestions range from focusing on market integration (Salafsky et al., 2001) to providing education (Jacobson et al., 2006). Since there are so many suggestions, and so many approaches to doing CBC, better scrutiny of existing CBC conservation outcomes is essential (Saterson et al., 2004).

In the last decade, systematic reviews of evidence have been promoted as a robust and objective approach to informing policy and practice (Centre for Evidence-Based

Conservation, 2008; Roberts et al., 2006). A systematic review (SR) aims to objectively locate and synthesise the research literature that bears upon a particular question (Littell et al., 2008). Unlike a traditional review, the procedure for searching for data is specified and documented a priori, together with the aims or hypotheses of the review. The search may be useful even to highlight the absence of evidence on a particular issue. However, if the results of the SR uncover two or more primary studies, then the SR can include a meta-analysis. This is simply quantitative synthesis of data from multiple studies, which can then permit the use of statistical description and analyses of the data (Littell et al., 2008). Although SRs are thought to be relatively objective ways to locate and assess evidence, like all reviews, they cannot overcome any biased reporting (perhaps favouring success) in the original studies. SRs originated in the social sciences but have been popularised in the medical and health care fields, where they are considered one of the best ways to inform healthcare practice and policies (e.g. Petticrew, 2001). By comparison, evidence-based conservation practice has a long way to go. More systematic comparative analyses of conservation success are needed (Sutherland et al., 2004).

So far, there have been only a few quantitative comparative analyses relevant to understanding how project characters influence conservation success. There have been even fewer studies which can be defined as SRs. The only one directly relevant to CBC success was a recent review of 28 ICDPs, which focused on the role of permitting use of natural resources, better market access and more community involvement (Brooks et al., 2006). Since SRs appear a valuable but under-used way of evaluating evidence, this study will therefore use the SR procedure to focus on the role of local social context on CBC outcomes.

3.1.1. Lessons from previous reviews

Although there have been no systematic analyses focused on local social context in relation to CBC, several pieces of work provide valuable guidance as to what factors could be included in a SR of CBC outcomes. In addition to the SR of ICDPs (Brooks et al., 2006), at least two other studies have used some kind of quantitative comparative procedure to evaluate conservation project success, although their methods of selecting data mean they cannot strictly be called SRs (Salafsky et al., 2001; Struhsaker et al., 2005). A summary of the findings of these three quantitative comparative studies is presented in table 3.1.

Table 3.1 Predictors of CBC success positively identified by quantitative comparative project reviews. Studies selected as relevant are: Brooks et al. (2006) review of ICDPs; Salafsky et al. (2001) review of enterprise strategies; and Struhsaker et al. (2005) review of protected area effects. Only variables related to the topics of development or community involvement are noted from Struhsaker (neither employment benefits for the neighbouring community, conservation education, conservation clubs, nor presence and extent of ICDPs were found to be linked to conservation success). The review of Save the Tiger Fund projects by Gratwicke et al. (2007) is not included because success of projects was measured in terms of achievement of tasks as promised in project proposals: these ranged from zoo-breeding to education projects, and so did not directly assess conservation success.

Subject	Review	Subject	Specific variables	Success measure
Enterprise strategy - provision of material benefits improves success	Brooks et al.	Utilisation of natural resources allowed	Protected area type (degree of human use allowed)	Economic
	Brooks et al.	Market integration	Extent of market sales	Economic
			Extent of market purchases	Attitudinal
	Salafsky et al.	Community-based enterprise strategy	Enterprise linkage with biodiversity	Threat reduction
Community participation improves success	Brooks et al.	Community input into project design	Administrative level of the organization responsible for initial implementation of the project	Behavioural
	Salafsky et al.	Community involvement in enterprise	Local community enterprise ownership and management	Ecological threat reduction
	Salafsky et al.	Community policing	Ranking of local policing ability	Ecological threat reduction
	Brooks et al.	Community control of day-to-day decision making	Level of community involvement with respect to day-to-day decision making	Behavioural Ecological Economic
Community characteristics influence success	Salafsky et al.	Effective leadership of stakeholder group	Ranking of strength of leadership	Ecological threat reduction
	Struhsaker et al.	Low population density, low immigration	Human population density estimates for 5-km perimeter around PA	Perceived conservation (ecological) success
Non-local factors influence success	Struhsaker et al.	Government support and law enforcement	Law enforcement perceived as effective	Perceived conservation (ecological) success in PA
		International donor support	Supported in part by foreign donors	Perceived conservation (ecological) success in PA

Struhsaker et al. (2005) investigated correlates of protected area conservation success in Africa, and found support only for the role of regulation enforcement, not for the provision of employment benefits, education or ICDPs to communities adjacent to parks

(although some aspects of local social context were influential). However, this pattern may not be relevant to more community-based approaches. Brooks et al. (2006) found some aspects of ICDP success were associated with good market links and greater provision of benefits and use of natural resources. Similarly, Salafsky et al. (2001) reviewed 39 community-based enterprise projects in Asia and Pacific and found support for the hypothesis that if people can benefit financially from their natural resources, they will take action to conserve them. Both studies also found that giving people local influence or control over some aspect of the project was linked to success. Since knowledge is needed to understand the purpose of interventions, and so produce local enthusiasm and involvement in conservation (Jacobson et al., 2006), it is likely that conservation education also is a related and relevant predictor, though not focused on by those studies.

Support for the role of collaborating with local communities and gaining their support also came from a review of more than 250 'Save the Tiger Fund' projects (not focused on CBC, *per se*) (Gratwicke et al., 2007). This study also suggested poor results were associated with factors such as a lack of local capacity for management, lack of higher level political support and interventions made at an inappropriate scale. However, since its measures of success were based on project outputs (e.g. number of booklets printed) it is hard to place much confidence in its findings, despite the large sample size. SRs from the related fields focused on managing single resources: marine reserve management (Beger et al., 2004) and forestry management (Pagdee et al., 2006), have also noted that success in resource management is positively associated with increased community control, low community heterogeneity, and high local capacity for management.

Narrative reviews provide insights complementary to those of more quantitative approaches. To complement table 3.1, three major qualitative analyses are presented in table 3.2. These types of reviews support some of the factors identified by the quantitative analyses: they also suggest that market benefits and enterprise strategy can, at least sometimes, influence conservation outcomes, and there is agreement about the importance of local participation. This must therefore be accounted for in any SRs of CBC. Existing reviews have provided some useful insights into factors underlying past conservation outcomes, but no conclusive patterns have yet emerged.

Table 3.2 Predictors of CBC identified by selected qualitative reviews. Qualitative studies presented here are not exhaustive but selected as representative of discussion and recommendations presented in the literature, to compare with the three quantitative reviews presented in the previous table. Jansen *et al.* (1997) reviews 6 World Bank ICDPs in Asia, Alpert (1996) reviews 6 ICDPs in Africa whilst Newmark & Hough (2000) also have an African focus.

Subject	Review	Factors promoting success
Enterprise strategy - provision of material benefits improves success	Alpert, Jansen et al., Newmark & Hough	Opportunity to generate income from some local development e.g. tourist revenues
	Jansen et al., Newmark & Hough	Benefits appropriately and fairly distributed
	Newmark & Hough	Development activity not conflicting with conservation aims
Community participation improves success	Jansen et al.	All tiers of stakeholders involved
	Newmark & Hough	Authority devolved
Community characteristics influence success	Alpert	Remoteness
	Alpert	High local capacity to manage projects and revenue
	Alpert	Amenable local traditions
Non-local factors influence success	Jansen et al.	Local people (rather than outsiders) exert primary pressure on biodiversity, rather than outsiders
	Alpert, Jansen et al., Newmark & Hough	External policies supportive for long-term e.g. stable market access, dialogue between stakeholders allowed
Demonstrable long-term commitment improves success	Jansen et al.	Long term commitment
	Jansen et al.	Community expectations managed
	Newmark & Hough	Success takes time – project must not be assessed too early

Although many previous reviews provide some suggestion that some aspects of local social context might affect conservation outcomes, there was no clear effect and no identification of particular factors to focus on. Furthermore, many of these studies also reported problems with the quality of reporting on conservation. Any review is necessarily constrained by the type of information its original sources contain, and since social context is a topic often neglected by conservationists, it is unlikely that very detailed information about local social context will be available to code in a new SR.

This review therefore focuses on two broad aspects of local social context and project engagement with this context. Firstly, it looks closely at supportiveness of the pre-existing social context. It is often noted that the effectiveness of institutions directly related to community governance or natural resource management can provide a receptive foundation for an intervention to build upon (Thomson & Schoonmaker Freudenberger, 1997) and so these are perhaps likely to often be noted in project reports. These are called governmental institutions. Also of potential importance are

non-governmental institutions (for example, established religions), but these are less often reported. Similarly, other aspects of social context, such as local norms, history and traditions (hard to define (Jenkins, 2002) but together referred to here as culture) may also not be frequently described. Although all these various aspects of social context would ideally be analysed separately, in this review the only distinction is between governmental institutions and non-governmental institutions and culture. Furthermore, as the equitable and efficient functioning of governmental institutions linked to land tenure has received particular attention from conservationists (e.g. Linkie et al., 2008), it is separately recorded. Community homogeneity is relevant to tenure, and other governmental institutions, as it may facilitate functioning of local institutions by increasing trust between members and reducing transaction costs (Ostrom, 1990).

The second focus of this review is on a project's understanding and engagement with the local social context. It has been argued that projects which do not engage with local communities, or even conflict with local culture, would be expected to do badly, since community engagement and support is less likely (e.g. Gill, 1994; Satria et al., 2006). Conversely, attempts to engage with communities, and create or improve institutions are likely to be helpful (e.g. Berkes, 2004), as they improve local capacity for equitable management and adaptation (e.g. Botha et al., 2007). Project engagement with either governmental institutions, or non-governmental institutions and culture can be relevant to conservation outcomes. For example, failure can result when interventions make little attempt at local engagement, or even promote socially unacceptable activities (e.g. Klein et al., 2007). The methods section contains further detail about the coding of the variables describing these aspects of social context and project engagement.

3.1.2. Project outcomes

Discussions of what predicts CBC success are complicated by what is taken to mean success. For ecologists, and most conservationists, the ultimate measure of success for a conservation intervention is progress towards species or habitat conservation goals. This is the position taken by this study. However, the CBC rationale argues that conservation success is supported by positive attitudes to conservation interventions (perhaps caused by the receipt of financial benefits), and in turn by pro-conservation behaviours of the local community (Western et al., 1994). Therefore measuring local attitudes and local behaviours also becomes relevant. Many studies accordingly evaluate success based upon the views of local people towards conservation and/or the

conservation project. Evaluations of conservation behaviours are often more tricky, because many behaviours that pose a threat to natural resources are illegal and/or sensitive, so unlikely to be accurately or honestly reported to researchers (Milner-Gulland & Rowcliffe, 2007). For example, Lepp (2006) evaluated the effects of a CBC project in a rural Ugandan village by means of in-depth interviews to determine local attitudes, but speculated about effects on pro-conservation behaviours, which included treatment of primates which were officially protected but raided local crops.

For projects where economic or development benefits are provided, it is also relevant to consider the economic impacts of the project on the community. Indeed, for ICDPs, these outcomes may be equally prioritised with ecological goals (Alpert, 1996). The overall relationship between attitudes, behaviours and economic outcomes with ecological goals is shown in figure 3.1. Since conceptualised relationships between attitudes, behaviours, economic and ecological outcomes are not always found (for example, economic benefits may not lead to pro-conservation attitudes (Walpole & Goodwin, 2001), and pro-conservation attitudes may not lead to pro-conservation behaviours (Waylen et al., 2009) it is preferable to measure as many aspects of outcomes as possible.

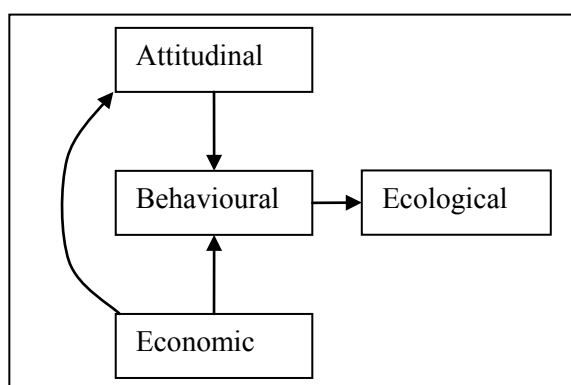


Figure 3.1 The conceptualised relationship between different types of CBC project outcomes. Further detail on attitudinal outcomes, behavioural outcomes, and economic outcomes is provided in the text. Ecological outcomes - the ultimate ecological goals of a CBC project, such as reduction in threat status for a species or reduced habitat degradation – are taken as the ultimate aim of interventions.

Unfortunately, evaluations of all these various outcomes are not consistently reported, perhaps biased either by what topics are most accessible or by researcher interests (Fox et al., 2006). Furthermore, the quality of measurement has been frequently found wanting, with reports less detailed and reliable than recommended (Stewart et al., 2005). Any reviews of CBC studies must therefore carefully assess more than one aspect of outcomes, and take into account the quality of reporting in the source studies.

3.1.3. Hypotheses

The main aim is to identify the effect of local social context on past CBC project outcomes. This is reflected in the first hypothesis, whilst the second hypothesis concerns the main factors suggested to be important predictors of success by previous quantitative studies (table 3.1).

1) Outcomes of CBC interventions are positively influenced by:

- a) a supportive local social context
- b) project engagement with local social context.

2) Outcomes of CBC interventions are positively influenced by:

- a) high levels of local participation,
- b) conservation education,
- c) market integration and benefit provision by projects.

3.2. Methods

The case studies which formed the dataset were systematically selected from the conservation literature. For each case study, variables were coded to test each hypothesis, and the results were analysed using statistics suitable for meta-analysis (Littell et al., 2008).

3.2.1. Sampling evidence

The procedure for selecting and coding information for this study was based on the established principles for SRs (Centre for Evidence-Based Conservation, 2008; Littell et al., 2008). To find case studies for review, web-based searches (of ISI Web of Knowledge, Anthropology Plus and JSTOR) were made using the search terms community based conservation, integrated conservation and development, ICDP, CBC and community conservation. As much 'grey' literature in conservation is of high quality and may be valuable for evaluating and understanding conservation success (e.g. Adams et al., 2002), the first 500 returns from the Google Scholar search engine were also screened.

Every article returned by the databases had its full text viewed if the title and abstract indicated it might meet the study inclusion criteria. About 320 sources appeared acceptable but 15 could not be viewed due to copyright restrictions. Studies were accepted if they met four criteria: (1) source quality, (2) subject, (3) outcome measurement, (4) quality of predictor measurement. First, the study had to be sourced

in the primary literature, not in reviews or other secondary evidence. Where more than one acceptable source referred to the same intervention, the most recent source was used but the older source supplied any missing information about predictors. Second, the subject of the study had to be a CBC intervention. This term was broadly interpreted, to encompass both wildlife and area-based conservation (as in Jones, 2007). However, this did not include interventions designed without conservation goals, such as ecotourism operations set up without explicit conservation aims (e.g. Wunder, 2000). Third, at least two of four outcome types had to be measured. Finally, no more than 25% missing information about predictors was acceptable. A few sources contained information on more than one intervention: each of these was accepted if it met the inclusion criteria. About 270 sources were reviewed and the final sample size was 68 case studies from 69 sources (Appendix A). Ten sources in the final sample were not peer-reviewed journal articles. There was no obvious difference between these and peer-reviewed articles in the quality or type of outcomes reported.

3.2.2. Development of coding protocol

Fifteen explanatory variables were created to describe the interventions' context and design. The researcher developed the coding protocol, informed by the protocol of Brooks et al. (2006) and tested on studies that did not qualify for inclusion. Table 3.3 lists the six variables related to the first hypothesis: three described aspects of local social context (supportive institutions, human population size, land tenure) whilst three described aspects of a project's engagement with local social context (institution building and engagement with either governmental institutions, or non-governmental institutions and culture). Table 3.4 lists the variables related to the second hypothesis: three variables related to local participation (participation in both design and implementation of intervention, and presence of charismatic individuals), one variable represented conservation education, and five related to the extent of benefit sharing and market links.

Table 3.3 Variables relevant to the first hypothesis that conservation outcomes would be positively associated with supportive local social context and project engagement with local social context. Further descriptions of these variables and their selection are in the text. Variables were coded so positive associations with outcomes indicated support for the hypothesis. Where no information was available, observations were coded 'NA'.

Variable names	Description of variables and coding
<i>1.a Local social context</i>	
supportive institutions	information on the supportiveness of non-governmental institutions (for example, a taboo on hunting a protected species) and effectiveness of governmental institutions (for example, intra-community conflicts indicate poor effectiveness); three-level ordinal variable (from unsupportive/conflicting institutions, to supportive institutions)
devolved land tenure	control and ownership of land; four-level ordinal variable from low to high community control (1: no community control, 2: mixed community and other control, 3: local but private land ownership, 4: total communal and/or community control)
human population size	population size (used as a simple indicator of community homogeneity) targeted by the conservation intervention; seven-level ordinal variable (over 50,000, 10,000-50,000, 5,000-10,000, 1,000-5,000, 500-1,000, 200-500, under 200)
<i>1.b Intervention engagement with local social context</i>	
institution building	assistance by the intervention for institution building, activities designed to create and/or improve institutions for governance or natural resource management; binary variable (no/yes)
positive approach to governmental institutions	approach of the intervention to local governmental institutions (local level organizations and formal social constraints, including constitutions, laws and enforcement); three-level ordinal score (from conflict to active engagement by an intervention)
positive approach to non-governmental institutions and culture	approach of the intervention to local non-governmental institutions (such as traditions or religion) and culture (such as widespread pride in a particular local feature) ; three-level ordinal score (from conflict to active engagement)

Table 3.4 Variables relevant to the second hypothesis which relates to other issues likely to influence conservation success. Variables relating to these issues were used as predictors of CBC intervention outcomes. Further descriptions of what they represented are in the text. Variables were ordered such that positive associations with outcomes indicated support for the relevant hypothesis. Where no information was available, a variable was coded as ‘NA’. PA=protected area, IUCN is the World Conservation Union.

Hypothesis and variable names	Description of variables and coding
2.a Community participation	
establishment local input*	community involvement in the intervention’s initial design and development; five-level ordinal score (from control only by outside NGO or other agency, to complete community control)
devolved decision control*	community control of day-to-day decision making on the intervention; three-level ordinal scale (from no community, to total community control)
charisma	presence of charismatic individuals may strengthen institutions and galvanize support for conservation (Oldfield, 2004); recorded as a binary variable (no/yes)
2.b Conservation education	
education provided	provision of conservation education to the community by the intervention; binary variable (no/yes)
2.c Benefits and market integration	
market threat	if the principal threat to biodiversity is linked to commercial market forces; binary score (no/yes)
market integration	market integration is based on a community’s involvement in wage labour, market sales, market purchases and distance from markets; three-level ordinal variable (from low to high market integration)
PA use allowed*	if an intervention is associated with a protected area, the permitted resource utilization of that area is estimated by the IUCN ranking of the area (www.iucn.org/themes/wcpa/ppa/protectedareas.htm); six-level ordinal score (from no use, to unrestricted resource use)
intervention benefits *	approach of the intervention to the generation and provision of tangible benefits for the community; seven-level ordinal variable ordered as per Brooks* (from no community use, to interventions that use a variety of approaches to benefit the community)
benefit inequity	benefits generated by the intervention were inequitably distributed; binary variable (yes/no)

*Where possible, to facilitate comparison, variables and ordered categories were coded as in Brooks et al. (2006). These variables are marked * and their labels correspond with Brooks: establishment local input = implementation, devolved decision control= decision, PA use allowed = IUCN, intervention benefits = use.

To maximise ability to detect effects on outcomes, four distinct measures of intervention success were used, although the ultimate measure of success was regarded as progress towards species or habitat conservation goals, the ecological outcome. Although any one outcome type was not expected to be a complete proxy for another, success in any one aspect may be a useful proxy for indicator of unreported outcome types, as well as facilitating comparison with other work. The quality of measurement of outcomes was also recorded. Table 3.5 describes the four outcome variables.

Table 3.5 Variables used as indicators of outcomes of community-based conservation interventions, together with descriptions of what they represent. Quality of reporting of outcome variables was also recorded and showed no effect on level of success reported. Where no information was available, a variable was coded as 'NA'. To qualify for inclusion each case study required a minimum of two or more outcome variables to be reported. Although examples of success and failure are provided here, assessments of failure or success were based on judgements made by each source, not by the coder.

Outcome variable	Description of variable and coding
attitudinal	local attitudes towards the conservation intervention and conservation activities; three-level ordinal variable, ordered from failure (e.g. no changed attitudes and even creation of negative attitudes), mixed effects (e.g. some evidence of positive attitudes or changed attitudes in a few), to success (e.g. significant positive attitudes in the population)
behavioural	local behaviours of interest to conservation (either avoidance or alteration of destructive behaviours and/or adoption of new pro-conservation behaviours); three-level ordinal variable, ordered from failure (e.g. no behavioural change), mixed effect (e.g. a few or limited behavioural changes) to success (e.g. significant change of behaviour and/or change in the majority of the community)
ecological	ecological outcomes of interest to conservation (either species or area-based, depending on intervention goals); three level ordinal variable, ordered from failure (e.g. decline or no improvement in ecological status), mixed effects, to success (e.g. improvement in populations of interest, or improved habitat diversity)
economic	local economic outcomes influenced by the project, including community level developmental benefits; three level ordinal variable, ordered from failure (e.g. failure to improve income of any participants, or failure to provide community-level benefits) to mixed effects, to success (e.g. significant improvement in income of majority of community)

No review can guarantee to be immune from bias. Bias arises for three reasons: (1) bias in the type of projects reported (2) bias within reports of projects, and (3) bias introduced by the reviewers. The first two types of bias are hard to tackle. Although this study used an unbiased systematic search of case studies, if there is bias in what case studies are reported (i.e. to success stories) and the reporting itself is incomplete or biased, then the review will reflect this (Littell et al., 2008). In this study the distribution of projects results was not overly biased to positive results, but there is no

way of knowing if this reflects the true distribution of project outcomes. Authors may also vary in how they define failure and success. For example, one source might report long term sustainability of livelihoods as economic success, whereas another might report limited short term financial benefits as success. However, since layering the researcher's judgement on top of the judgement of the original authors only adds to subjectivity, this study coded outcome variables based on the judgement of the source paper, not the researcher's views.

Although biased reporting is hard to tackle, there are strategies to limit bias introduced by the reviewers. The poor quality of much reporting, combined with the qualitative nature of many of the variables of interest, makes coding of many variables more likely to be a subjective process. To minimise any potential effects from coder-bias, coding was cross-checked by a second researcher, and outcome variables were coded separately. The researcher and an undergraduate student (M.Rack) coded the same twenty-five studies separately, and their inter-coder reliability was assessed by calculating Cohen's Kappa with the 'irr' package (Gamer et al., 2008) in R version 2.6.0 (R Development Core Team, 2007). Cohen's Kappa was used to represent the proportion of agreement after accounting for the level of agreement expected by chance when coding categorical data (Cohen, 1960), and Cohen's weighted Kappa for ordinal data (Cohen, 1968; Siegel & Castellan, 1988).

The first version of the coding protocol showed moderate agreement for the fifteen predictors (mean $\kappa = 0.52$) and four outcomes (mean $\kappa = 0.41$). However, a few predictors and outcomes had very poor reliability (minimum $\kappa = 0.12$). There tended to be less reliability with poorly described non-numeric variables, which required subjective interpretation by the coder, so the protocol was revised and expanded for these variables. When rewriting the protocol did not improve reliability, or where variables were dependent on infrequently reported data, the variables were removed from the study. For this reason, only certain aspects of social context could be coded, some of which were relatively broad (e.g. supportive local institutions). Community heterogeneity is thought to significantly impede local conservation management (Agrawal & Gibson, 1999) but could only be indicated through a proxy of community homogeneity, namely community size.

Based on the revised coding protocol, all sixty-eight studies were recoded. Categorization of all variables was ordered so that positive associations between

predictors and outcomes indicated support for the hypotheses. In addition, the quality of measurement of each outcome was coded, on a three-level ordinal scale from low to high, to check outcomes reported were not biased by the quality of the reporting. There were no associations between measurement quality and level of success recorded, so all 68 case studies were retained for analysis.

3.2.3. Analysis of predictors and outcomes

The analysis of each two-way association between predictor and outcomes followed the precedent of Brooks et al. (2006). For each two-dimensional table, the degree of association was indicated by the Goodman-Kruskal gamma statistic (Goodman & Kruskal, 1954). This test makes use of ordering within variables (it represents the difference between frequencies of concordant and discordant pairs of observations) so information is not lost as it would be, say, in a χ^2 or Fisher Test, but is more appropriate than Spearman Rho correlations where there are many ties (Siegel & Castellan, 1988). Gamma lies in the range -1, +1, and the variables were coded in such a way that positive gamma values indicated support for the hypotheses.

For each test statistic a p-value was calculated using the Monte Carlo method, which is appropriate for small or heavily tied data sets (Agresti, 2002). For each observed table, 5000 random tables were generated based on the assumption of predictor and outcome being independent but with the same row and column sums. For every random table, a gamma was generated and stored. The p-value was calculated as the proportion of those 5000 random gamma statistics that were larger than or equal to the observed gamma (one-sided as the hypotheses are directional).

Running multiple statistical tests raises the likelihood of accepting spurious associations as significant. Since 15 predictors and 4 outcome measures were used to generate 60 observed tables and test statistics, this was a potential problem. The false discovery rate was controlled using the procedure of Benjamini & Hochberg (1995), generating a q-value to replace each p-value, using the 'qvalue' package in R, based on the algorithms of Storey (2002), as per the procedure in Brooks et al. (2006).

Based on conceptual links between predictors, it was expected that some of the predictors would covary. For example, projects which demonstrate greater adaptation and engagement with local culture may also have greater community involvement in decision making. Therefore, for each pair of predictors a Goodman-Kruskal gamma and

Monte Carlo p-value were generated. In order to identify all possible covariance (rather than conservatively test hypotheses) these were not replaced with q-values.

The structure of significant predictors was also examined using a Categorical Principal Components Analysis (catPCA) in SPSS 17.0 (SPSS Incorporated, 2008b). The procedure reduces the dimensionality of the data into principal components (PCs), and the loading of each predictor onto each PC indicates its contribution. PCs were retained if they accounted for significant variance in the predictors, by selecting those with Eigenvalues over 1. Missing observations were ignored in forming the optimal scaling of each variable, but were still used to scale other variables (Gifi, 1990).

3.3. Results

The final data set contained 68 case studies listed in Appendix A. Fifty of the articles were in peer-reviewed journal publications, one was a thesis, two were conference papers, and fifteen were from NGO reports or NGO serial publication. Publication dates of articles ranged from 1988 to 2007.

3.3.1. Project descriptions

Projects came from 31 different countries and the largest single region represented was the African tropics (figure 3.2). The earliest project began in 1976, and the latest in 2000: the shortest period of time between project launch and review was only 2 years, but the maximum period was 21 years, with a mean of 9.7 years. Project age has been suggested to affect outcomes, with a minimum amount of time considered essential for developing success (e.g. Baral et al., 2007; Sanjayan et al., 1997), but this study found no relationship between age and any of the four outcomes.

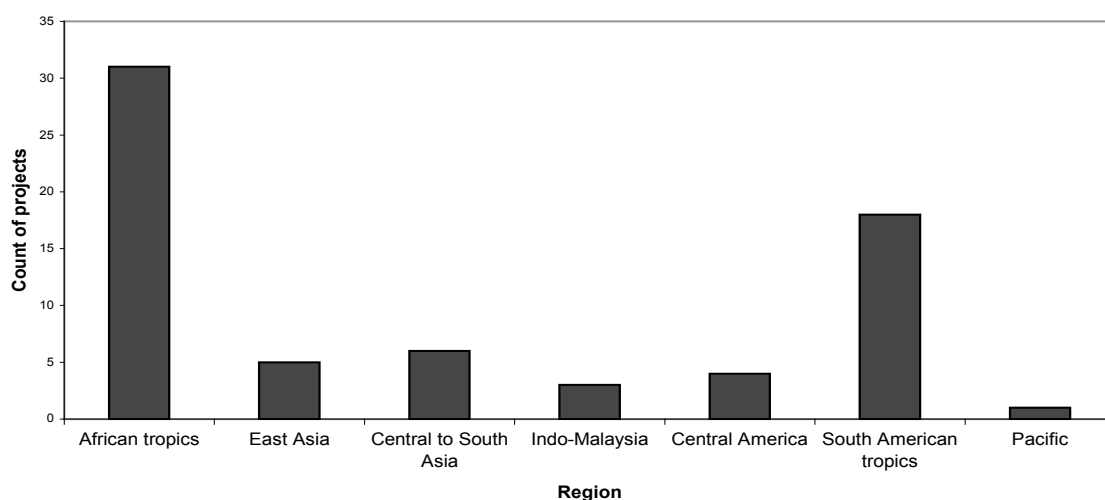


Figure 3.2 Geographical distribution of projects included in this review, N=68

The majority of projects (N=51) were associated in some way with a protected area, forty-five projects had a focus on habitat conservation (e.g. Stocking & Perkin, 1992), and twenty-two an approach focused on a species (e.g. Zhang & Wang, 2003), or group thereof (one project could not be classified). Although many projects did not define themselves as ICDPs, the majority (58) were involved in the distribution of one or more form of benefits to the community: 25 provided compensation in the form of infrastructure or cash to benefit the community, 17 provided alternative livelihoods, and 42 provided assistance in accessing markets.

3.3.2. Predictor and outcome associations

As every study contained missing information, the effective sample size for each test varied from 27 (for the association of human population size and attitudes) to 64 (for the association of several predictors with economic outcomes). Of the 60 tests generated by exploring the effect of 15 predictors on 4 outcomes, 20 were associated with q-values under 0.05 and accepted as significant (table 3.6). Control with q-values means only one of these significant tests is expected to be a null case, compared to three had p-values been used. All the significant associations were positive and so support the direction of the predictions of the hypotheses.

All outcomes were associated with at least one aspect of social context. Supportive institutions predicted successful behavioural and ecological outcomes, whilst devolved land tenure predicted successful attitudinal and economic outcomes. In contrast, human population size had no effect. There was a strong effect of a project's engagement with social context. Both institution building and engagement with non-governmental institutions and culture predicted success in all four outcome types, whilst engagement with governmental institutions predicted success in all but economic outcomes.

Four other predictors were associated with outcomes. Successful attitudinal and economic outcomes were predicted by community control of day-to-day decision making (but not community involvement in the establishment of the intervention, or charismatic individuals), giving some support to the participation hypothesis. Projects delivering conservation education were positively linked with successful attitudinal outcomes. Finally, protected area use and increased market integration had positive associations with outcomes (behaviour and economics), but there was no association with market integration, benefits generated by the intervention, nor benefit inequity.

Table 3.6 The associations between predictors (described in table 3.3 and table 3.4) and the four outcome types (described in table 3.5 and shown in each of the four columns). There were no significant negative associations. The association is measured by Goodman-Kruskal gamma statistics, where gammas over zero indicate positive associations supporting the hypotheses. Gamma values are shown, followed by sample size in brackets. Asterisks indicate significant associations as measured by q-values (q-values replace p-values to control for the false discovery rate): q<0.05 *, q<0.01 **, q<0.001 ***. NS= non-significant association. Tests where p<0.05 but q>0.05 are shown by the 'p' symbol; these would have been accepted if conventional p-values were used. PA=protected area.

Hypothesis	Predictor	Outcome measure			
		Attitudinal	Behavioural	Ecological	Economic
1.a Local social context	supportive institutions	0.21 (52) NS	0.58 (56) **	0.55 (41) *	0.28 (64) NS
	devolved land tenure	0.53 (46) **	0.22 (46) NS	0.03 (31) NS	0.46 (53) *
	human population size	0.36 (30) NS	0.46 (34) NS	-0.46 (27)NS	0.42 (37) NS
1.b Intervention engagement with local social context	institution building	0.58 (52) *	0.45 (56) *	0.51 (41) *	0.43 (65) *
	positive approach to governmental institutions	0.56 (59) **	0.44 (56) *	0.58 (41) *	0.31 (54) p
	positive approach to non-governmental institutions and culture	0.47 (52) *	0.50 (56) *	0.83 (41) *	0.68 (64) **
2.a Community participation	establishment local input	0.11 (50) NS	0.24 (54) NS	0.27 (38) NS	0.10 (62) NS
	devolved decision control	0.47 (51) **	0.32 (55) p	0.18 (40) NS	0.50 (63) *
	charisma	-0.49 (52)NS	-0.07 (56)NS	-0.20 (41)NS	-0.14 (64)NS
2.b Conservation education	education provided	0.39 (52) *	0.26 (56) NS	0.41 (41) NS	0.25 (64)-NS
2.c Benefits and market integration	market threat	0.29 (50) NS	0.34 (52) *	0.21 (37) NS	0.25 (58) NS
	market integration	0.17 (47) NS	-0.15 (49)NS	-0.66 (35)NS	0.13 (56) NS
	PA use allowed	0.29 (44) NS	0.06 (44) NS	0.17 (30) NS	0.63 (50) **
	approach to use	0.17 (51) NS	0.01 (55) NS	0.12 (41) NS	0.22 (63) NS
	Benefit inequity	0.47 (52) NS	0.66 (56) NS	0.46 (41) NS	0.54 (64) NS

3.3.3. Associations between predictors

There were 17 significant associations between the 9 significant predictor variables. The associations are conceptually plausible, for example, interventions that engaged with local governmental institutions were more likely also to show engagement with non-governmental institutions ($N=68$, $\gamma=0.46$, $p<0.05$). There were no strong associations (mean $\gamma=0.45$) so no predictor's effect was completely subsumed by the effect of another. The pattern of associations was confirmed by examination of the predictors using CatPCA (table 3.7). All variables relating to social context and project engagement made a strong contribution to the first component. Although protected area use also contributed to the first component, the variables representing market-linked threats and conservation education did not. Conservation education was the sole strong contributor to the second component, whilst the third component was positively linked to market threats and protected area use, and negatively with project engagement with governmental institutions.

This suggests that linkages between groups of variables are between those that relate to similar issues. This is not surprising, conceptually: for example, it is likely that where project have greater participation from local people, the implementation of the project tends to reflect their views and values. Since the social variables largely correlate with each other, this suggests their association with outcomes is not explained away by any of the other variables measured here.

Table 3.7 Loading of each predictor onto the principal components (PCs) derived from reducing the dimensionality of the nine significant predictors with a categorical PCA (Gifi, 1990). The variance of the predictors captured by the first 3 PCs cannot be exactly derived, but are indicated by Eigenvalues of 2.73, 1.575 and 1.268 (only PCs with Eigenvalues over 1 selected for analysis). The strength of each variable's contribution to the component is indicated by shading: light shading highlights those values with a magnitude between 0.5 and 0.64, and heavy shading those values between 0.65 and 1.

Hypothesis	Predictor	PC 1	PC 2	PC 3
1.a Social context	supportive institutions	0.546	-0.256	-0.221
	devolved land tenure	0.553	-0.324	-0.161
1.b Intervention engagement with social context	institution building	0.658	-0.171	-0.170
	positive approach to governmental institutions	0.529	0.312	-0.504
	positive approach to non-governmental institutions and culture	0.504	0.453	-0.362
2.a Participation	devolved decision control	0.780	-0.376	0.236
2.b Conservation education	education provided	0.176	0.851	-0.024
2.c Benefits and market integration	PA use allowed	0.610	0.011	0.573
	market threat	0.384	0.455	0.628

3.4. Discussion

There is clear support for the first hypothesis, that the outcomes of conservation interventions are positively affected by supportive social context and engagement with local social context. This study also provides limited support for the previously highlighted roles of local participation, conservation education, benefit provision and market integration.

3.4.1. Local social context

All four measures of intervention success were affected either by the level of community tenure (attitudes and economics), or by the effectiveness of other community institutions (behaviour and ecology). This supports the hypothesis that a supportive social context significantly influences intervention outcomes. For example, effective governing institutions enable successful and equitable control of community activities and responsibilities, whilst local control of land tenure promotes individual security and concern for resources (Noss, 1997). Similarly, some resources receive protection from directly supportive non-governmental institutions such as traditional beliefs and taboos (e.g. Colding & Folke, 1997; Madden, 2004) but when these conflict with conservation goals (for example, a traditional preference for meat) they can significantly contribute to species declines (e.g. Wiles et al., 1997).

All measures of intervention success were affected by two or three of the variables indicating whether an intervention had adjusted and engaged with local social context. This is good support for the hypothesis that conservation interventions are more successful if they understand and respond to local social context. However the aspects of social context recorded in this study mainly relate to the aspect of local institutions, since these were mentioned more often than other aspects such as local culture. Future work better investigating culture, not just institutions, would be valuable.

However, there were many interventions where cultural sensitivity was evident. For example, in Guyana, *Arapaima gigas* fish are the subject of many beliefs, folklore and taboos in traditional Makushi culture. Although taboos had become ignored, a partnership of local communities and national NGOs succeeded in influencing social norms so that informal social pressure made it unacceptable to overfish (Fernandes, 2006). Equally, there are examples where lack of engagement with culture has caused problems. A management plan for Ambohitanelo Special Reserve in Madagascar made no mention of traditional village-level institutions. The NGO involved unwittingly

suggested cooperation that cut across traditional frameworks for reciprocal work, conflicted with local land tenure and inflamed existing disputes (Klein et al., 2007).

Regrettably, there is no ‘one size fits all’ response to ensure that future interventions can better understand and adapt to a community’s institutions and culture. However, it is very likely that participation will help. Commentators agree that inadequate engagement with the perspectives and values of local or indigenous people (Sharpe, 1998) can produce interventions that are alien or incomprehensible to local people (Pujadas & Castillo, 2007).

Capacity building was also useful. For example, the success of Ngarambe Natural Resource Management Programme partially depended on its provision of training (in bookkeeping, transparent management of funds, roles and responsibilities of village government and patrolling) which assisted and supported village management of a hunting quota (Alcorn et al., 2002). These approaches should be ideally based in a society’s existing rules and organizations (Ostrom, 1990). However, this is neither easy to do, nor an assurance of what may be regarded as equitable outcomes by outsiders; for example, many traditional societies marginalize women (e.g. Watts, 2008). Literature from the fields of common property and development suggests that shaping equitable and effective institutions at the community level may take about a decade (Berkes, 2004). However, investing in local capacity building projects is likely to be particularly important for maintaining any favourable outcomes in the long-term, when external interventions and donor support is removed (Bradshaw, 2003).

3.4.2. Participation and education

The results give some support to the argument that greater community participation is associated with intervention success. Although devolving intervention design was not associated with success, community control of decision making during implementation influenced both attitudinal and economic outcomes. Furthermore, there were several associations between variables for participation and engagement with local culture. This provides some support for the claims in literature (e.g. Western et al., 1994), the SRs of related topics (e.g. Brooks et al., 2006; Salafsky et al., 2001), and more qualitative reviews (e.g. Newmark & Hough, 2000; Sanjayan et al., 1997). Unfortunately, participation often falls short of the ideal, both in planning (Goldman 2003) and implementation (e.g. Musumali et al., 2007). So, efforts should continue to facilitate community participation in conservation, perhaps requiring a further change in

the mind-set of practitioners involved, to appreciate other cultural views and ways of doing (Blaikie, 1995).

However, it is important to note that participation is not a 'silver bullet', whereby utopia is assured if communities have complete control (Adams & Hulme, 2001). For example, a participatory decentralized forest management intervention in Tanzania gave good ecological outcomes but inequitable social outcomes, as resources and power were controlled by local elites (Friis & Treue, 2008). Many interventions have fared worse. Generally, the distribution of authority across multiple institutions and levels may often be appropriate (Barrett et al., 2001) but exactly when and how it is appropriate to devolve power will depend on the effectiveness of existing institutions (Borgerhoff Mulder & Coppolillo, 2005). Furthermore, participation did not predict behavioural and ecological outcomes, which are arguably the ultimate goal of conservation interventions.

There was some support for the role of community outreach and education, as projects providing this were more likely to successfully change attitudes than those that did not. This supports the argument that giving information to people will persuade them to become concerned about nature (Jacobson et al., 2006). Education was the only variable which has little association with other variables representing aspects of project approach and social context, suggesting that education campaigns can be implemented independent of whether a project engages with local culture, or attempts to encourage local participation. However conservation education had no effect on the other three measures of intervention success, so if implemented alone, it may have limited effects on conservation project goals. This suggests interventions must address other drivers and constraints on behaviours before local participation and education can become linked with the ultimate measures of conservation success.

3.4.3. Benefits and market integration

Success was not predicted by interventions that had made greater efforts to provide communities with economic and practical benefits, nor equitable delivery of benefits. However, interventions associated with protected areas that allowed community use tended to do better than those that did not. This supports the idea that giving people use and control over natural resources encourages their concern for conservation of those resources. Similarly, market integration did not predict any outcomes, but an intervention where threat was in some way linked to commercial markets was more

likely to generate pro-conservation behaviours. Resource users driven by commercial forces may have greater ability to switch behaviours than users driven by subsistence needs. These mixed findings do not provide strong support for the hypothesis that benefit provision and market access can be important determinants of intervention success. This contrasts with previous reviews which supported the role of market access and benefit provision (Brooks et al., 2006; Salafsky et al., 2001). In contrast to those studies, this study encompassed interventions that did not have strong development objectives: the implication may be that interventions asserting development goals must deliver practical benefits in order to motivate conservation support, whilst benefit delivery is less critical to interventions that do not emphasise development objectives. Mixed support for this argument may also reflect that commercialization, market access and access to technology can also lessen the sustainability of resource exploitation, depending on the context.

3.4.4. Relationships between outcomes

This study was not designed to investigate the relationship between different aspects of intervention success. However it is worth noting that the four aspects of success did not perfectly correlate. To some extent this is not surprising: for example, it is well known that attitudes often do not directly correspond with behaviours (e.g. Holmes, 2003a; Waylen et al., 2009). However, it is particularly notable that none of the ecological (and ultimate) measures of success were correlated with any of the predictors under the second hypothesis. This may highlight the need for a supportive social context for conservation, before any other factors can influence conservation goals.

It is possible that the passage of time may improve links between outcome types; it may take time for a project to influence positive attitudes, and then for behaviours to translate into ecological outcomes (Sanjayan et al., 1997). For example, an ICDP in Sarawak was found to change attitudes and behaviours but had only limited effects on ecological outcomes (Horowitz, 1998): it is possible that later monitoring at this site may find the ecological situation improved. It is important to do such follow up studies, to determine if and when it is worth tracking attitudes, behaviours and economic outcomes, if ecological outcomes are seen as the ultimate goal. It is likely that quite different influences and constraints operate on each outcome type, and it is critical to understand when one outcome type may or may not influence another. For example,

pro-conservation attitudes are irrelevant if livelihood constraints make it impossible to express pro-conservation behaviour.

There are also implications for the reporting of CBC projects. Studies that report only on one aspect of success cannot assume it translates into other aspects of success. Reporting on progress to conservation goals is needed, such as population status of a species to be protected, rather than reporting based on short term project outputs, such as number of education booklets produced (Kapos et al., 2009).

3.4.5. Systematic reviews in conservation

SRs can provide a useful approach to evaluating conservation evidence to inform debates in the conservation literature. Future reviews based upon larger sample sizes will be able to offer firmer conclusions and probe more complex topics. In addition, it would be useful to study many other topics, such as the effect of external shocks or political instability (e.g. Glew & Hudson, 2007).

However, all reviews are limited by their original sources, and the sample size of this study is small, though large compared to similar studies (e.g. Brooks et al., 2006). This study concurs with the many calls for more monitoring and reporting in conservation (e.g. Saterson et al., 2004; Sutherland et al., 2004). The poor quality of data that is available further hinders analysis and restricts the strength and subtlety of conclusions that can be made based on it (Wolman, 2006). Reporting must also be of higher quality, for some of the papers viewed omitted to describe even basic details, such as project start-date (such poor quality descriptions were not included in this study).

These problems can be tackled by careful planning so that monitoring is an integral part of implementation (Nichols & Williams, 2006). One sustainable and low cost way to improve the frequency and sustainability of monitoring required to generate information may be to involve local people in the process (Danielsen et al., 2005). However, whoever is reporting, there must be some reliable means of assessing project outcomes (Salafsky & Margoluis, 1999), as every paper presents a version of reality constructed to convince a reader, and there is probably a general tendency to under report failure (Knight, 2006).

Even if conservation evidence is provided in greater quality and quantity, SRs may be well complemented by traditional reviews. Certain types of data, that require subjective interpretation, are problematic to code for a SR. And, even if a protocol can be revised repeatedly, individual coding decisions may still differ. Furthermore, chains of

causality between relevant variables are likely to be multiple and complex. At this time the conservation literature does not permit the creation of the large datasets needed to build the complex statistical models required to analyze these interactions quantitatively, though Bayesian methods may help (Ellison, 1996). In such situations, the strengths of traditional reviews (Baumeister & Leary, 1997) – which can incorporate expert knowledge, exploit the richness of narrative content and untangle complex patterns of causality – make them powerful complements to systematic approaches.

3.4.6. Conclusion

This study provides clear support for the arguments that conservation (and hence conservationists) needs a better understanding of and adjustment to the ‘community’ in community-based conservation (e.g. Spiteri & Nepal, 2006). There was more evidence to support this than to support the argument that success depends on economic benefits or market links. This is an important and controversial finding that requires further investigation. A more fine-grained analysis of the role of different aspects of community institutions and cultural factors would be useful for understanding exactly how conservation practice should be modified.

It is not easy to promote understanding and appreciation of local social context, although local participation is likely to be a mutually supportive goal. However it is necessary to try, as so far the reluctance to view conservation as a social and political process has led to many failures (Brechin et al., 2002). Conservation practitioners need to better embrace expertise from the social sciences and development sector, which have been confronting these challenges for much longer than conservation (Campbell & Vainio-Mattila, 2003). The social context of conservation matters – but recognizing this will be easier than deciding how to respond.

4. THE INFLUENCE OF BUDDHIST ECOLOGICAL TEACHINGS ON ENVIRONMENTAL VIEWS AND BEHAVIOURS IN KALMYKIA, RUSSIA

The previous chapter analysed past CBC projects to demonstrate that engaging with local culture improves the chance of successful conservation outcomes. Building on this finding, this chapter looks closely into one case study set in the Republic of Kalmykia, a poor part of Russia, with several environmental problems. A series of semi-structured interviews was used to probe whether an intervention linked to religious teachings could have meaningful influence on pro-environmental views and behaviours.

4.1. Introduction

Although it is thought that past CBC projects have often employed simplistic conceptions of all aspects of community, the cultural aspects of local life are perhaps most likely to be overlooked (Spiteri & Nepal, 2006). The aspects defined here as ‘culture’ are interrelated and hard to classify – they include history, religion, traditions, informal social norms – which may be one reason why they receive less attention. For example, historic aspects have often been overlooked (Berkes, 2009). Even a very recent extensive framework designed to evaluate conservation activities (Kapos et al., 2008) only once mentions “social capital” (a concept which captures some these facets). Culture can also be perceived as irrelevant to conservation, even when economic factors and governmental institutions are appreciated for their direct critical influence on natural resource use and management (Peterson et al., 2009). However, Chapter 3 indicated that conservation outcomes are influenced by not only governmental institutions but also by the supportiveness of non-governmental institutions and culture.

Why might culture influence conservation outcomes? Much existing discussion of cultural influences has focused on taboos or norms that directly influence treatment and use of natural resources (Colding & Folke, 2001). For example, in eastern Madagascar, a mixture of strict taboos and social norms about harvesting behaviour has provided valuable protection for several threatened species, including some with economic value (Jones et al., 2008). Such motivations can have both ‘good’ and ‘bad’ implications for resource use: for example, in South Africa the pursuit of hornbills for use in medicine and sacred rites is a significant threat to hornbill populations (Coetzee, 2009). However, culture does not have to link with resource-use rules for it to be influential.

Societies vary not only in how they conceptualise the relationship between people and nature (Nash, 1989), but also in how they understand responsibilities, relationships and exchanges with others (Berry et al., 1997). Since every conservation initiative is concerned with nature, and in taking actions that encourage people to adopt pro-environmental behaviours, these issues of culture are therefore likely to be important to the practice of conservation. However, given that CBC is often practiced in a very different context to the background of conservationists (Fazey et al., 2005), it is very likely there often great differences in cultural backgrounds of conservationists and the societies they work in. Understanding the difference in points of view can be very challenging. However since underestimating cultural differences can mean conservation efforts are poorly received – as in the legacy of mutual dissatisfaction and disappointment felt by local and outsiders at an intervention in Papua New Guinea (West, 2006) – understanding culture is at least sometimes of crucial importance.

Religion is one aspect of culture for which there is growing interest in its links with conservation behaviours (religion can also be classed as a non-governmental institution, usually with both formal and informal features). Documents such as WWF's 'Beyond Belief' (Dudley et al., 2005) and collaborations such as that between World Bank and ARC (Alliance of Religions for Conservation), demonstrate emerging mainstream recognition for the potential positive role of religion. This study does not take the position that any religion is inherently 'good' or 'bad' for the environment. For example, Christians who literally interpret the bible may have less concern for the environment for its own sake (Schultz et al., 2000) whereas other Christians see it as their duty to care for 'God's creation' (A Rocha, 2007).

Both in the developed and developing world, links between ecological messages and religious precepts are thought to have tremendous potential to influence the behaviours of believers (ARC, 2009). Some argue that it is one of the primary motivators of behaviours, regardless of location or economic circumstances (Rappaport, 1999). For example, at the Misali island of Tanzania, attempts to reduce coral reef degradation through environmental education and top-down regulation were unsuccessful, until the issue was incorporated into Islamic teachings (Furniss, 2007).

If conservationists engage with local religion, it offers a very powerful way to influence behaviours for conservation. Approaches building on this aspect of culture could be particularly attractive if they can work even when there are short-term economic

motivations not to conserve natural resources or engage in other pro-environmental behaviour. Since religious beliefs are both motivating and relatively enduring (Ano & Vasconcelles, 2005), they may offer a relatively sustainable way to foster conservation support.

This study focuses on probing the effect of an intervention that aimed to promote conservation behaviours solely through links with local religion, without using any practical motivations or other interventions to encourage change. The intervention is a set of special pro-ecological teachings by the ‘Dharma Centre’, a Buddhist teaching centre in the little known Republic of Kalmykia, within the Russian Federation. As an ex-Soviet society trying to reincorporate elements of its ethnic Mongolian past, the cultural context of this work is particularly intriguing and likely very different to the West.

4.1.1. A conservation intervention based on Buddhist teachings

In 2007 a Darwin Initiative project funded the Dharma Centre to carry out some teachings that would contain an ecological or pro-environmental element, and specifically promote conservation of saigas (Darwin Initiative, 2009). The saiga antelope (*Saiga tatarica tatarica*) is a Critically Endangered antelope native to the steppe in Kalmykia, Kazakhstan and Mongolia (Mallon, 2008).

Buddhism certainly has the potential to be linked with pro-environmental issues. This is how its philosophy is often interpreted in the West, where eastern religions are often assumed to promote a sense of harmony between humans and nature (Eckel, 1998). In particular, the concept of karma is invoked to show all life forms are linked, since through reincarnation any animal could be a relative from a former life. Furthermore, the actions of Buddhist institutions linked to communities have sometimes shown to support conservation outcomes: the creation of a successful community management of a mangrove in Thailand was greatly supported by the local Buddhist temple (Senyk, 2006), and the white-eared pheasant is fed and protected near Buddhist temples in West Sichuan (World Pheasant Association, 2007). However, the Western interpretation of Buddhism as good for the environment is not unproblematic. Buddhism’s effect is rather more likely to depend upon interpretation. For example, if it encourages detachment from surroundings and suffering, this can be interpreted to mean we should not care for suffering of others, or other life forms (Harris, 1994). Furthermore, evidence of treatment of the environment from Tibet – whose Lamaist form of

Buddhism is also followed in Kalmykia – is equivocal. For example, resource accumulation is encouraged, but at the household and temple level rather than at an individual level (Mills, 2007a). Land use practices were certainly influenced by religious beliefs (Mills, 2007b) but they were not inherently pro-conservation. Therefore, this study does not assume Buddhism to be either ‘good’ or ‘bad’ for the environment. However, Buddhist-ecological teachings are expected to have some kind of effect on those who are already faithful Buddhist believers.

Probing the effects of the Dharma Centre’s teachings represents an opportunity to explore if linking pro-environmental messages to religious teachings can have any tangible influence on views and behaviours relevant to conservation. Prior to the intervention, monks from the centre would pray and teach about Buddhism with lay people both in the capital town (Elista) and a village called Orgakin about 30-40 minutes away. The Darwin funding encouraged them to build on these teachings to incorporate a specifically pro-ecological (and pro-saiga) element. In particular they printed and distributed special booklets dedicated to the subject of Buddhism and the environment, containing prayers as well as some description of why Buddhists should care for the environment. There is no documented record of exactly what was delivered in the teachings, but the leader of the Centre, Baatyr Kondratevich, describes the general message of the special teachings as care for the environment being integral to Buddhist practice. There have also been some other activities such as lectures in schools, a school trip to a saiga breeding centre, and special festivities on traditional holidays. The teachings are based in Lamaist Buddhism but incorporate some elements of distinct Kalmyk beliefs – particularly a belief in a ‘White Old Man’ (WOM). The WOM is a feature of prebuddhist Shamanism specific to the Mongols and traditionally incorporated into Lamaism in Kalmykia and Mongolia (Walter & Fridman, 2004). In the Dharma Centre’s teachings he is described as specially associated with saiga and the Kalmyk people. It is not known what effect, if any, these teachings about Buddhism and the WOM have had on pro-environmental views and behaviours. As saiga are a particular feature of the teachings, and sometimes specially linked to Kalmyk culture, they were a key focus of this study. However, as Kalmykia experiences many other environmental problems, and saiga are rarely seen in Orgakin, the research also focused on other environmental problems perceived by respondents, and how they thought these problems could be tackled. Some of these problems are interrelated, and all are connected to the history of Kalymkia, and its place within Russia.

4.1.2. Study site and environmental problems

The Republic of Kalmykia is located between Dagestan and Volgograd within the Russian Federation (figure 4.1). There is a relatively small human population of about 300,000, of which one third live in the capital Elista, so it is a predominantly rural territory. Its status as one of the twenty-one republics of the Russian Federation gives it rights to its own language and constitution, and it proudly identifies itself as the only Buddhist nation in Europe. However, Kalmykia's present situation has very much depended on its relationship with Russia, and centralised policies and planning.



Figure 4.1 Location of the Republic of Kalmykia taken from Grin (2000).

Kalmykia has been an administrative unit of the Russian empire since the mid 17th century. The early Kalmyks were a subset of Mongol tribes in the East, and as such they continued to follow their traditional way of life (pastoral nomadism) and culture, which included faith in Gelukpa Lamaist Buddhism (Guchinova, 2006). They were forced to abandon nomadism around the time of the revolution, but the gradual adjustment to collective farming was abruptly halted when they were later accused of treason by Stalin, and deported to Siberia in 1943. Their language, traditions and religion were prohibited, as for many other ethnic peoples in the Soviet Union. In 1957 they were allowed to return to Kalmykia, which was given the status of Autonomous Republic, a status awarded to ethnically-distinct areas. However, this status did not allow any freedom to express distinct ethnic or religious practices, and by that time the

territory was also settled by ethnic Russians. By the 1980s the area appeared socially very similar to other rural territories within Russia (Grin, 2000).

In 1987 the Soviet leader Mikhail Gorbachev introduced a series of economic and political reforms, termed 'perestroika'. The era of perestroika accompanied new religious and political freedoms ('Glasnost'), and since the 1990s there has therefore been a resurgent pride in Kalmyk culture (Guchinova, 2005). This was particularly expressed by a growing enthusiasm for Buddhism. The Dharma Centre was set up in Elista in the 1990s, two large temples were built in and near the city centre, and the Dalai Lama has visited the country. However the eventual dissolution of the Soviet Union in 1991 led to a decline in security and standard of living for many Russians (Gleason, 2009). Rural areas, including Kalmykia, suffered badly from the lack of state support and subsidy (O'Brien & Wegren, 2002). It was nearly impossible for the collective farming system to remain viable, and many rural people pursued whatever strategy they could, legal or illegal, to meet their basic needs. Since that time economic stability within the Russian Federation has greatly improved and Russian GDP is now about US\$15,800 per capita (CIA, 2009). The situation is not nearly as desperate as in the 1990s. However there are still relatively few livelihood opportunities in rural areas, and so Kalmykia is poor relative to much of the rest of Russia. In 2005, more than 60% of inhabitants were thought to be living beneath the Russian subsistence level (UNDP, 2007) and there was net emigration to urban centres such as Moscow (Russian Federal Service of State Statistics, 2002).

The poverty of rural Kalmykia, post-perestroika, was linked with the decline of the saiga antelope. Saigas can provide both meat and horns, but the horns are particularly valuable since they are a prized ingredient in Chinese medicines. When the Soviet Union collapsed in the 1991, the opening of international borders, combined with the collapse of rural economies and the breakdown of centralised law enforcement, meant large numbers of saiga were hunted. Saiga underwent a massive decline in the mid-1990s and the species is now classified as Critically Endangered (Mallon, 2008). Hunting is agreed to be the primary reason for its population collapse (Milner-Gulland et al., 2001). Since then there has been no recovery in its population. Although saiga are now quite scarce, the horns are still very valuable, and so they are still hunted by poor unskilled rural inhabitants with few other livelihood options (Kuhl et al., 2009).

However hunting has not been the only threat to saiga. Other influences include changes in forage land, competition with sheep and irrigation canals (Lushchekina & Struchkov, 2002). All of these problems stem from Soviet-era planning for the region, which provided many subsidies and inputs to intensify agriculture and increase production in the region (IUCN East European Programme, 1991). For example, there was intensive spraying of pesticides, which was thought to change the composition of wild plant, insect and mammal communities.

Kalmykia has a continental climate, supporting steppe, semi-desert and desert habitats over its 5,900 km² (Government of the Republic of Kalmykia, 2002a) so it is not well able to withstand the impacts of high intensity agriculture. The land is prone to desertification if stocked with high densities of non-native sheep breeds, whose narrow hooves trample the ground. High intensity agriculture also involved the construction and maintenance of irrigation canals, which contributed to water salinisation in the region, as well as causing problems for saiga migration. Since perestroika the intensity of agricultural practices has declined, but there is still a legacy of environmental problems in the region (LEAD, 2004).

Tackling these environmental problems is challenging. In Soviet times, the state strongly controlled resource use and management (Dinerstein et al., 1994). Although its policies were not always appropriate (e.g. over-stocking grazing animals), on the whole they helped ensure saiga populations remained at a viable level (Lushchekina & Struchkov, 2002). State control collapsed with perestroika. Kalmykia still contains reserves to protect habitats and wildlife, but their enforcement is not always satisfactory (Milner-Gulland & Kühl, 2006). Problems with the water quality and quantity persist and desertification persists in some places, and may return in other areas if sheep are overstocked. Climate change may exacerbate these issues. Although these problems are reasonably well known in the scientific literature, the perceptions of local people are unknown. Excepting some efforts related to saiga (Howe, 2009), it is not known if there have even been any environmental education campaigns in the media, or pro-environmental messages taught in schools.

It is not known what local perceptions of the key environmental problems are. Therefore, this study defines any behaviour they see as tackling perceived problems as pro-environmental behaviour. Although very different constraints and behaviours may apply to each pro-environmental behaviour (whether changing existing harmful

behaviours, or adopting new behaviour), it is important to understand what if any cultural issues have common influence.

The community-based approach could be a useful way to tackle problems linked to changes in animal populations. Indeed, the provision of alternative livelihoods has been recommended as a way to prevent and mitigate environmental problems to reduce the appeal of saiga poaching (Dordzhieva, 2005) and a project giving cows to rural households that might otherwise poach is already being trialled (Saiga Conservation Alliance, 2007). However, chapter 3 demonstrates that economic factors are clearly not the only influence on conservation project success. If a project engaging with culture – such as the Dharma centre’s efforts – is able to influence views of the environment, it may even have the potential to complement the influence of livelihood-based projects but perhaps also influence a range of other pro-environmental behaviours.

4.1.3. Research objectives

The overall aim of this study is to understand how a project linking religious and ecological teaching – the pro-ecological teachings of the Dharma Centre – can influence environmental attitudes and behaviours, in the context of post-Soviet Kalmyk culture.

- 1) Identify awareness and concern for environmental issues, and any pro-environmental actions taken by Kalmyks
- 2) Understand how Dharma Centre teachings have affected these perceptions and behaviours.
- 3) Distinguish any other key influences on conservation views and behaviours

4.2. Methods

This study of the links between Buddhist teachings and environmental views used a qualitative research methodology. Qualitative approaches were particularly suitable for probing the research topics, since the issues were relatively poorly understood, complex, and with multiple linkages. Data were collected using semi-structured interviews and explored using thematic analysis, which is one of the principal methods of generating and analysing data for qualitative analysis (Legard et al., 2003), and commonly used within work with a broadly pragmatic epistemology (Creswell, 2005). By unpicking discourses it was possible to produce a rich understanding of the complexity of the data, and of the pattern and process linking topics and concepts (Ritchie & Lewis, 2003).

Data collection, sampling and analysis are below described separately, although the overall process contains iteration and is not entirely linear (figure 4.2). The study sought a pragmatic balance between inductive and deductive approaches. Grounded theory argues that analysis should be ‘grounded’ in the data (the ‘bottom-up’ approach), emphasizing an inductive approach to uncovering patterns and process, rather than a deductive or ‘top-down’ approach (Ritchie & Lewis, 2003). However, inductive and deductive approaches are never entirely separate in practice: it is never possible to collect data without being influenced by existing ideas, whilst too much focus on imposing pre-existing ideas risks neglecting the data. Accordingly, whilst this study’s sample was stratified according to assumptions that certain characteristics may influence responses (and these ideas also influenced the study objectives), the assumptions were recognised and challenged during interviews. Similarly, notes on emergent themes were kept during data collection, but explicitly challenged during subsequent interviews and later analysis.

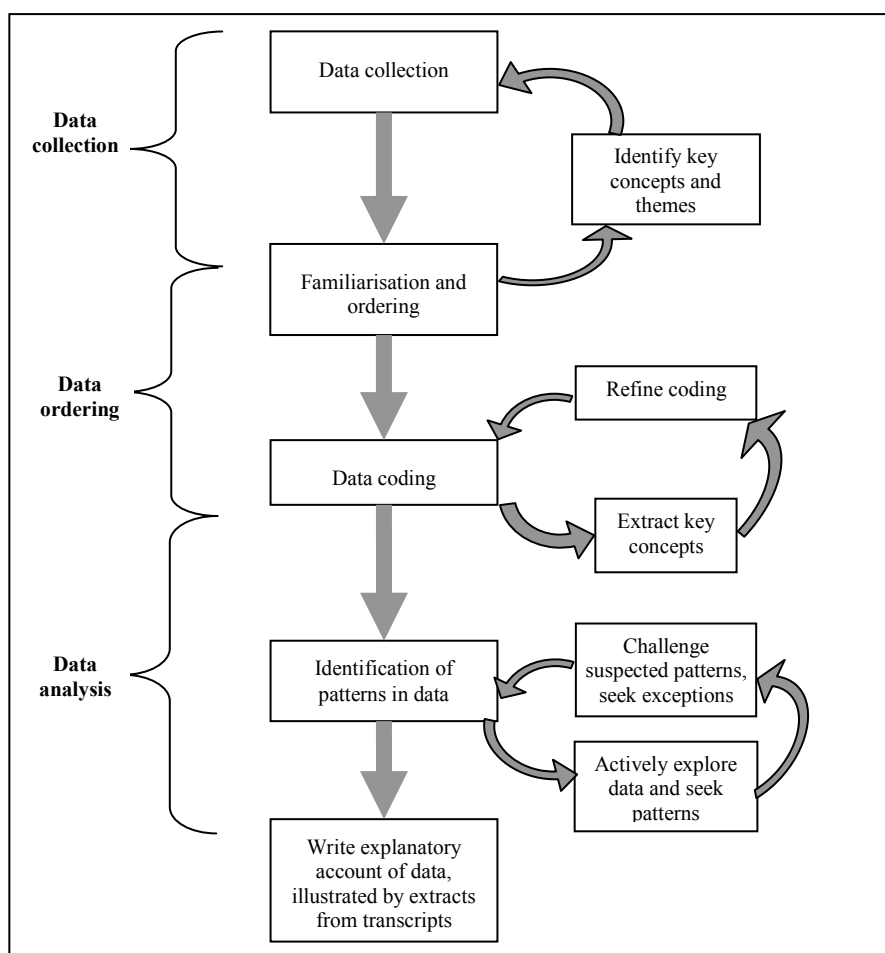


Figure 4.2 The process of qualitative data collection and analysis, influenced by the diagrams of Emerald (2006) and Ritchie & Lewis (2003). The processes of data collection, ordering and analysis are iterative and cannot be neatly separated. For example, reflection on themes mentioned in one interview may inform topics probed in a subsequent interview.

4.2.1. Semi-structured interviews

When conducting interviews, the overall aim was to provide an setting “conducive to the production of the range and complexity of meanings” held by respondents (Holstein & Gubrum, 2004). The use of language, categories provided, and attention to detail were considered and carefully controlled during interviews, as these all affect the data elicited (Holstein & Gubrum, 2004). For example, during a discussion on poachers, it could be useful to examine categorisations of poaching (Baker, 2004).

The researcher spoke only a little Russian and so was always accompanied and assisted by a translator. Before beginning interviews, the translator and researcher thoroughly discussed the purpose of the researcher and the role of the translator (Temple & Young, 2004) as the presence of a translator can add more layers of perception and interpretation (Twyman et al., 1999). Even if a completely objective translation process was possible, there can never be perfect conceptual equivalence between languages (Phillips, 1959). Therefore, the translator was asked to be as non-judgemental as possible, and not to ‘edit’ responses to fit the researcher’s perceived interests or prevent offence. Potential question topics, and the meaning or intention of particular questions, were discussed before each interview, and translators debriefed afterwards. This research was unusual in that practical problems meant three translators were used at different stages of data collection, rather than one. It is generally better to use one translator but comparison of transcripts from each translator revealed their use and translation of terminology to be broadly consistent.

A topic guide (Appendix B) was used to structure the interview, with its use guided by the interests and experiences of respondents. The selection of topics was informed by readings on the history of Russia and religious expression, all available English language literature on Kalmykia, and by preparatory interviews with academics who studied Buddhism at Kalmyk State University, local saiga specialists, the head of the Dharma centre, and members of the Institute of Rural Studies in Elista.

The only constant requirement was to mention three broad topics: (1) Buddhism, (2) environmental views and (3) the Dharma Centre. A number of general principles were followed, when planning and guiding discussion (Arthur & Nazroo, 2003). In particular, opening questions usually related to personal experiences of Buddhism when growing up, as this proved to be a non-sensitive topic and direct experience is generally easy to discuss. Occasionally definitions of topics were elicited to assist interpretation

of discussion, and at the end of the interview it was common to seek an overall summary of someone's attitudes, or their recommendations for future actions to help the environment. Successive interviews were used to influence the details of the topic guides of later interviews.

4.2.2. Sample strategy

This study used a small sample of in depth interviews to allow detailed exploration of the research topics. Reliability came from the consistency of interpretation and communication of the observations (Patton, 2002), with no ability to report population trends since the sample is not representative (Snape & Spencer, 2003). Some respondents were contacted by randomly approaching strangers, whilst other respondents were selected by personal recommendation from the researcher's host in each location. An information sheet was given to each respondent, with plenty of opportunity to ask questions before informed consent for the interview was sought.

In some regards the sample was relatively homogenous, since all respondents were ethnically Kalmyk, though they form only 53.3% of the population of Kalmykia (Russian Federal Service of State Statistics, 2002). A valid set of narratives can be obtained even from one homogenous group, for an in depth analysis of a subject from a certain point of view (e.g. Bell et al., 2008). Differences between Kalmyks and other ethnicities were not the focus of this study. However, the interviews were stratified in three ways. Firstly, respondents of a range of ages were sought, since age influences experiences of Soviet life and ideology. Secondly, interviews were held with both those who have and have not experienced Dharma Centre teachings. Thirdly, respondents were taken from both rural and urban locations. This stratification is described below.

In 2002, the median age of Kalmyk citizens was 33, similar to Russia as whole, with declining birth rates (Russian Federal Service of State Statistics, 2002). The middle-aged were not only most economically active but dominated the population in terms of numbers (figure 4.3). This study aimed to capture the full range of ages, and hence the likely range of Soviet experiences and influences (figure 4.4). The oldest generation had seen changes from Bolshevism, to deportation, Stalinisation, later phases of Soviet planning and the collapse of the Soviet system. By contrast, the middle aged grew up in and were accustomed to a relatively controlling and stable Soviet regime, which was later destroyed by perestroika. The youngest generation are unused to this control and might be relatively entrepreneurial and individualistic (Delmar & Davidsson, 2000).

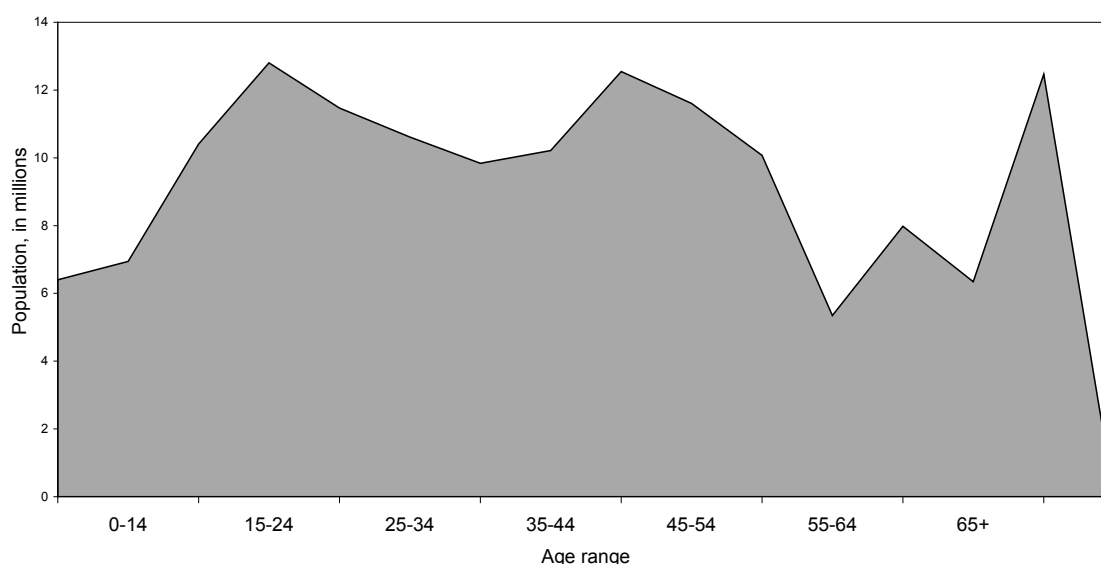


Figure 4.3 The age distribution of the Russian population at the last census (Russian Federal Service of State Statistics, 2002).

Those who had and had not experienced Dharma centre teaching were sought to draw out the effect of its teaching and understand direct perceptions of its effects. Two rural locations were visited which had not experienced Dharma centre teachings, and one (Orgakin) which had. Most respondents were drawn from rural locations (table 4.1) because rural Kalmyks are most likely to be involved in saiga poaching and this was a particular early interest of the researcher. One village, Khulkutta, was definitely known to be involved in poaching, whilst the village of Malie Derbetie did not poach, and was known not to have experienced Dharma Centre teaching, but was about to unveil a statue of the WOM. The traditional Kalmyk deity would be placed in a village clearing, and shown standing next to a baby saiga.

Table 4.1 Locations from which respondents were sought for interviews, June-July 2008

Name	Rural/urban	Dharma centre teaching?	Number of interviews
Malie Derbetie	Rural	No	12
Khulhutta	Rural	No	11
Orgakin	Rural	Yes, most respondents	13
Elista	Urban	Yes, one respondent	6

Six respondents were selected from the town of Elista. One of these was one of the most devout and frequent attendees of the Dharma centre and so a good indicator of its extreme potential effects on perceptions of the environment and conservation. Other urban interviews provided an insight into rural-urban differences in experiences of religious views in Kalmykia, as well as providing a check that the devout Dharma

centre attendee's views were not just an artefact of her urban life. By sampling across a range of ages, locations and Dharma centre experiences (figure 4.4), it was possible to identify cross-cutting themes as well as differences between groups.

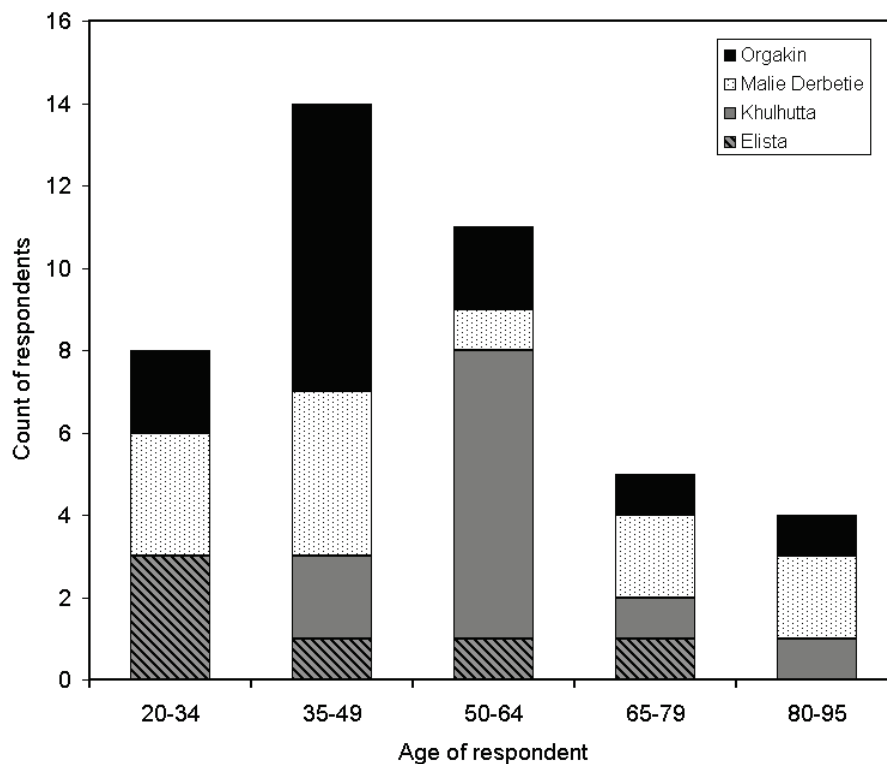


Figure 4.4 Distribution of ages of respondents interviewed by this study, in four different locations.

Forty-two interviews were conducted over June and July 2008. This set of interviews was sufficient to allow stratification by age, location and exposure to the Dharma Centre. Furthermore, individuals had a range of backgrounds, both as regards religious belief (some were atheist, most were at least nominally Buddhist) and occupational status. Nearly all were educated to secondary standard, and many had received higher education or further specialist training to equip them for specific jobs. Those over 60 were retired, whilst the occupations of others varied from teaching, midwifery, private business, and unemployment. Many had some involvement in agriculture, keeping livestock for family use if not for sale. Twelve respondents were male and thirty female: a more balanced ratio was not sought as gender did not seem affect respondent views. Respondent details, with names changed for anonymity, are listed in Appendix C. Where individuals are quoted in the results, the same names are used.

4.2.3. Data Analysis

A typical interview had a duration of about 60 minutes, but the length of interviews ranged from 25 minutes, to 105 minutes. All interviews were recorded through detailed hand written notes taken during the interview, as far as possible copying verbatim the translator's reports, as well as the questions asked and other comments about the interview's progress, such as respondent body language.

The interviews were also digitally recorded onto an MP3 player, and six chosen (at least one from each location and translator) for transcription and translation into English. Transcription allows for more detailed analysis of the discourse of respondents, as well as providing a check that translations provided during the interview corresponded to meanings in the original Russian. For the six interviews that were transcribed, the transcripts were compared to the interview notes, and the concepts recorded were very rarely found to be different. Further confidence in the quality of the reporting and note taking was given by similar distinctive phrases – such as “individuals are helpless” – being reported by more than one translator. This suggested such phrases were not an artefact of a particular translator's idiom or translation style. Therefore, the analysis was based on both the 6 transcribed interviews and the 36 interviews recorded as notes taken during the interview.

The principles of thematic analysis were used to deal with data by creating and applying 'codes' for data (Boyatzis, 1998; Denzin, 1989). Coding is the creation of categories that are applied to the data, and so different instances of the same code can be grouped together. (For example, in a set of interviews about family life, every time dogs and cats are mentioned by interviewees, these sections of the conversation could be coded under the category 'pets'.) Every part of the interviews was coded to reflect the subject and content of conversation, inductively building initial descriptive codes. The process of creating higher level codes (or themes) was partially dependent on deductive reasoning, as topics of interest were deliberately focused on (and inevitably influenced relationships perceived in the data). The software package Nvivo 8 was used to store and code transcripts, together with supporting information and thoughts on emergent themes (QSR International, 2008). Figure 4.5 shows a section of the final coding scheme.

Percep of enviro - feelings, connection	33	66
Connectivity nature	33	56
B realise love connection to surround	10	13
circle of life	5	5
environment-people connected (or n	28	36
local linked to global	2	2
nature in balance	7	8
nature reigns	2	2
people well-being linked to enviro	14	19
Feelings about enviro	10	15
environment here beautiful special	4	4
need action not feelings	2	2
steppe and Kalmyks	2	2

Figure 4.5 An example of a coding hierarchy, extracted from the final coding schema. This section represents codes created to reflect different views and feelings about the environment that were stated by respondents. The codes (or categories) are presented as created with Nvivo software. The first column of numbers represents the number of cases (respondents) coded at each category, and the second column the total number of references to the code. The original data can be easily viewed by clicking on the code.

Analysis consisted of examining the relationships and patterns of coding, while retaining links to the original data. The process of building general ideas from specific ideas is called analytic induction, and involves the use of constant comparative plus deviant case analysis. Individual cases (respondents) were constantly compared to find similarities and co-occurring themes. Then on identifying such themes, explanations, variations or exceptions and reasons for discrepancies were actively sought. Figure 4.2 demonstrates the research process, particularly how analyses are iterative and cannot be neatly separated from other stages of research.

In qualitative studies, results are often incorporated with evidence from other studies and concepts from theory. However, in this study a format familiar to the quantitative sciences is used, with the discussion separated from the data. The data are presented as a coherent narrative, emphasising patterns and their explanations based on the evidence collected during the study. The narrative is illustrated by quotes from respondents, with those selected that could particularly amplify, link or add detail to points made in the text. The discussion reflects on the links with other studies and concludes with implications for conservation practice in Kalmykia and elsewhere.

4.3. Results

This analysis section begins by identifying locally known environmental problems (both saiga conservation and other environmental issues), and the reasons perceived to underlie these problems. Views on possible responses to these problems are presented, which reveals a trend towards low individual agency to carry out pro-environmental behaviours. Lastly, the influence of Dharma Centre teachings is addressed, together with that of other new Buddhist teachings.

4.3.1. Views of saigas and saiga hunting

All respondents – whether villagers or town-dwellers – knew about the saiga antelope and its decline, even though only in Khulkutta were saiga still seen and hunted. Where saiga had disappeared it was referred to fondly, associating it with the steppe. It was thought “very beautiful” especially when running. In Khulkutta the existence of hunting was undisputed (although the interviewers sometimes knew that some respondents elided the topic of their personal involvement). Where meat was available, in Khulkutta, the price was 70-80 Rb/kg (similar to the price of mutton), whereas horns were worth much more, about 7-10,000 Rb/kg. In fact, since bringing the low value meat into the village risked detection, meat was often left in the steppe or taken east to Astrakhan.

The last time I saw saiga was in 1976. They have declined because of hunting for horns and meat. The main place for hunting was Yashkul. The irrigation canal is also a problem.

Natasha, a retiree in Orgakin.

Respondents who had not seen a saiga for years still knew of saigas and poaching. This common knowledge was at least partly due to the media, with coverage recalled from both television and radio. Some spontaneous descriptions of saigas as “the most ancient animal” also suggested exposure to natural history programmes or writing about its evolutionary distinctiveness (Nowak, 1999). Although the problem of poaching was also well known, outside of Khulkutta two other explanations for saiga decline were offered; the building of irrigation canals, and increasing levels of wolf predation. One urban respondent had been involved in the planning and building of irrigation canals, and had directly observed that these could act as a significant barrier to saiga migration, causing deaths and changing distribution patterns in the steppe. This individual’s observation supported the threats to saiga identified in publications and policy processes (e.g. CMS, 2006).

Saigas were clearly hunted before Soviet regulations, since their population declined sharply in the late 19th century (Lushchekina & Struchkov, 2002). The Kalmyk people, particularly the prosperous, hunted and fished throughout their nomadic history (Guchinova, 2006; Perdue, 2005) so it is likely that these activities included saiga. Although three respondents said that it was forbidden to hunt saiga before the revolution, they also recurringly blamed other ethnic groups for starting hunting saiga, or at least changing the culture of hunting. So, their accounts may have tied into a larger discourse in Kalmykia, which is building identity around the idea of a distinguished noble past disrupted by deportation (Guchinova, 2005). Respondents who instead thought that saigas “have always been hunted” both before and after Soviet times, supported their views with more detail and evocative explanations.

There was a short supply of bread and meat after Siberia. You had to queue at 2am to get bread. That's why people hunted saiga. Out of the short supply of meat and food. My husband even had a coat made of saiga.

The elderly Raya recalling the situation in Orgakin after returning from deportation.

Many respondents even described the health properties of saiga meat, how it was thought to be ‘dietic’ when cooked in certain ways. However, being a source of meat did not mean saigas were not held in special regard. Traditional Kalmyk norms meant that saiga could only be hunted for meat shared with others “in little pieces”, not for sale or profit.

If a real Kalmyk wanted to kill, it should be only for himself, not for sale. If he killed saiga he should give the meat to three families.

Dasha, a midwife and farmer in Khulkutta.

There was complete agreement that the scale of hunting increased dramatically after perestroika. As Kalmykia is a rural republic, it suffered heavily from the collapse of Soviet economic system (Humphrey, 1998) and so many people turned to hunting out of need. A young man who graduated from art college during the “the wild 90s” pursued a variety of jobs without turning to hunting, but agreed poaching was justified in that time “What should they have done? They were in need”. Although Kalmyks still struggled to find jobs, especially in villages, it was agreed that current times were not so dire, and so there was “no need” to hunt saiga to survive. However, hunting certainly continued where saiga were still found:

There were such a lot of them then! When we were going somewhere we were standing on the road and waiting for saiga running across the road. We were standing and waiting. Nowadays when you see one saiga people begin to take their motorbike, begin to catch it.

Alisa, a recently retired culture-worker (musician and dancer) in Khulkutta, recalling the situation twenty or thirty years ago.

In Khulkutta the general consensus was that those who start to poach may find it difficult to stop, especially as men with families can not easily emigrate to cities for jobs, or learn new skills. Some respondents took a less sympathetic view to those who continued to hunt after the 1990s, calling hunters “lazy” for persisting in poaching. Not many of those knowledgeable about poachers and current hunting practices were comfortable to discuss the subject at length, but it was generally thought that those who began poaching (always referred to as men), would tend to continue to poach, because effort and qualifications were needed to switch to alternative occupations. However, the general impression was that respondents perceived hunting to be a “very dangerous” occupation (linked to the physical dangers of driving at night in the steppe, but also the risk of prosecution), and so it probably appealed only to those unable or unwilling to pursue more conventional jobs. A previous study focused on saiga poaching in Kalmykia (Kuhl et al., 2009) also concluded that poaching is ‘low prestige’ occupation.

4.3.2. Links with Buddhism

Part of the reason why saiga hunting was disagreeable was that saigas were usually thought to be “special” if not “divine”. Such views were woven into descriptions of saiga and its problems:

As for me I thought it was a sin but what should people do? One of my pupils had no shoes, so his father had to kill saiga and mother had to sell it.

Vika, who worked as teacher during the 1990s.

However, divine status did not necessarily entail that hunting or consumption was absolutely prohibited, prior to perestroika or even prior to the Soviet revolution.

All animals are creatures of god so they must not be destroyed. Before the revolution saiga meat was divided into little pieces and shared between all as it was considered to be a divine animal. Nowadays they cut the horn off the animal and leave the meat.

Ilya, a 82 year old devout Buddhist in Khulkutta.

Descriptions of exactly how or why saiga were divine were varied. Although some viewed them as a special “servant of God” [Buddha], others thought only white [albino] saiga to be special and never for hunting. This association was never known by younger

people under thirty. Statues of a saiga standing next to the White Old Man (WOM) were recently erected in both the town of Elista and the village of Malie Derbetie (the latter was formally unveiled just before interviews took place, whilst that in Elista was erected in the preceding year). Some of those who saw these statues said that this was the first time they had realized that the WOM was associated with saiga. However it did not affect all: amongst those who saw the statues, some did not remember an animal, and one respondent was even convinced that it was a lamb!

Although the view of saiga as divine was also held in Khulkutta, where poaching occurs, this did not mean religious views were irrelevant to poaching: rather, it depended on their interpretation. One respondent was known to make her livelihood from selling horns. She used a major part of these proceeds to fund a pilgrimage to see the Dalai Lama in Dharamsala, and was saving for another trip. This demonstrates both the power of faith and the depth of some Kalmyks' belief, but also how religious belief does not automatically lead to pro-environmental behaviour. Even this lady considered saiga to be special for Kalmyks "as the host of the ground" and thought that hunting and destruction of life had implications for karma. However, she knew no general connection between Buddhism and taking care of the environment, and evidently she did not feel a Buddhist could not be involved in the horn trade.

In contrast to this case, other devout respondents in this study strongly felt any involvement in saiga poaching was wrong, saying that a "true" or "genuine" Buddhist would never poach. These respondents had had relatively secure jobs or pensions during perestroika: those with less financial security at that time admitted the overriding need for survival meant terrible things had to be done.

I was asked to find 700kg of saiga horn. They are very little, the weight of a pair of horns is only 200-300g, so many must be killed. I saw all the horns and there was fresh blood everywhere, it was horrible.

Nikita, now a martial arts teacher and Buddhist healer.

However, all those who identified themselves as Buddhist agreed that nowadays that killing saiga was definitely wrong, and the people who hunted would be "punished" either in this life or in the next. Over the course of multiple interviews, it became clear that Buddhist views could be seen relevant to environmental care, but the relationship depended on teachings received and their interpretation. It was beyond the scope of this study to deconstruct the various Buddhist philosophies and practices in Kalmykia. However, the evidence collected during this study suggests it may be useful to

distinguish two types of Buddhism, each with separate implications for views on environmental care (table 4.2).

Table 4.2 A categorisation of Buddhist philosophies and practices, as currently found in Kalmykia. Categorisation based on this study's evidence identified two main streams: Buddhism as originally practiced and understood in Kalmykia, versus that evolving now from more standardised teachings. Only aspects of faith relevant to implications for environmental views and behaviours are presented.

	Original Buddhism	New Buddhism
Origin:	Syncretic mix of Lamaist Gelug Buddhism and Shamanism similar to that practiced by all Mongols	Lamaist Gelug Buddhism as practiced in Dharamsala, India Some efforts to incorporate influences from Mongolian practices, and valorisation of remnants of practices unique to Kalmyks (such as WOM)
Typically learnt from:	Family, especially grandparents. Emphasis on practices without philosophy	Monks Literature, emphasis on philosophy
Role of White Old Man (WOM):	Importance and knowledge of WOM depends on association with lineage. Host of the ground, associated with all living things. Sometimes associated with white saiga.	WOM contested and sometimes not accepted. A symbol of wisdom for those new to Buddhism, or a symbol special to Kalmyks. Sometimes associated with saiga.
Implications for general environmental care:	Karma less explicitly articulated, but duty of care felt. Killing may be prohibited but involvement with products of killing (trade etc) is not.	Karma means 1) all life forms are related so worthy of care 2) taking of any life should be avoided
Implications for saiga:	Killing only for households consumption	Killing should be avoided. If WOM believed in, then he may protect saiga and/or punish hunters

The 'original' Lamaist Buddhism, as practiced in Kalmykia before collectivisation, did not hold killing of animals – either domestic or wild – to be completely prohibited, only “a little sin”. It could be regarded as a special dispensation for Kalmyks (and all Mongols) to do these things which were necessary for their nomadic way of life, as long as certain rules were observed (such as prohibitions against killing on certain days of the month). Those whose knowledge of Buddhism came from family traditions further explained that “to cut” certain meats could be a sin, but to eat the same meat would not be wrong. A similar reasoning process may explain why some thought it wrong to kill saiga, but acceptable to handle saiga products or be involved in the supply chain. This was not seen as hypocrisy.

It is especially people from Chechnya [that hunt]. The Kalmyk people buy the meat, and they buy the horns separately.

Julia in Khulkutta, commenting on the saiga hunting.

Knowledge of WOM and his associations were variable: although most respondents knew of him, associations were often vague and variously concerned with protecting the steppe, animals and/or Kalmyk people. Varying perceptions of the WOM have probably arisen because each lineage is “protected” by one of a hundred spirit gods (such as Green Tara), with those who were protected by the WOM likely to know more about him. A typically vague description was provided by Liza, an erudite town resident who had inherited belief and basic Buddhist practices from her family, but knew relatively few details or points of philosophy (other respondents also considered the WOM to be a “patron” of the Kalmyk people, or “master” of water and ground):

As far as I know, he is the host of the steppe. He is patron of the Kalmyk people. Every Buddhist highly respects the WOM. We always pray and sometimes we put a white and yellow coin down next to his statue. I don't know what this means – maybe our grandmothers knew.

Since perestroika, those who wished to become monks have been able to go to study in Dharamsala, India, since this is the centre of Buddhist teaching by the Tibetan community in exile. Discussions with academics in Elista and some lamas suggested that when monks return to Kalmykia to practice and teach, their religious beliefs and practices tend to have little connection to distinct Kalmyk traditions. As such, their teachings are more ‘standardized’ Gelupka Buddhism: for example, most Kalmyks would not dream of avoiding meat, the staple of their diets, but some monks were vegetarian. However, the influence of these standardised teachings may be spreading with increasing interest in Buddhism amongst ordinary Kalmyks. Larissa described interest as “turned from a spring into a waterfall”.

This fluid situation means that within Kalmyk Buddhism there is dispute over the role of specific Kalmyk deities, such as the WOM. A statue of the WOM was prominent within the compound of the high profile Golden Temple, erected in 2003, but he stood outside the temple, not within it, to show that he was not fully accepted as part of the Buddhist pantheon (“not canonised” as explained by one old lady). Some respondents (perhaps those for whom the WOM was not a “protector” of their family) mentioned that WOM was even better known now than it had been in the past. Similarly, academics in Elista agreed that a widespread emphasis on WOM was new, part of efforts to restore and celebrate traditional Kalmyk culture where little of that original culture remained. Inevitably, in a changed context where few original traditions persist, new traditions and practices differed to that of the ‘original’ Kalmyk Buddhism. The

interpretation of Buddhism by an individual depended on both family (most learnt about Buddhism from parents and grandparents) and sometimes other influences.

Are there many opportunities to learn [about Buddhism] here in the village?

There is not so much opportunity, but you can visit the temple. For example, on holidays people visit. In the year of the horse (the year of my son's birth) I pray.

Have you heard about the WOM?

I heard about him from the words of my parents and grandparents. He is the most divine person. Before lighting candles I pray to the WOM and then to lamas in the temple, then to the family of my husband, then to my father and mother.

Marina in Khulkutta.

Since the 1990s temples and stupa have been built, monks trained, and even at schools some aspects of Buddhism are taught (Government of the Republic of Kalmykia, 2002b). These developments were welcomed by all but are most likely to influence the basic Buddhist understanding held by the younger generation. It was telling that no respondents younger than thirty knew of saiga as a divine animal, whereas the views of older people were rather more variable, dependent on family teaching. It seems likely that 'standardized' Buddhist teachings are becoming an increasingly important influence on Kalmyk views and understanding of Buddhism, and hence its interpretation with respect to environmental care.

4.3.3. Other environmental problems in Kalmykia

Discussions on saiga and its conservation revealed influences on people's views of this species, and its links with Buddhism. However, saiga poaching was not an issue that directly involved respondents outside of Khulkutta. By contrast, several other environmental issues were perceived to be common across Kalmykia. Detailed discussion on these topics also revealed perceptions of individual and government roles in relation to these issues, and this is explored in following sections.

Conceptions of the environment and its problems were similar to Western interpretations, with the exception of Andrei, in his eighties, who thought of infrastructure improvement and talked about repairing roads. As a result, a fairly wide range of environmental problems were raised by respondents, which broadly corresponded with problems documented in literature (e.g. LEAD, 2004). In particular, nearly all respondents mentioned problems with water, both in quantity and quality. Many aquifers in Kalmykia were contaminated and lake levels had fallen, causing

problems both for humans, who must buy their drinking water, and for livestock. Climate change was often blamed for this. Direct experience – of some unusually dry and hot summers in recent years– was cited as evidence of climate change. In order for respondents to identify links with personal experience, information about this phenomenon had probably been spread by the media, and several mentioned they had learnt about environmental problems “from television”. Climate change was also linked to desertification, and was clearly understood to cause problems for agriculture.

Heat, it is getting worse. The harvest declines – everywhere they plant, it is a lot of work, but then the harvest declines, it makes no sense. It used to be not so hot, now it is intolerable

Nadia, a market trader, describing the main environmental problems in Kalmykia, having already discussed changes in animal populations.

Connections between other environmental issues were frequently perceived, not only with climate change. For example, it was widely agreed that there had been a decline in Suslik numbers (*Spermophilus pygmaeus*). This ground squirrel has traditional importance to Kalmyks, who used it as a medicine, and as food in times of hardship. Although many did not know any reason for the decline, causes suggested included heat, decline in certain grasses, or deliberate poisoning in Soviet times. Although some of the connections identified concur with current academic understanding, connections made by respondents could also be vague and even linked to general changes in all aspects of life that came with Perestroika.

We used to gather berries, there were lakes full of fish. In those days it was not necessary to buy something, to be able to eat. There were a lot of gardens (e.g. for tomatoes), there was a garden situated next to every lake.

When did all this change?

Even before and during perestroika, everything changed. All state owned enterprises closed.

Why did saiga and suslik decline?

Maybe because we used to plant rye and other seeds, which suslik ate. When they stopped planting, after 1991, suslik had nothing to eat.

And saiga?

All those hot and dry periods meant there was no grass. Nowadays there are too many wolves from the Caucasus. This combination of factors may have resulted in the current state of things.

Sveta, born in the steppe and working in a maintenance role for a state farm until perestroika.

Such statements showed that perestroika – obviously, a human-made event – was perceived to be generally linked to changes in the environment. Actions in distant Moscow had caused changes for local life and environment. However, more specific links between humans and the environment were nearly always perceived as environmental issues causing difficulties for humans (rather than humans causing problems in the environment). For example, the potential harm to human well-being was very clear for the issues of climate change, desertification and water shortages, since these caused problems for agriculture and livestock breeding. Similarly, recreation in the steppe has been made less enjoyable – they could no longer “run barefooted” – because of changed snake and insect populations. This, with fewer tulips in the steppe, made visits less enjoyable. Nursery children were no longer taken to picnic in the steppe because of fears of infectious insects. Kema explained:

Now there are lots of them [insects], that is our main problem. We are very afraid of insects, around this town there are currant bushes, but no they no longer pick fruit from them as they are afraid.

Kema, recalling changes in Orgakin since the end of Soviet farm management. Like many respondents, she had not seen saiga for a long time, and also perceived increases in wolves and declines in ground squirrel populations.

All these changes were relatively recent, and respondents who were not particularly old still perceived significant negative change. Nikita, who was forty, said that when he was a child “the steppe was red and yellow” with tulips, but now there were few. Even young people were more reluctant to walk in the steppe than in their childhood, due to fears about dangerous insects and animals.

4.3.4. Individual roles

Although the environment was seen to affect humans, the behaviour of local people was rarely perceived to cause environmental problems. In the case of tulips, the few who mentioned their decline also all said they tried not to pick them, and, of course, poaching of saiga was seen as problematic (though often attributed to non-Kalmyks). However, other individual or personal actions were not seen as relevant to affecting or mitigating the key local environmental issues, including wildlife population changes, climate change, water shortages, desertification, pollution. For desertification, two respondents suggested “regulating” grazing and ploughing, perhaps because both were experienced in agricultural work. However, to tackle the other issues, no individual actions were identified.

For most respondents, careful disposal of litter was the only activity considered as a possible way for local people to help the environment. Respondents' focus on litter was unaffected by age or educational attainment. For example, Olya, a young graduate, had identified water shortages and salinisation as a serious problem, along with desertification, heating and declines in wild animal populations. However when discussing how people could help the environment, she focused on litter, and even after prompting proposed "only taking care of wild animals" by improving the reserve system "to make control of workers and animals stronger". Both the causes and solutions for these problematic environmental issues were generally attributed to external agents. This suggested little consciousness of personal agency or ability to influence events.

It does not depend on one individual. Some problems must be solved on the government level. Specific problems took place in Kalmykia. There are two problems: water quality and desertification. ... We have high levels of minerals in our water as we are located at the former bottom of the Caspian sea, so the soil and water is salty. We need new water, so channels will be made to the Stavropol region and Caucasus Mountains. Our own water is impossible to improve, so this project is being planned.

The other solution is that people don't use tap water but delivered water.... it would be better if the government level purified the water, it would be cheaper.

Katya, who worked for local government in Elista. She did not mention agricultural practices such as irrigation as a cause of environmental problems, nor did she mention any potential behaviours that individuals could carry out to reduce or mitigate the problem

The issue of littering emphasised how villagers could perceive a problem but continue to contribute to it. Firstly, there was high awareness of littering in every location, and all agreed it to be a problem. Indeed, if environmental issues were discussed without prior reference to saiga, this was likely to be the first topic mentioned. Secondly, this problem was not only experienced locally, but clearly caused locally (except in Khulkutta, which is bisected by the major Astrakhan road, whose road users were thought to "throw a lot of litter"). However, recognition of the problem and its cause did not necessarily translate into pro-environmental behaviour. Western standards of orderly rubbish disposal were not followed by most Kalmyks. Rubbish could be seen blowing through villages and accumulating behind houses, and respondents described "rubbish is everywhere". To tackle the problem, teachers and parents reported that children collected litter as part of school-organised activities: "there is a group who study ecology and help the authorities to gather rubbish". In addition, every year some

villages carried out a spring clean. Excepting these organised activities, it was generally agreed that “careless” littering was carried out by most people.

Of course, every year in spring we clean the territory but nevertheless each person has his own character. ...Most people prefer to throw litter than to gather it.

Alisa in Khulkutta.

Many respondents were asked to identify what kind of people did or did not litter. Except for a few of the elderly, who blamed younger people, most did not see any distinctions between social or age groups. Instead, the concept of “culturedness” was frequently invoked as an explanation for differences between individuals’ behaviour. A cultured person, in English, could be described as having refined thought and civilised behaviour.

Personality, family upbringing and propaganda influence behaviours to take care of environment, not religion.

Valya, young mother and dentist.

Personality is strongly influenced by upbringing and early experiences (Eysenck, 1997). So, many respondents referred to the need to influence the views of children, through teachings and setting good examples. Liza, the only respondent in this study to think of helping the environment by not wasting food and saving electricity, directly attributed her awareness and behaviour to her upbringing. She noted: “as far as I have noticed, I behave like my mother”. Such experiences also shaped recommendations for promoting future environmental care. Although “self-development” can take place later in life, parents were held responsible for inculcating pro-environmental habits and views in children.

The surroundings in the village depend on ourselves. For example, on having an icecream, many children throw their rubbish into the street – their parents should tell them what to do.

Lyuda, a young mother in Orgakin.

4.3.5. Individual responsibilities

The discussions about culturedness and upbringing indicated that the practice of environmental behaviours depended on more than an individual’s opportunity and awareness of environmental issues. When respondents discussed the importance of the role of upbringing, they mainly focused on instilling culturedness or conscientiousness in children, rather than on teachings about pro-environmental behaviours. They

thought, for example, individuals with short-term views who “live for the moment” were unlikely to care about the consequences of their actions (such as littering or hunting). By contrast, cultured and thoughtful individuals would consider the consequences of their actions, and so try to choose actions that would not harm the environment.

Is it any particular type of person [who throws away litter]?

I suppose that age is not relevant. It comes from the lack of culturedness.

What is the best way to encourage people to take better care of their surroundings?

It is a matter of one's background. It must be taught by parents and grandparents, it is a matter of inner culturedness. If someone does not have this, no amount of encouragement will help

Vera, a retired teacher in Elista.

Of course, to some extent limited individual pro-environmental action can be explained by a lack of opportunity, and several respondents complained about the lack of rubbish collection services, with a couple of respondents even recalling recycling facilities lost since Soviet times. Furthermore, Kalmyks had quite limited opportunities to tackle other issues: for example water and electricity meters were unheard of. Nevertheless some actions were possible, particularly for the management of litter. In Khulkutta, Dasha was proud to say “A lot of people throw litter into the streets, but I have a special hole in my yard where I keep it and then burn it”.

During most interviews, respondents were asked what could be done to take care of the environment. The immediate response of many was to assume action by higher bodies was needed. These could be either government bodies or dedicated organizations. Many explicitly stated they did not consider individuals to be able to do anything alone, except perhaps if “acting together”. Regardless of age, affluence, education or general Buddhist beliefs, a frequent refrain was that “individuals are helpless”. Trying to direct conversation to individual level behaviours was often fruitless:

Do people here take good care of their environment?

There is one organisation for protection of environment, at Zapovednik nature reserve there is a reserve for saiga.

Is there anything we can do as individuals?

No.

Can we take care about rubbish?

The district has a special place for rubbish.

Lena in Khulkutta.

There was a common expectation that higher authorities should take care of the problem, even when current government was recognised to be inadequate or even corrupt:

...individuals are helpless. Most important is the leader, the government. In different cities if you forget your bag it will not be stolen. However, in this village people will steal it, the government is to blame. "The fish begins to stink from its head."

Ilya, who had travelled extensively in his youth and was now a critic of Kirsan Ilyumzhinov, the President of the Republic of Kalmykia.

This expectation influenced recommendations for how to better address environmental problems in Kalmykia. For example, Andrei, another elderly man stated: "My attitude is that there are some people above us and they must rule the situation". Within this view, individual action should only arise as commanded from above, as part of collective action. One of the more elderly respondents even explicitly requested that authorities gather them together to "tell us what to do". Both in practice and principle it seemed futile for individuals to even think of action.

Many expected the government to provide financial incentives to do whatever activities it deemed useful, such as tidying litter. However immediate financial benefit was not the only the reason strong government input was desirable. The return of certainty and "order" was widely invoked, as part of a general nostalgia for the Soviet past. Respondents seemed to be demanding more state control, and certainly no individual wished for less state control. Decline in government "strength" was linked to all environmental problems, including the saiga's decline.

After perestroika everything spoiled. So for example, before perestroika people were punished for poaching. Now people do what they want to do

Ekaterina, a devout Buddhist involved in the horn trade, who blamed the absence of a strong state for the current situation.

The middle-aged explicitly recalled Soviet times, regardless of their background or education. A woman with an unusual knowledge of recycling recalled the treatment of litter to be much better in the past:

In Soviet times, there were special sites for paper recycling, and metal, and so it should be with plastic. I wish there were such sites... this will save our forests, as paper is forests".

Rosa, a market trader in Malie Derbetie.

She equated increased power of the state with better outcomes for the people, not just the environment, and wished the government to pay people to look after the

environment: “We would have order ... money is lying under our feet”. Kalmyks of all ages and backgrounds felt that state power and involvement was the best solution for Kalmykia’s environmental problems. Whether or not an individual was Buddhist did not affect this attitude. As such, specific recommendations for saiga conservation involved the state providing more jobs – “it is a matter of financial aid” – and strengthening law enforcement. Indeed, the role of law enforcement was demonstrated by the effect of a set of arrests made in Khulkutta four or five years beforehand. According to local accounts “half of the women” of the village were arrested, resulting in them having to pay fines and a couple going to prison. After this, involvement in poaching fell, and one respondent was happy to admit to us that she herself had been involved until that event.

4.3.6. Dharma centre influence

The Dharma Centre has been visiting the village of Orgakin since about 1993, and in recent times had used the support of the Darwin Initiative to deliver teachings emphasising the need for Buddhists to care for ecology. These teachings also linked Buddhism, saiga, and Kalmyks, for example the WOM was depicted as associated with both saiga and the Kalmyk people. This played on the post-Soviet enthusiasm for resurrecting Kalmyk culture and celebrating Kalmyk identity, encouraging a sense of attachment to the land of the steppe.

It is our motherland. We come from this land. From it is springs [sic].
That's our roots, our history, our people. We should look after it.

*Maya, a teacher in Orgakin nursery, where Kalmyk traditions
are taught to children.*

A cursory inspection of Orgakin could have concluded that these teachings had little influence on the village. Firstly, environmental problems in the village were similar to those found elsewhere, and secondly, there was little evidence of pro-environmental activities. At least some continued to litter – “some people throw it anywhere” – and young people were especially blamed. Furthermore, there was a relatively limited conception of how individual actions can care for the environment, as found in other locations. For example, the farmer Borya had observed several problems such as desertification, but focused on littering when asked how the environment could be better cared for:

What kind of things can we do [to care for the environment]?

One can not throw out rubbish. Not to pollute nature.

Is that all?

Yes.

However, it would have been a mistake to see no impact, or to attribute this to limited exposure to Dharma centre teachings. It was certainly true that Dharma Centre teachings had not been attended by all. During interviews, several respondents in Orgakin (such as Borya) apologised for being unable to attend the lectures, as these were given at the temple in Sharing, 18-20 kilometres from the village centre. In the village centre only prayers with limited teachings were given, for the two major festivals every year (*Tsangsar* and *Zhul*). It was not known what portion of the community had been able to attend the lectures but most do not have their own cars (and of those that do, many may not have time to travel there). The elderly claimed more interest in these topics than younger people, and were especially frustrated to be unable to attend the prayers and teachings:

Yes, of course, I know [about the Dharma Centre]... we are very glad to have such a possibility. We go the prayer and that's all. It's difficult to go there every time.

Raya in Orgakin. She had an 'international marriage' (a Russian husband) but this does not prevent spouses from pursuing separate faiths.

However, Dharma centre teachings did have wide influence. Those that could not attend teaching sessions discussed the topic with friends and neighbours. Furthermore, many were aware that the Dharma Centre had produced a booklet describing why Buddhists “should treat the environment well” and this had been widely distributed (and read) in many homes:

I have learnt more [about Buddhism] from my neighbours and acquaintances than from lectures (or ancestors). Lamas might explain some aspects but mainly they read prayers.

Is there anything to read about Buddhism?

I have no books and my eyesight is bad. Normally my neighbour reads something and tells me about what she has read.

Masha, another elderly lady in Orgakin, explaining how she learnt about the Dharma centre's teachings.

Attending prayer sessions and reading the booklet resulted in a widespread practice that was not evident in other villages. This was called positive practice at the “energetic level”.

Firstly each person if he changes his consciousness and begins to change then the environment will also change. If he will not only think but also practise, well, we know that mantras are vibrations, very good vibrations. Also if a person finds people who think the same way, they gather together and practise together even if they just read mantras, they do a very big and important work. We have already tried to do such things ... a good practice, yes, we read mantras, harmonize it on the mental level.

The primary mechanism of influencing the environment, as explained by Larissa, the most devout Dharma Centre attendee in Elista.

The practitioners of these actions believe these actions are not merely symbolic expressions of care, but result in actual improvements to the environment. As such, several described this praying and harmonization as actions they took to care for the environment. This could be undertaken privately, beginning every prayer with “we want our nature to prosper”, and going on to mix requests for nature with requests for personal benefits:

Every time we pray for rain, prosperity, we pray for every living being including grass, trees, etc. Only after that do we pray for ourselves and our families.

Sveta, who had not attended Dharma Centre teachings but had heard and learned their prayers. She said her belief was also influenced by her grandparents faith and practices, and referred to the film of the Lion King as an influence on her views on the “circle of life”.

This mix of requests in prayer reflected a general perception of the relationship between humans and the environment. Those influenced by the Dharma Centre regarded humanity and all parts of the environment as “absolutely interrelated”, and viewed humans as “an inseparable part of nature and wildlife”. Whilst respondents elsewhere certainly recognized links between humans and nature, it was often expressed rather less explicitly, for example as “everything is connected”. By contrast, some people in Orgakin even thought humans could be “lower on the staircase” than animals, and so should be prayed for only after praying for the rest of nature and the universe:

In my opinion, people are more stupid and angry than animals. As a rule it is people who attack animals first. What is more, we depend on all those living beings, so killing one of them might lead to catastrophic effects in future. Though we are quite educated and technologically developed, it is only knowledge of Buddhism that might help us to stop and understand what is happening.

Description of the relation between animals and humans by Natasha in Orgakin. Her understanding of Buddhism had been strongly informed by Dharma Centre teachings: eight years ago she received an initiation name during a five day course on Buddhism it organised, and she continued to attend its lectures.

To these devout believers exposed to Dharma Centre teachings, a belief in Buddhism automatically moderated human actions to do no harm. Buddhism could also do more than prevent harm, by promoting positive action. So, belief in the power of positive energy had led to group efforts for the improvement of the environment for human prosperity. For human benefit at times of distress, such as drought, a group had visited a nearby *suburgan* [sacred hill] to pray for rain, creating positive vibrations to change the environment. More routinely, groups took care of wells and springs, visiting to “pray there, clean the territory, whitewash”. As a result of these actions the springs are left spiritually clean. As the process involved placing various “offerings” into the water’s source – which included unwrapped biscuits and sweets, tea, oil and flowers – physically there was a temporary decline in cleanliness, but this cleared, whilst the spiritual cleanliness remained. Offerings were made to the spirits of ground and water, as well as the WOM, demonstrating acceptance of elements of original syncretic Kalmyk Buddhism.

Non-Buddhists may regard praying and purifying as actions with no practical effect on the environment. Indeed, some respondents themselves asked for information that would help them translate care for the environment into actions that helped the environment in “concrete” ways (other than picking up litter). However, as elsewhere in Kalmykia, there were limited opportunities to practice pro-environmental behaviour in Orgakin. Municipal lorries collect litter but there are no opportunities to recycle, and of course there can be no direct implications for saiga conservation behaviour, as there have been no saigas in the area (and hence no poachers) for at least 20 years.

However the actions of praying and purification did reveal that individuals felt both responsible and able to take care of the environment themselves. This was a crucial issue, given the reliance on “authorities” otherwise held by Kalmyks of all backgrounds in other locations. This influence lead individuals to feel responsible for their own environment. For example, when discussing how to help the environment, rather than jumping to the level of governmental interventions, a typical response was “I try to create surroundings for the better, e.g. plant trees”. Dharma Centre attendees also felt an obligation to try to help and encourage others, a strong contrast to the passivity noted elsewhere. As Kema noted:

Each must start with his or her yard or house. I plant trees, flowers, have plants in the house and on window sills....One should think of everything... I personally try to give good seeds to other people so they can also enjoy good flowers, and I tell people about Buddhism.

The recognition of individual roles meant that no-one interviewed in Orgakin requested the state to tell them “what to do”, nor wished for a return to Soviet times, even though the village’s buildings and economy had greatly suffered from the withdrawal of state support. The most state-dependent response in Orgakin was shown by Sveta, who had attended Dharma Centre prayer sessions but no teachings. She jointly recognized the role of individuals, and authorities after prompting:

It depends on each of us – we must plant trees, protect nature etc.

Should the state do more?

Had it helped we'd have no problems. During the socialist period, we had a strong state, now it is not even worthy to be called a state

Although financial help from government would have been appreciated – and was requested to assist in greening projects – nobody assumed that as individuals they were “helpless”. Ivan, who had struggled greatly during perestroika, but had also read the Dharma centre booklet, did not call for more government control. When discussing how to improve environmental care he suggested: “on the state level there are decrees and rules, but it is better to influence me, individuals, maybe by religion”. His response was not unusual.

The Dharma Centre’s teachings influenced Kalmyk views throughout Orgakin. Instead of fostering a wide range of pro-environmental actions, the effect of the Dharma Centre’s teachings were mainly expressed in prayers and religious practices to purify the environment. However, it did seem to increase the sense of individual responsibility for one’s actions, which is crucial in the collectivist culture of post-Soviet Kalmykia.

4.3.7. Influence of alternative Buddhist teachings

The Dharma Centre’s effects on individual views and behaviours relate to its particular interpretation of environmental care and positive actions as integral to Buddhist practice. Individuals outside of Orgakin and Elista were unlikely to come into contact with the Dharma Centre, but could nevertheless improve their knowledge of Buddhism in other ways, perhaps from “special literature”, or occasional lectures from visiting monks.

Outside of Orgakin, older people were unlikely to pursue new opportunities to learn about Buddhism. Most had inherited a deep faith from their parents, and were generally content to share what they already knew and follow remembered practices. For example, in Malie Derbetie Nadia explained “all of my knowledge comes from

babushkas”. Only in Orgakin were elderly people influenced by other teachings, from the Dharma Centre.

This feeling was absorbed from her parents, with the milk of her mother. ... Their souls were Buddhist, old people celebrated some religious holidays. They had special beads, icons etc. Our parents were able to leave these to their children, with these things they extended their faith to their children. Since early childhood we repeated the mantra of Green Tara and the main mantra of *Om mane padme hum* but I did not understand its meaning, my mother just told us to do it.

[Later] the teachings of “Makha Kala” were given at school by a French lama. Teachings were also performed due to the assistance of the Dharma Centre. There were many Buddhists from all over Russia who came here. ... The teachings were here at the school and lasted five days.

Natasha, 62, describing how she learnt about Buddhism. Her description of her early experiences is typical of older people, but her later experiences would only be found in Orgakin.

Younger believers were more likely to explore opportunities to improve their understanding of Buddhism, even if their “first teachers” were also parents and grandparents. This study did not aim to compare the Dharma centre to the influences of other such Buddhist teachings, but three individuals in this sample were devout and self-taught, without influence by the Dharma centre. These were university graduates that had mainly pursued their learning in libraries, so their understanding of Buddhism may have more closely corresponded to ‘philosophical’ Buddhism, as it is often understood in the West (McIntosh, 1997). This provided some insight into whether other recent Buddhist teachings were likely to influence views as the Dharma Centre had.

Certainly, to some extent, the influence of these opportunities mimicked the effects of the Dharma Centre, as spiritual self-development was held to automatically lead to a sense of care for life, for example trying “not to hurt a fly”.

Well, we talked about not hunting as a way of caring for the environment, are there any other ways of caring about environment?... What can an individual do?

Well, I don’t know. For me the spiritual self-development is the first. If a person does this work then he is on the right way. He will always behave as he should. There would be no need to give him money for gathering litter and so on, and so forth.

Ruslan, an artist and intellectual who came to Buddhism as an adult

For these Buddhists, the need to care for life was explicitly linked with the concept of karma, which dictates that actions in this life will affect our reincarnation into the next

(so those that take life unnecessarily will be punished). For example, Liza, who learnt about Buddhism from her mother and books, invoked karma as the key principle:

Do you see a link between Buddhism and the environment?

Yes for me. For example, I never kill flies and insects. I catch it and let it go (even though my daughter wants me to kill it because she is afraid of all animals!)... As a Buddhist, I think that all of us will have future lives, so I always think about what will happen to me, when I don't live, to me, my family, my daughter.

However, karma can also be interpreted to reduce sympathy for animals, since they are being punished for actions in a previous life. Ruslan, quoted above, later went on: “If he was born a saiga it means that he had done something bad. And so to feel sorry for an animal, I think, it’s an unnecessary sympathy.” Such views have the potential to limit concern for saiga conservation, but were never expressed by those influenced by the Dharma centre. Furthermore, whilst those influenced by the Dharma centre’s teachings always viewed the WOM as a real protector of Kalmyks (and saiga), he has no place in philosophical Buddhism, being viewed as a “story”, or at best a symbol.

Buddhism is not worshipping idols, fire etc, but to believe in yourself. This personality [WOM] can do something to help... I don't know about special links with saiga.

Nikita, the martial arts teacher and Buddhist healer

Based on the small number of ‘philosophical’ Buddhists in this study, it seemed all those seeking to learn more about Buddhism may have a greater sense of environmental care. However different Buddhist teachings were not equivalent, as regards implications for the environment. Care for the environment and individual responsibility was more greatly emphasized by the Dharma Centre’s teachings.

4.3.8. Summarising influences on environmental views and behaviour

Respondents’ views and recommendations highlighted various influences on environmental views and behaviours. The intervention by the Dharma Centre influenced Kalmyks regardless of their prior interest or views about the environment and conservation. All of those influenced by the Dharma Centre thought spreading its Buddhist teachings could assist in promoting pro-environmental attitudes and behaviours in Kalmykia. This study found a key effect was promoting a sense of individual responsibility for taking pro-environmental action, against a collectivist context where higher authorities are expected to “control” situations. However, the effect of religious teachings cannot be assumed ‘good’ or ‘bad’, since other religious

views and teachings can have different effects. Table 4.3 summarises the major influences on environmental concerns and behaviours identified in this study, both the pre-existing situation and the new influences of the Dharma Centre and other Buddhist teachings.

Table 4.3 Influences on actions taken for the environment by Kalmyks. The first two rows relate to significant pre-existing influences in Kalmyk culture, and the last two rows to new Buddhist influences.

Influence	Implications for environmental views and behaviours			
	Who affected	Personal ability or responsibility	Environmental care	Environmental behaviours
Upbringing & general social norms	Children, through their upbringing, and social norms can influence at any age	Culturedness linked with conscientious behaviour	Environmental problems taught in school	Copy parents' behaviour esp wrt litter disposal. Similar activities carried out in organised groups
Collectivism	Everyone, especially older people	Responsibility to act only as directed. Individuals have little ability to act alone.	Expectation that higher authorities will manage the environment	Organised groups are needed for any actions to improve the environment.
Dharma centre	Elderly and those with free time already with some interest in Buddhism. Indirect effect on friends and neighbours	Positive practice part of Buddhism. Personal action possible, either individually or in a group	Connectivity of all life and environment (little explicit emphasis on karma) WOM punishes those who kill saiga	Praying Spring purification Greening house and surroundings
Self-taught Buddhists	Young to middle-aged seeking to learn more	No influence observed	Kharmas limits sympathy as animals are being punished for past misdeeds	Avoid killing as destruction of life is punished in this life or in next

4.4. Discussion

4.4.1. Environmental concerns and behaviours

There was widespread concern for environmental issues in Kalmykia, with topics such as climate change, desertification and water shortages prominent amongst concerns, similar to officially recognised environmental concerns (e.g. LEAD, 2004). Many of these problems were perceived to have worsened since perestroika. The recognition and concern for environmental problems may be a sign of the effectiveness of past education campaigns in the area, focused on saiga (Howe, 2009) and other issues. Awareness of environmental problems is a promising foundation for any future campaigns to encourage pro-environmental behaviours (Jacobson et al., 2006).

However, direct links between human activities and environmental issues were less often perceived. In particular, actions by local individuals were not seen to affect any of these issues. For just two species – tulips and saiga – was the local action of over-harvesting seen as problematic. Even for saigas, a much loved animal agreed to have undergone a massive population decline, some respondents preferred to discuss other threats from canalisation or changes in the steppe. This suggests a disconnect between awareness of environmental issues and any personal role or contribution to those issues. This point is worth making, since it reiterates the warning that attitudes cannot be treated as simple proxies for behaviour when investigating the impact of conservation activities (e.g. Kapos et al., 2009). However such a finding is not surprising, given theoretical expectations that various other predictors and more specific attitudes to behaviour should inform behaviours (e.g. Ajzen, 2001), and the combined evidence of previous case studies which show environmental awareness to be just one amongst many predictors of pro-environmental behaviour (Bamberg & Moser, 2007). A more unusual insight was made possible by analysing why individuals did not act for the environment.

4.4.2. Collectivisation and conservation

The disconnect between individual concern and action for the environment in Kalmykia was best illustrated by the subject of litter. Littering was universally agreed to be a problem directly experienced, and caused locally. Despite this recognition, when asked how the situation could be improved, there was a strong emphasis on authorities, who should take control to manage the situation. Individuals would act only as directed, working together in organised groups.

This suggests that collectivist thinking has a strong influence over individuals, even though it is over 20 years since the collapse of communism. *Collectivism* is the label for a set of constructs summarising values, moral principles and beliefs about relationships of the individual with others and relationships among social communities (Triandis, 2001). It stresses interdependence and prioritises communal goals over individual goals, whilst its opposite, individualism, places more weight on individual self-sufficiency and self-expression. Collectivism influences many forms of evaluation and decision-making. For example, traditional societies are often associated with collectivism (Inglehart & Welzel, 2005), and more traditional individuals are thought to place greater weight on the needs and views of others, over the self (Triandis, 1989). In

Soviet society the influence was slightly different. Soviet societies were described as *vertical collectivist* cultures, since they emphasised a hierarchy of authority, with individuals expected to submit to authority, to the point of self-sacrifice (Triandis & Gelfand, 1998).

Westerners may be tempted to see the Soviet Union as history, but it is difficult to understate and understand the long-lasting influence of the Soviet system on politics, economics and ideology on contemporary Russian thinking; collectivist tendencies remain (e.g. O'Brien & Wegren, 2002). In this situation, individuals expect the state to take care of problems, with local involvement coming only collectively and if commanded. Other studies have shown that once in the habit of being forced to do things, individuals lose perceived control over situation and need to be told what to do (Figueiredo & Drottz-Sjöberg, 2000). Many respondents in this study almost seemed to demand that the state tell them what to do, and explicitly described themselves as helpless. This highlights the need to understand social context when trying to predict and understand why individuals do or do not engage in pro-environmental behaviours. When trying to predict pro-environmental behaviours, social science studies often focus on an individual's specific attitudes towards the issue in question (e.g. Fiallo & Jacobson, 1995) and occasionally less specific concerns about the environment (e.g. Bamberg, 2003). Whilst understanding these cognitions is useful, their narrow scope may explain why attitudes are generally poor predictors of actual behaviours (e.g. Holmes, 2003b). Collectivist tendencies are not directly related to environmental awareness. However, they influence general views on the governance of environmental issues. Here they explain at least some of the reluctance of individuals to personally recognise their role in environmental problems, or engage in pro-environment behaviour.

This has interesting implications for promotion of conservation and pro-environmental behaviours in the region. Messages and initiatives from higher authority have greater potential to effect changes than in more individualistic societies. Individuals may be more strongly motivated by the fear of failure and deviation from social norms (Iyengar & Lepper, 1999), and if initiatives can persuade some in society to change their behaviour, others are more likely to act similarly, since social norms may matter more in collectivist societies (Suh et al., 1998).

Elsewhere, the general trend in natural resource management has been for increased local participation and devolved governance of resources (Adams & Hulme, 2001). However, in Kalmykia, the local people expressed a preference that higher level authorities manage and dictate the actions to be taken. In this situation, command and control governance may be a swift and socially acceptable way to promote conservation. However, the cost of effective enforcement can be prohibitive (Moyle, 2003). Furthermore, devolved governance may be viewed as morally desirable by modern western conservationists.

4.4.3. Lessons from the Dharma Centre's influence

The Dharma Centre's teachings were linked with a general sense of care for the environment, and an understanding that humans and the environment are linked. Crucially, they also led to a sense of individual responsibility to help the environment, which led individuals to pray and do 'greening' of their surroundings. This effect was greater than that evidenced from respondents exposed to other Buddhist teachings, which may encourage the avoidance of killing through the concept of karma, but did not encourage positive pro-environmental action by individuals as integral to the expression of Buddhist faith.

The influence of the Dharma Centre demonstrates that it is possible to influence people to feel as individual agents. Even though collectivism is thought to be a relatively stable and enduring trait in individuals (Triandis, 2001), perhaps views and behaviours in specific environmental domains are malleable when appropriately presented. In this case the influence was linked to a trusted and well-known institution, the Dharma Centre, linked to deep seated religious beliefs.

More simply, the effect of the Dharma Centre's teachings also demonstrate that it is possible for interventions linked to religious non-governmental institutions to play a positive role for conservation. Since many conservation interventions have focused on giving benefits to individuals (e.g. Alpert, 1996) this argument is pertinent. Understanding local culture and engaging with local institutions offers the ability to reach an audience that may be otherwise uninterested in environmental issues. Of course, religion is not automatically 'good' or 'bad' for conservation, although it may tend to activate altruistic views, which in turn could support pro-environmental behaviours (Shariff & Norenzayan, 2007). Here, the Dharma Centre tapped into a local enthusiasm for resurgent cultural identity, and made care for living things integral to

Buddhist practice. Since values are thought to be relatively enduring and influential (Schwartz, 1997), approaches such as these that work with existing values, may also offer the chance for relatively sustainable and enduring changes even in times of hardship (Ano & Vasconcelles, 2005).

However, there were limits to the Dharma Centre's influence. Firstly, it mostly influenced only those individuals who were already interested in Buddhism. Perhaps with time it will change wider social norms, so even those not interested in Buddhism are influenced, but action is needed now for many issues such as desertification or saiga conservation. Secondly, Kalmyks were practically constrained in how they could express care for the environment: for example, water and electricity meters were unknown and inaccessible. With respect to the ubiquitous issue of litter, there was a lack of facilities. This meant that the feeling of individual agency was rarely translated into behaviours, and as regards large-scale issues such as climate change, no personal actions were ever identified, let alone practiced. Conservation interventions must take multiple approaches if they wish to change behaviour. For the situation in Kalmykia, environmental education which focuses on environmental problems and causes is of course helpful (Isildar & Yildirim, 2008), but may have little effect on behaviour. As well as focusing on individual ability and responsibility for pro-environmental behaviour, it is useful to provide information about what behaviours are helpful, and provide opportunities for change. For example, climate change was constantly mentioned in Kalmykia but there was little knowledge of how individual household activities contributed to this problem. Nor was there metering equipment or links between use and price: so there was neither opportunity nor economic incentive to reduce domestic energy use. Working with a variety of tools, from economic incentives, to changing social norms through engagement with religious institutions, can have complementary effects on different motivations for conservation. Different tools may also be useful over different time scales. For example, once a link between Buddhism and the environment is perceived by a passionate believer, it will not be quickly forgotten, whereas the effect of economic incentives may take wide effect as soon as applied, but if removed can be forgotten equally quickly.

4.4.4. Conclusion

This study demonstrates that awareness and concern for environmental issues does not necessarily translate into pro-environmental behaviour. More uniquely, it shows how culturally influenced values, for example collectivism, can influence views on individual roles and responsibility for pro-environmental action. Collectivism is not immediately relevant to environmental views but causes individuals to expect control of problems by authorities, and perceive little role for themselves. However, recognising this effect offers opportunity for effective interventions: for example, command and control interventions may be socially acceptable. However, if devolved local level control of problems is seen as desirable by conservationists, then the influence of the Dharma centre shows that promoting a sense of self and agency is possible.

Ultimately, the varied influences found in this study confirm that a one-size-fits-all approach to conservation is always unlikely to be successful. Most likely, a combination of interventions is required, but the mix must always be decided and designed based on an understanding and engagement with the local social context.

5. VARIED DRIVERS OF RESOURCE USE WITHIN COMMUNITIES: IMPLICATIONS FOR CONSERVATION IN PIPAR, NEPAL

The previous chapter described how an intervention linked to religion could influence views and behaviours of relevance to environmental issues and conservation. However, it was clear that no single intervention was likely to influence the entire population. This chapter further focuses on this issue of heterogeneity within communities, using a site targeted by a conservation intervention within the developing country of Nepal. Aspects of social heterogeneity are relevant to understanding both natural resource use – some driven by practical need and others by cultural preference – and conservation behaviours.

5.1. Introduction

Analyses of community-based conservation have already noted a tendency for conservationists to stereotype the communities they work with (Agrawal & Gibson, 1999). Although this argument is well known, at present there is little evidence that interventions are improving in this regard, and there are continuing reports of conservation failures (Brooks et al., 2006).

Amongst the stereotyping and misunderstanding of communities by conservationists (Campbell & Vainio-Mattila, 2003) three types of assumptions are particularly likely (Agrawal & Gibson, 1999). Firstly, that communities correspond with small spatial units; secondly, that they form a homogenous social structure; and thirdly, that everyone there shares social norms. These assumptions may be rooted in romantic ideas about exotic communities' way of life and attitudes to nature (Alcorn, 1994). However, examples show that any or all of these convenient assumptions are often untrue. For example, communities may be rife with conflict or elitism (e.g. Nelson & Agrawal, 2008), and local views of conservation issues may be diverse (e.g. Fiallo & Jacobson, 1995). Understanding community heterogeneity may be helpful for conservationists.

5.1.1. Social heterogeneity and conservation outcomes

Many descriptions of conservation projects note that access to resources and participation in interventions is influenced by 'elite capture', the undue concentration of power in the hands of a minority (Larson & Ribot, 2004). An understanding of community can help to identify how this problem may occur. For example, in India and Nepal, a caste system structures social interactions and status, and so higher castes have

often controlled access and use of forest resources (Thoms, 2008). Communities often have such social hierarchies, or at least sub-groups with different interests (Agrawal & Gibson, 1999). As a result, when projects promote local involvement in conservation, without recognising such inequalities, inequity may be reinforced and local elites disproportionately benefit (Iversen et al., 2006). As well as being a cause for concern in of itself, such effects are unlikely to foster pro-conservation attitudes and behaviours. For example, ignoring issues of class, gender and patronage meant an ecotourism project in Belize created very little support for conservation (Belsky, 1999). As negative attitudes can also spread to agencies associated with the projects (e.g. Gillingham & Lee, 1999), this can further impact long-term success.

Not every community is dominated by elites, but other differences can still cause problems for interventions. For example, a project which used plant nurseries to tackle poverty in South Africa experienced multiple incidences of conflict, some violent (Botha et al., 2008). Such conflicts of interest are not always expressed as violence, but they frequently influence patterns and drivers of resource use as well as responses to interventions (e.g. Kumar, 2005). In particular, livelihood strategies are frequently identified as a reason for varied responses. For example, elsewhere in South Africa, different livelihood goals, combined with age effects, caused different social groups at one site to have quite different views of and involvement with a game reserve (King, 2007). Different livelihood strategies may also be linked with the issues of unbalanced participation. For example, a study of resource use in southern Nepal found livelihoods were associated with status, with the poor particularly dependent on grasses but also the least likely to participate in formal conservation activities (Brown, 1998). It is clear that social heterogeneity of local communities, particularly as regards livelihoods, affects the interests, needs, constraints and cooperation of individuals in conservation.

However, it could be simplistic to consider only livelihood concerns as influences on resource use and engagement with conservation. Of course, resource use is often driven by the need to fulfil the basic requirements of food, shelter and warmth, and this is why it is often useful for conservation projects to link with poverty alleviation strategies (Agrawal & Redford, 2006). However, local reactions vary even to 'pure' development projects which offer seemingly unequivocal benefits (e.g. McKay & Sanders, 2007). Responses to interventions for conservation can be equally perplexing, at least when drivers for behaviours are not well understood. For example, tackling over-use of

resources by providing substitutes is not always successful (Wainwright & Wehrmeyer, 1998). The diverse motivations of different groups must be appreciated before appropriate interventions for conservation can be identified.

A useful complement to looking at practical needs may be attending to cultural influences on natural resource use. These may include a preference for the taste of wild products (e.g. Schenck et al., 2006), a role for nature in recreation (e.g. Dowsley, 2009), or links to religion and traditions (e.g. Aiyadurai et al., In press). These varied preferences for resource use, which are not driven by immediate practical needs, are labelled 'cultural preferences' by this study.

Cultural preferences are potentially a matter of conservation concern because they can act as drivers of resource over-exploitation. For example Pacific islanders' traditions of celebrating special occasions by serving fruit bat meat has driven the fruit bat *Pteropus tokudae* extinct, whilst populations of *Pteropus mariannus* have declined severely (Wiles et al., 1997). Problems are particularly likely where rarity is valued, since searching for the resource will continue even when declining populations make this process difficult and increasingly costly (Hall et al., 2008). For example, the swimbladder of the bahaba fish *Bahaba taipingensis* was prized by Asian herbalists for its ability to prevent miscarriages, but as its rarity increased, its value became greater than that of gold, and was fished close to extinction (Sadovy & Cheung, 2003). These types of preferences are common enough to feature at international scale, driving trade and decline in many wild species (Courchamp et al., 2006).

Different interventions may be appropriate for these different drivers. For example, where preference for wild foods drives resource use, offering alternative sources of food may not reduce pressures on wild resources (Horowitz, 1998). However, it is not clear if both preferences and need can drive resource use within communities. The need for conservationists to appreciate and reflect local social heterogeneity is already well known, but effects such as elite capture may still be underestimated and changes in conservation practice are yet to be made. The argument for understanding local context and tailoring conservation strategies will be even more powerful if it can be shown that social heterogeneity links to differing drivers of resource use even at a small-scale. This chapter therefore centres on identifying key aspects of social heterogeneity within a population targeted by a conservation intervention in Nepal, and the links with natural resource use and conservation involvement.

5.1.2. Research objectives

The overall aim of this study is to describe social heterogeneity and linkages to variation in natural resource use, within communities at the scale of a CBC project in Nepal.

- 1) Identify key aspects of social heterogeneity within communities
- 2) Understand variation in the drivers of natural resource use within communities, particularly whether drivers include cultural preference as well as practical need.
- 3) Discuss the implications for actual and potential conservation practice.

5.2. Methods

This study draws on mixed methods research in Nepal carried out in 2007 and 2008. In 2007 the techniques of rapid rural appraisal (RRA) were used to collect qualitative data, whilst in 2008 a questionnaire survey collected quantitative data. Chapter 2 discussed the rationale for mixed methods, and combining RRA and questionnaire research can capture the strengths of both approaches.

5.2.1. Study area

This study focuses on people living near to Pipar Forest (approximately 28°24'N, 83°57'E), within the Annapurna Conservation Area, central Nepal. Pipar is a site of special conservation interest because it contains an unusual diversity of vegetation types and pheasant species, related to its altitudinal range, from 1300m to 4000m, on a ridge of the Macchapuchare mountain (Poudyal, 2005). Five of Nepal's six pheasant species are found in this relatively small area, including the Himalayan Monal (*Lophophorus impejanus*), the national bird of Nepal (Lelliot, 1981). Below this ridge, the Seti Khola river runs south, fed by the Sardi Khola and Birjung Khola, all flanked by villages where this study was conducted (figure 5.1).

Hunting, grazing and NTFP collection by local people are thought to pose a threat to the bird populations and vegetation diversity of Pipar (Gyawali, 2004). The NTFPs include fruits, vegetables and medicines, some of which, such as Nirmasi (*Delphinium denudatum*) and Yarsa gumba (*Cordycep sinensis*) are known to be valued on national and international markets. Destructive activities often occur when villagers take livestock to graze, and the decline of *Rhododendron campanulatum* forest, the habitat for many species of interest, is of particular concern (Poudyal, 2005). A group of bamboos called Nigalo may also be threatened. Nigalo is the local term for all bamboo

species useful for construction and household purposes. In addition, the shoots of *Malinge nigalo* (*Himalayacalamus* spp.) can be harvested as a very prized vegetable. Nigalo is widely acknowledged to be declining in the area, although the link between this decline and human use is poorly understood, and requires further research (Stapleton, 2007).

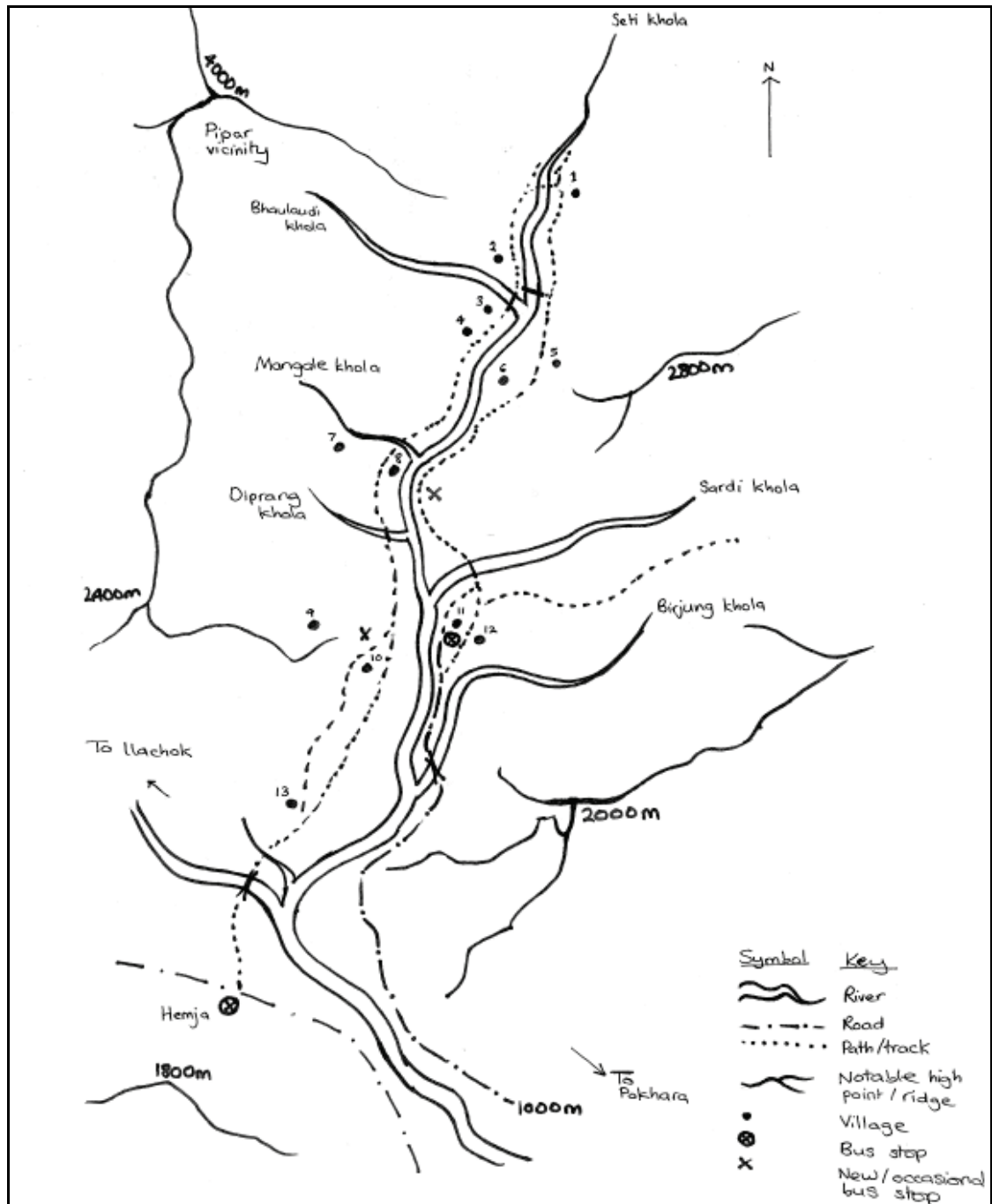


Figure 5.1 Sketch map of the Seti Khola valley lying beneath the Pipar forest, within the Annapurna Conservation Area, Nepal. Sampling took place in villages through this valley, and along the Sardi and Birjung Kholas (rivers) – the main villages visited are numbered points on this map. Points 13 & 10 set the approximate boundary of the most southerly portion, Ghachok VDC. Sardi Khola VDC lies to the east of the main Seti Khola valley, encompassing points 11 & 12. Point 1 is the most remote settlement, in Macchapuchare VDC. The distance from points 1 to 13 is about 10 miles. Pokhara, the nearest town, lies about 10 miles further south. VDC = village development committee, a local administrative unit.

There are thirteen villages in this area, which fall within three administrative units (Village Development Committees, VDCs) in the Kaski District: Macchapuchare VDC, Ghachok VDC and Sardi Khola VDC. These VDCs are biogeographically similar, with inhabitants living in the lower altitude ranges (1100-1700m) in a sub-tropical to temperate climate zone. They are also relatively similar in ethnic composition and livelihood strategies (Central Bureau of Statistics, 2001) within the context of the whole of Nepal, which contains about 75 ethnic groups speaking over 50 languages (Bista, 2004). Hinduism is the most common religion, linked to caste, although Buddhism is also common.

The caste system in Nepal (which incorporates ethnic groups) was officially outlawed in the 1990s, but still remains relevant to understanding socio-economic status (Bista, 2004; Gurung, 1989). In this area the main ethnic groups are Gurung and Magar (Tibeto-Burman ethnic groups, mid-status in the caste system), Brahmin and Chhetri (high caste, Indo-Aryan origins), and Damai, Kami and Sarki groups (low caste, Indo-Aryan origins) (Folmar, 2003). Traditionally, low caste groups were unlikely to be involved in governance and had restricted interactions with higher caste individuals. This is known to still influence the interactions of individuals and involvement with governmental institutions (Folmar, 2003).

Nepal is one of the poorest countries of the world (UN, 2006), although the region below Pipar is relatively prosperous. Livelihood strategies depend on farming both for subsistence and for income, usually on terraced hill slopes. The main crops are maize, millet and rice, with some vegetable and livestock farming. Although less obvious, external remittances are of growing importance (Adhikari, 2001) and mask a food deficiency in this region (Bohle & Adhikari, 1998). Many young men (and some women) work in towns, Arabian countries, and a few have prestigious jobs in the Indian and British armies where they are known as Ghurkhas. Throughout Nepal, wild resources are known to supplement livelihood strategies by providing fuelwood, fodder and timber (Gilmour & Fisher, 1992). Hunting and NTFP collection may also supplement income, especially for the poorest (Adhikari, 2001). Although some trees are grown on private land, these resources are usually sourced from community forests (CFs) managed by Forest User Groups (FUGs). Nepal is famous for its relative success in managing these resources (Gilmour & Fisher, 1992). FUGs and other related conservation committees are seen as the basis for all Nepali conservation strategies.

However, the fairness of these management and conservation strategies has been called in question in other parts of Nepal. Chakraborty (2001) found that FUGs in the southern plains of Nepal reflected the existing hierarchies in local society. Women can be underrepresented and also the lower castes (Agarwal, 2001) (Kellert et al., 2000). A study of a general assembly of Nepali FUGs found that out of 175 participants the only suggestions were made by elite members, and these would have been to the detriment of the poor (Timsina, 2003). As a result of the limited power of women and minorities, benefits can be unfairly distributed both within communities and between communities within conservation areas, as found in a study of two protected areas in the middle hills by Kellert et al. (2000). It is not known if similar problems exist in the study area.

Given the ecological significance of Pipar and the relative poverty of Nepal, the valley below Pipar is suitable for community-based conservation approaches. Accordingly, the World Pheasant Association (WPA) has been working in this area since the late 1970s. In an early example of a CBC approach, it supported schools and school teachers in exchange for local promises to support conservation (The World Pheasant Association, 2008). Furthermore, since the creation of the Annapurna Conservation Area Project (ACAP), Pipar has been part of the largest area in the world that has been specifically designated for community-based conservation. Within the Annapurna area, considerable resources have been given to communities for empowerment, development and conservation (Baral et al., 2007), often linked to inputs for development from international NGOs and agencies such as the UN. ACAP has some influence on Community Forest designation and its project activities have also produced Conservation Area Management Committees (CAMCs), with subsidiaries in each village linked to normal administrative structures.

Since the mid 1990s Maoist rebels have caused extensive civil unrest in Nepal (BBC, 2009). This has caused extensive damage to all Nepali governance institutions, including those relevant to conservation and the Annapurna area. For example, about five years ago an ACAP office in the Seti Khola valley was firebombed and thereafter abandoned. In general, ACAP activities were very much weakened and effectively suspended (Laxman Poudyal, pers. comm.). The insurgency ended shortly before this study was conducted. Although the centuries-old monarchy was abolished and the Maoists were elected into government in 2008, repairing the damage caused, both social and physical, will be a slow process.

Since the WPA's initial intervention near Pipar, the region has benefited from semi-regular ecological surveys to monitor its flora and fauna. However, despite social and political changes and instigation of the ACAP project, there has been little research into the needs and views of those living near to Pipar. This chapter focuses on this issue, paying particular attention to the drivers and role of resource use in the area, and the implications for conservation of local natural resources.

In this case, the flexibility of qualitative research is appropriate to probing a poorly understood situation, but a questionnaire survey can usefully provide representative information about households in the area. So, this chapter primarily draws on findings of rapid rural appraisal, reinforced by some of the survey data. Other aspects of the survey data are discussed in detail in chapter 6.

5.2.2. Application of RRA techniques

When researching resource use and conservation issues in developing countries, it is generally agreed that approaches that encourage participation are both pragmatically and morally desirable (e.g. Roe, 2008). Participation requires the researchers learning from, with and by members of the community, with opportunity for local people to influence and even take ownership of the research process (Kapila & Lyon, 1994). Participatory Rural Appraisal (PRA) is a loose set of principles and approaches, all focused around encouraging participation, that are particularly appropriate for working with rural illiterate people (Kapila & Lyon, 1994). Research conducted over shorter time scales, as used by this study, is called rapid rural appraisal (RRA).

RRA sessions (also called focus group discussions) lasted about one hour and were held in groups of three to five people (although this number varied), in an informal setting. To triangulate findings, one topic would be approached in different ways by the same group, and the same topics covered by different groups. Participation and interest were encouraged through the use of visual techniques, which also allowed discussion to be understood by all participants, including the non-literate. For example, pictures of food types discussed were drawn onto cards, not just labelled in writing. A research assistant acted as translator and accompanied the author at all times. Before visiting the field, he was fully briefed in the principles of RRA and the study aims, and before talking with each group certain topics were planned and discussed together. The total range of topics covered was intended to allow a broad understanding of local life and livelihoods, using methods intended to be engaging and interesting for participants (table 5.1).

Group composition was carefully considered to maximise the range of views that were captured by the study, and to encourage freedom of expression within each group. Respondents of different backgrounds and status were sought as it is important to capture a range of views, not just to rely on elite key informants (Wieczorek Hudenko et al., 2008). Although we did not object to mixed groups, we usually attempted to segregate different types of people into different groups. Age, gender and caste were thought potentially important factors, so groups usually included a men's group, a women's group, a youth group, children, and a separate group for people of low socio-economic status (often the occupational castes). Selecting participants from pre-existing village groups (e.g. selecting women from a mothers' group) encouraged group members to feel comfortable working together and expressing their views.

Each visit to a village began by seeking permissions to do research and publicising the purpose of our visit. During the time spent in a village genuine engagement was sought at all levels, with questions, feedback and discussion encouraged (although only in a longer study would local ownership be feasible). At the end of each visit to a village, the data collected were copied back to villagers – so they held duplicates of all visual outputs – and there was opportunity for further discussion and feedback.

Table 5.1 The main RRA exercises used to probe research topics in this study.

Research topic	Exercises used to probe topic
Understanding general village life and livelihoods, the role of natural resources in livelihoods	<p><i>Timelines</i>: village events and trends were visually represented by using lines and pictures on a scale, going back as far as the oldest participant could remember.</p> <p><i>Livelihood ranking</i>: local livelihood options were discussed and ranked for their desirability and for various local constraints.</p> <p><i>Participatory mapping</i>: a map of the village and surrounding area was made with the aid of local children and/or any interested local contacts. The map would feature key local landmarks, rivers and paths.</p>
Perceptions of local natural resources, including their role in culture and social life, e.g. religious ceremonies or recreation	<p><i>Participatory mapping discussion</i>: after or during mapping, the map used to prompt discussion about locally perceived land types (which could be pictured on different cards), land uses, and historical land use.</p> <p><i>Food sources</i>: the important local categories of food, including wild sources, and the relative importance of different sources of food, shown by discussing food types, picturing them on separate cards, and then dividing 100 beans between the cards to indicate relative importance.</p> <p><i>Natural resources roles and ranking</i>: identification of the various benefits from the forest. This was sometimes compared with benefits from any other land types identified, like agricultural land or rivers.</p>
Perceptions, understanding and involvement with conservation activities	<p><i>Conservation discussion</i>: local conservation problems were identified and ranked, causes and solutions discussed.</p> <p><i>Flow charts</i> of 'cause and effect' were sometimes produced during the discussion.</p>

5.2.3. Questionnaire survey of households

A questionnaire survey was used to elicit data about the composition of households throughout the valley. The development of the questionnaire was guided both by the research topics and by practical constraints on question and answer formats (described in Saunders et al., 2003), and was informed by the data collected during the RRA.

The data were used to understand the range of livelihood strategies in the valley (the questionnaire also collected data on other issues, which are the focus of Chapter 6). A variety of personal attributes were collected at the household level: family size, number of children, household religion, occupations of family members, and involvement in conservation activities or committees. Some information about the main respondent was also collected: age, education level and length of residence in the village. The location of the respondent's household was converted into a remoteness score, by working out typical journey time (walking and bus) to the nearest large town, Pokhara. Household wealth is relevant but notoriously difficult to measure because respondents are often reluctant to self-report (Kapila & Lyon, 1994). So, this study used phrasing about how 'comfortable' the respondent felt their household was relative to others in their community, on a 4-level scale. This phrasing was acceptable yet still well understood by respondents, with only two refusals. Table 5.2 lists the final set of questions probing household and personal attributes.

Table 5.2 The questionnaire items measured for this study, details of their coding, and their location in the questionnaire (Appendix D). Label ^r by item indicates it was reverse recoded for analysis.

Variable	Operationalisation	Question number
Age	Numeric, open response	8.c
Gender	Male or Female respondent	Recorded prior to interview by enumerator
Education	Open format description, later coded into a five-level scale from 1 (illiterate) to 5 (degree held).	8.e
Caste level	Open format description of caste group, later recoded into 1 (low caste, used for occupational castes), to 3 (high caste, Brahmin Chettri castes).	Recorded prior to interview by enumerator
Wealth	One item, four level-response from high to low wealth relative to others in area.	7 ^r
Household size	Numeric, open response. Household size includes members working abroad but does not include family members usually based in another household.	8.a
Remoteness	Typical travel time by foot and bus from village of respondent to reach the nearest large town of Pokhara, in minutes.	Recorded prior to interview by enumerator

Question wording, order and use of language were checked to ensure neutrality and ease of understanding. We used a variety of answer formats: both open (any response permitted) and closed (response limited to a predetermined list or scale). Although closed questions can be easily recorded and analysed, when the range of answers was not certain open format questions were used. After extensive pretesting, a satisfactory pilot test (N=95) in the Llachok valley (adjacent to the target valley), prompted a slight reduction in questionnaire length (to about thirty minutes), to avoid boring respondents. The final questionnaire (Appendix D) was written in Nepali script, with open answers written in Nepali and translated to English on the same day.

5.2.4. Sampling strategies

The sample frame was all the villages in proximity to the Pipar Forest (approximately the area bounded by the points 28°18'N, 83°56'E, 28°24'N, 83°59'E and 28°22'N, 83°59'E), within the Annapurna Conservation Area, central Nepal.

To carry out the RRA, the researcher stayed with families in eight villages between May and June 2007. The main intention was not to sample the area representatively, but rather to scope the way of life, the range of livelihood strategies and locally important issues, especially with respect to natural resource use and conservation. Therefore, contrasting villages were visited: both large and small, and remote and less remote. Duration of stay ranged from eight days in the beginning, to three days for later visits aimed at confirming patterns and spotting exceptions. Twenty-nine groups were interviewed in eight villages around the Pipar area, and six groups were spoken to twice, in order to discuss more issues with them (not all issues could be covered by one group, in one session).

The questionnaire survey was carried out in October to December 2008. Three enumerators, trained during pretesting and piloting, worked separately to interview 661 individuals from all parts of the valley. The strategy was to draw a representative selection of the adult population via random sampling. Households were selected randomly by walking every path in and around the village, and knocking on every other door. Within each household, one individual was selected by asking the first adult encountered (this did not seem to favour any particular type of individual, and avoided bias to head-of-households). Where individuals were not available, enumerators would call up to 3 times, and/or arrange a more convenient time for the interview. The sample represents a high proportion of the households within the valleys: the last available

census data suggested a total of 1478 households in this area (Central Bureau of Statistics, 2001). It is impossible to know exact sampling intensity because civil unrest has caused emigration since this time: enumerators often noted unoccupied houses.

5.2.5. Data analysis

Local views elicited during discussions were recorded in detailed hand written notes during the meeting, together with comments about group dynamics. These notes were later typed into Word. For ease of access these files were imported into Nvivo (QSR International, 2008), where they were coded by subject to aid searching and information retrieval. Questionnaire data were stored, coded and presented with Microsoft Excel, with SPSS 17.0 used for basic descriptive statistics (SPSS Incorporated, 2008b).

5.3. Results

This section presents evidence about social heterogeneity in communities in the Seti Khola valley, particularly as variation between households in geography, livelihood strategy, and the role of caste in structuring this. This leads to presentation of links with motivations behind natural resource use, and finally on actual and potential conservation behaviours. Data are presented according to topic, rather than by method (RRA or the questionnaire survey). All narrative description and quotes are based on RRA data, whilst descriptive statistics and tests are based on questionnaire data.

5.3.1. Social heterogeneity and livelihoods

Questionnaire data show that household size ranged from 1 to 18 people, with a mean size of 6.0, including 1.9 children under 16. Most respondents (70%) had always lived in their village, and many of the immigrants were women who had moved upon marriage. Religious beliefs followed a similar pattern to census data, with Hinduism most common (74%) followed by Buddhism (17%). Some respondents to the survey described themselves as 'Hindu-Buddhist', reflecting the mixing of religions in Nepal.

In the questionnaire survey, the most common respondent caste was the Gurung ethnic group (22%) followed by Magar (19%) and Brahmin (18%), leaving the lower castes as a minorities within all settlements (Damai 6%, Kamai 6%, Sarki 7%). This is broadly similar to the distribution recorded in the census (Central Bureau of Statistics, 2001). There were never any mixed caste households. No village was entirely comprised only

of people of one caste, although there were slight differences in composition between villages, with more remote villages less diverse.

The remoteness of the villages in the study area varied considerably. When measured by typical time taken to walk the shortest path, and then take a bus (assuming no wait) in the dry season, the time to travel to Pokhara ranged from 1 to 3.5 hours. Some of those in the southern end of the valley were therefore able to visit town regularly, which entailed greater options for access to healthcare and employment.

Throughout the valley, the dominant occupation was agriculture, with 96% of households maintaining crops and sometimes livestock, even as an addition to paid employment (table 5.3). With the exception of teaching, all of the desirable jobs which paid a high rate of income could be pursued only by moving out of the village, even abroad. The need for a cash investment and/or a good education limited pursuit of these options. Livelihoods that depended on working for others in the local community were not desirable. For example, agricultural labour was performed only by those without land.

Table 5.3 The occupations of adult members of households in the study area, as described by respondents of the questionnaire survey (N=661, up to four occupations listed for each adult member of the household of the respondent). Occupations ordered by frequency, and those given by less than 1% of households are not shown. 'Labour' is a type of work generating monetary income by working for others.

Occupation	Frequency	Percentage of households	Occupation	Frequency	Percentage of households
Agriculture	633	96%	Army (inc Ghurkas)	25	4%
Housewife	417	63%	Carpenter	24	4%
Labour abroad	314	48%	Animal husbandry	12	2%
Student	238	36%	Disabled	11	2%
Retired	109	16%	Paid manual labour	7	1%
Agricultural labour	78	12%	Government employment	7	1%
Mason	48	7%	Tailor	6	1%
Own business	45	7%	Trekking guide	5	1%
Teaching	43	7%	Electrician	5	1%
Nigalo weaving	42	6%	Blacksmith	4	1%

A few occupations were nearly always combined with other activities; tailoring, masonry and nigalo weaving were usually seasonal or minor occupations. For example, figure 5.2 shows the major livelihood options in order of increasing desirability, as identified by a youth group in the relatively remote village of Karuwa. Here, there were fewer options described than in the south, but as usual agriculture was seen as the reliable mainstay, with collecting plants for vegetables and medicine a lowly 'side job'. These activities produced materials that were often exchanged locally. For example,

vegetables could be traded for biscuits or milk at the local shop. Valuable vegetables and medicines could also be sold further afield, to markets in the town of Pokhara and beyond. No part of the valley – and no livelihood strategy - was entirely self-sufficient or isolated from the rest of Nepal.

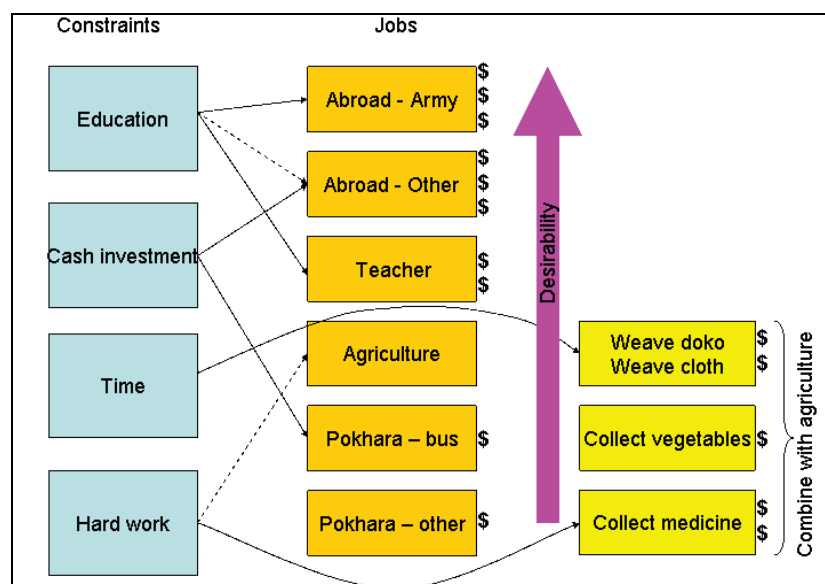


Figure 5.2 Major livelihood options, desirability and constraints, as identified by a youth group in Karuwa (location 2 on the map in figure 5.1). “Pokhara-bus” means making a living driving a vehicle for goods in the town of Pokhara. “Abroad other” is emigration to India or Gulf states to do manual labour. The lines joining boxes represent which constraints are associated with which livelihood options. The dollar symbols beside boxes represent the financial productivity of each livelihood option.

5.3.2. Wealth and caste

To the outside eye, varying remoteness may be the most obvious aspect of difference between households in the study area. However, this did not correlate with wealth, as might be expected from the increased options that proximity to town brings (Spearman $Rho=0.016$, $N=659$, $p=0.676$). This was not due to perceptions of high equality; indeed, householders often judged there to be significant variation in wealth between households within a community. Focus group discussions agreed that poorer people were less likely to own land, more likely to depend on working for others, their houses were often smaller and more crowded, and their children did not attend school for long. In discussions about status and wealth in the area, local people found it useful to categorise households into four levels of wealth or status, which subsequently formed the basis of a question in the survey (table 5.4).

Table 5.4 The choice of questionnaire respondents (N=659), in response to the question ‘Compared to other people in this area, how would you say your household is living now?’

	Frequency	Percent
Comfortable	198	30.0%
Coping	383	58.1%
Coping with difficulty	47	7.1%
Coping with extreme difficulty	31	4.7%

Local people perceived the caste system to be the most fundamental source of differences between people in the valley. As expected from focus group discussions, in the questionnaire survey higher caste status was positively associated with increased wealth status (Spearman’s $Rho=0.125$, $N=659$, $p=0.001$). Of course, this was not an absolute relationship: many high caste households were not rich, whilst some low caste respondents did not see themselves as particularly poor. Households in remoter areas had a particular tendency to see all in their village as relatively equal, perhaps because fewer inequalities were possible with the traditional way of life. There was no overall association between caste and remoteness (figure 5.3), but when walking around larger settlements it became clear that people of minority castes always lived together, forming separate social units.

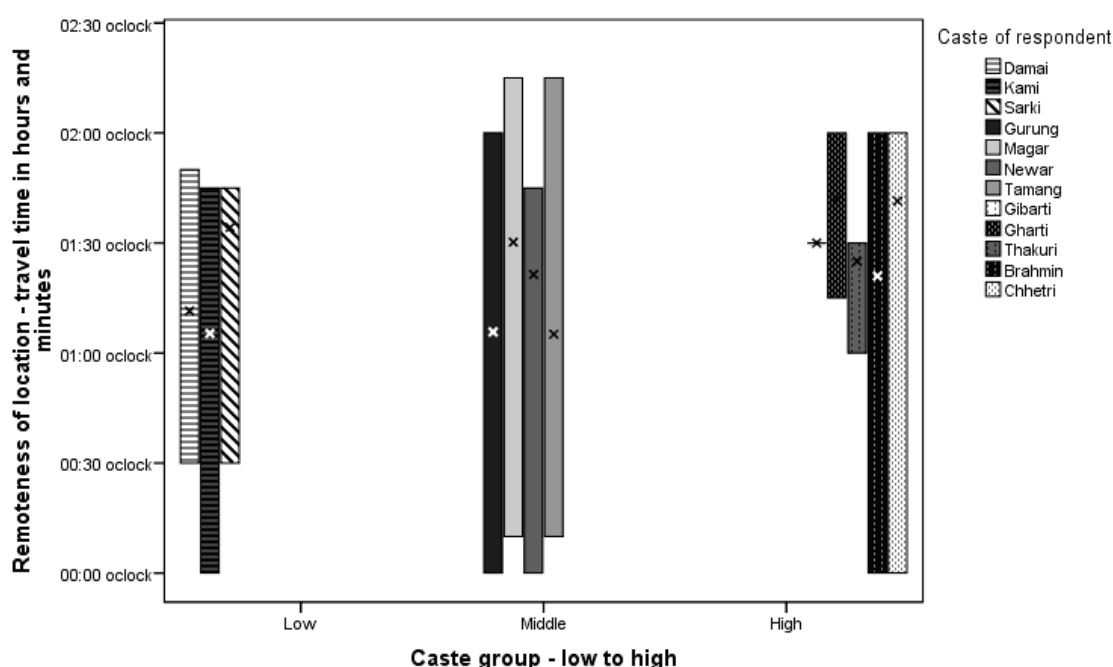


Figure 5.3 The distribution of different caste groups throughout the valley, as shown by travel time to the nearest town. Stars in the middle of bars indicate mean travel time for that caste group, the range of the bar represents minimum and maximum time for that travel group. High caste: Brahmi, Chhettri, Gharti and Thakuri. Middle caste: Gurung, Magar, Low caste: Damai, Kami, Sarki. $N=661$.

The way in which caste structures everyday life and household structure was also evident from tests of questionnaire data. Higher caste was associated with smaller family sizes (Spearman rank, $Rho=-0.093$, $p=0.017$, $N=661$), particularly fewer children (Spearman rank, $Rho=-0.189$, $p=0.000$, $N=661$). It was also linked to different livelihood practices: for example no lower caste respondents were teachers or in government employment, compared to 28 employed from the mid and high castes. Some associations between caste and occupation had positive connotations – the Gurung ethnic group has traditionally been associated with soldiering, particularly with the most prestigious job possible, a Ghurkha in the British army. However, the specialised jobs of blacksmith, mason, and tailor were the exclusive preserve of the lower castes, and were perceived as extremely low status jobs.

Agricultural labour was disproportionately common in the lower castes ($\chi^2=30.2$, $df=2$, $p<0.0001$). Focus groups explained this occurred because those with the lowest status were unlikely to own their own land, so instead they had to work on others' lands, in return for cash payments. This also meant they were unable to access loans from the agricultural development bank, to set up new business, as they could offer no deposit or collateral. These various constraints meant that the lowest castes perceived fewer livelihood options (table 5.5). Their livelihood strategies were considerably more constrained than for higher status groups.

Table 5.5 Livelihood options, listed in order of desirability, as perceived by two different groups living nearby in the same administrative unit: Chhetri caste and Damai caste in Ghachok VDC. All of the options ranked by the Damai people fit within the fifth ranked option of the Chhetri group.

	Chhetri (high caste)	Damai (low caste)
1	Private and government employment, e.g. teacher, government, health agencies, bus driver	Ploughing
2	Own business, e.g. rice mill, saw mill, alcohol brewing, medicinal shops, veterinary shops, transport company	Planting
3	Working abroad	Portering & carrying stones
4	Agriculture, vegetable farming, animal husbandry	Mason
5	Manual labour, e.g. ploughing, planting, portering, mason, also blacksmith, carpenter, tailoring	

5.3.3. Livelihood strategies and natural resource use

Local natural resources were essential to all livelihoods, predominantly as an input for agriculture. Surrounding forest was perceived to be particularly useful. Table 5.6 gives an example of the various types of value for forest, as perceived by men in one village.

In every area, forest was perceived as important for livelihoods – in particular, the collection of vegetables for eating, and fodder for livestock was reported by every group across the valley – but in addition to these practical values, cultural values (such as value for religion, recreation or attachment) were also always perceived (table 5.7).

Table 5.6 The benefits of forest identified by a male discussion group in Ghachok VDC. The numbers assigned to each benefit category result from dividing 100 beans between the categories, according to their importance. Meat from the forest was discussed but not scored as hunting was a sensitive activity.

Benefits from Forest	Rating	Notes
Fodder	24	This is declining due to plantation trees and invasion of plants
Firewood	13	We get twigs from here and around house
Nigalo	13	-
Leaves for compost	10	-
Vegetables	8	Some vegetables have disappeared due to heavy use. (Medicines are only found higher than we usually go.)
Fruits	6	We take care not to pick all fruit
Religious site	4	Where there are temples we can kill nothing.
Love	22	Our attachment relates to the benefits we get from the forest

Table 5.7 The relative weighting given to practical and cultural values of forest, as identified by fifteen respondent groups throughout the valley. Each group identified its own categories of value for forest, so each group generated slightly different list. Every group identified several types of value that had practical value for sustaining livelihoods (for example, vegetables, wood for building, medicinal herbs, firewood, fodder for animals) and one or more types of cultural value (for example, religious value, recreation value, attachment or love). Participants divided 100 beans between these categories to indicate their relative importance.

Group	Region	Practical values	Cultural values
Children	Chamlung	78	22
Children	Ghachok (Lower)	85	15
Children	Ghachok (Upper)	84	16
Children	Kabre and Bharaburi	64	36
Children	Sariphaka	73	27
Men	Chamlung	75	25
Men	Ghachok (Lower)	73	27
Men	Ghachok (Middle, Balabot)	87	13
Men	Kabre and Bharaburi	76	24
Men	Kabre and Bharaburi	81	19
Men	Karuwa	83	17
Women	Ghachok (Lower)	79	21
Women	Kabre and Bharaburi	95	5
Women	Karuwa	66	34
Women	Sariphaka	77	23
Mean scores		78	22

Overall, any environmental impact of agriculture may have been less than in the past, due to emigration to towns. Emigration rates were particularly high during the instability and danger of Maoist insurgency, and abandoned fields were a common sight in remoter areas (figure 5.4). Similarly, animal husbandry was declining, so animal grazing was decreasing (although collection of fodder may not, as there was an

increased tendency to keep animals close to home rather than practice transhumance). Those herders who went to high altitudes were said to “hunt all day” and so it was widely agreed that the decline in transhumance meant less hunting now than in the past.

The sustainability of remaining agricultural practices was unknown, although it may be pertinent to note that in the south of the valley artificial fertilisers were mentioned as recent option that was perceived favourably over traditional leaf-composting methods. Those using fertilisers had reduced visits into surrounding forests, but if fertilisers were to be inappropriately used, there would be potential for new problems with soil quality and water contamination.

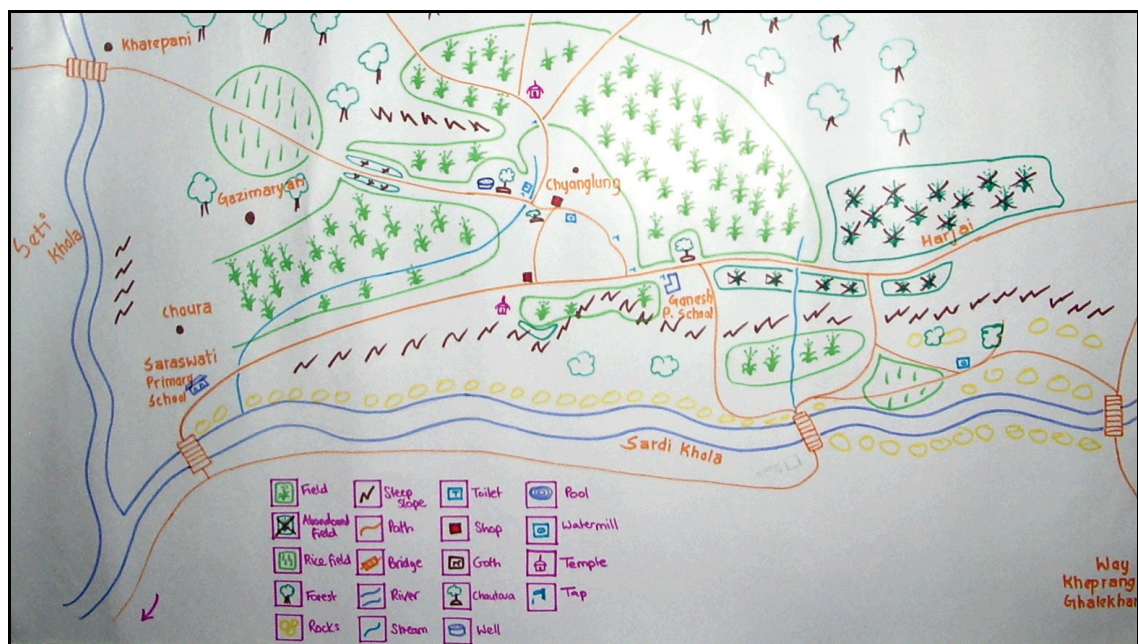


Figure 5.4 Portion of a map depicting the region of Chaunglung, Sardi Khola VDC, produced by local children and adults, copied into English. The creators were asked to mark local landmarks and land types, and this resulting map highlights the significant amount of abandoned agricultural land in this region.

Many of the conservation concerns in the region relate more to direct use of species from the surrounding forests: hunting and the harvest of wild plants (e.g. McGowan, 2004). Most of those whose livelihoods were based on agriculture still consumed products from the forest. The forest was visited to collect firewood, fruit, vegetables, medicinal herbs, meat and ‘Nigalo’ (bamboos used to make household implements such as baskets, furniture and household structures such as fences). Respondents in villages at the northern end of the valley also discussed weaving a rough fabric from Pua (*Girardinia diversifolia*) for their own wear, although they preferred to purchase clothes made of other materials. Depending on the value of these wild products, they were consumed, exchanged locally or traded to other parts of the valley and beyond.

However, richer individuals, especially in less remote parts of the valley, perceived these forest products more as an optional supplement to their life and lifestyles. For example, a high caste group of men in the southerly Ghachok VDC identified the local forests as useful for wild vegetables, fruits and medicines (figure 5.1). Such respondents often did not harvest these products themselves. Instead, female family members might pick fruit and vegetables, or all these products could be purchased locally, using income or domestically grown produce. Firewood was collected from privately owned land, or again could be bought in.

Many well-off people had no practical need for forest products. However, many still did use them, motivated by a preference for the taste or perceived properties of wild products. For example, many focus group participants said they grew more than enough vegetables in their domestic plots to comfortably feed themselves. However, nearly all esteemed wild vegetables for the “variety” they provide in diets, and also for their “special taste”. Wild meat was also thought to be more tasty, as well as having medicinal properties, such as the ability to alleviate back pain. Wild food was not necessarily a substantial part of the diet (as indicated by food ranking exercises such as that in table 5.8) even though it was often reported as desirable. For example, women in the remote village of Kabre unanimously preferred to receive a gift of wild vegetables, meat and spices, rather than domestic equivalents.

Table 5.8 The different types of food identified by a high caste women’s group, and the relative importance of domestic (home-grown), shop-bought and wild-harvested sources, indicated by dividing 100 beans between each source, for each category of food. *Several types of wild meat were discussed, but as this is a sensitive subject the final number assigned to wild meat was zero. †Goths are high altitude semi-permanent sheds used by shepherds (Gothalos) when taking animals to graze at high pastures.

	Field	Shop	Wild	Notes
Rice	60	40	0	
Beans	70	30	0	
Vegetables	70	10	20	If we are offered a choice of wild or domestic, with no effort involved, we choose wild as it is tasty and rare.
Maize	100	0	0	
Millet	100	0	0	
Wheat	100	0	0	
Eggs	10	90	0	
Meat	80	20	0*	By shop we mean the meat produced in the village at high altitude goths†, we go to the goths† to buy it.
Sweets	0	100	0	
Milk	100	0	0	
Fruit	40	40	20	We buy fruit if we visit Pokhara
Overall	80	10	10	Many wild fruits and vegetables are only seasonal ... we just buy them opportunistically

5.3.4. Caste, elite control, and resource access

The preference for wild food was especially marked in people of the Gurung ethnic group (mid caste level). When asked if any caste group had a special association with natural resources, the Gurungs were nominated both by themselves and the other castes. Their use of resources was thought to be higher, since they brew 'raksi', the potent local spirit which requires copious amounts of firewood for distillation.

The Gurungs – and to a lesser extent Magars – were also thought to be good at hunting and to have the most definite knowledge of and penchant for wild foods. Hunting with dogs took place both for meat and as recreation “for fun”. For other groups the motivation was meat, using traps placed during visits to the forest for other purposes, as when taking livestock to graze. Studies of other Magar communities have found belief in multiple spirits dedicated to good hunting (Gurung, 1989). It was usually difficult to hold lengthy discussions about the subject, because hunting was widely understood to be illegal, and therefore a sensitive topic. Rarely would focus group participants directly confess to hunting, but they were often willing to identify hunters from other villages.

We don't know how to kill here...hunters are old and youths are not interested, and there is increased forest. In the past [before 20 years ago] everything above was fields (rice, maize, millet), and pasture at the top. We had to go very high to see the animals, now tiger and bear come into maize fields, they kill goats and dogs. We can get dry meat from Kabre and Bharaburi. One kilogramme of Jharal costs about 500NPR.

The report of a focus group discussion in the predominantly Gurung-Magar village of Chaunglung (village 12, figure 5.1.), where respondents denied personal involvement in hunting but were happy to say nearby villages hunted. 'Jharal' is the goat-deer Capricornis sumatraensis.

Children were often the least guarded. In the village of Chaunglung they were well aware of hunting and boasted how they practiced with slingshots and stones. By triangulating all reports it became clear that Gurungs and Magars in the northern end of the valley were particularly likely to go hunting, with some of the meat being dried and traded within the valley, or to urban centres. For example, the participants in the above discussion pointed out that Chaunglung had an unusual number of men employed in the British and Indian armies, so households could afford to buy in meat. There may also have been some hunters that came in from adjacent valleys, and visitors from town would pay local people to hunt meat. Because animal populations were perceived to be

higher than in the past (perhaps because of encroaching forest), there was widespread support for re-authorizing hunting.

We kill animals near the house (even if a man is committed to conservation he can't let an animal live if it is grazing his crops). But we used to go daily in the past. If we stop now we don't get to eat wild meat. But we need the rules as it stops carelessness. We should be allowed take a little systematically - e.g. one or two animals per month. Lots of people in this area eat wild meat so we don't need to go somewhere else to eat, meat is sold locally in the village.

The conclusion about hunting reached by Magar and Damai men in the village of Kabre

The topic of hunting also showed how those harvesting wild resources were often motivated by practical need, since the resources could be sold to those who had a cultural preference for wild foods. For example, for a Damai (low caste) teenager in Chaunglung, his slingshot could bring a useful if infrequent source of income:

Once I killed a Pura [hill partridge, *Arborophila torquelo*] and sold it here for 350Rs, I bought clothes for my family. I caught a Phisto [*Prinia* spp.] but it is only worth one bite! Someone killed a Kalij at Gurubato, using a gun.

The topic of wild vegetables was slightly less sensitive and therefore discussed more often. Here again, the same links between practical need and cultural preference were found: finding and selling wild vegetables could be a very useful source of income for those who were not wealthy. Various pieces of evidence collected during fieldwork suggested there was a widespread preference for wild foods, that lead some people to supplement their incomes by collecting these foods for sale or trade (table 5.9). In particular, the vegetable Tusa (*Himalayacalamus* spp.) was much in demand. This became more common further north in the area. It was perceived as a delicacy by nearly all, and particularly esteemed by the Gurung and Magar castes.

Tusa is collected for selling within the village, mostly by poor people. They go once a week in season. Other vegetables are not sold. They go to the village 2-3 times per week to get vegetables to eat. A little bunch of Tusa [makes ring between thumb and forefinger] costs 5-10 NPR. For example, we didn't have rice one day, so we collected some Tusa and sold it and got rice. My family has no land, but other Damai families [here] do, it is just mine that is landless.

Damai boy, 14, in Chaunglung, Sardi Khola VDC (village 12 in figure 5.1)

Table 5.9 A selection of types of evidence that indicate wild foods from the forest are commonly seen as a desirable source of food throughout the valley, and collected by poor people for sale or trade.

Type of evidence	Description or example												
Passing comments in informal conversations	Notes from a conversation with men in a teashop in Ghachok VDC: “Agricultural productivity is high enough here that they produce enough to eat. We are water limited, but there is just enough for agriculture via the irrigation channel. Poor people collect wild vegetables (neuro) and sell it in the village to the better-off.”												
Given a straight choice, wild food options are often preferred, when available	Karuwa women’s comments about food, after categorising all the different types of food they eat: “If we are given a choice between a plate of wild and domestic vegetables would choose domestic vegetables if we had grown these ourselves. But if we did not grow domestic vegetables we would choose the wild vegetables. Wild vegetables give variety and are less work to get. In the rainy season wild vegetables are collected, as they are growing now so easy to get. This harvesting period lasts about 6 months, from Mar/April - ~August. In winter there is no harvesting.”												
The preference is commonly expressed across and different age groups and in different locations	For example, a children’s group in lower Ghachok voted for what foods they preferred. Repetition of this exercise with different groups produced similar results: <table><tr><td></td><td></td><td>Wild*</td><td>Domestic</td></tr><tr><td>Vegetables</td><td>4</td><td>0</td><td>/4</td></tr><tr><td>Meat</td><td>3</td><td>1</td><td>/4</td></tr></table> Because it is more tasty, and rarer.			Wild*	Domestic	Vegetables	4	0	/4	Meat	3	1	/4
		Wild*	Domestic										
Vegetables	4	0	/4										
Meat	3	1	/4										
Wild foods may have special properties	Speaking to a group of four women from Kabre and Baraburi, all four preferred wild spices, vegetables and meat. When asked why, a variety of reasons were offered. One woman said “Wild vegetables are more tasty and no fertilizer is used. The meat is tastier and can even be used as medicine.”												
Wild foods are often bought if it is not easy or convenient to collect them, but there are spare resources to trade for /buy them.	Discussions about hunting with a youth group at Chamlung that were from well off Gurung and Magar families: We eat wild meat but we don’t collect it ourselves, we ask someone who goes (nobody pays for it, nobody sells). Youths and old people go hunting. [Who does hunting?] Only some hunt, killing depends on luck and some do not have the skill to catch anything, 75% don’t even see anything. 3-4 households here are hunting, and they think they must sell meat ‘to pay for bullets’. [Why do people hunt?] Wild meat is very tasty.												
Wild foods can be expensive	Comments from a women’s group in Chamlung, discussing food after a food ranking exercise: “Wild meat is more expensive than domestic meat. A joint of Jharrai costs 600-700Rs. It is more expensive than domestic meat which is, for example, 250Rs for a parcel of meat from buffalo slaughter”												
Discussion focused on livelihoods reveals collecting and selling wild foods can be useful as a job ‘on the side’.	Comment about supplementary ‘jobs on the side’ identified by young men and women discussing livelihood options open to them in the village of Karuwa. In the rainy season, there is wild vegetable collection and wild medicine collection. We sell wild meat. We think local people have the right to take 1 or 2 animals for ourselves.												
Wild foods can support livelihoods through both direct consumption and sale	Informal chat with young men in Karuwa: “Wild vegetables are harvested in the rainy season. The first major vegetable is ‘Neuro’ and then others come into season. Wild medicines are harvested at a similar time. Wild vegetables are more tasty and easier to get.” [Is it different for poorer people?] “Poorer people harvest more wild vegetables. They do a bit less agricultural work but otherwise have a similar work pattern.”												
Observations of poor people selling wild foods	Field notes from Chamlung: Whilst sitting outside the village shop, a pregnant woman of low caste (Kamai), badly dressed comes with a apron full of wild vegetables (Tusa?) which she trades for a small bag of rice.												

Demand was both local and urban, with vegetables sold in the same village, in villages further south in the valley, and in the town of Pokhara. Medicines may also be sold but as an illegal activity this was often difficult to discuss, and perhaps underreported. For poor landless people, this source of income may be particularly useful during the dry seasons, when little labour is required on farms (table 5.5).

Tusa is collected before the rainy season. Other vegetables collected are neuro, kourila (which follow the same pattern) and caulisaag, as they come into season. Everybody collects these for themselves, and some collect for selling.

We don't collect much medicinal herbs, it is not legal. We ask the forest guard for a little for ourselves. We will go to collect herbs if we are not too busy. People who stay in goths can collect more. There are gaps in our collection time in summer (due to leeches), and in winter (due to cold).

A group of men from the Sarki (low caste) group, who were poor but not lowest status group in Ghachok VDC

However, collecting wild plants may be less important for the very poorest, in the southerly areas. From here, it was a long walk to remote areas where vegetables are found. Those whose livelihoods entirely depended on labouring may never have had the time to make lengthy trips into the forest. Some of the very poorest low caste individuals claimed to have no time to look for wild fruits, vegetables or medicines, but also little knowledge of where these plants could be found:

We have no idea about medicinal herbs or where to find them, and no time to go there

Middle aged man of the Damai caste, Ghachok VDC

It cannot be assumed that all low caste individuals were engaged in finding wild natural resources to sell to the higher castes. For example, the very poorest cannot afford guns or the time to lay and maintain traps, so they are unlikely to be hunters. However, throughout the valley the general pattern was for the poor and low caste to seek wild resources in order to meet the desires of others in the local community, and beyond (figure 5.5). By contrast, wild resources had much less direct relevance to the livelihood strategies of those who had higher status. For these groups, the consumption of wild resources was carried out to provide variety to the diet, satisfy cultural preferences for wild products, and even to provide recreation.

	Firewood	Wild vegetables, medicines, meat	
	Harvest & consume	Harvest	Consume
Low caste & status	Yes, required by all	For sale	Little known
Mid caste, Gurung	Yes, use the most of all 3 groups	Yes, especially hunting	Yes, traditional associations with wild products (and hunting)
High caste	Yes, least often as alternative fuel sources	Only occasional	Yes, seen as tasty

Figure 5.5 The pattern of resource use and harvesting by different social groups in the Seti Khola valley. The use of wild vegetables and meats by the very low status may be limited by time constraints.

5.3.5. Elite control of natural resources

Discrimination against lower caste groups was illegal but evidently continued. For example, lower caste individuals were not allowed into the houses of the higher castes, and if they touched water it was contaminated for the higher castes. Although some higher castes blamed lower castes for learnt helplessness, they also freely remarked that the lower castes were “dirty”. The lower castes concurred:

Discrimination, as well as present poverty, prevents us from improving our position. There is suppression by other castes. Our condition is worsening and we are living like slaves, living in the dark. We cannot get loans because we do not have the deposit needed. We have no money and are very poor. Nobody trusts us, so will not lend us money. We have no roads, high illiteracy and suffer from suppression, discrimination. It is hard to send children to school.

Report of participants in focus group discussion held with Damai caste members in Ghachok VDC.

This had implications for any new investments or interventions in the valley, whenever the minority low caste households were clustered together (in large settlements, section 5.3.1). In the more southerly accessible parts of the valley, some amenities such as biogas toilets, electricity lines, and water taps were becoming available, but they tended to be routed only to the areas where the higher castes lived. For example, within 20 minutes walk of a low caste household with no amenities, were some high caste households with a satellite telephone, biogas toilets, direct access to a semi-paved track, a shared water tap and access to the new electricity supply.

The lower castes also claimed to have restricted access to wood, even having to sneak into nearby forests at night, because the forests designated for their use were inconveniently located very far away. As this group also tended to own less land, and so fewer trees, they struggled to secure access to firewood. All households in the study area needed fuel for cooking and lighting, but this need was reduced by access to biogas. A biogas toilet, which converts human and animal waste into gas for cooking, offer its users great improvements in convenience and air quality, as well as benefiting the environment (George, 2008). These had been greatly subsidised by ACAP and a Biogas Support Programme, to cost 5000 NPR per toilet, and a further subsidy by UNICEF meant they should have cost nothing for the poorest. However, although every house was supposed to have a biogas toilet, most of the lower caste households did not. This seemed to reflect a general pattern of resource flow to the higher castes, sustained by the dominance of high caste individuals in governmental organisations.

Within one administrative unit, Ghachok VDC, the researchers stayed in the house of a high caste (Brahmin) who was employed as a teacher but also active in numerous committees. Through this contact it was possible to meet all individuals in positions of influence with local government organisations, and they were all males of high caste (Brahmin or Chhetri). This meant that all activities mediated by these organisations were biased to favouring those castes. A frequent complaint of the lower (occupational) castes was that “nobody will hear us”. Elite dominance also affected the institutions for natural resource governance (e.g. forest user groups, CAMC committees).

Brahmin and Chettri have more control and rights over the forests, they think it is their ancestral right. Lower caste people don't have a place in the forest. We have no community forest and need permission to use. We go higher [up in the mountains].

Key posts in the CAMC are held by Brahmin and Chettri. The funds collected are used for these people (e.g. wards 1, 2, 3). Anyone should be able to use any forest e.g. people from ward 7 should be able to use forest in ward 1. We have no private forest so we need to go high for timber

Discussing different use of natural resources by Sarki (low caste men)

5.3.6. Participation in conservation interventions

Interactions between caste groups and resource access affected involvement in conservation activities, and potential responses to conservation interventions.

For example, many questionnaire respondents reported involvement in organised tree planting activities, but some who did not said that they would not contribute to something from which they would not benefit. Many claimed they had in the past given time to help the planting of 'Utis' (*Alnus nepalensis*) but now that the Utis stands were maturing, they were excluded from taking firewood from them.

As well as affecting current resource use and involvement in conservation and development activities, elite control has implications for any future interventions by outside agencies. When the questionnaire survey asked how the practice of conservation could be improved, eight respondents (none of them high caste), directly called for nepotism and corruption to be reduced. Others respondents made more oblique references to corruption or discrimination, or accepted it as the way of life. For example, a Magar (mid caste) respondent felt it was a problem, but was not hopeful of a solution:

Leaders will take. But no one will do anything. They get money and increase the size of their stomachs. All are autocrats and feudals. Who will act? What will be done for the uneducated and illiterate?

Where there is considerable experience of development interventions, in the lower half of the valley, the poor have also become sceptical, saying: "lots of organisations come and ask us but our life standards are still low". Low caste people alleged that "elite people show us [to demonstrate poverty to outsider agencies] but then use us to make money". This group are now very hostile to outside interventions, regardless of their purpose. The researcher was often faced with hostility or even violence when attempting to contact the most deprived groups for the purposes of her research. Engaging with these groups will be difficult for any future conservation interventions.

5.4. Discussion

This study demonstrates variation between households within one area, with natural resource use influenced more by social structuring via caste than by geographical influences. Low status individuals may pursue quite different livelihood strategies (paid manual labour) to high status individuals (agriculture and self-employment). This finding of social heterogeneity is not surprising, and concords both with academic expectations (Agrawal & Gibson, 1999) and with observations in other parts of Nepal (Brown, 1998).

However, this study is unusual in demonstrating that social heterogeneity is linked to completely different drivers of natural resource use within communities. Natural resource use of poor households is often driven and constrained by need, with firewood used for heating and cooking, and other products sold for cash. These products are bought by the higher castes. Demand is driven by cultural preferences for the taste, rarity and health properties of wild foods and medicines. Compared to other mid to high status consumers, those of the Gurung caste may be even more likely to favour wild foods and engage in hunting for recreation, as well as for meat. Because the populations of Galliform birds and medicinal herbs are thought to be threatened in the region, these harvests are of conservation concern. The potential for the taste of wild products to motivate harvest of wild species is already documented (e.g. Waylen et al., 2009) and known to be able to cause conservation problems. For example, widespread fruit bat population declines and extinctions in Pacific Islands have been driven by cultural preferences for bat meat (Mickleburgh et al., 2009). However it is worth highlighting this effect in one of the poorest countries of the world, where it could be easy to assume that natural resource uses are driven predominantly by people trying to meet their practical needs.

Any conservation interventions in this region must recognise the coexistence of practical need and cultural preference. This may also be true for many other sites in developing countries, and reinforces the need to develop CBC interventions that are not based on simplistic stereotypes of small, apparently homogenous communities (e.g. Peterson et al., 2009). Where natural resources are over-used, conservation interventions must potentially tackle multiple drivers of use within one community, linked to multiple livelihood strategies. For example, a detailed study of illicit forest resource use in India found widespread objection to harvesting rules was actually linked

to multiple and contrasting livelihoods strategies, and also embedded and sustained by long-standing governance arrangements (Robbins et al., 2009). In this situation no single intervention would be able to reduce illicit resource use and achieve conservation goals.

In this case, to tackle those driven by a preference for diversity in the diet, demand may fall if rarity causes increased scarcity and price rises, and/or there is a sufficient mix of non-wild alternatives available to buy or grow (Milner-Gulland & Rowcliffe, 2007). Education may assist in preventing rarity becoming such an attractive property to elite consumers that declining populations face disproportionate threat. If wild products have traditional ethnic associations, as in the case of the Gurung caste, it would be futile and unethical not to respect this. However, if the topic is approached in the correct way, interest in wild species may become the basis of committed conservation action. The example of Inuit engagement with conservationists in Arctic Canada is a promising example (Dowsley, 2009). The Inuit have traditionally hunted Polar bears (*Ursus maritimus*), and this practice supports many traditional skills and cultural practices. A ban on hunting would very badly received and lead to a rejection of all conservation measures. However, to date the Inuit have been very happy to engage with western style science and recommendations, in a mutual learning process, because they are keen to learn more about the bear and recognise the need to maintain bear populations (Dowsley, 2009).

While education and persuasion may work for preference-driven demand, resource use which is driven by practical need will probably need to be tackled through the provision of alternative livelihoods (Greenberg & Brown, 2005). This would also help to avoid depriving poor individuals of income, if other strategies caused reduced demand from rich consumers.

Social structuring, via caste, also carries direct implications for the activities and outcomes of present and future conservation interventions. Caste relationships are perhaps an extreme example of competing power interests which have been shown to influence the outcome of other conservation projects (e.g. Klooster, 1999). These power relationships must be addressed if conservation goals are to be achieved and maintained (Dressler et al., 2006). In this case, the history of discrimination and caste roles means that for the short term, demonstrable provision of tangible benefits may be needed in order to engage those who are poor. Encountering local hostility is not a

unique situation, and other projects have shown that providing concrete benefits can help to offset prior hostility. For example, in El Salvador successful set up of a plant to generate electricity from solar energy was able to overcome local reluctance to engage with an outside NGO for conservation (Balint, 2006). However, in this case good community governance and support from the NGO was also thought to contribute towards willingness to engage with the project and achieve conservation.

In Pipar, although there are numerous institutions for local governance, with higher level support from ACAP, the governance situation is not encouraging. There is evidence of elite domination of governance committees, and inequitable access to natural resources. This is a common problem (e.g. Chakraborty, 2001) but elite capture makes it unlikely that interventions will reflect the interests of the whole community, and so succeed in tackling conservation threats (Iversen et al., 2006; Sommerville et al., In press). As is so often recommended (McShane & Wells, 2004), participatory processes must be improved and widened to genuinely include and value poorer groups. This is not a simple process (e.g. Campbell & Vainio-Mattila, 2003) but may ensure that benefits from local natural resources are more equitably shared, and conservation activities are more widely supported. However, caste is a deeply embedded part of Nepali culture (Bista, 2004). A future challenge is to study how promoting participation may be reconciled with the need to respect local culture and traditions – such as caste – that may unequally empower different groups (Wyckoff-Baird et al., 2001).

5.4.1. Conclusion

This study found considerable social heterogeneity within communities, within an area that was relatively small and biogeographically homogenous. This heterogeneity had direct implications for resource use of interest to conservation (such as firewood use or medicinal herb harvest) but also for potential responses to interventions. This demonstrates that conservation interventions must be based on an understanding of local social heterogeneity and of separate but linked interests those within communities. Entirely different strategies may be needed to address resource use driven by need, versus that driven by preference.

6. INDIVIDUAL VALUES FOR NATURE AND EFFECTS ON SUPPORT FOR CONSERVATION IN NEPAL

The previous chapter demonstrated that considerable variation can exist within and between communities within the area within which one project may operate, and that this variation can affect the drivers of resource use, both through need and preference. This has implications for the appropriateness of interventions and highlights a need for understanding within-community variation.

This chapter, based in the same study area, demonstrates that variation in values held at the level of the individual has further implications for conservation, by influencing individual views of nature and support for conservation. Both chapters demonstrate that conservation behaviours are influenced by much more than economic constraints and drivers.

6.1. Introduction

In the many pleas for conservation interventions to better engage with local communities (Western et al., 1994) it is increasingly clear that communities cannot be considered as homogenous units (e.g. Brown, 2002; Chapter 5). To move beyond this, interventions need to recognise and engage with the differing views and needs of the individuals within communities (e.g. Marshall et al., 2007). This study therefore focuses on how individual views and perceptions can influence their intention to support conservation.

In the past, some general theories of human decision-making have suggested that poor people are entirely focused on meeting their physical needs (e.g. the Hierarchy of Needs; Maslow, 1970). However both theoretical and empirical work (particularly in the development sector), has demonstrated the problems of such limited definitions of individuals' concerns (e.g. Hanmer et al., 1997). To improve their success, interventions for development now prefer to use concepts such as 'well-being', which recognise the multiple needs and motivations of individuals (e.g. Scoones, 1998). Although this terminology is also being promoted in conservation (e.g. UNDP, 2005) conservation practice may be lagging behind (Campbell & Vainio-Mattila, 2003), with well-meaning efforts to engage with local people still focused on meeting practical needs (as in payment for ecosystem services schemes; Wunder, 2005).

Whilst practical concerns are undisputedly important for inhabitants of developing countries such as Nepal, and so should be taken into account by conservation interventions, it is simplistic to assume these are the only concerns which matter. For example, generations of Indian farmers have cut trees for their basic heating and cooking needs, but have left certain trees untouched because of their religious values for sacred areas (Bhagwat & Rutte, 2006). When evaluating how to behave towards a species, it seems that perceptions of both practical and cultural value matter. Practical value is defined here as a species' value in meeting basic human needs, such as food, fuel etc, whereas cultural value is defined as its value for religion, beauty, tradition etc.

Investigating if and how an individual's conservation support is determined by more than socio-economic status or other socio-demographic variables is the aim of this study. For this purpose it is useful to explore how perceived values of a species may influence conservation support. To look beyond these variables and appreciate what else generally influences on conservation support, it is necessary to probe an individual's views and general attitudes. This is challenging, but there is a rich body of theory from social and environmental psychology, which suggests how to probe an individual's views, and provides examples where these approaches are useful in richer developed countries (e.g. Fischer & Young, 2007). These studies provide a starting point for exploring conservation views in poorer countries. The following section discusses in more detail an aspect of individual views called value orientations, which other studies have found relevant to understanding attitudes to conservation and may be relevant to understanding the situation in Nepal.

6.1.1. Understanding influences on conservation support

The field of social psychology centres on understanding influences on decision-making and the formation of attitudes, and behaviours. Its ideas have been adopted and further refined by studies of pro-environmental and conservation behaviours by the field of environmental psychology. Its various models of behaviour are continually being refined and tested, but there is general agreement that individuals develop specific attitudes and intentions to carry out behaviour by evaluating information about the situation using more general pre-existing values (figure 6.1). According to this broad cognitive hierarchy (Ittelson et al., 1974), value orientations and beliefs directly influence evaluations of specific objects or situations (attitudes, such as approval of a particular conservation project). Perhaps the best known model of behaviour is the

Theory of Planned Behaviour (Ajzen, 1991), where values combine simply with information to form specific attitudes, which then predict behaviour. This simple approach to predicting behaviours has been used with some success for pro-environmental activities such as recycling (Do Valle, 2005).

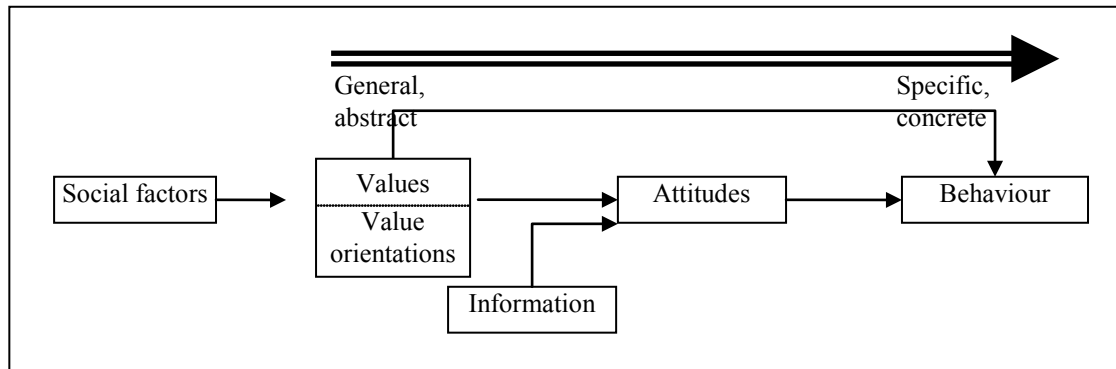


Figure 6.1 The general mental constructs which influence intention to engage in specific behaviours. General high level constructs such as values and value orientations are shown on the left, which are broad guiding principles used to evaluate specific situations and form more specific attitudes and intentions, shown on the right. This study argues that understanding these value orientations is helpful for understanding specific conservation behaviours.

Values act as enduring guiding principles for life, which inform evaluations of specific objects and situations, with variation between individuals due to influences such as upbringing and social experiences (Schwartz, 1994). Values combine into ‘value orientations’, a set of related values that are important to an individual, relative to another set. These value orientations are thought to influence the formation of any new attitude, and related behaviours towards the environment, whether stopping ecologically harmful behaviour, or adopting new pro-environmental behaviour (Stern & Dietz, 1994). The two basic value orientations most often thought relevant to environmental behaviour are the extent to which someone is: firstly, self-transcendent, that is open to the welfare of others, benevolent and altruistic (versus self-interested); and secondly, open to change (versus traditionalist) (Dietz et al., 2005). These two distinct value orientations are argued to be some of the most fundamental views held by humans, and cross-culturally relevant (Schwartz et al., 2001). When tested across cultures, self-transcendence has been the orientation most reliably linked to concern about environmental issues and behaviours such as recycling or volunteering for an environmental group (Schultz et al., 2005). This may be because those scoring highly for altruism, and able to empathise and care about others, are also likely to care about non-human others, such as wild animals and other components of the environment

(Dietz et al., 2005). Whilst it is not the only point of view informing environmental concerns and behaviours, it is consistently important in countries where tested (e.g. Ojea & Loureiro, 2007). It is therefore relevant to test for the presence and influence of these value orientations in Nepal.

It is also possible that there are patterns of values more specifically related to environmental views. So far, there has been little consensus about the role of any more specific value orientations, which provides little guidance for new research looking to explore these issues. However, there is growing evidence that a pattern of values towards wildlife called Wildlife Value Orientations (WVOs) is found cross-culturally and relevant to general environmental concerns (Teel et al., 2007). Preliminary evidence suggests that a WVO called mutualism is particularly likely (though not always) to be relevant to views of wildlife views in locations outside of Western Europe and North America (e.g. Raadik & Cottrell, 2007; Tanakanjana & Saranet, 2007).

Mutualists view human relationships with wildlife as similar to those with other humans, and view wildlife as being capable of relationships of trust with humans, having rights like humans, and being part of an extended family. For example, in America, mutualists are less likely to engage in hunting or support lethal control for human-wildlife conflicts (Manfredo et al., 2009). By contrast, those with a utilitarian view (also called domination) see wildlife as a resource to be used by humans (Dayer et al., 2007). Mutualism has been argued to be related closely to self-transcendence, particularly altruism (Teel et al., 2005). The usefulness of this construct is supported by similar parallel research into the idea of connectivity with nature, or the extent to which others are included in self-identity (e.g. Schultz, 2001).

The value orientations self-transcendence (versus self-interest) and mutualism (versus utilitarianism) will be used in this study to demonstrate how an individual's abstract views may influence their intention to give help for conservation. As such, the broad schema of variables to be tested by this study is shown in figure 6.2. Value orientations are thought to directly affect conservation support but are also expected to mediate the effect of socio-demographic attributes such as age, wealth or educational status.

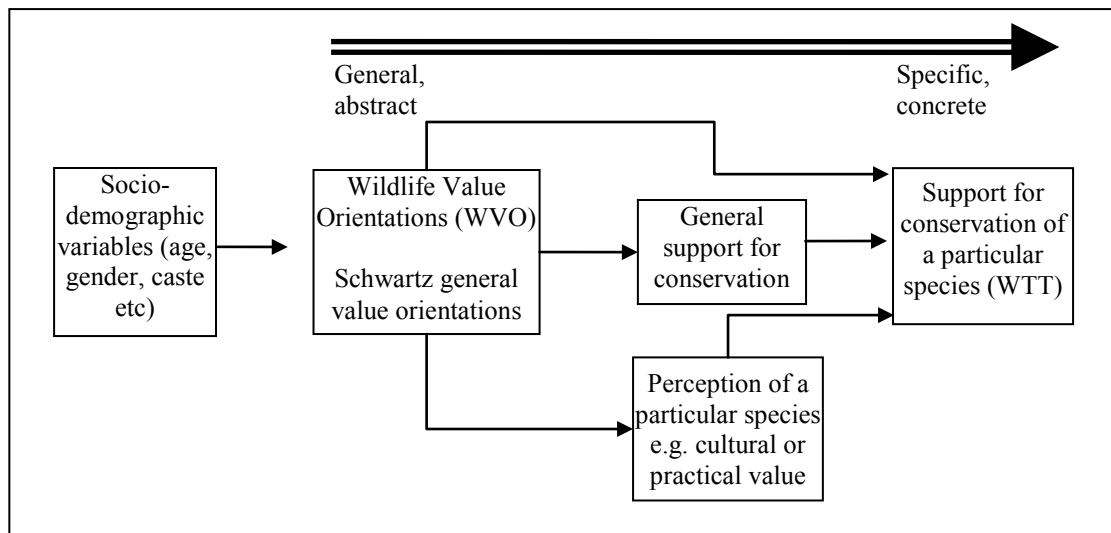


Figure 6.2 The general variables measured to predict intention to help conserve a particular plant. This is a refinement of the model in figure 6.1, showing the same general layout of general high level constructs on the left, which influence more specific attitudes and intentions, on the right. Wildlife value orientations and Schwartz value orientations are not the only aspects of individual views thought to influence conservation support, but aspects found important and cross-culturally relevant by other studies. Only relationships of particular interest to this study are represented here by linking arrows.

As figure 6.1 implies, the link between value orientations and decisions on particular conservation behaviours may not be direct. Many and varied factors may influence how more abstract views are interpreted and applied in each particular situation. To understand how value orientations may directly and indirectly influence behaviours, other more specific views must be assessed.

A more specific view likely to be relevant is general conservation support, a sort of generalised attitude. This still is not at the level of specificity of behaviour but likely to closely inform it. For example, general environmental concern has been shown as an important, but indirect influence on individual's decisions to request more information about green electricity products (Bamberg, 2003).

It is important that specific aspects of a situation being discussed are well understood, to understand how views such as conservation support translate into actual behaviours. Perceptions of a species to be conserved, but also constraints and other incentives may influence conservation or pro-environmental behaviour (Thøgersen & Ölander, 2006). For example, if an individual has pro-environmental attitudes but perceives themselves to have no ability to influence a situation, then positive pro-environmental attitudes are unlikely to be expressed in behaviour (e.g. Kaiser & Gutscher, 2003). This consideration may also affect research design in favour of choosing focal behaviours that are familiar and freely discussed by those that carry them out.

Although a questionnaire survey is an appropriate way to investigate perceptual variables – value orientations and perceived values for species – it cannot directly assess individuals' conservation behaviours. Furthermore, when existing conservation-relevant behaviours are sensitive, they may not be accurately self-reported (Milner-Gulland & Rowcliffe, 2007). For example, as hunting pheasants and collecting some wild herbs is illegal in the study site, if people are asked to report these activities they will probably either lie or give no reply.

However, the economic literature demonstrates that hypothetical scenarios can be used to elicit willingness to pay for a good (or willingness to accept compensation for the loss of a good; Mäntymaa, 1999). This 'contingent valuation' (CV) can be used to elicit behavioural intentions (Bateman, 2002). With care, a CV scenario can be developed that is perceived as realistic, and allows the respondent to express their support for conservation. Contingent valuations were originally developed in cash-rich developed countries, and so usually elicit support in monetary terms. Although some studies based in poorer countries have also elicited support in this way (e.g. Poudel & Johnsen, 2009) this can risk producing misleading and inappropriate results where respondents are not part of a cash-based economy (Alam, 2006; Regens, 1991). Some studies have suggested that donations of time may be a more valid metric for developing countries (e.g. Echessah et al., 1997; Hung et al., 2007; Swallow & Woudyalew, 1994). This study therefore uses willingness to give time (WTT) to conserve two local species, as a proxy for actual conservation behaviour.

6.1.2. Hypotheses

The aim of this study is to investigate how individual views can influence potential conservation behaviours within the developing country of Nepal.

- 1) Individual conservation support is predicted by more than practical needs**
 - a) Nepalis support conservation regardless of relative socio-economic status**
 - b) Species with both practical value and cultural value receive support.**
- 2) Individual conservation support can be best understood by combining measures of an individual's views and perceptions with socio-demographic variables.**
 - a) Value orientations detected in and relevant in more developed countries, can also be present and relevant to understanding support for conservation in Nepal**
 - b) Value orientations mediate and supplement the effect of other perceptual variables and socio-demographic variables on willingness to give time for conservation.**

To test these hypotheses it is necessary to understand many individuals' value orientations, perceptions of species, socio-economic attributes and indicators of conservation behaviour. Questionnaire surveys of individuals, to collect structured quantitative data, are best suited to testing such proposed relationships, though more discursive methods are suitable for understanding general value-types and concepts held locally (Teel et al., 2007).

The rest of this chapter is laid out as follows. In the methods section, the case study site, sampling method and operationalisation are described, finishing with the statistical tools used to analyse the data. The results section is structured around the study hypotheses and culminates in an overall model of how the perceptions of species, value orientations, and socio-economic attributes interact to affect willingness to support conservation of a species. Finally, the implications of the study are discussed, finishing with the overall conclusion.

6.2. Methods

The primary method used to answer the research questions was a structured questionnaire which collected quantitative data. However, this was preceded and informed by a period of investigation drawing more on qualitative methods, using the techniques of Rapid Rural Appraisal (RRA). This work has already been described in Chapter 5, and further detail about a technique to probe perceptions of values of species is described below in section 6.2.1.1. By allowing an understanding of the general context of resource use and attitudes, the qualitative research facilitated the design of a survey relevant to local life and locally held concepts.

This section focuses on how attitude-survey research was used to address the hypotheses. During pre-testing and piloting, research topics, sample strategy and practical design considerations were taken into account when developing the final version of the questionnaire.

6.2.1. Operationalisation of selected constructs and topics

This section describes how the constructs and topics of interest were measured in the questionnaire. The final questionnaire had ten sections: (1) knowledge of local species; (2&3) perceived values for two species, and willingness to help conserve them; (4) value orientations towards nature and conservation; (5&6) general value orientations in

life; (7&8) wealth and other personal information; (9) conservation involvement; and (10) views on conservation. This section describes how individuals' views were assessed. The collection of personal socio-demographic data has already been described in chapter 5.

6.2.1.1. *Perceived values for species*

Participatory group discussions in 2007 included the topic of values perceived for natural resources. This issue was discussed after either identifying different types of natural resources, or after discussing the relative value of different local species. To probe the issue, open discussion on the use of a species or resource was started by asking why the species was valuable. The reasons – for example, value in provisioning food – were drawn onto cards.

There were a variety of types of value. Although discussion usually began with consideration of the different practical ways a resource could be used by people, participants usually went on to discuss the value of rivers and forests in regulating water and soils (and sometimes climate). When asked about “less practical” ways in which they benefited – cultural values – many said they would sing and socialise whilst on trips to and from the land, whilst children would play. Sometimes, after labelling cards to represent all the participants' ideas of value for a particular species or resource, they were asked to share 100 beans between these cards to indicate their importance, for a particular resource. Between 5 and 44 beans were also allocated to these values. Table 6.1 shows a typical value table for the values of forest land. (Nigalo was considered of sufficient importance here to warrant its own category.)

Table 6.1 The value types identified for forest land by a women's focus group. Relative importance of each type was assigned by dividing 100 beans between the categories.

Benefit type	Relative importance	Benefit type	Relative importance
Food	18	Nigalo	10
Attachment as part of nature	16	Temple	9
Fuel	12	Recreation	9
Medicine	11	Building	8
		Fodder	7

Overall, combining the results of the focus group discussions produced seven value types. These were loosely divided into practical use values (food, fodder, making things, medicine) and cultural values (beauty, part of nature, religious value). In the survey, to compare the effect of practical values versus cultural values as predictors of conservation support, concern for a plant perceived to have only cultural value was

compared to concern for a plant perceived to have practical value, using the locally defined value types. This was carried out by each respondent, rather than through a split sample, to maximise sample size.

Considerable discussion was held with villagers to identify two such plants. A culturally valuable plant was identified as Lalupate (known as Poinsettia in the west, *Euphorbia pulcherrima*). Although Lalupate is not a native to Nepal, it has grown there for several generations and is not regarded as alien. It is primarily valued for its beautiful red flowers, which are used in Puja (daily worship), grown for decoration, and used to make garlands for ceremonies and welcoming guests. It has no uses as fodder, food or materials supporting livelihoods.

By comparison, Nigalo is the name for a set of extremely useful bamboos (*Fargesia chigar*, *Himalayacalamus falconeri*, *Himalayacalamus asper*, *Thamnocalamus spathiflorus*) that are used nearly everyday in villages (Stapleton, 1994). When Nigalo is processed into flexible strips, these can be used to make myriad products, from baskets to umbrellas or roofing. In this sense it is indispensable, since it provides many commodities that have no locally available substitute. It is also used as fodder for animals, and the young shoots as a vegetable for humans, and less often as firewood or as a torch. It has no obvious visual appeal and no special role in religious ceremonies or cultural events.

To test our assumptions about the values (or otherwise) of Lalupate and Nigalo, each survey respondent was asked to rate each plant for the seven types of value perceived on a scale of 0 (no value) to 5 (lots of value). Willingness to support conservation was then probed, with Lalupate presented first, to avoid a sense of obligation artificially inflating stated support for it, if presented second.

6.2.1.2. Willingness to support species conservation

Respondents' specific behavioural intention to help conservation was assessed by asking individuals their willingness to give time (WTT) for the conservation of the two species perceived to have cultural and practical value (respectively Lalupate and Nigalo). For each plant a CV scenario was presented, before asking the respondent if they would be prepared to help. Crafting an unproblematic CV scenario is always tricky, particularly in developing countries (Whittington, 1998). For example, WTP can be influenced by the cause of an environmental problem (the 'outrage effect') (Bulte et al., 2005) or the social context of the scenario (Welch & Fischhoff, 2001).

The scenario therefore described a non-anthropogenic cause of a conservation problem (plant disease causing a precipitous population decline) to be tackled by scientists (a neutral outside agency) who had identified a new disease resistant variety of the species. Local support was required to help tend a nursery of the new disease-resistant seedlings. The scenario was the same for both plants. Local perceptions of scientists, re-introductions and the nursery plan were checked to ensure they were seen as realistic and did not have associations likely to prejudice support for the hypothetical project.

Each respondent was asked if they would be willing to help grow the new seedlings, and if so, how much time they would give (WTT). This was accompanied by a ‘cheap-talk script’ reminding respondents about demands on their time, to prevent over-inflated bids (Cummings & Taylor, 1999; Smith, 2006). The payment frame was limited to 6 months to further improve respondent certainty (Berrens et al., 2002).

The choice of answer format is controversial. An open choice without guidance leaves many respondents uncertain (Bateman et al., 1995). Many recent CV studies have offered dichotomous choice to respondents (i.e. ‘Would you pay £5 or more?’), presenting different amounts to different respondents. However, in small communities, this can lead to confusion and even resentment as respondents wonder why they have been asked to give different amounts to their neighbour (Whittington, 1998). Furthermore, yea-saying may be common (Berrens et al., 2002), and analysis of such data is complex, requiring a sample size impossible within the sample frame of this study. Other recommendations for bidding games may be unsuitable for a culture characterised by bargaining which is strategically influenced by start bids (Kohlin, 2001), whilst hesitant respondents may feel unable to answer. Therefore, this study used payment cards, an elicitation format which presents respondents with a visual aid containing several amounts of money (or time) to facilitate the valuation task.

The number of choices is unimportant (Kerr, 2000), and responses are not necessarily prone to range or centring bias, as long as there are a wide range of bids (Roach et al., 2002; Rowe et al., 1995). Although exponential intervals have analytical advantages (Rowe et al., 1995), respondents need to see sensible amounts and intervals (for example, 4 hours is better than 4.3 hours). Discussion with villagers identified realistic amounts of time and the likely range of responses. The final choice of options, ordered from low to high (table 6.2) was checked during pretesting and piloting. Respondents were also allowed to give other amounts if their preferred option was not presented.

Table 6.2 Options presented to respondents, for donating time to conservation of a threatened species. Respondents were also allowed to give other amounts of time, if their preferred option was not in this list.

Option	Amount of time
A	Less than 1 hour every 4 weeks
B	1 hour every 4 weeks
C	1 hour every 2 weeks
D	1 hour per week
E	2 hours per week
F	4 hours per week
G	7 hours per week
H	14 hours per week
I	21 hours per week
J	More than 21 hours per week

There was no measurement of uncertainty of WTT estimates, even though it has been suggested that measuring uncertainty can improve the reliability of WTT estimates (e.g. Wang & Whittington, 2005). It is also possible that the uncertainty attached to Lalupate bids differed to that for Nigalo (perhaps respondents were more committed to Nigalo). However, measuring uncertainty would have further raised cognitive burden for the respondent, which was already high, and could confuse respondents (especially those who found it difficult to understand and commit to a WTT). In addition, some authors say uncertainty measurements do not necessarily improve the consistency of bids, or resulting model fit (Akter et al., 2008).

Although uncertainty was not measured it was thought to be low, for several reasons. Firstly, prior knowledge and familiarity with the species to be valued improves the confidence of respondents and the certainty in bids (Loomis & Ekstrand, 1998), and this was high since care was taken that the two species to be valued were very well known through the target area, with little possibility for differences in prior information to affect responses (Tisdell & Wilson, 2006). Explicit consideration of the types of values the respondent had for the species (section 6.2.1.1), helped to make the topic salient and ensure the WTT elicited was relatively reliable (Paradiso & Trisorio, 2001). Finally, respondents were given time to think about the scenario, since this reduces uncertainty (Svedsäter, 2007). They were encouraged to ask questions, and the enumerators were coached to give similar answers if respondents required more information, since the type and quantity of information provided can sometimes affect contributions (Boyle, 1989).

6.2.1.3. General support for conservation

Several items were used to assess general perceptions and support for conservation action in the area (a more general concept than the behavioural intentions in the specific hypothetical scenarios; figure 6.2).

Three items assessed conservation support using a 6-point Likert-type response format (Saunders et al., 2003), two scaled negatively and one positively. This is a forced choice scale; three levels of agreement, three levels of disagreement, and no middle option permitted. This follows the precedent of previous studies on similar issues, and can avoid potential central tendency bias. These items were mixed with other questions on views of nature. The issue was also directly probed with a late question asking if there should be more or less effort spent on local conservation, with responses on a 5-point Likert-type response format. Because yea-saying can be particularly prevalent for questions where the respondent perceives direct links with the enumerator's interests, this question was followed by a 'cheap-talk script' reminding the respondent that more effort for conservation might mean less resources and time for other projects, and opportunity to modify their choice. There was also opportunity to discuss ideas for priorities and responsibility for local conservation.

As WTT bid amounts can be affected by prefacing a scenario with environmental attitude questions (Pouta, 2003), these items were placed after the scenario. (This may have had the effect of making the responses to these items more conservation friendly, but was decided to be preferable to ordering the conservation items before the bids, which would potentially influence the bids.)

6.2.1.4. Value orientations

Psychologists usually elicit views on certain issues in standardised ways, by asking specific questions and often recording responses in structured formats. Where possible this precedent was followed. In particular, value orientations were measured using multiple statements of opinions (items). Every respondent was asked to indicate if they agreed or disagreed with each statement, on a six point Likert-type response format.

All items measuring value orientations used a 6-point Likert-type response format. Manfredo (2008) presented 19 statements to assess WVO, of which nine were linked to a mutualism orientation. Of these nine, two were directly translated and a third was used with its meaning reflected (to highlight any yea-saying). From the items measuring utilitarianism, four were selected. These items required more modification to

make sense in a Nepali context, but no statement's meaning was 'reflected' since none of the resulting statements seemed meaningful.

To assess the Schwartz model's dimensions of self-interest/self-transcendence, seven items were selected from the 21 items used in the European Social Survey (ESS, 2007). Two further ESS items were specifically chosen to assess the aspect of altruism, together with an additional altruism item worded to highlight yea-saying. The items measuring value orientations were followed by a short question asking the respondent to choose two of four items, where the first and third items were linked with materialism and the second and fourth items with post-materialism (WVS, 2006). This concept was later deemed not to be theoretically useful and is not further discussed here.

6.2.2. Development of the survey and sampling strategy at the study site

Any questionnaire requires an extensive period of development (e.g. Saunders et al., 2003), but eliciting perceptual variables is particularly challenging mostly because these topics are relatively abstract and complex. For this reason the questionnaire went through several stages of revision which paid particular attention to items on views and perceptions. This section describes the aspects of question development and sampling strategy relevant to eliciting perceptual variables (a summary of general design and sampling strategy was provided in chapter 5).

Topics and questions were translated and evaluated by research assistants, ordinary townspeople in Pokhara, and finally village people, to ensure that problems were identified and corrected. Pretesting was carried out by the whole research team, and so assisted with the training of enumerators, to ensure consistency of their approach, understanding and explanations. Subjects tested particular parts of the questionnaire and were afterwards debriefed, paying particular attention to question comprehension and answer format. To maximise understanding and minimise cognitive burden, wording was refined into simple everyday language, and where possible visual aids were used. In the later stages of testing, length and effects of order were also checked.

Although many constructs measured by psychologists are typically elicited with a standard set of pre-existing items, these items may not be suitable for use in developing country contexts, or in orally administered questionnaires. Furthermore, working with translated questions, in a non-Anglo Saxon culture, means the concepts evoked may differ from their original meaning in English (Twyman et al., 1999). For that reason, some of the items were not direct translations of the English equivalent, but effort was

made to adhere closely to the original concepts. Not only were the concepts employed discussed before and during the design of the questionnaire, but back-translation (Brislin, 1970) was used to avoid significant changes in concept, by using a different translator to translate the Nepali versions back into English, for comparison with the original wording. However the possibility for changes in meaning, though subtle, remains. Question wording and use of language was checked for ease of understanding, whilst neutral phrasing and presentation was used so that certain responses would not be perceived as 'correct'.

A pilot study (N=95) in the Llachok valley (adjacent to the study site and thought to be socio-culturally and biogeographically similar) confirmed there were no significant problems with understanding and responding to these perceptual items. It also allowed the enumerators to practice interview technique: training and maintaining the quality of enumerators' work is often difficult, but important, in such studies (Lund et al., 2008), and is particularly important when probing complex topics. The data from the pilot study were stored in a spreadsheet. Data were checked for covariance between items designed to act as indicators of the same variable. As a result of this, and to decrease the length of the interviews, six items on views were removed to produce a questionnaire with an intended completion time of 30 minutes that would not bore respondents. Details of the questions included and used in later analysis are summarised in table 6.3.

Eligible respondents were all the adult inhabitants of all villages or settlements within Macchapuchare VDC, Ghachok VDC and Sardi Khola VDC. Adults were accepted as those who defined themselves as such. Chapter 5 highlighted the high variation in socio-economic attributes and livelihood strategies, with attendant implications for resource use and conservation. However, within the context of Nepal as a whole, these villages are relatively similar in ethnic composition and biophysical constraints (Central Bureau of Statistics, 2001) so making it possible to use one questionnaire across the entire area. Although the primary aim of this study was not to estimate population values, it was desirable to avoid unduly concentrating on particular socioeconomic groups, so a random sampling strategy was used (Chapter 5).

Table 6.3 The variables measured for this study and details of the coding of the questionnaire items. Label ^r by item indicates it was reverse recoded for analysis. Question numbers refer to location in the final questionnaire (Appendix D).

Topic	Variable	Operationalisation	Question number
Value Orientations	Wildlife-Mutualism	Three items, each with a six-point Likert-type response format.	4.5 ^r , 4.9, 4.11
	Wildlife-Utilitarianism	Four items, each with a six-point Likert-type response format.	4.2, 4.4, 4.6, 4.8 ^r
	Self-transcendence	Five items, each with a six-point Likert-type response format.	5.1, 5.2, 5.4, 5.6 ^r , 5.10
	Self-interest	Three items, each with a six-point Likert-type response format.	5.3, 5.8, 5.9
Perception of case study species	Cultural value	Three items: beauty value, religious value, value as part of nature. Each rated on a six-level scale from zero (no value), to five (lots of value).	2.c iv,v,vi, 3.c iv,v,vi
	Practical value	Three items: food value, fodder value, making things. Each rated on a six-level scale from zero (no value), to five (lots of value).	2.c i,ii,iii, 3.c i,ii,iii
Conservation support	Support for conservation of case study species	Two items, willingness to give time to help conserve plant of cultural value, and plant of practical value. Time selected from ten-level payment card (table 6.2) or open response permitted.	2.d, 3.d
	Local conservation support	Three items using a six-point Likert-type response format, one item using a five-point Likert-type response format.	4.1 ^r , 4.7, 4.10 ^r , 10.a ^r
Socio-demographic variables	Wealth	One item, four level-response.	7 ^r
	Household size	Numeric, open response. Household size includes members working abroad but not family members based in another household.	8.a
	Age	Numeric, open response	8.c
	Education	Open format description, later coded into a five-level scale from 1 (illiterate) to 5 (degree held).	8.e
	Gender	Female or male	Recorded prior to interview by enumerator
	Caste level	Open format description of caste group, later recoded into one (low caste, used for occupational castes), to three (high caste, Brahmin Chettri castes).	Recorded prior to interview by enumerator
	Remoteness	Typical travel time by foot and bus from village of respondent to reach the nearest large town of Pokhara, in minutes.	Recorded prior to interview by enumerator

6.2.3. Data analysis

Questionnaire data were stored, coded and presented with Microsoft Excel. SPSS 17.0 was used for statistical analysis (SPSS Incorporated, 2008b) and AMOS 17.0 (a complement to the SPSS package) was used to model multiple relationships simultaneously through structural equation modelling (SEM), using maximum likelihood estimation (SPSS Incorporated, 2008a). All statistical tests were two-tailed (unless otherwise stated) with a critical significance value of 0.05. Test significance values quoted in tables are represented through the star system, as follows: ‘***’= $p < 0.001$, ‘**’= $p < 0.01$, ‘*’= $p < 0.05$, and ‘NS’=Non-significant ($p \geq 0.05$). Sample size or degrees of freedom (‘df’) are given where appropriate, and test statistics are followed by the relevant number of observations.

6.2.3.1. *Estimating validity of value orientations*

In selecting inputs for SEM, the contributing items designed to indicate value orientations were assessed beforehand for construct validity, to determine if they adequately assessed the concept they were intended to. Of course, given the challenges of estimating a latent (unobservable) construct such as mutualism, evaluating content validity cannot be completely objective. However, the items designed to measure one construct should show good correlations with each other (convergent validity), and should group with each better than with other items (discriminant validity).

The convergent reliability of items supposed to be linked to one concept was assessed by Cronbach's alpha (α), a test statistic that measures the correlation between all the items; items were used to form the construct only if they were consistent with one another and contributed to an improvement in α . As a rule of thumb, an α of around 0.70 is usually considered to be an indicator of sufficient correlation (Nunnally & Bernstein, 1994). In this study, because of the respondents' unfamiliarity with questionnaires and particularly with Likert-type response formats, a lower α of 0.4 was considered acceptable. Discriminant validity was explored by Exploratory Factor Analysis (EFA) using a PCA, to demonstrate whether the items intended to measure one concept correlated better than with items intended to measure other concepts.

6.2.3.2. *Identifying relationships between variables*

Socio-economic variables and value orientation scales were used as predictors of measures of support for conservation using ordinal and linear regression. Relationships accepted as significant, or close to significance, were selected for combination with

other relationships in structural equation modelling. Covariance of predictors was also checked for, and if found included in later models which use those predictors. A paired t-test was used to compare WTT for Lalupate and Nigalo.

6.2.3.3. *Structural Equation Modelling (SEM)*

To decipher multiple relationships and covariances between variables, SEM was used. SEM estimates causal relationships between multiple variables, and allows latent (unobserved) variables to be estimated from observed variables. The statistical techniques are essentially extensions of regression modelling, to provide confirmatory factor analysis and path analysis, and as such some of the same limitations and data requirements apply. Ordinal variables are allowed if considered to represent an underlying continuous variable (e.g. strength of opinion). Simple models (two or more pathways) should be checked for acceptable fit before combining into larger models.

There are pros and cons to all measures of SEM model fit (Barrett, 2007), so several measures were considered when selecting models. The original measure is Chi-squared (χ^2) which indicates the likelihood of the data fitting the model provided (a significance value of 0.05 or more is considered acceptable). Unfortunately, larger sample sizes are nearly always likely to produce p-values under 0.05. It is not clear when the use of χ^2 should be discontinued – recommendations range from 200 to 2000 – so two other measures of fit were also used. These are weighted to favour model parsimony or avoid sensitivity to sample size (for further detail see Arbuckle, 2007; Hu & Bentler, 1999). Firstly, the ‘root mean square error of approximation’ (RMSEA) penalises models with fewer degrees of freedom, so values under 0.05 indicate close model fit in relation to its degrees of freedom, and those over 0.1 are unsuitable. Secondly, the comparative fit index (CFI) compares an independence model to the estimated model, reflecting the average correlation between variables penalised for every parameter estimated, so values over 0.90 indicate acceptable model fit. The Akaike Information Criterion (AIC), an information-theoretic approach to penalising complexity and badness of fit, was used for model comparison.

Bayesian parameter estimates were used to check significant relationships identified in the final models. Bayesian methods make fewer assumptions about data structure and are more robust to missing values (SPSS Incorporated, 2008a). The original WTT variable contained a mix of ordinal, censored and point observations, which were processed as a continuous variable in SEM and so particularly needed checking.

Bayesian methods allow such data to be correctly specified, and so were used to check that treatment in SEM did not significantly change interpretation of results. Bayesian parameter estimates could only be used for checking, since their calculation in AMOS was time consuming and awkward, the procedure gave little insight into overall model fit, and did not allow comparison of nested models. Estimates of direct effects in SEM were accepted if they lay within 0.02 units of the Bayesian estimates, and the boundaries of the 95% credible interval did not encompass zero. We specified priors appropriate to parameter means (e.g. age between 13 and 95), and variance to be positive. We made no other assumptions about distributions of responses, and so used the flat uninformative prior distributions, the default specification of AMOS, together with its other standard settings of Bayesian estimation.

6.2.3.4. *Linear mixed modelling*

Linear mixed modelling (LMM) was used to highlight the effects of the values perceived for each species on WTT for that species. LMM is an expansion of general linear modelling that estimates both random and fixed effects, and permits error terms and random effects to exhibit correlated and non constant variability. It is therefore useful where predictors may not be entirely independent, and can be applied to nested or repeated measures data. LMM is poorly supported by SPSS, so the 'nlme' package (Pinheiro et al., 2009) for R was used instead (R Development Core Team, 2007).

To identify any links between WTT and values-types for species, WTT for Nigalo and Lalupate were pooled into one variable and treated as repeated observations from one respondent. The natural log of WTT+1 was used to produce a model whose residuals were normally distributed. The six types of perceived value for the species were ordered first to highlight their effect. The other variables tested were those already identified by SEM. Respondent identity was specified as a random effect, with an unrestricted covariance structure. The Restricted Maximum Likelihood (REML) method was used to estimate the covariance matrix of the final model, but the Maximum Likelihood (ML) method used when comparing models. Variance estimates are generally more realistic under REML but only ML estimators can be used to compare models with different fixed effect structures (Crawley, 2007).

6.3. Results

The results are presented in order of increasing complexity of analysis. A description of the sample is followed by discussion of the value orientations (and tests of their indicator reliability). Direct associations and relationships are discussed before significant relationships are combined into more complex models for simultaneous estimation with SEM and LMM models.

6.3.1. Sample characteristics

The final sample of 661 individuals was taken from every part of the study site, with mean interview duration of 34 minutes (range 15 to 75 minutes). There was no significance difference in respondents or responses recorded between enumerators, and enumerators noted no bias in the type of individuals who refused or agreed to take part. Missing values were infrequent and present in only about 40 cases. Comparison to census data (Central Bureau of Statistics, 2001) revealed no large biases in age or gender of respondents, although there may be a bias to favour older rather than younger men (Appendix E). Details of the socio-economic characteristics of the sampled individuals were discussed in section 5.3.1, chapter 5.

Path analysis (multiple regression) in AMOS revealed a complex relationship between different socio-economic variables (figure 6.3) that should be taken into account by other statistical analyses. Many covariances linked to social trends: for example, females and older people tended to be less well educated, whilst higher caste people were more likely to be better educated and wealthier. Other covariances were probably an artefact of respondent distribution (all caste groups were found throughout the region, but some lower castes were clustered in the less remote areas) or sample (increasing age was linked to higher caste). No variable completely subsumed another, so all were retained for use in later analysis.

The distribution of responses to Likert-type response formats was examined, since this format is conceptually complex and novel for respondents. All response options were used for all items. However, all items but one had skewed responses, most (18 out of 22) to the positive agreement options (perhaps due to yea-saying). This reduces the efficacy of statistics based on those responses and ability to detect effects. Kurtosis (tendency to centrality) was also noticeably non-normal, with about half the items centrally concentrated and half overly flattened.

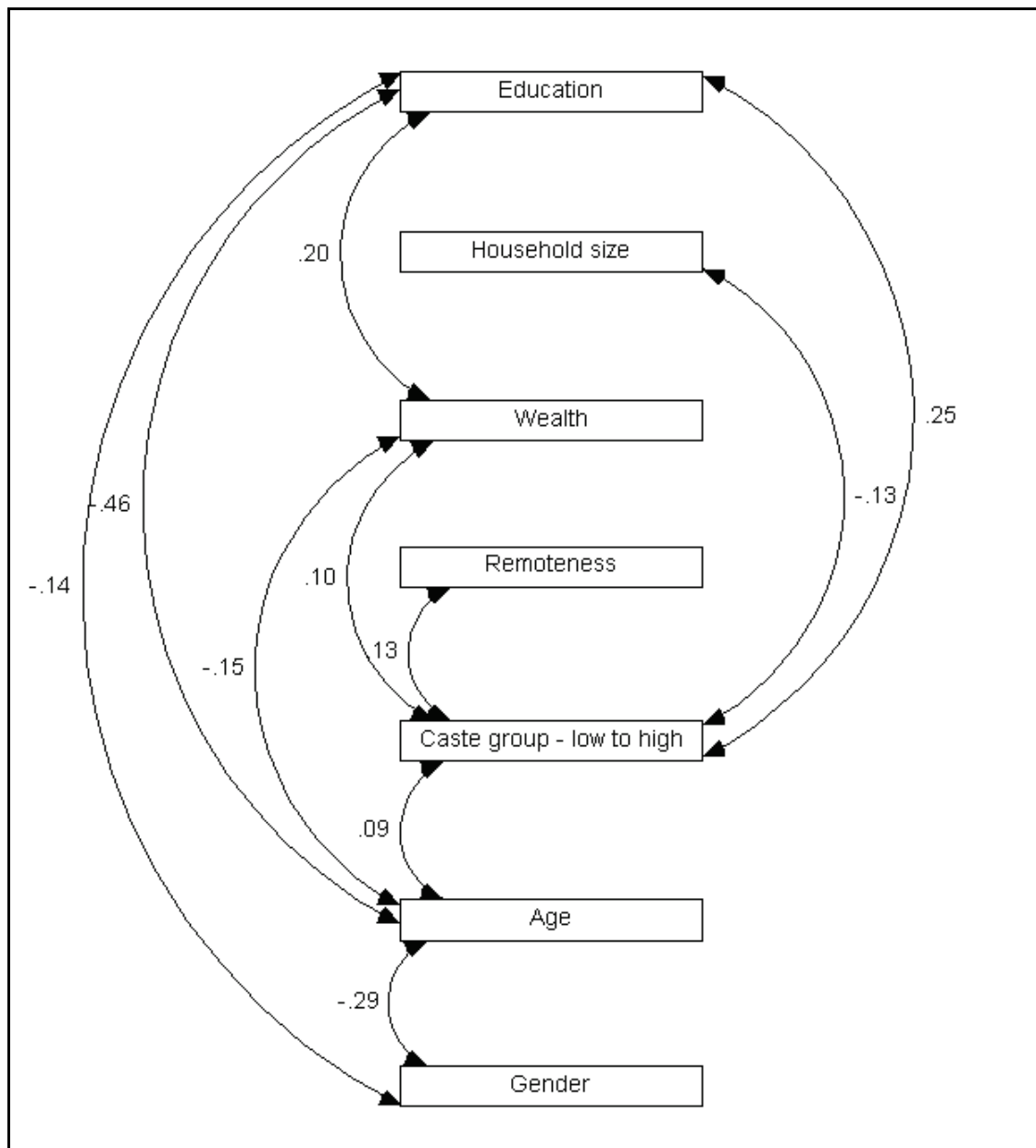


Figure 6.3 The relationships between predictors as modelled using AMOS. Gender coded female=0, male=1. All covariances shown are those estimated to be significant at $p < 0.05$. Initial maximal model contained all possible covariance pathways, at each step of the modelling process one non-significant pathway was removed. Model fit is acceptable: $\chi^2 = 8.874$, $df = 11$, $p = 0.634$, $RMSEA < 0.001$, $CFI > 0.999$, $N = 661$. Standardised direct effects are shown as estimates of relationship strength.

6.3.2. Individual views: value orientations and values for nature

Support for the existence of value orientations comes from the structure and reliability of items designed to predict these latent constructs.

6.3.2.1. Wildlife Value Orientations

To identify if the pattern of responses supported the existence of separate value orientations towards nature, exploratory factor analysis was used on the items designed to measure mutualism and utilitarianism. As expected, the PCA extracted 2 factors from the 7 items, explaining 41% of the variance (table 6.4). The variables strongly

associated with factor one were the three mutualism items, whilst the factors associated with factor two were the variables designed to represent utilitarian attitudes to the environment. Utilitarianism and mutualism appear to be separate orientations, not two ends of a scale, although one mutualism item is negatively associated with the utilitarian items. This supports the value orientation structure found by previous studies in other locations (e.g. Teel et al., 2005).

Table 6.4 Factor loading of rotated components formed by principal components analysis of responses to the seven items designed to measure views of nature and wildlife: questions 4.4, 4.9 and 4.11 measure mutualism whilst 4.2, 4.4, 4.6 and 4.8 are designed to measure utilitarianism. All items were adapted from pre-existing items for measuring these constructs (Manfredo et al., 2009), except the last item which is new. Pale shading indicates factor loading magnitude greater than 0.40, dark shading greater than 0.60, whilst hashed shading indicates negative direction of loading.

Value orientation	Item loaded	Component	
		1	2
Mutualism	He thinks that love and affection is an emotion that should be felt only for other people, not for wild animals. [Reversed coding for analysis]	.408	-.494
	He believes that all plants and animals are part of one big family	.711	.063
	He feels a strong emotional bond with wild animals.	.777	-.035
Utilitarian	He thinks that humans should manage wildlife populations so that humans can benefit	.350	.454
	He thinks wildlife exists on earth primarily for people to use.	.099	.586
	He believes that the needs of humans should take priority over wildlife protection.	.035	.642
	He thinks that if a plant has no value/importance to people then it should not receive any attention by conservationists	-.289	.514
Variance explained		23%	20%

Additional support for combining the variables into their associated constructs came from reliability analyses. The α coefficients for the items in each factor were 0.45 (mutualism items) and 0.41 (utilitarian items). These alphas are lower than in most published studies, which are usually 0.70 or above. This indicates that the items correlate but imperfectly, or are ‘noisy’. This is probably due to Nepali respondents’ inexperience with surveys and use of Likert-type response formats.

6.3.2.2. General value orientations

Items relating to self-transcendence and altruism were intelligible and relevant to a Nepali audience. Furthermore, during the questionnaire survey, respondents showed variation in their responses to these items – for example, not everyone valued equality between people. Items relating to self-interest were also widely intelligible. However other Schwartz items were not relevant for use in Nepal – for example very few could relate to a desire for “an exciting life”.

Schwartz’s individual values (benevolence/altruism, universalism etc.) are conceptually related and commonly represented as aspects of a circular continuum, so it is not appropriate to try to extract orthogonal factors from items designed to measure aspects of Schwartz values. However, reliability coefficients indicate the extent to which theoretically-linked items are associated. The problems with ‘noisy’ data also lowered these reliability coefficients.

The attempt to measure altruism with an item designed to check yea-saying was unsuccessful ($\alpha=0.19$) so altruism was best estimated with just the two original Schwartz items ($\alpha=0.46$). These altruism items correlated quite well with other items linked to self-transcendence ($\alpha=0.43$). The most reliable indicator ($\alpha=0.55$), used to scale self-transcendence, came from three items, two of which represented altruism and one universalism. The three items measuring self-interest had similar reliability ($\alpha=0.46$).

These findings support hypothesis 2, as concepts of value orientations from developed countries, are present in Nepal. This study has found the presence of and variation in two value orientations: mutualistic WVOs, and general self-transcendent/self-interest value orientations. However, there are significant challenges to operationalizing constructs that allow sufficient reliable data to be collected from illiterate respondents in non-Western cultures.

6.3.2.3. Value orientations and perceptions of species

Perceived values for Lalupate and Nigalo confirmed that Lalupate has few, if any, practical values, whilst Nigalo has many important practical values (figure 6.4).

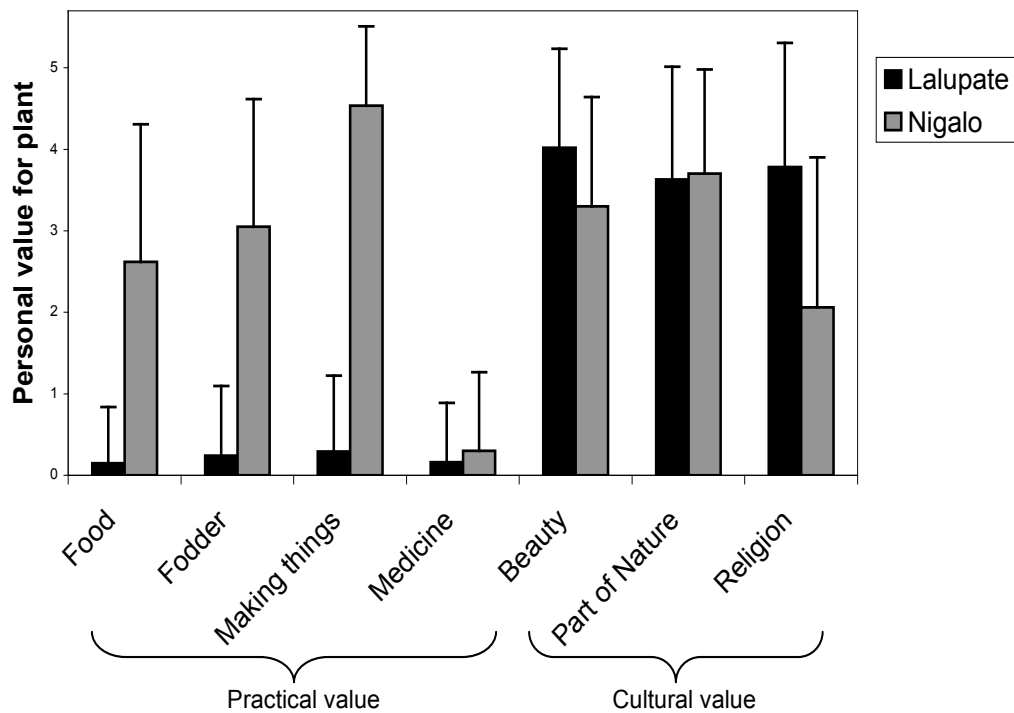


Figure 6.4 Mean rating of different value types perceived for a decorative species, Lalupate (*Euphorbia pulcherrima*) and a practically useful species, Nigalo (several local bamboo species). Minimum rating permitted 0, maximum 5. N for each category varies from 646 to 659. The error bars show standard deviation of each value-type estimate.

If mutualism encourages a feeling of connection to nature, respondents scoring highly for it may also place greater value on individual components of nature, even those with little practical value for them. Accordingly, mutualism was weakly but positively linked to value ratings of Lalupate, both for practical values (ordinal regression, $N=658$, Pseudo $R^2=0.033$, $\chi^2=18.296$, $df=1$, $p<0.001$), and for cultural values (ordinal regression, $N=651$, Pseudo $R^2=0.021$, $\chi^2=11.144$, $df=1$, $p=0.001$). As value orientations can be relevant to understanding views of nature, this also provides some support for the second hypothesis, which expected value orientations to link to other perceptual variables.

6.3.3. Understanding support for conservation

In the questionnaire section on views of nature and conservation, three items were designed to measure conservation support. However, there was nearly zero correlation amongst them ($\alpha = -0.055$) so they were discarded as unreliable. The first-placed item in

the questionnaire was very strongly skewed to conservation support, perhaps indicating the presence of yea-saying that lessened during the course of interviews. However, another item near to the end of the questionnaire assessed views on whether more or less effort should be given to local conservation efforts, assessed on a 5 point Likert-type response format. This was thought to be the best indicator of conservation support firstly because respondents were most relaxed by this stage in the interview, and secondly because there was opportunity to revise the statement after a ‘reality’ check, a reminder that resources were finite, and so more support for conservation might mean less support for other activities in the region. This reality check was useful. Forty-two percent of respondents took this opportunity to revise their support downwards, with most (N=181) reducing their support by one point, and a few (N=10) who had all originally given the most positive rating, reducing their support by three points on the five point scale. As figure 6.5 demonstrates, there was still a strong tendency to support either the status quo, or give more effort to conservation.

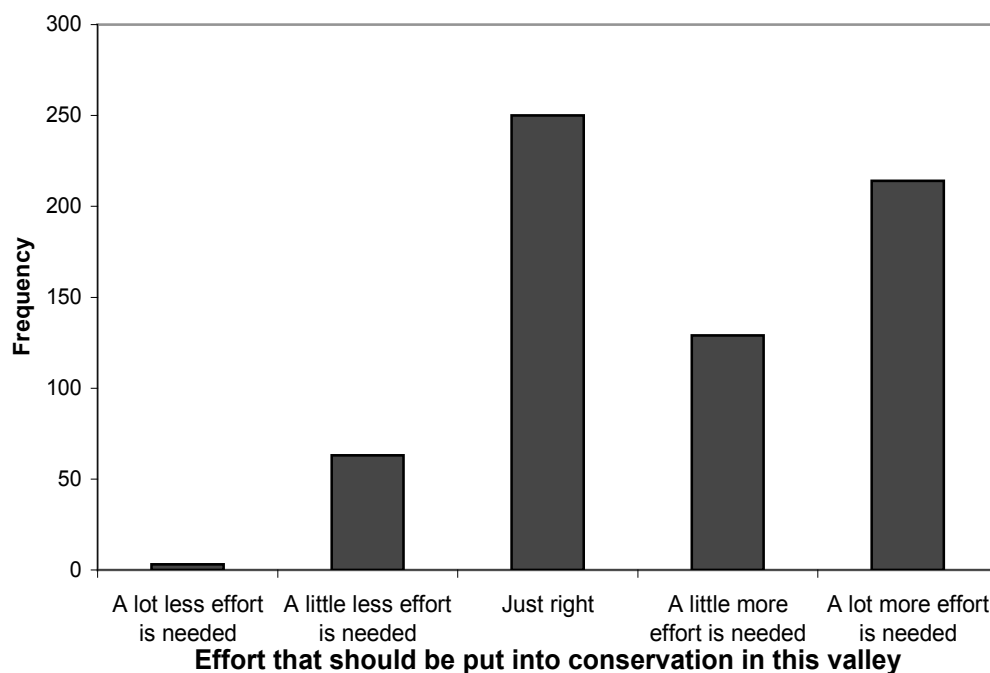


Figure 6.5 Responses to the question “What do you think of the amount of effort that is put into conservation in this valley?” N=659.

The other indicator of conservation support was the specific support for Lalupate and Nigalo, indicated by willingness to give time for their conservation. Most people gave some time for both Lalupate (63 zero bids, so N=596) and Nigalo (48 zero bids, so N=611), and the median WTT for both was about 4 hours per week. However, in general people were prepared to give slightly more time for Nigalo than for Lalupate,

(responses compared based on ordinal categories corresponding to the payment cards; Wilcoxon Signed Ranks Test, $Z=-8.645$, $p<0.001$; figure 6.6).

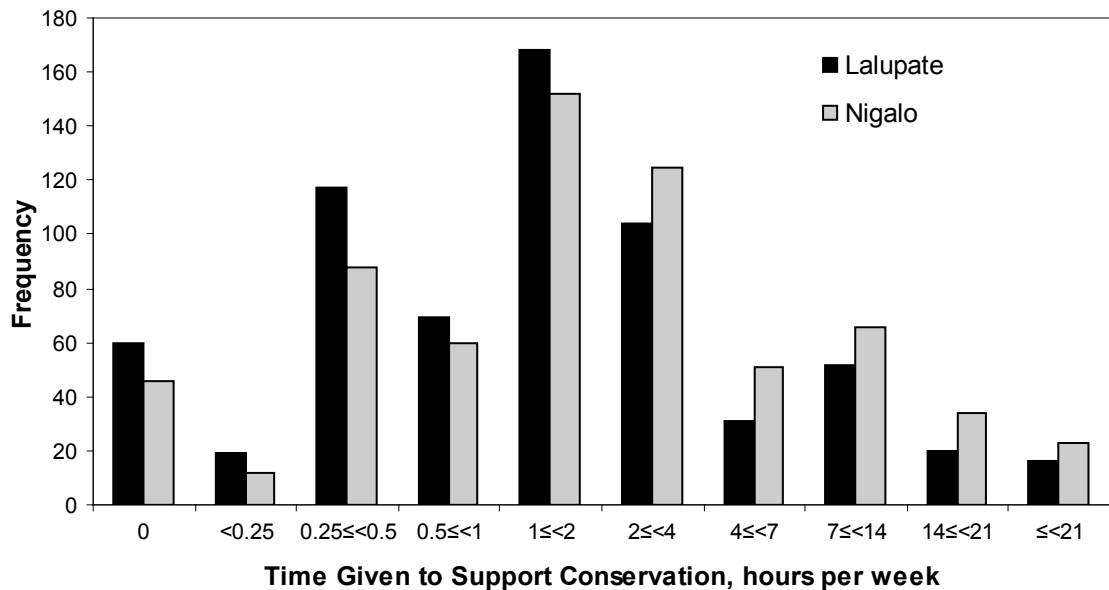


Figure 6.6 A comparison of willingness to give time to support conservation of Lalupate, a decorative plant, and Nigalo, a practically useful plant. $N=661$. Time given is time per week over approximately 6 months, categories reflect payment card options.

That the majority of respondents are willing to give time to Lalupate – a decorative plant – is clear evidence that practical values are not the only thing that influence support for conservation. This supports the first hypothesis: species with both practical and cultural value can receive conservation support.

The effect of socio-economic status on conservation views was also explored. When the effect of all socio-economic predictors was tested together, self-assessed wealth did not affect ratings of support for conservation effort, nor WTT for Lalupate or Nigalo. However, the other measure of socio-economic status, caste, did have some predictive power. It had only a weak effect on Lalupate WTT, but a significant effect on Nigalo WTT (figure 6.7), together with decreased remoteness and being female. Low caste respondents were likely to give more time for Nigalo, perhaps because they were more likely to directly use it in their livelihoods, and were less able to access alternatives. This result, together with the general population's support for conservation of both practical and decorative plants, provides further support for the first hypothesis: Nepalis, including the relatively poor, hold widespread support for conservation.

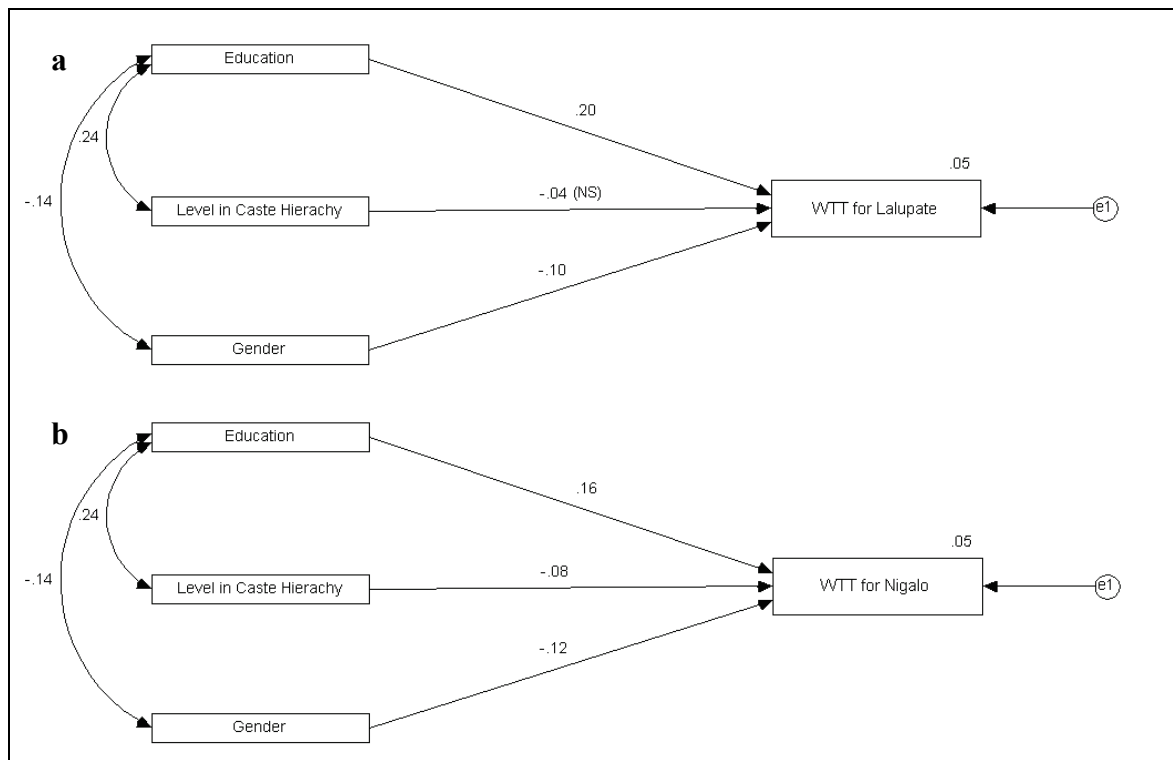


Figure 6.7 Socio-economic variables that predict Willingness to Give Time (WTT) to support conservation of two different plant species. N=661 for both, Gender coded female=0, male=1. Standardised direct effects are shown as estimates of relationship strength. Numbers above dependent variables represent standardised regression weights, with their error terms represented by circles ‘e’.

Figure 6.7a. WTT for Lalupate, a plant with cultural values. Model fit is acceptable: $\chi^2 = 0.067$, $df=1$, $p=0.795$, $RMSEA < 0.001$, $CFI > 0.999$, $AIC=26.067$ but the path from caste to WTT is insignificant, and constraining this to zero produces a more parsimonious model: $\chi^2 = 1.204$, $df=1$, $p=0.548$, $RMSEA < 0.001$, $CFI > 0.999$, $AIC=25.204$.

Figure 6.7b. WTT for Nigalo, a plant with practical values. Model fit is acceptable: $\chi^2 = 0.067$, $df=1$, $p=0.795$, $RMSEA < 0.001$, $CFI > 0.999$. Caste is a significant predictor of WTT and is retained in the most parsimonious model.

6.3.4. Value orientations and conservation support

To understand if conservation support could be predicted by an individual’s value orientations, the effect of mutualism and self-transcendence was considered (self-interest was not found to be linked to any other variables). Mutualism and self-transcendence were found to be strongly related constructs: people who scored highly on one were likely to score highly for the other (figure 6.8).

When investigating effects on measures of conservation support, self-transcendence showed similar but weaker effects than mutualism. Construct reliability for mutualism was poorer than is usual for use with SEM: for example, the path from item 1 to the latent construct was only 0.25, whereas the usual threshold is 0.4 (Thøgersen & Ölander, 2006), and so there was a risk that when combined with other variables during modelling, these would influence the construct’s value. For example, if wealth, age and gender are thought linked to mutualism, the value of the latent variable may be

influenced as much by the three demographic variables as by the three items designed to be used to construct it. We therefore fixed the value of mutualism by computing the average of its predictor items, which was thereafter treated as an observed variable by the modelling process. This item was related to three socio-demographic variables (figure 6.9).

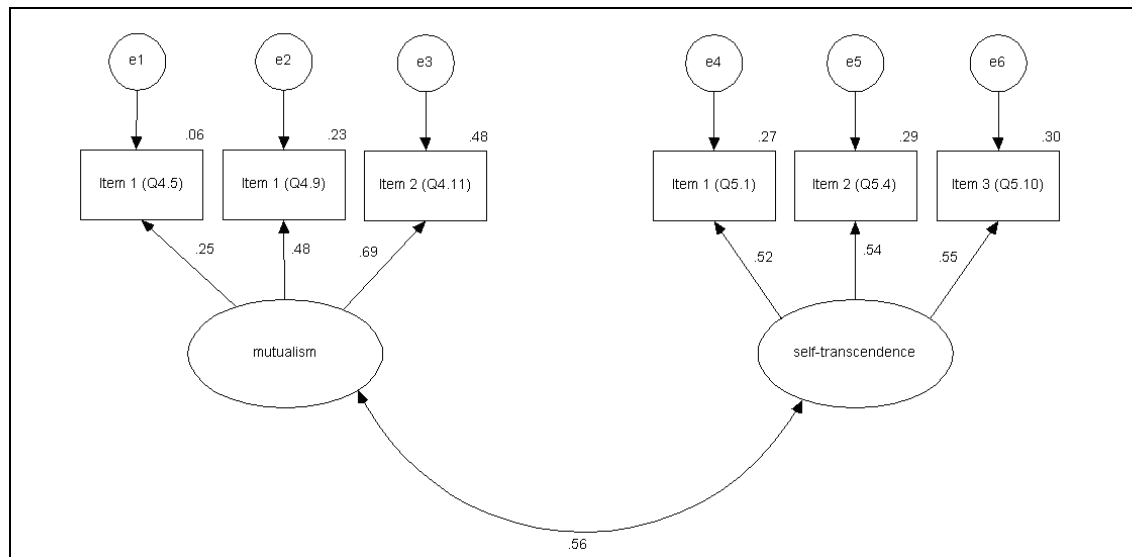


Figure 6.8 The relationship between mutualism and self-transcendence. Items were chosen to maximise the coefficient of reliability for each construct. N=661. Model fit measures except for χ^2 indicate acceptable fit: $\chi^2 = 17.343$, $df=8$, $p=0.027$, RMSEA=0.042, CFI=0.970. Observed variables are in rectangles, latent variables in circles. Standardised direct effects are shown as estimates of relationship strength. Numbers above dependent variables represent standardised regression weights, with their respective error terms represented by circles labelled ‘e’.

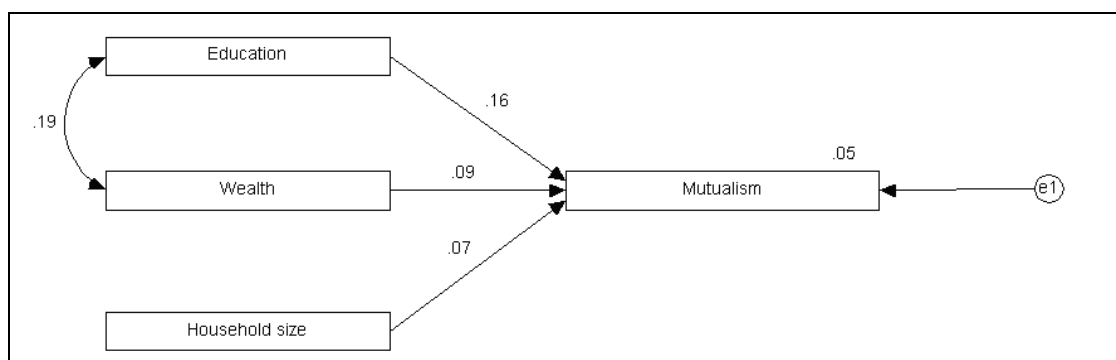


Figure 6.9 The socio-economic predictors of mutualism. Effect of household size is borderline significant ($p=0.056$) and retained here for best model fit: $\chi^2 = 1.50$, $df=2$, $p=0.472$, RMSEA<0.001, CFI>0.999. Standardised direct effects are shown as estimates of relationship strength. Numbers above the dependent variable represent standardised regression weights, with the error term represented by circle ‘e1’.

Using the new mutualism variable allowed us to test for any direct relationships with measures of conservation support. Mutualism was a significant predictor of conservation support, as assessed by the level of effort thought to be needed for local conservation (ordinal regression, $N=658$, $\chi^2=8.71$, $df=1$, $p=0.003$). It also had a significant positive association ($\beta=0.140$, $p<0.001$) on WTT for Lalupate (linear regression $Adj.R^2=0.084$, $F_{1,650}=12.903$, $p<0.001$) but not Nigalo ($Adj.R^2=0.004$, $F_{1,651}=3.808$, $p=0.051$). This supported the second hypothesis, as value orientations were relevant to understanding conservation support, particularly for a plant with predominantly cultural values.

6.3.5. Overall models of conservation support

Socio-economic variables and mutualism were incorporated in one model to understand their combined role as predictors of conservation support and WTT. All significant pathways from previous models were included initially, then removed to find the most parsimonious final model.

Both socio-economic and perceptual variables influenced intention to conserve species. For Lalupate WTT, education and gender were significant predictors, together with mutualism and general conservation support (figure 6.10). Mutualism also had a mediating role on the effect of education. For Nigalo WTT, the same pattern of predictors had a nearly identical model fit: $\chi^2=4.942$ for Nigalo, and 4.944 for Lalupate. The addition of caste as a predictor of Nigalo WTT (as suggested in figure 6.7) produced a model fit which, though still acceptable, was less satisfactory ($\chi^2=10.337$, $df=5$, $p=0.066$, $RMSEA=0.040$, $CFI=0.965$) with AIC increasing from 40.9 to 54.3.

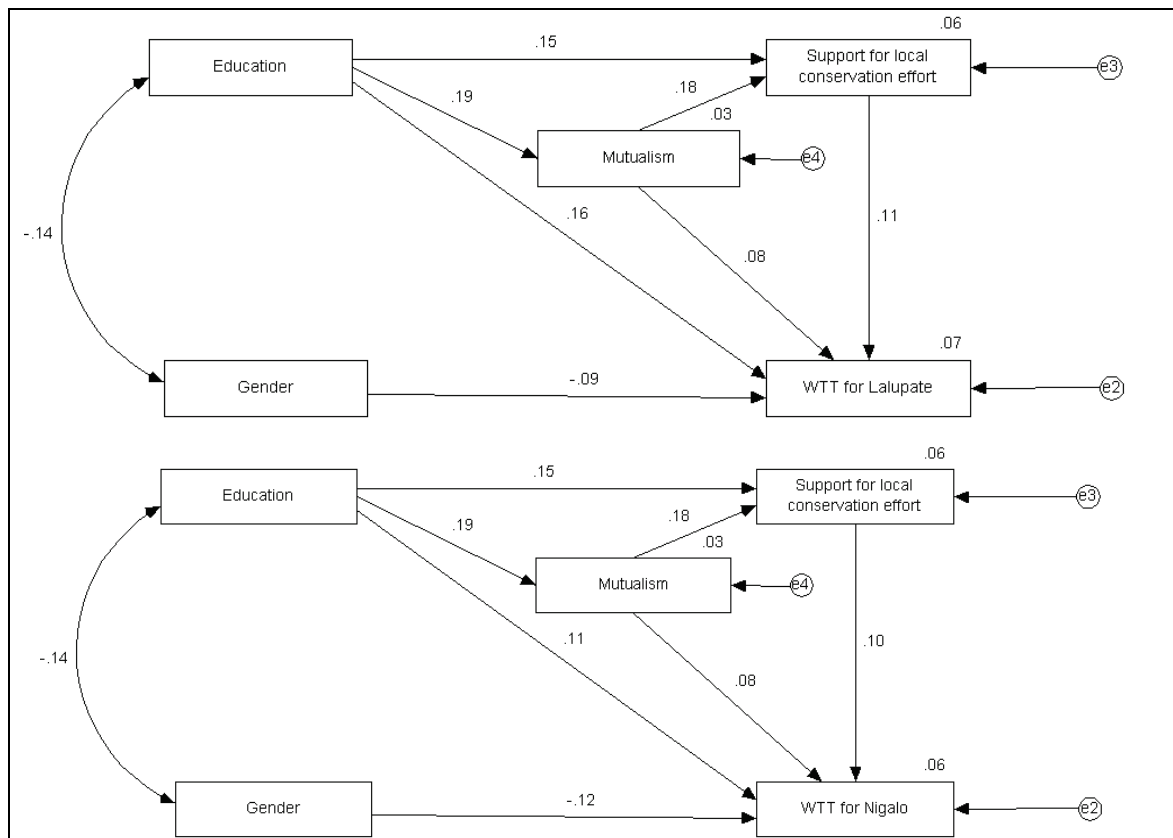


Figure 6.10 Willingness to give time for species conservation, predicted by mutualism, socio-economic variables, and general support for local conservation. All relationships retained are significant at $p < 0.05$, $N = 661$. Standardised direct effects are shown as estimates of relationship strength. Numbers above dependent variables represent standardised regression weights (standardised estimates are not affected by parameter constraints), with their respective error terms represented by circles labelled ‘e’.

Figure 6.10a WTT for Lalupate, a plant with cultural values: model fit is acceptable: $\chi^2 = 4.944$, $df = 2$, $p = 0.084$, $RMSEA = 0.047$, $CFI = 0.975$.

Figure 6.10b WTT for Nigalo, a plant with practical values. Model fit is acceptable: $\chi^2 = 4.942$, $df = 2$, $p = 0.084$, $RMSEA = 0.047$, $CFI = 0.973$.

Comparison of these two models suggests that a combination of mutualism and general conservation support, together with socio-economic variables, is relevant to understanding behavioural intention to conserve a species. This supports the second hypothesis: value orientations mediate and supplement the effect of other perceptual variables and socio-demographic variables on willingness to give time for conservation.

Although the most parsimonious models of conservation support are very similar for both Lalupate and Nigalo, the relative strength of predictors is slightly different (replacing Lalupate WTT with Nigalo WTT decreases education’s direct effect by about 30% and increases the gender effect by about 25%). Furthermore, the weak predictive role of caste suggests that socio-economic status can be relevant to understanding support for a practically valued species, so perceived values for species may influence what factors inform support for a practical species.

Since the models for the two species were not identical, it was appropriate to further probe if there was a significant effect of the species perceptions on WTT. The six ratings of perceived value recorded for each species (3 practical and 3 cultural) provided an opportunity to probe how variation in these perceived values influenced support for conservation.

A linear mixed model (LMM) was used to highlight the effect of these perceived values as predictors of conservation support. The set-up of the model – combining both WTT bids pooled into one variable in a doubled data set, and respondent used as random effect – was designed to allow a more nuanced exploration of the effect of perceptual variables, particularly the perceived values (table 6.5). With this approach, value as part of nature was a significant positive predictor of WTT. Value as beauty did not have a significant effect, but was retained as it significantly improved model fit. There were no significant interaction terms and caste also had no effect. The final model reinforces the support for the second hypothesis, as multiple perceptual and socio-demographic variables need to be considered as influences on conservation support. It also highlights how perceptions of cultural values, not just practical value, can influence decisions to act for conservation.

Table 6.5 Summary statistics of a general linear mixed model predicting willingness to give time (WTT) for species conservation. The model looks at the effect of perceptual variables on WTT, with species as a fixed effect and respondent as a random effect. The data set was doubled to N=1281 as WTT for Lalupate and Nigalo pooled into single variable (natural log of WTT+1), with a new separate binary variable created to indicate species identity (Nigalo=1). Type I sum of squares were used to estimate explanatory power of fixed effects for all six perceived values, as well as variables used in structural equation modelling, and their interactions. Variables with non-significant effect terms were removed. Resulting model fit indicated by comparison with null model, when calculated by the Maximum Likelihood (ML) method: Likelihood Ratio 125.7, df=7, $p<0.0001$.. Covariance estimates for individuals 0.433, for residual 0.156. Education recoded to a binary variable (0=primary or less, 1=secondary or higher). Effect estimates of education, caste, gender and species identity are shown in relation to the lower contrasting category (gender, female=0; species identity, Lalupate=0).

Predictor variables	Test of fixed effects			Estimate of fixed effects		
	Numerator, denominator df	F value	p	Estimate	t	p
Intercept	1, 643	1161.00	***	-0.0583	-0.32	NS(0.75)
<i>Perceived value of species</i>						
Value as part of nature	1, 630	23.50	***	0.0357	2.70	**
Value as beauty	1, 630	1.32	NS(0.25)	0.0347	2.65	**
<i>Other perceptual variables</i>						
Mutualism	1, 643	13.19	***	0.0729	2.23	*
General conservation support	1, 643	15.41	***	0.0863	3.03	**
<i>Socio-demographic attributes</i>						
Education = high	1, 643	9.70	**	0.186	3.13	**
Gender = male	1, 643	12.71	***	-0.209	-3.68	***
<i>Species identity</i>						
Nigalo	1, 630	82.16	***	0.219	9.06	***

6.4. Discussion

The results of this study demonstrate widespread support for conservation in the Seti Khola area of Nepal, suggesting that people are never 'too poor' to care about conservation (van Kempen et al., 2009). Conservation support was given for both a species perceived to have practical values, and one perceived to have cultural values. Furthermore, perceiving a species as either beautiful, or as part of nature may increase support for its conservation, confirming the relevance of both practical and cultural values (e.g. Winter & Lockwood, 2005). Rather than wealth, individual views and perceptions of species influenced concern for conservation. As an example of how views affect concern, the construct of mutualism, as a perception of human-wildlife connectedness, was an idea that Nepalis could relate to. Those holding this view were more likely to give more support for conservation. These data support the first hypothesis: individual conservation support is predicted by more than socio-economic status or perceived practical value of a species.

Variation in time given to help conserve species was positively associated with both general conservation support and mutualism scores, but also linked to socio-demographic variables. Higher educational status was associated with more mutualistic views, as well as being directly linked to greater conservation support. Women tended to give more time and there was also a weak effect indicating lower caste respondents gave more time than higher castes to a practically valued species. The existence of these multiple effects supports the second hypothesis: conservation support can be best understood by combining measures of an individual's perceptions with socio-demographic variables.

Hitherto, most surveys probing conservation concern in developing countries have tended to focus only on socio-demographic variables, such as gender, age or occupation (e.g. Gillingham & Lee, 1999). However, there is no way to know how attributes affect specific attitudes and behaviours, without understanding their links with perceptual variables, such as an association with age and more conservative views (Gilbert et al., 1998). For example, in this study mutualism not only had a direct association with willingness to give time for conservation, but it also mediated the effect of education. (The link between mutualism and time given for plant conservation also suggests this support may be generalisable to wildlife.) Better understanding of such interactions may also allow insights into how novel issues will be perceived and evaluated, which is

potentially relevant to those planning interventions. However, the existing bias towards measuring only socio-demographic variables may occur because they are relatively easy to define and measure, compared to more perceptual attributes such as views of nature (e.g. Saunders et al., 2003).

Understanding and measuring views of nature is always challenging, particularly for researchers in very different cultures working with poorly literate populations. Although this study found Nepalis could generally relate to mutualistic views, utilitarian views of nature were less well understood. This shows how theories developed in western settings may have limited applicability elsewhere (Sinha, 1987). Even where ideas are transferable they may need some re-examination; in this case the existence of mutualistic wildlife views in rural Nepal conflicts with the postulated origin of mutualism as a product of egalitarianism in post-industrial societies (Manfredo, 2008). And, when concepts are cross-culturally relevant, there remain problems in applying the instruments designed to measure them (van de Vijver & Leung, 2000). Despite extensive efforts to produce a locally comprehensible questionnaire, this study accepted an unusually low threshold for inter-item reliability (the correlation of items designed to measure a value orientation such as mutualism). Cross-cultural use of standard instruments in structured questionnaires is theoretically desirable, but may be very problematic in practice (Sinha, 1984), so development and recognition of alternative methods is needed (Teel et al., 2007). Mixtures of qualitative and quantitative methods are probably most appropriate (Camfield et al., 2007).

Efforts to understand local views are valuable because they offer an opportunity to understand the basis of conservation support (or otherwise), and so inform future interventions (Fishbein & Manfredo, 1992). At the very least these findings highlight the variability of individuals within communities. However, they also suggest potential themes or approaches it might be helpful for interventions to take. Interventions that are actively tailored to reflect these local views are more likely to succeed (Infield, 2001). Since such views may be relatively fixed and enduring (Olver & Mooradian, 2003), engaging with them to create positive attitudes for conservation may be particularly useful to achieve long-term conservation objectives (Brown, 2002).

This study has provided empirical evidence of the role of mutualism, but this is only one view with potential to influence conservation support. Even within developed countries such as the UK, differing perceptions of nature can affect actions taken for conservation

(Harrison & Burgess, 1994). Relevant issues and perceptions are likely to differ even more across cultures, as often occurs when western proponents engage with developing country communities (Peterson et al., 2009). However, when interventions do engage with local views, potential sources of conflict and engagement can be identified in advance, offering a culturally sensitive way to encourage conservation support (Cable & Ernst, 2003). For example, in Lake Mburo National Park, Uganda, belated recognition that the local views of nature were tied to a particular prized variety of cow, led to less antagonistic relationships between local people and park authorities, and some adaptation of the park's management (Infield, 2002).

Of course, this study's focus on individual perceptions and views does not imply practical concerns and constraints are irrelevant to conservation interventions. The difficulty of rural life in Nepal is well known (e.g. Bohle & Adhikari, 1998) and in this study most of those giving no time for conservation explained they had little leisure time. Previous work has already emphasised the need to understand local context (Brechtin et al., 2002) rather than predict behaviours from general theories. In this case, finding that the lower castes gave more time for Nigalo conflicts with theories which suggest poor people are concerned only with immediate survival needs (e.g. Maslow, 1970). However, Nigalo has practical value and the lower castes have less access to substitutes for the products it provides, and are also more likely to have livelihoods directly dependent on Nigalo. This suggests they were thinking ahead and quite reasonably concerned to secure their livelihoods in the long term. This finding could be relevant to planning interventions for any such practically-valued plants.

This study found women tended to give more time for conservation, which is not easily explained except as a general tendency for women to care for others (Dietz et al., 2002; Van Liere & Dunlap, 1980). Women are generally repressed in Nepal (Dhakal, 2008) including in the organisations governing natural resource use (Agarwal, 2001). Conservation could be promoted by actively seeking to increase female participation, borrowing approaches from the development sector (Narasimhan, 1999). However, gender roles are deeply rooted in local and national institutions and culture (Rao & Kelleher, 2000). Therefore there is potential tension between goals for equitable local involvement and adaptation to local culture.

It is less problematic for interventions to promote education. Higher educational attainment was directly linked with intention to conserve, as well as general

conservation support and more mutualistic views. This accords with the generally observed effect of general education on environmental and conservation concern (e.g. Fiallo & Jacobson, 1995; Kideghesho et al., 2007), and supports the provision of education as a long-term strategy for fostering conservation concern (Jacobson et al., 2006). Conservation education could usefully emphasise human-wildlife connectedness, and link this to a need to conserve. Such approaches may be particularly useful where behaviours of conservation concern are sensitive or unaffected by provision of alternatives, such as illegal hunting driven by preferences (Chapter 5).

In the context of the Seti Khola valley, continued support of education by conservation organisations is likely to be fruitful, whilst interventions to engage with local views, and recognition of the constraints of caste, could also be useful.

6.4.1. Conclusion

This study demonstrates how a better understanding of an individual's support for a particular conservation project comes from understanding their views of nature (values orientations and perceived values of species), in combination with socio-demographic attributes. Theories created in developed countries may be cross-culturally applicable and so be useful for understanding views in individuals in developing countries (in this case the concept of mutualism was particularly useful). However, challenges remain in understanding and measuring these views.

7. DISCUSSION

This chapter relates the findings of the data chapters to the aims of the thesis, and goes on to identify their combined implications for conservation practice, research and policy. The overall aim of this thesis was to investigate the role of multiple aspects of local social context – from institutions to individual views – as influences on conservation outcomes. The findings of chapters three to six provide strong evidence that local views, culture and institutions can significantly influence conservation outcomes, and therefore should be taken into account by CBC interventions. The findings are summarised in relation to the four specific objectives of the thesis (section 1.1), and then discussed in relation to findings from other studies.

7.1. Addressing the research objectives

- 1. Identify if outcomes of CBC are positively influenced by a supportive social context (particularly local institutions), and project engagement with this context*

The systematic review and meta-analysis of past CBC outcomes presented in chapter 3 clearly show that a supportive cultural context positively influences CBC outcomes, and also that projects which engage with this context are more likely to succeed. Taking a different perspective, the qualitative study of a religious-linked intervention in Kalmykia (chapter 4) shows at the scale of a single intervention how a particular cultural and institutional context can affect individual views and behaviours for conservation and the environment. A collectivist culture and history may not appear immediately relevant to conservation and environmental issues, but in Kalmykia it had significant implications for the practice of pro-environmental behaviours through influencing sense of agency and deference to authority. These findings give strong support to the arguments advocating that project planners should prioritise better understanding of the communities they work with (Belsky, 1999) but particularly that they should not overlook non-governmental institutions and cultural features that may seem to have little direct relevance to conservation (Peterson et al., 2009).

- 2. Understand how a CBC project may influence individuals through engagement with local institutions and culture*

The Kalmykian study focused on the effects of an intervention to encourage pro-environmental behaviours, which embedded pro-ecological messages within religious teachings by a Buddhist learning centre (the Dharma Centre). By working through the

Centre to link with pre-existing and popular religion, the project was embedded and engaged with local culture and non-governmental institutions. In this way it was able to encourage pro-environmental attitudes and behaviours. The influence of the Dharma centre in Kalmykia was particularly interesting because it influenced people's views by stimulating a sense of personal agency and responsibility to take action, rather than by simply informing them about environmental issues or encouraging them to care more about the environment. Not only can conservation goals be reached by engaging with local cultures (Infield, 2001) but conservation education and outreach should focus on more than environmental problems and behaviours, to also address culturally specific incentives and barriers to behaviour (Schultz, 2002).

3. Understand social heterogeneity within communities at the scale of a CBC project, and links to natural resource use and conservation behaviours

The Dharma centre was influential but had limited effect at least partly because of social heterogeneity; only those who are Buddhist are influenced by its teaching, at least in the short term. Furthermore, without enabling conditions (perhaps through engagement with governmental institutions) individuals were constrained in their potential conservation behaviours. The issue of the influence of social heterogeneity was the central focus of chapter 5. Even within the scope of a small CBC intervention in Nepal, different groups had quite different motivations for use of wild natural resources, with poorer low caste people harvesting resources to satisfy the preference of some more high status groups. Variation in livelihood strategies, and discrimination in the caste system, also acted to limit engagement with outsiders and existing conservation projects. As such, any intervention to conserve wild resources would need multiple strategies to address both preference and need, and to engage marginalised groups. This supports the use of flexible and adaptive strategies for conservation (Wells & McShane, 2004), tailored between sites but also to different interest groups within sites (Li, 1996).

4. Investigate how individual views can influence intended conservation behaviours

Further probing the situation in Nepal, Chapter 6 demonstrated that individual views (focusing on mutualistic feelings towards nature) could influence intention to engage in conservation behaviour. Although socio-demographic variables typically measured by surveys were also influential predictors, it was of particular interest that none of these factors could act as a proxy for views of nature, or general conservation support. For example, lower castes did not express more or less mutualistic views than the higher

castes. So, individual responses cannot be entirely predicted by demographic attributes or place in society; whilst this would be expected in western studies, a reminder is perhaps needed for developing country contexts. Conservation interventions must be prepared for such variation between individuals, but engaging with these views may also offer a valuable avenue for encouraging behavioural change for conservation (Saunders et al., 2006).

7.1.1. Contribution of the thesis

This thesis provides evidence that conservation outcomes can be influenced by multiple aspects of the local social context of conservation. Such effects would be obvious to many in the social sciences, and many analyses of conservation outcomes already demonstrate how some aspect of social context is a crucial influence on conservation outcomes. However, many conservationists still do not engage with the social science literature (Adams, 2007) and often projects do not reflect local needs and views, contributing to conservation failures (e.g. Klein et al., 2007). This study is therefore valuable for building on multiple disciplines to reiterate the need to attend to local social context if conservation interventions are to succeed.

Furthermore, this thesis is novel in demonstrating how different aspects of local social context are relevant to understanding conservation outcomes. In particular, it points out a role for multiple aspects of local context – including non-governmental institutions and cultural influences – that may not appear directly related to conservation (such as collectivism in Russia or the caste system in Nepal). This finding is valuable as it is often not stated and easily overlooked, since wider social and historical circumstances may be perceived to have little direct relevance to conservation. The outcomes of conservation projects are best understood in the light of local community structure, institutions in the broad sense and individual views, as well as their interactions.

The thesis uses an unusually diverse set of methods to probe and illustrate how local social context can be relevant to conservation project outcomes. Although a single study cannot comprehensively cover all aspects of local social context, the mix of qualitative and quantitative approaches generated a complementary mix of numeric and narrative data to describe and explain patterns. This use of mixed methods, drawing on insights and techniques from different disciplines, may be a useful model for future research into the social context of conservation. Probing social systems is always challenging, and researchers must be prepared to be creative in their research strategies.

7.1.2. Limitations

This thesis is broad in its scope, calls on several disciplines and employs diverse methods to collect and analyse data. Whilst this approach has strengths, there are also potential weaknesses. Firstly, making diverse concepts accessible sometimes requires eliding the complexity within topics, and a use of terminology different to that accepted within disciplines. In this work, a sociologist, psychologist and political scientist might each take a different approach to framing the issues discussed: attempting to write one work which combines their insights and is accessible to all risks creating a work which has parts unsatisfactory to all. Secondly, mixing methods risks loss of clarity and inappropriate treatment of data, since reliability and credibility are achieved quite differently for qualitative and quantitative work (Creswell, 2005). However, this study has taken care to describe the research approaches and presentation, and justifies the methodological basis in section 2.3.

The study of individual behaviours in Nepal (chapter 6) is based on behavioural intentions, not actual behaviours. As stated intentions can be a bad proxy for actual behaviours (Whittington, 1998) it would have been preferable to link views to actual behaviours. However this was not feasible in the absence of a new conservation intervention. Furthermore, many conservation-relevant behaviours are sensitive and difficult to track. As far as possible the stated behaviour was designed to reflect commitment to the plants' conservation, through careful design and testing of the hypothetical scenario. Every aspect of the scenario was extensively discussed with local people to ensure it was understood as intended, and the reasons for responses were fully explored during the pretesting phase.

Research into the case studies in this thesis (Kalmykia and Nepal) is based entirely within the social sciences. Both study sites are associated with pre-existing ecological research, which gives some indication of what local behaviours may be of conservation interest, but no further research into the ecological systems was carried out. This may be seen as a weakness of the study since linking social and biological research is widely recommended (Nicholson et al., 2009). However, as for any common pool resources, it would be very challenging for a single study to link individual behaviours with ecological changes. Whilst it is important that future research attempts to link social and biological systems, the approaches taken by individual studies must be sensibly tailored to particular research questions, informed by knowledge of particular systems.

7.2. Conservation implications and recommendations

Recognising the role played by local institutions, culture and views offers a way to improve conservation practice. The findings and limitations of this thesis also point to other useful topics of research and supporting policy.

7.2.1. Implications for conservation practice

Firstly, greater efforts must be made by conservationists to understand the views and culture of local people, rather than relying on simplified concepts of community (Brown, 2002). Focusing on governmental institutions is important since when these are ineffective, project outcomes are often inequitable and ineffective (e.g. Sommerville et al., In press). However, non-governmental institutions and culture also matter. For example, new recommendations for sustainable resource use can be reinforced by linking them to traditional management practices (Abbot et al., 2001). Using staff with knowledge of local culture makes it more likely that key aspects of local society will be reflected (e.g. Stearman, 2006). Secondly, this understanding of community must be allowed to influence practice, with planners and practitioners prepared to see that CBC projects may need to vary even over small areas and take many forms (Adams & Hulme, 2001). In the case of the Bolivian projects discussed by Stearman (2006), the successful project was centred around a settlement of only 500 people but still involved multiple strategies and activities to encourage sustainable use of forest products.

To some extent, the role of such influences is already recognised in some activities and conservation programmes which are attempting to better prioritise community understanding and engagement. Protected area managers are now incorporating consideration of the sacred values of some habitats (Verschuuren et al., 2007), and several programmes exist to promote engagement between religions and the environment (see for example, the work of the Mountain Institute; Bernbaum, 2006). However, it is important that this is not seen solely as an issue of religion (Tiedje, 2007). Reflecting on social heterogeneity in the site at Nepal best demonstrates the need not to simplify or focus on single issues. Interactions between preferences and practical needs within a community can result in a complex mixture of incentives and constraints relative to conservation. The prospect for reducing or changing resource use can be challenging – a recent study of diverse strategies driving illegal resource use in India paints a daunting prospect for prospective conservation there (Robbins et al., 2009) – but can certainly not be achieved by single strategies alone. Recognising the

multiple ways in which culture can affect conservation behaviours in a community offers the best chance for implementing successful conservation interventions. For example, in some cases using the arts has shown promise in engaging people with conservation (Jacobson, 2007).

It is impossible to be entirely prescriptive about how to go about incorporating and engaging with local culture. For example, the project in Kalmykia was influential because Buddhism was a key part of local people's identities and interests, so they were receptive to linked pro-ecological teaching. Conversely, in some cases it can be appropriate to recognise when links with traditions will not be positively interpreted. For example, it would not be helpful to use traditional terms if they have old-fashioned or 'backward' connotations (Boonzaier, 1996). However it is possible to specify that projects should always prioritise a comprehensive and reflexive analysis of social context in which they are to operate. Successful projects would not romanticise community and culture, and are open to the form community engagement takes (Peterson et al., 2009). This may involve anything from consulting with local spirit mediums prior at an early stage (The Bawa Village Community, 1997), to encouraging community pride and attachment to local species (Marcovaldi & dei Marcovaldi, 1999), or giving subsidies for social welfare and cultural preservation (Tai, 2007).

Practical needs, local views and institutional settings must be taken into account by conservation interventions (Acheson, 2006; Wells & McShane, 2004). Without understanding all of these aspects, outcomes will be constrained. In some cases, there may be constraints on behaviour that must be addressed by providing opportunities for change, perhaps through offering new livelihood activities in conjunction with other activities (e.g. Cullen et al., 2001). However, care must be taken that any such opportunities are designed and presented appropriately to avoid wasting resources and opportunities (Gubbi & MacMillan, 2008). The worst case scenario is not inefficiency but failure. A host of potential pitfalls – anything from donor-dependency to low experience and capacity for governance – can spell disaster for a project if they are not recognised and tackled (e.g. Hough, 1994). Indeed, a detailed understanding of local social context may sometimes suggest that in the short-term local communities can not effectively or equitably govern their natural resources (Barrett et al., 2001). Although taking into account culture and institutional settings whilst working with multiple interest groups is challenging, some success stories show it is possible. For example, in

western Tanzania, working with multiple stakeholders, enhancing capacity in conflict resolution, cementing rights of access and providing technical support were all relevant to achieving social and ecological goals (Hausser et al., 2008). Project planning must also be adaptive and flexible (Mendis-Millard & Reed, 2007). As such, the potential forms of CBC will be diverse.

The most important single priority to enable appropriate and successful CBC projects may be improving local participation in conservation (Wyckoff-Baird et al., 2001). Greater local participation has often been recommended as a way to improve the practice of CBC (e.g. Larson et al., 1998; Spiteri & Nepal, 2006) and it is notable that some of the most successful examples of CBC have been those with strong local control and involvement (e.g. The Bawa Village Community, 1997). Promoting participation is particularly important where conservationists are likely to have quite different cultural backgrounds to the communities involved (Blaikie, 1995). For example, out of a set of externally-driven projects for tiger conservation, successful projects were nearly always those that were collaborative, with high community visibility and support (Gratwicke et al., 2007). In these situations the tools and practices of development – such as use of PRA – may be of great assistance (Lynam et al., 2007). However, incorporation of social science and development perspectives must go beyond a toolkit approach, beyond seeing local people and their knowledge as a tool for providing knowledge to conservationists (Goldman, 2003). Conservationists must recognise their own views and assumptions (Matsuda, 1997), take care with the use of language and concepts (Mayhunga & Dressler, 2007), and internalise the principles of participation (Holland & Campbell, 2005).

There may be an eventual tension between the goal of conserving biodiversity and that of participation. Where local people have complete control over their local biodiversity, they may decide not to conserve it or to follow a management course contrary to the recommendations of Western science. Whether local participation and control will remain a priority in this scenario is not yet widely tested. In some respects this tension between imposing outside views and promoting local control is shared with the development sector (e.g. Chambers, 1997). Promoting community-based conservation can be seen as part of a drive for globalisation (Rodary, 2008) or furthering the neoliberal agenda (Igoe & Sullivan, 2008). As such, conservationists may need to follow the ethical and philosophical debates within this field, as much as borrowing its

principles and tools for promoting participation. However, for now at least it seems the best course of action is to engage and empower local people for conservation (Smith et al., 2009). Improved community participation will not be a cure-all that can always ensure conservation success (McShane & Wells, 2004). However, if local people are involved from an early stage in planning then it is more likely that subsequent project design and implementation will be able to engage with existing culture and institutions, and reflect local views.

7.2.2. Specific research recommendations

1. Checking and refining the key aspects of local social context

This study's conceptual framework (figure 2.2) may have some relevance to other research on CBC. Firstly, it may provide a useful guide to researching the various aspects of local social context that must be addressed by those seeking to understand CBC outcomes, and provide a visual tool linking different studies. There are examples where similar frameworks have been useful; for example, Gibson (2000) used an IAD approach to examine why some people use forestry resources sustainably, and others do not, in Bolivia, Ecuador, India, Nepal, and Uganda. Examples focused on non-forestry projects include work in the Caribbean (Renard, 1991) but it would be helpful to see IAD approaches applied to a broader range of CBC projects. Secondly, the model is deliberately simple so as to remain accessible, but its components conceal complexity that may be further explored. It may become relevant to insert aspects of this complexity that are considered crucial. An extensive literature exists to aid further enquiry into various aspects of such models (e.g. Fischer et al., 2007; Ostrom, 1999; Thomson & Schoonmaker Freudenberger, 1997).

2. Analysing progress in engagement with the local social context of conservation

In the last ten years it has become a well-established critique that conservation does not adequately engage with local social context, and tends to rely on simplified conceptions of community (Brown, 2002). Since this can detrimentally influence conservation outcomes, it is important to assess whether this continues to be the case. For example, is elite capture reported more or less often than in project reports from ten years ago? These investigations could also help make accessible and constructive recommendations about methods and working practices that may help conservationists to engage with local social context. Insights may come from comparisons of different approaches across sites, as well as tracking one project from inception over time.

3. Research on actual behaviours

When behaviours of interest to conservation are sensitive (i.e. illegal hunting or plant collection) it is notoriously difficult to collect information on them (Milner-Gulland & Rowcliffe, 2007). However, using proxies such as stated behaviours can be problematic (List & Gallet, 2001). Understanding the drivers of actual behaviour allows much greater confidence in the research findings and applications. Future research into individual views on conservation issues should be more closely linked with actual behaviours. This may be facilitated by working at sites where communities already understand and trust pre-existing research/project teams, and by adopting participatory methods. Triangulating insights from different methods – for example, complementing reported behaviour with law-enforcement records – may also be useful (Gavin et al., In press).

4. Connecting social science disciplines

Social science disciplines working on conservation issues need be prepared to engage with each other. Often there is considerable common ground waiting to be discovered; for example, when talking about the need to make an intervention appropriate to its social context, an anthropologist might talk of the need for “context fit” (Ensminger, 1997), a sociologist might talk of “embeddedness,” (Granovetter, 1985), and institutional economists would talk about the need for formal institutions to build on informal institutions (North, 1995). Rather than dogmatically insisting on defending single models or approaches to problems, as sometimes happens, probing and resolving differences may provide valuable insights relevant to real world practice.

Combining tools from different disciplines is challenging but can be rewarding: for example, in this study the Kalmykian case study offers complementary insights to the quantitative systematic review. And, although it is unreasonable to expect a single approach to be taken when designing and planning conservation interventions, pooling expertise from the social sciences could potentially offer a set of factors to consider and methods to use when attempting to understand and engage with communities.

5. Connecting social science insights with conservation

Principles and tools from the social sciences can help to understand of the social context of conservation, as well as facilitate work with communities. (e.g. Robinson, 2006). This thesis reiterates the many recommendations for the social sciences to be better

appreciated and incorporated into conservation (e.g. Mascia et al., 2003). Various social science fields from psychology (Vlek & Steg, 2007) to political ecology offer insights into human-environment relationship (Robbins, 2003). However, given the breadth of social science disciplines, it may be best first to focus on integrating lessons from development studies, which has already spent three decades trying understand how to work with local people (Campbell & Vainio-Mattila, 2003). Its tools are appropriate for developing country use, and designed to be used to encourage change under similar time and resource constraints (Hagmann et al., 2002). Improving connections with the social sciences should be a two-way process, and the social sciences may need to adapt their approaches to produce findings that are accessible to those working in conservation (Adams, 2007). A conceptual framework such as that used here may help, but attention should also be given to communication, to make accessible the wealth of relevant expertise.

6. Linking local social context to the broader picture

This thesis focused only on the community level, but no community exists in a vacuum, no matter how remote (Berkes, 2007). Many linked issues, including anything from civil unrest, national wealth, supportiveness of regional or national governments – can also influence conservation outcomes. Is reinforcing high-level institutional support and effectiveness more important than investing in engagement at the local-level? National governments, for example, seem influential, and can assist a project through supportive policies, (e.g. Watson et al., 2007), or negatively influence outcomes through ineffectual governance (e.g. Adams & Infield, 2003). Weakness in high-level institutions can also constrain the positive influences of some CBC projects (see for example the discussion of internationally funded ICDPs in Madagascar by Gezon, 1997) and corruption and poor governance are generally thought to have an adverse influence on conservation outcomes (Smith & Walpole, 2005). However, in some situations establishing strong local institutions and conservation support has allowed projects to weather even civil war (Robbins et al., 2001). Further research is required on this issue (Barrett et al., 2001). Whilst nuanced narrative approaches will be appropriate to untangling and explaining detailed patterns, more systematic approaches may also shed light on the relative importance of these factors in the existing evidence (as shown for warfare by Glew & Hudson, 2007). We cannot assume that either state or local institutions are best placed to manage and conserve natural resources (Robbins, 1998).

7. Linking thinking about social and ecological systems

The most appropriate strategy for implementing conservation may vary according to the biophysical properties of the natural systems to be conserved. However, research that is focused on the social system will not discover this. Conversely, ecological research alone will not reveal how local social context shapes the biological system. Although it may not always be appropriate for a single study to collect all types of data, many of the studies included in chapter 3 were overly biased to describe only one aspect of a situation (e.g. attitudes). Considering biological and social data together will generally allow greater insight into the relationship between different aspects of conservation outcomes (Nicholson et al., 2009). This is needed for a full understanding of existing projects, and to detect any general relationships between outcome-types.

8. Evaluating past conservation evidence

The need for more evidence is widely lamented in the conservation literature, including evidence relating to the social context in which conservation is practiced (Sutherland et al., 2005). However, chapter 3 demonstrates that systematic analysis of existing evidence can yield valuable insights into factors key to conservation outcomes. Better quality and quantity of evidence is always desirable but enough already exists for some useful analyses. It will be valuable to use these data to test other ideas about conservation project outcomes. For example, a systematic review focusing on the role of broader socio-political context would complement the review presented in this thesis.

7.2.3. Specific policy implications

Resources for conservation are scarce, so it is important that conservation policy allocates them wisely (James et al., 1999). Those controlling resources and policy have the potential to influence both conservation research and practice.

1. Promoting participatory practice

It is important that when funding conservation interventions or creating policy frameworks, community engagement is prioritised. For example, it can be made an explicit pre-condition of support. Participatory rhetoric already features heavily in policy and project documents, but this principle needs to be better expressed in every aspect of project commissioning and support, perhaps through detailing specific tools and processes that enable these issues to be taken seriously. For example, large funders and proponents of conservation should aim to work through small-scale agencies (e.g.

Stearman, 2006). The initial phase of any project could explicitly allocate time for building local rapport, before moving onto formally probe aspects of social context.

2. Supporting flexible practice

Whilst prioritising community engagement should be an immovable priority, funders should be prepared and indeed expect that interventions will need to vary in response to local conditions, and so should favour context-specific approaches rather than one-size-fits-all prescriptions (Carney, 1999).

3. Monitoring conservation outcomes

In order to better understand the key aspects of project and context which conservationists should attend to, monitoring and evaluation of projects must be improved (Nichols & Williams, 2006). Policy-makers and funding bodies have strong influence over the quality and quantity of monitoring in the projects they support. Without monitoring, important decisions about conservation must rely overly on interesting ideas and convincing rhetoric. Some recent proposals have been made for structuring the data collected from projects (e.g. Kapos et al., 2008) but an accepted format has not yet been agreed. Policy makers should urgently promote resolution of this issue. Until then, funders should specify a minimum level of monitoring and evaluation for all new projects, preferably capturing each aspect of the model (figure 2.2) as part of an evaluation of local social context, in addition to elements of the broader socio-political context, and the biophysical system.

4. Permitting failure

It is often suspected that failures are underreported in conservation (e.g. Redford & Taber, 2000). The agendas of funders and planning timetables may underlie this problem, by favouring project reports that emphasise quick delivery of unambiguous successes. The paucity of high quality reporting in the literature (see chapter 3) may be linked to both this problem, as well as the problem of how to define and evaluate outcomes. By reducing the perceived pressure to report successes, conservation funders and planners would actually improve the chances of genuine success in the long-term, through the possibility of improved understanding of existing practice.

5. Funding interdisciplinary research and training

The tendency of natural scientists to be uncomfortable with the social sciences has already been noted, but it is also true that social scientists can be uncomfortable and

uninformed about biophysical processes key to conservation outcomes (Adams, 2007). Important new insights about conservation come from research that spans ecological and social systems (Agrawal & Redford, 2006), but the training of conservation practitioners also merits attention (Noss, 1999). Support is needed to train a new generation of conservationists that have insights from a variety of perspectives and are comfortable working with specialists from several disciplines (Fisher et al., 2009); indeed, working with people to do conservation requires interpersonal skills as much as scientific expertise (Manolis et al., 2009).

7.3. Conclusions

This thesis demonstrates that the social context of conservation in developing countries should not be stereotyped or oversimplified. The use of mixed methods provides complementary information from several case studies, with evidence from quantitative systematic approaches balanced by more explorative qualitative approaches. Multiple aspects of local community – including aspects not immediately relevant to natural resource use or management, such as religion and other aspects of culture – can influence individual behaviour for conservation and the outcomes of CBC projects. Therefore, conservation interventions should prioritise understanding and engaging with local individuals within the context of local culture and institutions. This recommendation has been made before, but must be reiterated, since it is not clear that conservationists have fully taken this on board.

Future interventions should make greater efforts to understand and engage with local communities. A conceptual framework is proposed, drawing on institutional analysis models, which may act as a useful reminder of different aspects and levels of local social context that must be considered. However, it will be necessary for conservationists to better appreciate and accept detailed input from the social sciences and development sector, in order to unpack different parts of this model.

Those supporting conservation interventions must be willing to accept that different packages of interventions will be appropriate in different situations, but also multiple approaches may be necessary within one site, according to social heterogeneity within and between communities. We cannot expect a one-size-fits-all prescription for how to ‘do’ conservation. Although the existing body of conservation evidence could be improved, we know enough to start pushing for better engagement with local communities.

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APPENDIX A.

Case studies and source articles used in meta-analysis

The sources of the 68 projects used in the meta-analysis by Waylen et al. Level of measurement of project outcomes shown (implied (poor), qualitative or quantitative) together with the success of the outcome (fail, mixed (limited success), or success). NA=not measured. Symbols for project outcome types: A=attitudinal, B=behavioural, El=ecological, En=Economic.

Citation of source article (and secondary article, if any)	Project Name & Country	Project outcomes		
Abbot, J. I. O., Thomas, D. H. L., Gardner, A. A., Neba, S. E. and Khen, M. W. (2001). Understanding the links between conservation and development in the Bamenda highlands, Cameroon, <i>World Development</i> , 29 (7): 1115-1136.	Kilum-Ijim Forest Project, Cameroon	A:	Quantitative	Mixed
		B:	Quantitative	Mixed
		El:	Qualitative	Success
		En:	Implied	Success
Thomas, D. H. L., Anders, S. and Penn, N. J. (2000). Conservation in the community: the Kilum-Ijim Forest Project, Cameroon, <i>Ostrich</i> , 71 (1-2): 157-161.				
Abbott, A. (2001). Evaluation of an Integrated Conservation and Development Program in Vilcabamba, Ecuador. In <i>XXIII International Congress of the Latin American Studies Association</i> , Washington, D.C., USA.	Asociacion De Productores Autonomos De Frejol Para Semilla (APAFS), Ecuador	A:	NA	NA
		B:	Implied	Mixed
		El:	Quantitative	Fail
		En:	Quantitative	Success
Alcorn, J. B., Kajuni, A. and Winterbottom, B. (2002). <i>Assessment of CBNRM Best Practices in Tanzania</i> , USAID/Tanzania, Tanzania.	Cullman-Hart Project, Tanzania	A:	NA	NA
		B:	Poor	Success
		El:	NA	NA
		En:	Qualitative	Success
Alcorn, J. B., Kajuni, A. and Winterbottom, B. (2002). <i>Assessment of CBNRM Best Practices in Tanzania</i> , USAID/Tanzania, Tanzania.	Ngarambe Natural Resource Management, Tanzania	A:	Implied	Success
		B:	Qualitative	Success
		El:	Implied	Success
		En:	Qualitative	Success

Citation of source article (and secondary article, if any)	Project Name & Country	Project outcomes		
Alcorn, J. B., Kajuni, A. and Winterbottom, B. (2002). <i>Assessment of CBNRM Best Practices in Tanzania</i> , USAID/Tanzania, Tanzania.	Robanda Community Private Tour Operator Partnership, Tanzania	A:	Implied	Success
		B:	Implied	Success
		El:	NA	NA
		En:	Qualitative	Success
Alcorn, J. B., Kajuni, A. and Winterbottom, B. (2002). <i>Assessment of CBNRM Best Practices in Tanzania</i> , USAID/Tanzania, Tanzania.	Selous Conservation Programme (JUKUMU), Tanzania	A:	NA	NA
		B:	Qualitative	Mixed
		El:	Qualitative	Success
		En:	Qualitative	Mixed
Alcorn, J. B., Kajuni, A. and Winterbottom, B. (2002). <i>Assessment of CBNRM Best Practices in Tanzania</i> , USAID/Tanzania, Tanzania.	SIDA Lamp Community Based Forest Management Activity, Tanzania	A:	NA	NA
		B:	Qualitative	Mixed
		El:	Implied	Success
		En:	Qualitative	Mixed
Alcorn, J. B., Kajuni, A. and Winterbottom, B. (2002). <i>Assessment of CBNRM Best Practices in Tanzania</i> , USAID/Tanzania, Tanzania.	Tanga Coastal Zone CDP(TCZCDP), Tanzania	A:	Implied	Success
		B:	Qualitative	Success
		El:	Quantitative	Success
		En:	Qualitative	Mixed
Alcorn, J. B., Kajuni, A. and Winterbottom, B. (2002). <i>Assessment of CBNRM Best Practices in Tanzania</i> , USAID/Tanzania, Tanzania.	Tungamalenga Village Community Based Wildlife Management Area, Tanzania	A:	NA	NA
		B:	Implied	Mixed
		El:	Qualitative	Success
		En:	Qualitative	Success

Citation of source article (and secondary article, if any)	Project Name & Country	Project outcomes		
Bajracharya, S. B., Furley, P. A. and Newton, A. C. (2005). Effectiveness of community involvement in delivering conservation benefits to the Annapurna Conservation Area, Nepal, <i>Environmental Conservation</i> , 32 (3): 239-247.	Annapurna Conservation Area (ACAP), Nepal	A:	Qualitative	Mixed
		B:	Implied	Mixed
		El:	NA	NA
		En:	Qualitative	Mixed
(Mehta, J. N. and Heinen, J. T. (2001). Does community-based conservation shape favorable attitudes among locals? An empirical study from Nepal, <i>Environmental Management</i> , 28 (2): 165-177.)				
Balint, P. J. (2006). Improving community-based conservation near protected areas: The importance of development variables, <i>Environmental Management</i> , 38 (1): 137-148.	El Impossible National Park Projects, El Salvador	A:	Quantitative	Mixed
		B:	NA	NA
		El:	NA	NA
		En:	Qualitative	Mixed
Baral, N. and Heinen, J. T. (2007). Resources use, conservation attitudes, management intervention and park-people relations in the Western Terai landscape of Nepal, <i>Environmental Conservation</i> , 34 : 64-72.	Bardia National Park Buffer Zone, Nepal	A:	Qualitative	Success
		B:	NA	NA
		El:	Implied	Success
		En:	Qualitative	Mixed
Becker, C. D., Agreda, A., Astudillo, E., Costantino, M. and Torres, P. (2005). Community-based monitoring of fog capture and biodiversity at Loma Alta, Ecuador enhance social capital and institutional cooperation, <i>Biodiversity and Conservation</i> , 14 (11): 2695-2707.	Community Based Monitoring Of Fog Capture, Ecuador	A:	Qualitative	Success
		B:	Qualitative	Success
		El:	Implied	Success
		En:	Qualitative	Success
Becker, C. D. (2003). Grassroots to grassroots: Why forest preservation was rapid at Loma Alta, Ecuador, <i>World Development</i> , 31 (1): 163-176.				
Blomley, T. (2000). <i>Woodlots, Woodfuel and Wildlife: Lessons from Queen Elizabeth National Park, Uganda</i> , Gatekeeper Series, IIED, London, UK.	Queen Elizabeth National Park Woodlot Project, Uganda	A:	Implied	Mixed
		B:	Qualitative	Fail
		El:	Implied	Fail
		En:	Qualitative	Fail

Citation of source article (and secondary article, if any)	Project Name & Country	Project outcomes		
Boonzaier, E. (1996). Local responses to conservation in the Richtersveld National Park, South Africa, <i>Biodiversity and Conservation</i> , 5 (3): 307-314.	Richtersveld Contract, South Africa	A:	Qualitative	Fail
		B:	NA	NA
		El:	NA	NA
		En:	Qualitative	Mixed
Browder, J. O. (2002). Conservation and development projects in the Brazilian Amazon: Lessons from the community initiative program in Rondonia, <i>Environmental Management</i> , 29 (6): 750-762.	Rondonia Community Initiative Project, Brazil	A:	NA	NA
		B:	Qualitative	Mixed
		El:	Quantitative	Mixed
		En:	Qualitative	Mixed
Campbell, L. M., Haalboom, B. J. and Trow, J. (2007). Sustainability of community-based conservation: sea turtle egg harvesting in Ostional (Costa Rica) ten years later, <i>Environmental Conservation</i> , 34 (2): 122-131.	Ostional Wildlife Refuge, Costa Rica	A:	Quantitative	Success
		B:	Quantitative	Success
		El:	Implied	Success
Campbell, L. M. (1998). Use them or lose them? Conservation and the consumptive use of marine turtle eggs at Ostional, Costa Rica, <i>Environmental Conservation</i> , 25 (4): 305-319.		En:	Quantitative	Success
Caputo, F. P., Canestrelli, D. and Boitani, L. (2005). Conserving the terecay (<i>Podocnemis unifilis</i> , Testudines : Pelomedusidae) through a community-based sustainable harvest of its eggs, <i>Biological Conservation</i> , 126 (1): 84-92.	Terecay Community Management Programme, Ecuador	A:	NA	NA
		B:	Quantitative	Success
		El:	Quantitative	Success
		En:	Qualitative	Success
Chhetri, P., Mugisha, A. and White, S. (2003). Community resource use in Kibale and Mt Elgon National Parks, Uganda, <i>Parks</i> , 13 (1): 28-49.	Kibale National Park Community Resource Management, Uganda	A:	Qualitative	Success
		B:	Implied	Success
		El:	NA	NA
		En:	Qualitative	Mixed

Citation of source article (and secondary article, if any)	Project Name & Country	Project outcomes		
Daniels, R. and Bassett, T. J. (2002). The spaces of conservation and development around Lake Nakuru National Park, Kenya, <i>Professional Geographer</i> , 54 (4): 481-490.	Lake Nakuru Conservation And Development Project (LNCDP), Kenya	A:	NA	NA
		B:	Qualitative	Fail
		El:	Quantitative	Fail
		En:	NA	NA
Dressler, W. H., Kull, C. A. and Meredith, T. C. (2006). The politics of decentralizing national parks management in the Philippines, <i>Political Geography</i> , 25 (7): 789-816.	Puerto Princesa Park Decentralisation, Philippines	A:	Implied	Fail
		B:	NA	NA
		El:	Qualitative	Fail
		En:	Qualitative	Fail
Durbin, J. C. and Ratrimoarisana, S. N. (1996). Can tourism make a major contribution to the conservation of protected areas in Madagascar?, <i>Biodiversity and Conservation</i> , 5 (3): 345-353.	Amber Mountain, Madagascar	A:	Implied	Mixed
		B:	NA	NA
		El:	NA	NA
		En:	Quantitative	Mixed
Durbin, J. C. and Ratrimoarisana, S. N. (1996). Can tourism make a major contribution to the conservation of protected areas in Madagascar?, <i>Biodiversity and Conservation</i> , 5 (3): 345-353.	Isalo National Park, Madagascar	A:	Implied	Mixed
		B:	NA	NA
		El:	NA	NA
		En:	Quantitative	Mixed
Elliot, J. (2001). <i>Wildlife and Poverty Study, Phase I</i> , Livestock and wildlife advisory group (LWAG), DFID, London, UK.	Kuene Community Based Natural Resource Management, Namibia	A:	Qualitative	Success
		B:	NA	NA
		El:	Qualitative	Success
		En:	Quantitative	Success

Citation of source article (and secondary article, if any)	Project Name & Country	Project outcomes		
Fernandes, D. (2006). "More eyes watching..." Community-based management of the Arapaima (<i>Arapaima gigas</i>) in Central Guyana. In <i>Eleventh biennial conference of the International Association for the Study of Common Property (IASCP)</i> , Iwokrama International Centre for Rainforest Conservation and Development, The Center for Agrarian Studies (Pusat Kajian Agraria) of Bogor Agricultural University (Institut Pertanian Bogor), pp. 18.	Arapaima Management Project, Guyana	A:	Qualitative	Success
		B:	Qualitative	Success
		El:	Quantitative	Success
		En:	Qualitative	Fail
Fernandes, D. and NRDDDB (2004). <i>Lessons from the Equator Initiative: Community-based Arapaima conservation in the North Rupununi, Guyana</i> , Centre for Community-Based Resource Management, Winnipeg, MB, Canada.				
Fernandes, D. and TIDE (2005). <i>Lessons from the Equator Initiative: Community-based Management of the Port Honduras Marine Reserve, Belize</i> , Centre for Community-Based Resource Management, Winnipeg, MB, Canada.	Port Honduras Marine Reserve, Belize	A:	Qualitative	Mixed
		B:	Qualitative	Mixed
		El:	Qualitative	Mixed
		En:	Qualitative	Mixed
Maheia, W. (2003). Learning by doing in Port Honduras Marine Reserve, Southern Belize, <i>Policy Matters</i> , 12 : 246-253.				
Gibson, C. C. and Marks, S. A. (1995). Transforming rural hunters into conservationists - an assessment of community-based wildlife management programs in Africa, <i>World Development</i> , 23 (6): 941-957.	Luangwa valley, ADMARE, Zambia	A:	Implied	Fail
		B:	Quantitative	Fail
		El:	NA	NA
		En:	Quantitative	Mixed
Gould, K., Howard, A. F. and Rodriguez, G. (1998). Sustainable production of non-timber forest products: Natural dye extraction from El Cruce Dos Aguadas, Peten, Guatemala, <i>Forest Ecology and Management</i> , 111 (1): 69-82.	Maya Biosphere Reserve Gatherings Project, Guatemala	A:	Implied	Mixed
		B:	Qualitative	Fail
		El:	Quantitative	Fail
		En:	Qualitative	Mixed

Citation of source article (and secondary article, if any)	Project Name & Country	Project outcomes		
Haenn, N. (2000). <i>"Biodiversity is Diversity in Use": Community-Based Conservation in the Calakmul Biosphere Reserve</i> , America Verde Working Papers, The Nature Conservancy, Arlington, USA.	Calakmul Community-based conservation, Mexico	A:	Qualitative	Fail
		B:	Implied	Fail
		El:	NA	NA
Haenn, N. (1999). The power of environmental knowledge: Ethnoecology and environmental conflicts in Mexican conservation, <i>Human Ecology</i> , 27 (3): 477-491.		En:	Quantitative	Mixed
Hartup, B. K. (1994). Community conservation in Belize - demography, resource use, and attitudes of participating landowners, <i>Biological Conservation</i> , 69 (3): 235-241.	Community Baboon Sanctuary, Belize	A:	Quantitative	Success
		B:	Quantitative	Mixed
		El:	Implied	Mixed
		En:	NA	NA
Herrold-Menzies, M. (2006). Integrating Conservation and Development. What we can learn from Caohai, China, <i>The Journal of Environment and Development</i> , 15 (4): 382-406.	Caohai Conservation And Development Programmes, China	A:	Qualitative	Mixed
		B:	Qualitative	Mixed
		El:	Implied	Fail
		En:	Qualitative	Success
Holmern, T., Roskaft, E., Mbaruka, J., Mkama, S. Y. and Muya, J. (2002). Uneconomical game cropping in a community-based conservation project outside the Serengeti National Park, Tanzania, <i>Oryx</i> , 36 (4): 364-372.	Serengeti Regional Conservation Project (SRCP), Tanzania	A:	NA	NA
		B:	Qualitative	Fail
		El:	NA	NA
		En:	Quantitative	Fail
Horowitz, L. S. (1998). Integrating indigenous resource management with wildlife conservation: A case study of Batang Ai National Park, Sarawak, Malaysia, <i>Human Ecology</i> , 26 (3): 371-403.	ICDP At Batang Ai National Park, Malaysia	A:	Qualitative	Success
		B:	Qualitative	Success
		El:	NA	NA
		En:	Qualitative	Mixed

Citation of source article (and secondary article, if any)	Project Name & Country	Project outcomes		
Ite, U. E. (1996). Community perceptions of the Cross River National Park, Nigeria, <i>Environmental Conservation</i> , 23 (4): 351-357.	Cross River National Park, Nigeria	A:	Quantitative	Fail
		B:	NA	NA
		El:	NA	NA
		En:	Quantitative	Fail
King, B. H. (2007). Conservation and community in the new South Africa: A case study of the Mahushe Shongwe Game Reserve, <i>Geoforum</i> , 38 : 207-219.	Mahusha Shongwe Game Reserve At Mzinte, South Africa	A:	Quantitative	Mixed
		B:	Qualitative	Fail
		El:	NA	NA
		En:	Qualitative	Mixed
Kingston, D. G. I., Abdel-Kader, M., Zhou, B. N., Yang, S. W., Berger, J. M., van der Werff, H., Miller, J. S., Evans, R., Mittermeier, R., Famolare, L., Guerin-McManus, M., Malone, S., Nelson, R., Moniz, E., Wisse, J. H., Vyas, D. M., Wright, J. J. K. and Aboikonie, S. (1999). The Suriname International Cooperative Biodiversity Group program: Lessons from the first five years, <i>Pharmaceutical Biology</i> , 37 : 22-34.	Suriname International Cooperative Biodiversity Group (ICBG), Suriname	A:	NA	NA
		B:	NA	NA
		El:	Qualitative	Success
		En:	Qualitative	Success
Klein, J., Reau, B., Kalland, I. and Edwards, M. (2007). Conservation, development, and a heterogeneous community: The case of Ambohitantely Special Reserve, Madagascar, <i>Society & Natural Resources</i> , 20 (5): 451-467.	Ambohitantely Special Reserve, Madagascar	A:	Implied	Fail
		B:	Qualitative	Fail
		El:	NA	NA
		En:	Qualitative	Fail
Klooster, D. (1999). Community-based forestry in Mexico: Can it reverse processes of degradation?, <i>Land Degradation & Development</i> , 10 (4): 365-381.	San Martin Ocotlan Community Forestry, Mexico	A:	Qualitative	Mixed
		B:	Qualitative	Fail
		El:	Implied	Fail
		En:	Qualitative	Mixed

Citation of source article (and secondary article, if any)	Project Name & Country	Project outcomes		
Langholz, J., Lassoie, J. and Schelhas, J. (2000). Incentives for biological conservation: Costa Rica's Private Wildlife Refuge Program, <i>Conservation Biology</i> , 14 (6): 1735-1743.	Private Wildlife Refuge Programme, Costa Rica	A:	Qualitative	Mixed
		B:	Implied	Success
		El:	Implied	Success
		En:	Implied	Mixed
Lehmkuhl, J. F., Upreti, R. K. and Sharma, U. R. (1988). National parks and local development - grasses and people in Royal Chitwan National Park, Nepal, <i>Environmental Conservation</i> , 15 (2): 143-148.	Royal Chitwan National Park, Nepal	A:	Quantitative	Mixed
		B:	Qualitative	Mixed
		El:	NA	NA
		En:	Quantitative	Mixed
Malleson, R. (2002). Changing perspectives on forests, people and 'development': Reflections on the case of the Korup Forest, <i>Ids Bulletin-Institute of Development Studies</i> , 33 (1): 94-101.	Korup Project, Cameroon	A:	Implied	Fail
		B:	Qualitative	Fail
		El:	NA	NA
		En:	Qualitative	Fail
Manuel-Navarrete, D., Slocombe, S. and Mitchell, B. (2006). Science for place-based socioecological management: lessons from the Maya forest (Chiapas and Petén), <i>Ecology and Society</i> , 11 (1): 8 [online] URL: http://www.ecologyandsociety.org/vol11/iss1/art8/ .	Sustainable Resource Management For Income Generation Of The Maya Biosphere Reserve, Guatemala	A:	Implied	Mixed
		B:	Qualitative	Success
		El:	Implied	Mixed
		En:	Qualitative	Success
Marcovaldi, M. A. and dei Marcovaldi, G. G. (1999). Marine turtles of Brazil: the history and structure of Projeto TAMAR-IBAMA, <i>Biological Conservation</i> , 91 (1): 35-41.	Projecto TAMAR-IBAMA, National Marine Turtle Conservation Programme, Brazil.	A:	Implied	Success
		B:	Qualitative	Success
		El:	Qualitative	Success
		En:	Quantitative	Success

Citation of source article (and secondary article, if any)	Project Name & Country	Project outcomes		
Marcus, R. R. (2001). Seeing the forest for the trees: Integrated conservation and development projects and local perceptions of conservation in Madagascar, <i>Human Ecology</i> , 29 (4): 381-397.	Ranomafana Nark Park Project, Madagascar	A:	Quantitative	Mixed
		B:	Qualitative	Fail
		El:	NA	NA
		En:	NA	NA
Peters, J. (1998). Transforming the integrated conservation and development project (ICDP) approach: Observations from the Ranomafana National Park Project, Madagascar, <i>Journal of Agricultural & Environmental Ethics</i> , 11 (1): 17-47.				
Matzke, G. E. and Nabane, N. (1996). Outcomes of a community controlled wildlife utilization program in a Zambezi Valley community, <i>Human Ecology</i> , 24 (1): 65-85.	Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) at Masoka, Zimbabwe	A:	Qualitative	Success
		B:	Qualitative	Success
		El:	NA	NA
		En:	Quantitative	Success
Medeiros, D. (2004). <i>Lessons from the Equator Initiative: Cananéia Oyster Producers' Cooperative, Brazil</i> , Center for Community-Based Resource Management, Natural Resources Institute, University of Manitoba, Winnipeg, MB, Canada.	Cananeia Oyster Producers Cooperative, Brazil	A:	NA	NA
		B:	Qualitative	Mixed
		El:	Implied	Success
		En:	Quantitative	Mixed
Mehta, J. N. and Kellert, S. R. (1998). Local attitudes toward community-based conservation policy and programmes in Nepal: a case study in the Makalu-Barun Conservation Area, <i>Environmental Conservation</i> , 25 (4): 320-333.	Makalu Baran National Park, Nepal	A:	Quantitative	Mixed
		B:	Implied	Fail
		El:	NA	NA
		En:	Quantitative	Fail
Myers, G. A. (2002). Local communities and the new environmental planning: a case study from Zanzibar, <i>Area</i> , 34 (2): 149-159.	Jozani-Chwaka Bay Conservation Area (JCBCA), Tanzania	A:	Quantitative	Fail
		B:	Qualitative	Fail
		El:	NA	NA
		En:	NA	NA

Citation of source article (and secondary article, if any)	Project Name & Country	Project outcomes		
Nielsen, E. A. (2001). <i>Community-Based Ecotourism Development and Management in the Rio Platano Man and the Biosphere Reserve, Honduras</i> , International Conservation Program, The Nature Conservancy, Arlington, VA, USA.	Las Marias Ecotourism Project, Honduras	A:	Qualitative	Success
		B:	Qualitative	Mixed
		El:	NA	NA
		En:	Quantitative	Success
Ramangason, G. S. (1993). The Mananara-Nord Biosphere Reserve, <i>Nature & Resources</i> , 29 (1-4): 17-23.	Mananara-Nord Biosphere, Madagascar	A:	Implied	Fail
		B:	NA	NA
		El:	Qualitative	Mixed
		En:	Quantitative	Success
Ross, S. and Wall, G. (1999). Evaluating ecotourism: The case of North Sulawesi, Indonesia, <i>Tourism Management</i> , 20 (6): 673-682.	Bunaken National Park, Indonesia	A:	Implied	Fail
		B:	Implied	Mixed
		El:	Qualitative	Fail
		En:	Qualitative	Mixed
Ross, S. and Wall, G. (1999). Evaluating ecotourism: The case of North Sulawesi, Indonesia, <i>Tourism Management</i> , 20 (6): 673-682.	Tangkoko Duasudara Nature Reserve, Indonesia	A:	Qualitative	Fail
		B:	Implied	Fail
		El:	NA	NA
		En:	Qualitative	Fail
Ruiz-Pérez, M., Almeida, M., Dewi, S., Lozano Costa, E. M., Ciavatta Pantoja, M., Puntodewo, A., de Arruda Postigo, A. and Goulart de Andrade, A. (2005). Conservation and Development in Amazonian Extractive Reserves: The Case of Alto Juruá, <i>Ambio</i> , 34 (3): 218–223.	Alto Juruá Extractive Reserve, Brazil	A:	Implied	Success
		B:	Qualitative	Mixed
		El:	Quantitative	Mixed
		En:	Qualitative	Success
Schafer, J. and Bell, R. (2002). The state and community-based natural resource management: the case of the Moribane Forest Reserve, Mozambique, <i>Journal of Southern African Studies</i> , 28 (2): 401-420.	Moribane Forest Reserve, Mozambique	A:	Implied	Fail
		B:	Qualitative	Fail
		El:	NA	NA
		En:	Poor	Fail

Citation of source article (and secondary article, if any)	Project Name & Country	Project outcomes		
Schwartzman, S. and Zimmerman, B. (2005). Conservation Alliances with Indigenous Peoples of the Amazon, <i>Conservation Biology</i> , 19 (3): 721-727.	Xingu Lands Indigenous Association (Atix), Brazil	A:	Implied	Success
		B:	Qualitative	Mixed
		El:	Qualitative	Mixed
		En:	Qualitative	Success
Senyk, J. P. J. (2006). <i>Concurrent Conservation and Development: Lessons Learned from a Community-Based Case in Thailand</i> , Thesis submitted for the degree of Master of Natural Resources Management, Natural Resources Institute, University of Manitoba, Winnipeg, MB, Canada.	Pred Nai Community Forestry Group, Thailand	A:	Implied	Success
		B:	Qualitative	Success
		El:	Implied	Success
		En:	Qualitative	Success
Shukla, S. (2004). <i>Lessons from the Equator Initiative: Rural Commune's Medicinal Plant Conservation Centre, Pune, India</i> , Center for Community-Based Resource Management, Natural Resources Institute, University of Manitoba, Winnipeg, MB, Canada.	Rural Communes Medicinal Plant Conservation Center, India	A:	NA	NA
		B:	NA	NA
		El:	Qualitative	Success
		En:	Qualitative	Success
Stem, C. J., Lassoie, J. P., Lee, D. R., Deshler, D. D. and Schelhas, J. W. (2003). Community participation in ecotourism benefits: The link to conservation practices and perspectives, <i>Society & Natural Resources</i> , 16 (5): 387-413.	Corcovado Piedrasbalances National Park, Costa Rica	A:	Quantitative	Mixed
		B:	Quantitative	Success
		El:	Quantitative	Success
		En:	Implied	Mixed
Stocking, M. and Perkin, S. (1992). Conservation-with-Development - an application of the concept in the Usambara Mountains, Tanzania, <i>Transactions of the Institute of British Geographers</i> , 17 (3): 337-349.	The East Usambaras Agricultural Development And Environmental Conservation Project, Tanzania	A:	Implied	Success
		B:	Qualitative	Fail
		El:	Qualitative	Mixed
		En:	Qualitative	Mixed
Tai, H. S. (2007). Development through conservation: An institutional analysis of indigenous community-based conservation in Taiwan, <i>World Development</i> , 35 (7): 1186-1203.	Li-Chia conservation project, Taiwan	A:	NA	NA
		B:	Qualitative	Success
		El:	Qualitative	Success
		En:	Qualitative	Mixed

Citation of source article (and secondary article, if any)	Project Name & Country	Project outcomes		
Tai, H. S. (2007). Development through conservation: An institutional analysis of indigenous community-based conservation in Taiwan, <i>World Development</i> , 35 (7): 1186-1203.	Shan-Mei Common-Pool-Resource Initiative, Taiwan	A:	NA	NA
		B:	Qualitative	Success
		El:	Qualitative	Success
		En:	Qualitative	Success
The Bawa Village Community (1997). Mozambique's Tchuma Tchato initiative of resource management on the Zambezi: A community perspective, <i>Society & Natural Resources</i> , 10 (4): 409-413.	Tchuma Tchato, Zimbabwe	A:	Implied	Mixed
		B:	Qualitative	Success
		El:	Qualitative	Success
		En:	Qualitative	Mixed
Tobey, J. and Torell, E. (2006). Coastal poverty and MPA management in mainland Tanzania and Zanzibar, <i>Ocean & Coastal Management</i> , 49 (11): 834-854.	Mafia Island Marine Protected Area, Tanzania	A:	Implied	Mixed
		B:	Qualitative	Mixed
		El:	Qualitative	Success
		En:	Qualitative	Mixed
Topp-Jørgensen, E., Poulsen, M. K., Lund, J. F. and Massao, J. F. (2005). Community-based Monitoring of Natural Resource Use and Forest Quality in Montane Forests and Miombo Woodlands of Tanzania, <i>Biodiversity and conservation</i> , 14 (11): 2653-2677.	Mema Iringa District Participatory Forest Management, Tanzania	A:	NA	NA
		B:	Quantitative	Mixed
		El:	Qualitative	Success
		En:	Quantitative	Mixed
Wagner, J. (2007). Conservation as Development in Papua New Guinea: The View from Blue Mountain, <i>Human Organization</i> , 66 (1): 28-37.	Kamiali ICDP, Papua New Guinea	A:	Implied	Fail
		B:	NA	NA
		El:	NA	NA
		En:	Qualitative	Mixed
Wainwright, C. and Wehrmeyer, W. (1998). Success in integrating conservation and development? A study from Zambia, <i>World Development</i> , 26 (6): 933-944.	Luanga Integrated Resource Development Project, Zambia	A:	Implied	Mixed
		B:	Implied	Mixed
		El:	NA	NA
		En:	Qualitative	Fail

Citation of source article (and secondary article, if any)	Project Name & Country	Project outcomes		
Zhang, L. and Wang, N. (2003). An initial study on habitat conservation of Asian elephant (<i>Elephas maximus</i>), with a focus on human elephant conflict in Simao, China, <i>Biological Conservation</i> , 112 (3): 453-459.	Living With The Elephant ICDP, China	A:	Qualitative	Success
		B:	Qualitative	Success
		El:	NA	NA
		En:	Qualitative	Success
Zimmerman, B., Peres, C. A., Malcolm, J. R. and Turner, T. (2001). Conservation and development alliances with the Kayapo of south-eastern Amazonia, a tropical forest indigenous people, <i>Environmental Conservation</i> , 28 (1): 10-22.	Pinkaiti Research Station, Brazil	A:	NA	NA
		B:	Qualitative	Mixed
		El:	Quantitative	Success
		En:	Qualitative	Success

APPENDIX B.

General topic list for interviews conducted in Kalmykia (Chapter 4).

Objective: to identify influences of environmental teachings linked to Buddhism, on attitudes and behaviours relevant to conservation and environmental behaviour. Some topics shown could be listed under alternative sub-headings. The topic list was used to inform the structure of interviews. It was updated during the progress of the research, to reflect established and emergent themes. For example, the importance of collectivist influences on behaviour was not initially reflected in the topic list and only truly reflected in the final coding hierarchy, after analysis in Nvivo.

- **Buddhism in Kalmykia**

- How it is locally understood and practiced
 - Who is Buddhist in communities – who says they are, who has altar in their home, who follows Buddhist practices
 - What does it mean to be Buddhist, practices and beliefs are there, effects on general attitudes and behaviour
 - Associations with any animals (e.g. saiga)
 - Any role in community, within community groups
- Perceptions of links to pro-environmental behaviour
 - Relationship of humans to the environment
 - Relationship of humans and wild animals
 - Particularly relevant Buddhist concepts - karma

- **Kalmyk society and change**

- Traditions remembered and practiced
 - Are traditions still known and followed? e.g. is traditional epic Jangar still popular and known, do marriages follow 11-generation , exogamy rule
 - Special stories, associations or feelings about saiga
 - Differences between nationalities
- Effects and changes since perestroika
 - Economic changes, ease of finding job, practicing farming etc
 - Other changes i.e. freedom of expression, politics, religion, migration
 - Demographic trends in those more/less likely to practice/observe traditions and Buddhism

- **Activities of Dharma Centre**

- Dharma Centre activities
 - When and where dharma centre has worked
 - Extent, methods, content of its teachings
 - Attendees of Dharma Centre teaching
 - Effect of Darwin project funding
 - Detail of pro-ecological/pro-environmental messages
 - Buddhist concepts / principles invoked.

- Changes as a result of teaching
 - Expectations and explanations of effects on values, attitudes and behaviour
 - Observations, reasons for change if not yet observed
 - Suggested differences in effects to other interventions
- **Environmental problems and solutions in Kalmykia**
 - Problems known to rural people, and seriousness
 - With saiga, and with other wild animals
 - With plants and habitats
 - With other aspects of environment (e.g. soil, water, temperature)
 - How are problems known
 - Inferred, discussed observed, media, special programmes etc
 - Causes of problems
 - Changes in drivers over time, particularly economic need
 - Past failings responsible for current problems
 - Solutions to problems
 - Known /observed to occur by local people
 - New solutions suggested by rural people
 - Personal involvement in caring for environment
 - Constraints on action
 - Effect of religious teachings if threats are driven by livelihood activities
 - Responsibility
 - Who cares for the environment, who does not
 - Who should take care of the environment
 - Feelings about environment and connection with humans
 - Effect of environmental problems on humans – emotional and/or physical
 - Rationale for connections

APPENDIX C.

A list of all 42 respondents interviewed in Kalmykia (Chapter 4). All names have been changed for anonymity. Each assigned name is unique to each respondent, so allow identification of quotations presented in the results section of Chapter 4. In addition to showing their gender, age and location, the source field identifies if the interview information is sourced from a transcript or the text noted at the time of the interview.

Name	Gender	Age	Location	Source
Irina	Female	28	Elista	Text
Katya	Female	48	Elista	Text
Larissa	Female	53	Elista	Transcript
Liza	Female	30	Elista	Text
Olya	Female	22	Elista	Text
Vera	Female	69	Elista	Text
Alisa	Female	50	Khulkutta	Transcript
Anya	Female	49	Khulkutta	Text
Dasha	Female	57	Khulkutta	Text
Ekaterina	Female	41	Khulkutta	Text
Ilya	Male	82	Khulkutta	Text
Julia	Female	70	Khulkutta	Text
Lara	Female	52	Khulkutta	Transcript
Lena	Female	55	Khulkutta	Text
Marina	Female	53	Khulkutta	Text
Vika	Female	58	Khulkutta	Transcript
Yevgeni	Male	56	Khulkutta	Text
Andrei	Male	83	Malie Derbetie	Text
Igor	Male	28	Malie Derbetie	Text
Klara	Female	70	Malie Derbetie	Text
Lenina	Female	87	Malie Derbetie	Text
Misha	Male	20	Malie Derbetie	Text
Nadia	Female	46	Malie Derbetie	Text
Nikita	Male	40	Malie Derbetie	Text
Rosa	Female	52	Malie Derbetie	Text
Ruslan	Male	39	Malie Derbetie	Transcript
Sergei	Male	45	Malie Derbetie	Text
Tanya	Female	72	Malie Derbetie	Text
Valya	Female	28	Malie Derbetie	Text
Anton	Male	20	Orgakin	Text
Borya	Male	46	Orgakin	Text
Ivan	Male	45	Orgakin	Text
Kema	Female	57	Orgakin	Text
Lyuda	Female	20	Orgakin	Text
Masha	Female	74	Orgakin	Text
Maya	Female	35	Orgakin	Text
Natasha	Female	62	Orgakin	Text
Nelya	Female	45	Orgakin	Text
Raya	Female	80	Orgakin	Transcript
Rita	Female	39	Orgakin	Text
Sveta	Female	48	Orgakin	Text
Volodya	Male	41	Orgakin	Text

APPENDIX D.

English translation of questionnaire used in Nepal (Chapters 5 & 6).

Caste _____	Date _____	Start time _____	End time _____
Gender _____	Village/location _____	Interviewer _____	

My name is X, what is yours? _____

1. First of all we'd like to know if you recognise any of these plants and animals. [show cards]

(a) Do you recognise any of these plants and animals?

(b) Can you name any of them? [write what they say in Nepali, translate after interview]

Recognise?	Name	Recognise?	Name
Pic 1	<input type="checkbox"/> _1	Pic 7	<input type="checkbox"/> _7
Pic 2	<input type="checkbox"/> _2	Pic 8	<input type="checkbox"/> _8
Pic 3	<input type="checkbox"/> _3	Pic 9	<input type="checkbox"/> _9
Pic 4	<input type="checkbox"/> _4	Pic 10	<input type="checkbox"/> _10
Pic 5	<input type="checkbox"/> _5	Pic 11	<input type="checkbox"/> _11
Pic 6	<input type="checkbox"/> _6	Pic 12	<input type="checkbox"/> _12

2. Now we are going to read a short description of an imaginary situation involving Lallopatti [show card]

(a) You know Lallopatti - what do you think of it, does it have value to you?

Yes ☐_1 No ☐_2 Don't know ☐_3

(b) Why, what do you like or value about it?

Nepali	Translation
--------	-------------

(c) Do you like it for any of the following reasons? [Show value card, copy what they point at]

For what reasons do you like the plant?	Not at all	A lot
i. Food	<input type="checkbox"/> _0 <input type="checkbox"/> _1 <input type="checkbox"/> _2 <input type="checkbox"/> _3 <input type="checkbox"/> _4 <input type="checkbox"/> _5	<input type="checkbox"/> _5
ii. Food for animals	<input type="checkbox"/> _0 <input type="checkbox"/> _1 <input type="checkbox"/> _2 <input type="checkbox"/> _3 <input type="checkbox"/> _4 <input type="checkbox"/> _5	<input type="checkbox"/> _5
iii. Making things	<input type="checkbox"/> _0 <input type="checkbox"/> _1 <input type="checkbox"/> _2 <input type="checkbox"/> _3 <input type="checkbox"/> _4 <input type="checkbox"/> _5	<input type="checkbox"/> _5
iv. Medicine	<input type="checkbox"/> _0 <input type="checkbox"/> _1 <input type="checkbox"/> _2 <input type="checkbox"/> _3 <input type="checkbox"/> _4 <input type="checkbox"/> _5	<input type="checkbox"/> _5
v. Beauty, / Good to look at	<input type="checkbox"/> _0 <input type="checkbox"/> _1 <input type="checkbox"/> _2 <input type="checkbox"/> _3 <input type="checkbox"/> _4 <input type="checkbox"/> _5	<input type="checkbox"/> _5
vi. Part of nature	<input type="checkbox"/> _0 <input type="checkbox"/> _1 <input type="checkbox"/> _2 <input type="checkbox"/> _3 <input type="checkbox"/> _4 <input type="checkbox"/> _5	<input type="checkbox"/> _5
vii. Sacred/ religious value	<input type="checkbox"/> _0 <input type="checkbox"/> _1 <input type="checkbox"/> _2 <input type="checkbox"/> _3 <input type="checkbox"/> _4 <input type="checkbox"/> _5	<input type="checkbox"/> _5

viii. Anything else /any other value? _____

Ok, now I am going to read the story. I want you to imagine yourself in the situation that I am about to describe. Then I am going to ask a few questions about what you would want to do in this situation. There are no 'right' or 'wrong' answers as we are interested to know what people really think.

Imagine that Lallopatti gets a new disease and declines by day to day in this area. If nothing is done then in the near future it will disappear. Some scientists find a new variety of Lallopatti that does not suffer from the disease. They are sure that planting the new variety will solve this problem. However, they need help to grow and raise the seedlings.

Imagine that the scientists need the help of local people. Your help will be needed for a certain amount of time every month, until Bysarch. Would you be willing to help? The project will only go ahead if most people in the community agree to help, and the scientists will ensure that a fair rota is drawn up, and that the work is not strenuous.

- (d) Pretend that this is the situation here. The scientists have come to the village to ask for local people's help for this project. Would you be willing to contribute to the project, until Bysarch, to help raise the seedlings?

i. Yes ☐₁ No ☐₂ Don't Know ☐₃

ii. If yes, how much, remembering that you have other activities that you must spend time on?
[letter of option] _____ translation (hrs per week?) _____

iii. Any comments why, or why not?

Nepali	Translation

- (e) What did you think of this story?

i) I found it easy to imagine	Y <input type="checkbox"/> ₁ N <input type="checkbox"/> ₂ DK <input type="checkbox"/> ₃
ii) I found this story realistic	Y <input type="checkbox"/> ₁ N <input type="checkbox"/> ₂ DK <input type="checkbox"/> ₃
iii) If No or DK to either of of a) or b), why?	Translation

3. Imagine that instead of Lallopatti another plant – Nigalo - has this problem.

(a) You know Nigalo - what do you think of it, does it have value to you?

Yes ☐₁ No ☐₂ Don't know ☐₃

(b) Why, what do you like or value about it?

Nepali	Translation

(c) Do you like it for any of the following reasons?

[Show value card, copy what they point to]

For what reasons do you like the plant?						
	Not at all			A lot		
i. Food	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
ii. Food for animals	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
iii. Making things	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
iv. Medicine	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
iv. Beauty, / Good to look at	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
v. Part of nature	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
vi. Sacred/ religious value	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅

vii. Anything else /any other value? _____

The scientists are agreed that a similar type of programme of planting seedlings, will be able to help Nigalo. The same efforts will be made to ensure a fair system of is set up

(d) Pretend that this is the situation here. Would you be willing to contribute to the project, until Bysarch, to help raise the seedlings?

i. Yes ☐ No ☐ Don't Know ☐

ii. If yes, how much, remembering that you have other activities that you must spend time on?
[letter of option] _____ translation (hrs per week?) _____

iii. Any comments why, or why not?

Nepali	Translation

iv.

(e) What did you think of this story?

i) I found it easy to imagine	Y <input type="checkbox"/> ₁ N <input type="checkbox"/> ₂ DK <input type="checkbox"/> ₃
ii) I found this story realistic	Y <input type="checkbox"/> ₁ N <input type="checkbox"/> ₂ DK <input type="checkbox"/> ₃
iii) If No or DK to either of of a) or b), why?	Translation

4. Now we have some general questions about your opinions on nature and conservation. Please remember that there are no 'right' or 'wrong' answers. We are interested to know what people really think. For example, some people say that 'too much fuss' is made about nature conservation. Other people think that it is important. What do you think?
We are going to read some views of an imaginary person and we would like say how much like you is this person.

1. He thinks that most conservationists exaggerate, nature does not need as much protection as they say	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
2. He thinks that humans should manage wildlife populations so that humans can benefit	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
3. He thinks that declines in wild animals are unlikely to much affect people.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
4. He thinks wildlife exists on earth primarily for people to use.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
5. He thinks that love and affection is an emotion that should be felt only for other people, not for wild animals.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
6. He believes that the needs of humans should take priority over wildlife protection.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
7. He thinks that not enough is done to conserve our wild plants and animals.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
8. He thinks that if a plant has no value/importance to people then it should not receive any attention by conservationists.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
9. He believes that all plants and animals are part of one big family	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
10. He thinks most conservation projects are too expensive and don't work	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
11. He feels a strong emotional bond with wild animals.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆

5. Now I would like to know about your ideas on life, not your life but your ideas on life in general. What is important to you? Please tell me if you agree or disagree with each statement.

1. It is important for him to be loyal to his friends. He wants to devote himself to the people which we know.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
2. It is important to him to listen to different types of people. Even when he disagrees with them, he wants to understand them.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
3. It is important to him to be rich, to have lots of money and expensive things.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
4. He thinks that it is important that every person in the world be treated equally. Everyone should have equal opportunities in life.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
5. It is important to him always to behave properly. He wants to avoid doing anything that people would say is wrong.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
6. He can't help others, he has too many of his own problems to worry about.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
7. He believes that people should do what they are told (by someone in authority). He thinks people should follow rules and regulations, at all times, even when no-one is watching.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
8. It is important to him to get respect from others. He wants people to do as he says.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
9. Being very successful is important to him. He hopes other people will recognise his achievements.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆
10. It is important to him to help the people around him. He wants to care for their well-being/for them.	<input type="checkbox"/> ₁ <input type="checkbox"/> ₂ <input type="checkbox"/> ₃ <input type="checkbox"/> ₄ <input type="checkbox"/> ₅ <input type="checkbox"/> ₆

6. Finally, if you had to choose 2 out of 4 statements I am going to read, which would you choose?

If you had to choose amongst the following things, which are the two which seem most desirable to you?	
a. Maintaining order in the nation	<input type="checkbox"/> <input type="checkbox"/> ₁
b. Giving people more say in important political decisions	<input type="checkbox"/> <input type="checkbox"/> ₂
c. Fighting rising prices	<input type="checkbox"/> <input type="checkbox"/> ₃
d. Protecting freedom of speech	<input type="checkbox"/> <input type="checkbox"/> ₄

We would like to ask some questions about your household. Although we ask for some personal details this information is kept anonymous, so no one can ever tell what you personally answered. The reason we ask these questions is because it might have a big effect on peoples' answers. For example, perhaps people with big families have different ideas from people with small families.

7. i) Compared to other people in this area, how would you say your household is living now (choose 1)?

I am living comfortably.	<input type="checkbox"/> <input type="checkbox"/> ₁
I am coping.	<input type="checkbox"/> <input type="checkbox"/> ₂
I am living with difficulty.	<input type="checkbox"/> <input type="checkbox"/> ₃
I am living with extreme difficulty.	<input type="checkbox"/> <input type="checkbox"/> ₄

8. We would like to know a little about you and the people in your household

- (a) How many members of your household are there? _____
[check this includes those who work elsewhere and send money back]

- (b) How many are children under 16? _____

- (c) What is your age? _____

- (d) i) Have you always lived here? Yes ☐ ₁ No ☐ ₂
If not ii) how long have you lived here? _____
iii) where did you live before? _____

- (e) What is your level of education

What is religion of family members?

_____ H =hindu, C=christian,
B=buddhist, HB=Hindu-Buddhist

- (f) What are the occupations of adults in your household?
Does anybody have any other jobs, or do anything 'on the side'?
[Ag=agriculture, Ag.lab=labour on others land, R=retired, HW=housewife, soc=social wrks]
[continue on back if necessary]

Person	Position (in household mother, brother, daughter etc)	1ery Occ	2ery Occ	3ery Occ
1	Respondent			
2				
3				
4				
5				
6				

9. Is anybody in your household involved in any conservation activities or organisations?

(a) Y ☐₁ N ☐₁₂ DK ☐₃

(b) If Y, then who, and what do they do?

Who: _____ What: _____
 Who: _____ What: _____
 Who: _____ What: _____
 Who: _____ What: _____

Translation

10. Finally, what are your ideas for conservation effort in this valley?

(a) i) What do you think of the amount of effort that is put into conservation in this valley?

A lot more effort is needed	A little more effort is needed	Just right	A little less effort is needed	A lot less effort is needed
<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅

ii) Do you feel the same, remembering that effort and resources put into conservation can mean less for other projects. [If new answer, then asterix new box]

(b) Who do you think should have responsibility for conserving nature in this area?

Nepali	Translation
1.	1.
2.	2.
3.	3.

(c) What do you think should be the biggest priority for conservation organisations round here?

Nepali	Translation
1.	1.
2.	2.
3.	3.

Thank you for answering our questions!

Here is a gift.

We hope to see you again when we distribute what we have found out from this survey. Do you have any questions for us? If you think of any questions later you can contact us when we return to the village, or at the details provided on the sheet.

What did you think of our questions?

I responded seriously	Y <input type="checkbox"/> ₁	N <input type="checkbox"/> ₂	DK <input type="checkbox"/> ₃
It understood all of the questions	Y <input type="checkbox"/> ₁	N <input type="checkbox"/> ₂	DK <input type="checkbox"/> ₃
It was interesting	Y <input type="checkbox"/> ₁	N <input type="checkbox"/> ₂	DK <input type="checkbox"/> ₃

Do have any comments?

Nepali	Translation

We would like to ask you to help us by not discussing your answers with your neighbours until we have asked everybody their questions. This is because we do not want a person's answers to be influenced by what their friend has said! Of course, as soon as we have finished our survey here, you can talk about this!

Time finished: _____

For enumerator to note after interview

Was a 'comeback' interview arranged? When?	
Were there any breaks in the interview? When?	
Was more than one person present during the interview? If so, who?	
General notes on attitudes of respondents (and any other people present). Did they get bored?	
Were questions answered in the correct order? If not, which ones and why?	
If questions were refused, why?	
Which questions did they find difficult?	
House location on village map (if relevant) or other remarks to avoid duplication	
7 ii) Size and quality of house	7 iii) Your feelings on their wealth & status
Low <input type="checkbox"/> ₁ Medium <input type="checkbox"/> ₂ High <input type="checkbox"/> ₃	Low <input type="checkbox"/> ₁ Medium <input type="checkbox"/> ₂ High <input type="checkbox"/> ₃
Any other comments?	

APPENDIX E.

Discrepancy between census and survey data in Nepal (Chapters 5 & 6).

There is a possible age bias in the respondents of the questionnaire survey, revealed by comparison to census data. Respondents varied widely in age (15-83, mean 35.8). However, there was a slight bias to men in the older respondents, confirmed by comparison with census data ($\chi^2=17.114$, $df=6$, $p=0.0089$; Figure E1a) which also suggests younger men are underrepresented ($\chi^2=59.8$, $df=6$, $p<0.0001$; Figure E1b). Overall there was no significant difference between sample and census data in the gender ratio, approximately equal (341 female, 320 male). If census data are still applicable this effect is likely due to young men taking jobs elsewhere, whereas older men are have more leisure than other household members. Since age was not found to be a significant influence on and views about conservation, this bias is unlikely to affect the interpretation of results from this survey, as presented in chapter 5 and 6.

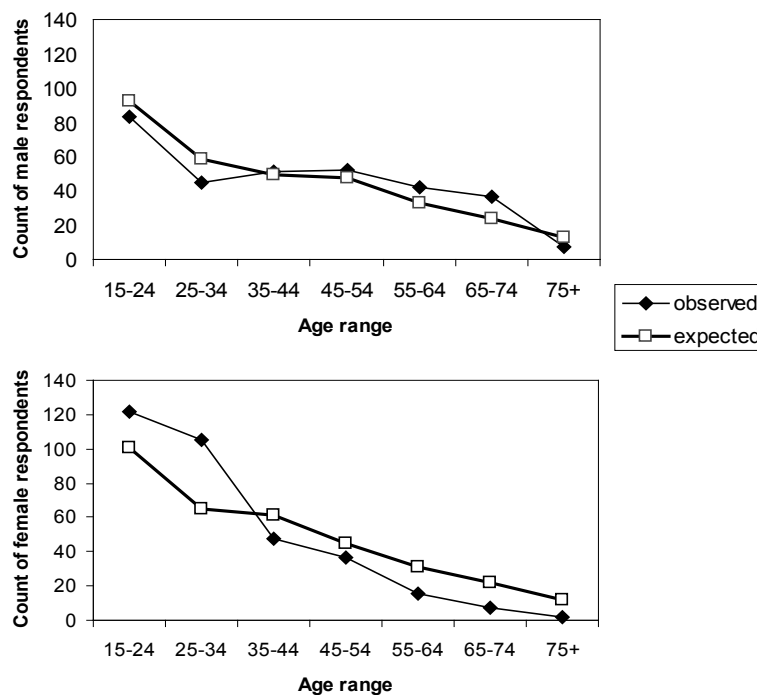


Figure E1. The age distribution of respondents, compared to that of census data, for both men (upper figure) and women (lower figure). Distribution of ages are significantly different from census data for both men ($\chi^2=17.114$, $df=6$, $p=0.0089$) and women ($\chi^2=59.8$, $df=6$, $p<0.0001$). Census data are drawn from the Central Bureau of Statistics (2001) and respondent N=661.