‘Conservationists’ and the ‘Local People’ in Biodiversity Conservation: The Case of Nech Sar National Park, Ethiopia

Girma Kelboro[1*], Till Stellmacher[2] and Volker Hoffmann[3]

Abstract

Studies on biodiversity in Africa show its rapid loss and degradation. This is commonly explained with non-sustainable use by local people. Across Africa, extensive systems of protected areas (PAs) have been established to mitigate this trend. Creation of PAs, however, resulted in manifold conflicts with people who depend on the use of the PAs’ natural resources for their livelihoods. This study empirically analyzes gaps in knowledge and perceptions between conservationists[2] and pastoralists in Nech Sar National Park, Ethiopia, and suggests ways of integrating the knowledge systems into practices. Research techniques used are key informant interviews, focus group discussions and interviews with 60 sample households conducted between May 2010 and March 2011. Pastoralists who live inside the park describe changes in biodiversity by observing trends of important trees, grasses, and larger wild animals based on traditional ecological knowledge. Conservationists tend to rely on standard scientific methods and “expert” observations to evaluate temporal and spatial changes of biodiversity. The pastoralists relate biodiversity loss to the prohibition of their traditional land management practices by the park authorities. Conservationists rather take the local people’s increased and non-sustainable resource utilization as a cause. We argue that improved knowledge exchange and understanding can be generated through more participatory and transdisciplinary research which can contribute to the development of innovative management approaches for the park that better integrates local peoples’ livelihood needs.

Key words: Biodiversity conservation, Nech Sar, protected areas, traditional ecological knowledge

[1] *Corresponding author, [1]Center for Development Research (ZEF), University of Bonn, [2]Center for Development Research (ZEF), University of Bonn, [3]University of Hohenheim,

[2] In this paper, the term encompasses conservation scientists, office holders and practitioners who promote preserving biodiversity mainly for its existence values.

Introduction

Article two of the Convention on Biological Diversity (CBD) defines biological diversity (biodiversity) as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species, and of ecosystems," (CBD 1992: 3). Ethiopia is known as a biodiversity hot spot (Mckee 2007). The country has taken a number of steps forward to identify its biodiversity resources and implement conservation mechanisms, both *in situ*[3] and *ex situ*. The biodiversity conservation initiatives taken by the Imperial regime (until 1974) were pursued strongly by the *Derg* military government (1974-1991) (e.g. Stellmacher 2007a) and further by the EPRDF government since 1991.

Understanding richness (in species and ecosystems) and degradation with explanations on the causes are the bases for the use, management and conservation of biodiversity in protected areas (PAs). The state of biodiversity in Nech Sar National Park has been assessed and documented by a number of conservationists who recommended various conservation strategies (see for example Hasan et al. 2011, Sintayehu et al. 2011). The studies rely on selected species and land use/land cover change as indicators of trends in biodiversity resources (Biodiversity Indicators Development National Task Force 2010).

Conservationists base their explanations for biodiversity loss in protected areas on abstract ecological concepts of interconnectedness amongst different living organisms and with their natural environment (Liu et al. 2001, Sinclair et al. 2002, Mora and Sale 2011, Laurance et al. 2012). It has been proved that loss of an organism from food chains negatively affects others which are interdependent on each other. For example, "the loss of large, apex predators from several terrestrial ecosystems has resulted in mesopredator release – the proliferation of moderate-sized predators that commonly reduce or eliminate the smaller vertebrate species," (Estes et al. 2001:857). Ecologists have established the knowledge that the natural process of loss of organisms goes on in a pace compatible with replacement except when there are major catastrophic events. In this classical thinking, the human element is simply considered as an agent of disturbance (Moran 2010). However, the analyses limited to the natural world are

[3] It refers to biodiversity conservation within the natural habitats such as forests, woodlands, and grasslands by establishing conservation areas as opposed to *ex situ* which refers to conservation in specially designated places or gene banks outside the natural habitats.

not able to show the full picture. For example, studies on the changes in land use/land cover selectively assessed by using GIS and remote sensing data often fail to explain the underlying reasons. But the findings and recommendations of conservationist scientific approaches based on such ecological knowledge shaped the international and national discourses on biodiversity conservation and PAs which largely perceive local people as conservation risks (for example, Holt 2005). Conventional conservationist approaches often fail to provide details on complex social-ecological interactions which can help to design sustainable biodiversity use, management and conservation approaches (Moller et al. 2004, Stellmacher et al. 2012).

The case of Ethiopia is illustrated in Keeley and Scoones (2000) in their work on how environmental degradation discourses developed and influenced national conservation policies which, however, failed to reverse the resource degradation in the country (see for example Yeraswork 2000, Dessalegn 2001). The effect of data and explanations about deforestation in Ethiopia is also another example that shows how the environmental narratives affect national policies and the establishment of PAs (McCann 1997, Stellmacher 2007b, Turton 2011). Local people, on the contrary, often value and describe the resources they use and the changes in their availability in terms of their day-to-day practical interactions on the basis of what is often referred to as 'traditional' knowledge. Anthropologists and other social scientists have long-recognized the importance of this knowledge for environmental management. But their lines of argument focused more on maintaining integrity of the knowledge and practices rather than its use by strengthening its weaknesses. In general, attention of conservationists and the social scientists more or less exclusively on the nature and the human dimension respectively remain as disciplinary boundaries and failed to address the multi-faceted and interrelated environmental problems and human needs (Berkes et al. 2003). Since the last decade, however, research on the global environmental changes has moved towards efforts to break the disciplinary boundaries (Moran 2010).

This paper is an attempt to contribute to debates based on studies on the knowledge and perception gaps that exist between conservationists and policy makers on the one hand, and local people on the other regarding use, management and conservation of biodiversity in protected areas in developing countries. Our purpose is not primarily to prove or disprove either the conservationists' or the traditional ecological knowledge. However, by arguing that the gap is among the causes for the continuity of biodiversity loss in protected areas in Ethiopia, we here aim at demonstrating how such differences in the way biodiversity resource dynamics are perceived and conservation measures are taken can be bridged to facilitate more common understanding. We focus on different perceptions on

biodiversity and its degradation, and how this affects relations and interactions between local people and conservationists. The case of Nech Sar National Park is taken to illustrate the practical context of our argument in the paper. The empirical findings show the contrasts between the knowledge and perception of conservationists and local people[4]. This paves a way for working towards a collaborative management through the strengths of the local people's practices (in their interactions with nature) and the knowledge of conservationists. We take the concept of worldviews as our point of departure to place the contrasts and similarities between the knowledge held by conservationists and local people.

Worldviews: a Foundation for Biodiversity Knowledge

Knowledge and perception of people about natural resources and their environment is founded on worldviews, understandings and interpretations. Worldview is a concept that can be fully addressed by answering its key constituent questions. Vidal (2008:3-6) lists and describes the seven questions calling for answers within the concept of worldview:

1) *The question of what*: A question that is directed to understanding the environment and how its components function. In the terms of Vidal, this is "*the question of ontology*" or "*a model of reality as a whole*".
2) *The question of origin*: A knowledge question that strives for explanation. The origin of the universe and things inside and how and why they are organized are among the issues covered in this question.
3) *The question of the future*: Where are we going from where we are? Depending on the envisioned future and uncertainties, people make decisions to take actions that appear to be safer.
4) *Differentiating good and evil*: Answers to this question determine what one endeavours to achieve.
5) *How to act*: Concerns with the actions and how to organize them. The nature of interactions among people as well as people and their environment are influenced by the way they perceive the appropriate ways to do things.

[4] By "local people" here we mean the Guji pastoralists who live inside the boundaries of Nech Sar National Park. In this paper, "Guji", "pastoralists", and "local people" are used interchangeably to refer to the Guji Oromo people who live inside the designated boundaries of the park.

6) *How to understand the world*: A methodological question about how to answer the first three questions.
7) *Available answers*: Although complete answers are not available for the questions, the partial answers available are considered as components to contribute to the worldview.

A further look at how worldview is nurtured and established takes us to culture, which is the basis for worldviews to develop as Aerts and his colleagues describe:

> Worldview construction is always connected to a culture in which 'meanings' are circulated, types of behavior are passed from generation to generation, socio-political problems are produced, and styles of art confront us. The material used to construct a worldview comes from our inner experience and our practical dealings with things, as well as from the interpretation of history and of scientific knowledge about our world (Aerts et al. 1994: 9).

The knowledge of both conservationists and local people can be understood within the context of their worldviews. Traditional ecological knowledge is embedded in the worldview constituting social institutions; natural resource use, management and conservation systems; and detailed knowledge about plants, animals, soil and other components of the environment (Berkes et al. 2000:1257). As a result, local people base their worldview on their intergenerational culture unlike conservationists who rely on the culture of conservation scientists and practitioners to generate data, analyze, and develop as well as contribute to the construction of their worldview. As defined earlier, the term biodiversity is understood among the conservationists as the diversity on the three levels: within species, between species and ecosystems (CBD 1992). The worldview of conservationists conventionally considers people as the most powerful agents in ecosystems. Hence, minimizing or, as the case in classical protected areas, avoiding people's impact on biodiversity is seen as essential for its maintenance.

For local people, on the other hand, biodiversity resources and the environment in which they exist are often beyond the material benefits they provide. In many cases, local people perceive themselves and their livelihoods not as opponents of their environment but as a part of it. For example, cultural values are attached to landscapes and ecosystems (e.g. Dudley et al. 2005) making culture "a complex and intrinsic system of interlinked components that contribute to an individual's identity by representing relationships with the surrounding environment" (Pretty et al. 2009:101). The difference in worldviews has contributed not only to a variation of how local people and conservationists perceive biodiversity but also in the way it is – or should be – used, managed, and conserved.

Traditional Ecological Knowledge

To understand traditional ecological knowledge, it is necessary to briefly elaborate on the concept of knowledge. Since there is no definition which fully satisfies all aspects of knowledge in different scientific disciplines (Gottschalk-Mazouz 2008), we focus on its components. There are tacit and explicit forms of knowledge (Nonaka 1991, Fazey et al. 2006). Tacit knowledge cannot be articulated and can hence not be easily captured by questionnaires. Explicit knowledge is more tangible, articulated and often well-documented (Fazey et al. 2006, Hoffmann et al. 2007).

Through long-term interactions with biodiversity, local people have developed knowledge through which they value the resources and monitor changes. This knowledge is described alternatively as traditional (ecological) knowledge, local (ecological) knowledge or indigenous knowledge. For the purpose of this paper, we use the term "traditional ecological knowledge" which is defined as follows (ICSU 2002:3):

> Traditional [ecological] knowledge is a cumulative body of knowledge, know-how, practices, and representations maintained and developed by peoples with extended histories of interaction with the natural environment. These sophisticated sets of understandings, interpretations, and meanings are part and parcel of a cultural complex that encompasses language, naming, and classification systems, resource use practices, ritual, spirituality, and worldview.

Traditional ecological knowledge differs from the scientific knowledge in many aspects. In the perspective of the former, the environment and resources with which people interact are intricate components of life and they provide both the tangible materials as well as the intangible spiritual values both of which are interconnected. This is oversimplified in the perspective of the conservation (western) scientific knowledge. Table 1 below summarizes the differences between the two forms of knowledge.

Table 1: Comparison of traditional ecological knowledge and conservation scientific knowledge

Criteria	Traditional Ecological Knowledge	Conservation Scientific Knowledge
Nature of information/data	Generally qualitative	Both quantitative and qualitative, with a tendency to give a higher value to quantitative
Level of rationality	Has an intuitive component	Purely rational
Scope of problem addressed	Holistic	Reductionist
Consideration to mind and matter	Mind and matter considered together	Mind and matter separated
Morality	Moral	Value-free
View	Spiritual	Mechanistic
Methodology	Based on empirical observations and accumulation of facts by trial-and-error	Experimentation and systematic, deliberate accumulation of facts
Data generator	Data generated by resource users themselves	Data generated by a specialist cadre of researchers
Temporal dimension of data	Based on diachronic data i.e. long time-series on information on one locality	Based on synchronic data i.e. short time-series over a large area

Source: Adapted from Berkes (1993:4)

Traditional ecological knowledge is more and more recognized by scientists as being important to develop strategies for sustainable use, management, and conservation of biodiversity. As Berkes et al. (2000:1253) summarize, the social-ecological practices include ecological knowledge for resource management, generation, and handling of knowledge required for the management; institutions that guide the management processes; and cultural back-up of the people-nature

interactions. In essence, the knowledge is created, transmitted, and modified into new situations through time with changes in the social, cultural, economic or ecological conditions, which can happen within a generation or inter-generationally through interactive social-ecological practices. Given the complexity of such systems, simple blueprint approaches could not address environmental degradation problems (Moran 2010). In the following section we briefly introduce a model known as Adaptive Collaborative Management (also known as Adaptive Co-Management) which can help to move away from fixed top-down (blueprint) to flexible, participatory adaptive approaches.

Adaptive Collaborative Management: A Model of Co-learning

A working model is needed in order to progress towards a common ground that combines conservation scientific knowledge and traditional ecological knowledge. The Adaptive Collaborative Management (ACM) framework has the potential to facilitate knowledge exchange and sharing among diverse groups of knowledge holders. ACM is a concept which encompasses exchange of knowledge and experiences among interest groups both on rhetoric and practices. ACM has been developed by the Center for International Forestry Research (CIFOR) for community forest management and applied in Asia, Latin America, and Africa. The concept is applicable to all situations of natural resource management in which the resource is complex in its nature and involves multiple interest groups.

The three components of ACM are (a) communication and creation of a shared vision, (b) learning among stakeholders, and (c) collective action (Prabhu et al. 2007:18). Communication is a means through which people exchange perceptions and share experiences as well as develop a common vision. Here we are referring to a form of two-way communication unlike the old conventional model which entails a linear flow of technologies and approaches from conservationists to the people (Hoffmann 2009). In ACM, communication which exhibits partnership between people and conservationists is needed both for developing a shared vision and "for creating a whole that is greater than the sum of its parts. Effective communication enables diverse actors to share – and ultimately negotiate and create synergies from – their worldviews, goals, values, and knowledge" (Prabhu et al. 2007:18). Continuous communications and discussions among interest groups also help in understanding their true intentions thereby building trust on each other. The shared vision developed in this way may also help people to consider their daily activities in terms of the long-term impacts

beyond their temporary needs. In other words, the shared vision is "*necessary for the shared ownership of processes, decisions, and outcomes*" (Ibid.).

Learning, which is the other key element in ACM, involves a process in which both the local people and conservationists are always prepared to deliberately and consciously understand and apply new inputs of knowledge in the process of natural resource use, management and conservation. The focus of learning is what makes adaptive management different from conventional management (Murray and Marmorek 2003:423). Learning is an unavoidable starting point in ACM (Armitage et al. 2009). The learning process provides technical and managerial inputs of knowledge that can solve problems identified in the learning process. With development of new understanding, it is possible to modify even the vision. More than that, "it also includes learning at a higher level rather than simply the learning of facts, the kind of learning that enables stakeholders to reframe their perspectives – or some part of their worldview," (Prabhu et al. 2007: 19). This entails social learning, which is a key in collaborative natural resource management leading towards effective joint/collective action (Schusler et al. 2003, Gabathuler et al. 2011).

Referring to collective action as the other element of ACM, Prabhu and his colleagues argue that this approach is essential in contexts, which are characterized by the complex nature of the resources, pluralism (in interests, rights and responsibilities of people) and tensions on different levels (Prabhu et al. 2007: 20). Local people are not taken merely as implementers of decisions made by conservationists; they are rather partners in all processes of decision-making, implementation and learning from feedbacks. This also shows their active roles in governance (Armitage et al. 2007). Therefore, we believe that the model is also relevant to consider in protected areas in Ethiopia in efforts to bridge the knowledge gap between local people and conservation scientists and practitioners.

Methodology

The Study Area: Nech Sar National Park and the People

Nech Sar National Park is located about 510 Km south of Addis Ababa. Its establishment had come as a response to reports based on observations by foreign travelers and government conservation advisors. European travelers and researchers, most notably the Childs Frick Expedition in 1912 (Friedmann 1937:17-18), indicated the area of Nech Sar in the Rift Valley of Southern Ethiopia as a biodiversity hot spot for the first time.

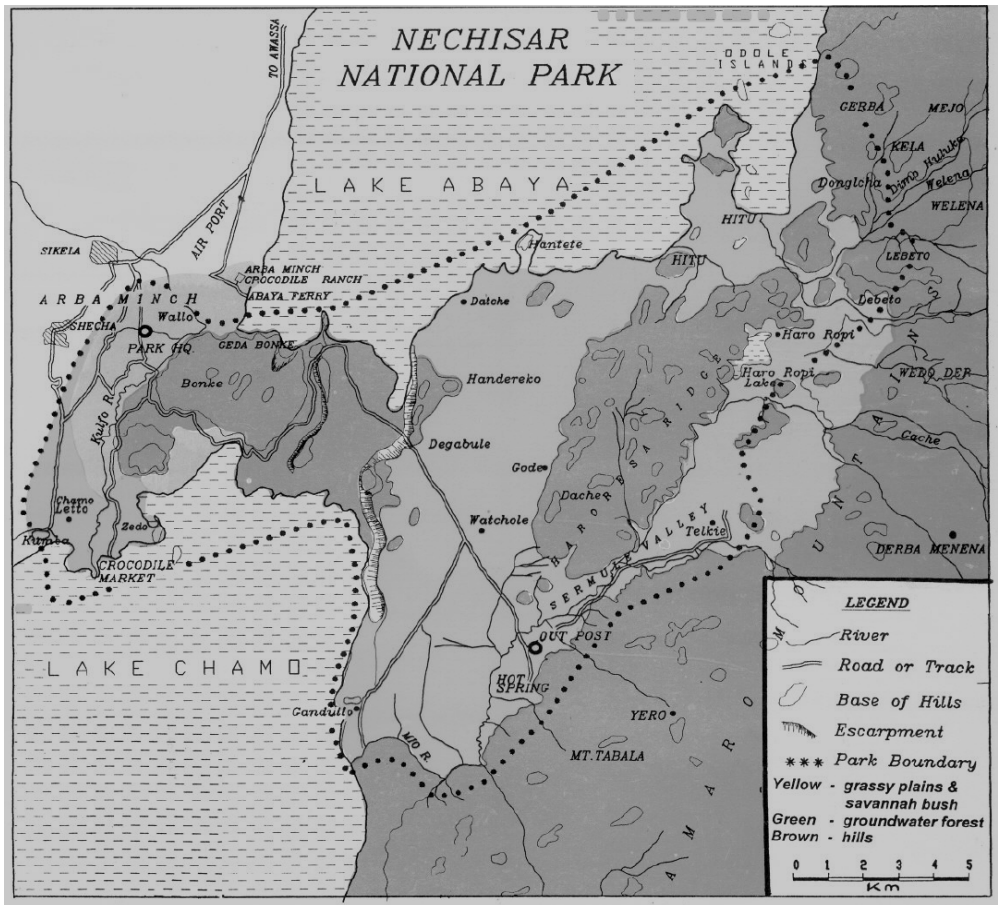

Figure 1: Map of Nech Sar National Park (*Source*: the archives in the park's headquarters)

The diversity of its ecosystems is composed of aquatic habitats (Lake Abaya and Lake Chamo), ground water forests, riverine vegetation, montane woodlands, and grasslands (Duckworth et al. 1992) (Figure 1). Based on the proposal of the UNESCO advisors to the government as part of their national mission to assess

the country's potential for wildlife conservation in the 1970s, Nech Sar was designated as a national park in 1974.[5]

However, the local people living in and adjacent to the newly established park were not a priori consulted, which immediately led to tensions between the park authorities and the local people. Interviews with Guji pastoralist elders who passed through that time show that in the early stages of the park establishment, people were told "not to kill" wild animals. This was only at the brink of the collapse of the Imperial Government of Haile Selassie I. In the *Derg* regime, the history of the people-park relationship continued with military conservation interventions. The *Derg*'s conservation approach followed the exclusion of all local people (Ganta/Gandule and Kore small holder farmers; Guji pastoralists; and residents of Arba Minch town and its surroundings who fish and collect wood and grass) from the park. However, the tension between the park and the people continued even after the change of regime in 1991.

Data Collection Process

This paper focuses on the Guji pastoralists who live in Nech Sar National Park. We used a combination of research techniques and tools such as key informant interviews, group discussions, participant observation, and sample household interviews during the fieldwork from May 2010 to March 2011. We started with the qualitative data collection in order to generate an in-depth understanding before formulating and testing a semi-structured household questionnaire. 60 households of the Guji pastoralists living inside Nech Sar National Park were interviewed. The different tools allowed triangulation. Several weeks with overnight-stays in the villages of Gode, Arda Gudina and Mado in the park allowed in-depth participant observation of resource use, management, and conservation practices.

Experts from research, state agencies, and NGO practitioners were interviewed to obtain data on their perceptions on the park's biodiversity and the approaches they would recommend for the use, management, and conservation of the park. In the presentation of the interview results, we kept our respondents anonymous given the sensitivity surrounding Nech Sar National Park governance at this time.

[5] Blower, John H. 1967. Report on a visit to the Nechisar area, Lake Chamo. Ethiopian Wildlife Conservation Organization. Addis Ababa, Ethiopia.
Bolton, Melvin. 1970. Rift Valley lakes ecological survey. Report 4: the Nechisar Plains (second part). Ethiopian Wildlife Conservation Organization, Addis Ababa, Ethiopia.

Similarities and Parallels in Knowledge and Perceptions

The Guij recognize the loss of biodiversity in Nech Sar National Park as a problem. In the interviews, 92 percent of them agreed that the quality and quantity of grass cover preferred for their cattle grazing in the park is declining. About 100 percent of them responded that invasive trees increasingly grow in the park. An elderly among the pastoralists described the historical trend of vegetation cover in the area as follows: "There were dense covers of grasses preferable for our cattle grazing. But, now, tree cover is increasing while grass cover is decreasing."[6] About 90 percent of the Guji observed that the cover of some tree species has increased. A similar result was obtained through group discussions but with reference to the trends of specific grasses and trees (Table 2). According to our group discussants, all the grass types considered had been declining whereas all the trees had been expanding into the grassland plains.

The Guji also perceive various changes in numbers and composition of wildlife in Nech Sar National Park. The experience the people have accumulated by spending day and night in the area has helped them to easily observe the changes in the general condition of wild animals in the park. Around 72 percent of the Guji interviewees perceive that the population of wildlife has been increasing. The remaining proportion of the interviewees thinks that the population of wildlife is decreasing. None of the respondents considered the wildlife population as stable. Informal interviews also show similar results. The informants illustrate their views using practically visible cases. For example, an elderly informant described his observations of the wildlife trends in this way: "We know the reproductive cycle of some animals since we live together. We know, for example, the time when a zebra gets pregnant and gives birth. We see that the number of some wild animals such as zebra is increasing while others are decreasing."[7] The Guji informants refer to the big mammals in their discussions about the temporal changes in the wildlife population.

Conservationists, on the other hand, strive to consider wildlife of all sizes to understand the trends. However, putting this biological principle in practice is extremely demanding in terms of the capacity required. In the case of Nech Sar National Park, there is lack of evidence even for conservationists to show the trends of small animals and plants. But it is possible to show here that the

[6] S120 interviewed on 11/10/2010, Nech Sar National Park

[7] K03 interviewed on 02/07/2010, Nech Sar National Park

perception of conservationists coincides with that of the Guji in terms of the general understanding about loss of wildlife in the park.

Interviews with conservationists and reviews of conservation-oriented studies reveal the available data and nature of discourses about resource degradation in the park. The park is considered among conservationists generally as one of the vulnerable protected areas in Ethiopia exposed to the risk of losing its biodiversity. Some of the exemplary results from interviews with conservationists show the commonly held perception regarding the condition of the park. An interviewee working in an academic position for Arba Minch University stated that "forests, fish and grasses are currently under a severe destruction in the park."[8] Another conservation expert working for the park claimed that "the park suffers from an alarming rate of wildlife loss."[9] The park conservation officer supported his arguments of degradation with data on examples of some species whose status had been recorded at different times since the designation of Nech Sar as a park. The most prominent example is the negative trends in the population status of Swayne's hartebeest (*Alcelaphus buselaphus swaynei*). At the time of this study, the park had recorded only about 12 individuals losing more than 90 individuals compared to the more than 100 population recorded in the 1970s. Studies which documented the population of this endemic mammal at different times are also indicative of an extreme decline in its size (Bolton 1973, Befekadu 2005, Aramde et al. 2011, Demeke and Afework 2011). Land use/land cover changes and habitat fragmentation are reported as major problems in the park due to a high degree of disturbance in the grassland plains as well as the riparian and ground water forest (Asaye 2008).

To sum up, both the conservationist knowledge and the traditional ecological knowledge holders agree that the biodiversity and natural resources were relatively intact in Nech Sar National Park in the first two decades of its establishment as a national park. The difference between the traditional ecological knowledge holders and the conservationists is their way of description and references. The conservationists use quantitative data of specific cases which they think are the key species that deserve a special attention. The traditional ecological knowledge holders, on the other hand, describe the situation qualitatively based on their life-long experiences.

[8] F017 interviewed on 25/10/2010, Arba Minch

[9] F019 interviewed on 25/10/2010, Nech Sar National Park

Table 2: Some indicators of biodiversity changes for local people in Nech Sar National Park

Grass species preferred for grazing				
Local name	**Scientific name**	**Main growing niche**	**Part Used/consumed**	**Trend**
Chokorsa/Korcha	Not known	Areas highly fertilized with cow manure	Grazing	Decreasing
Koidesa	*Chlorix roxburghiana*	Grassland plains	Grazing	Decreasing
Obba	Not known	Around rivers	Grazing	Decreasing
Argeda	Not known	Grassland plains	Grazing	Decreasing
Bule luka	Not known	Grassland plains	Grazing	Decreasing
Trees and shrubs preferred by browsing animals				
Debobesa	Not known	Hills and villages	Leaves	Increasing
Chigidida	Not known	Hills and villages	Leaves	Increasing
Kore koniye	*Combretum* spp.	Hills and villages	Leaves/fruits	Increasing
Turura guracha	*Acacia mellifera*	Hills and villages	Leaves/fruits	Increasing
Turura dalecha	*Acacia senegal*	Hills and villages	Leaves/fruits	Increasing
Sato	*Acacia nilotica*	Hills and villages	Leaves/fruits	Increasing
Jirme	*Dichrostachys cinerea*	Hills and villages	Leaves/fruits	Increasing

Source: Field notes from a focus group discussion in Nech Sar National Park, June 2010

The parallelism in the knowledge and perceptions between the Guji and conservationists is also ascertained by making a comparative analysis of the values attached by both. The Guji use plants and animals with socio-cultural and economic values as indicators of biodiversity trends. In the informal interviews, some of the qualitative descriptions the Guji used to show the resource dynamics in their environment include the fact that it was not a problem previously to access and use grasses for their cattle; traditional medicinal plants were abundant in their surroundings; and they never had a problem to get grasses needed for constructing their traditional shelters. Now, they experience shortage of these products in their daily life. For the local people, living in the area is inseparable from the use,

management and conservation practices. In an informal interview, a 90 years old elderly man stated:

> We belong to this land, and the land belongs to us. Irgansa (a Guji name for Nech Sar area) is one of the areas where our ancestors were sheltered. We are left with only this land whereas other areas are taken by settlements, farms and the Arba Minch town. This area is again needed by government for wildlife. We don't know what to do and where to go.[10]

Therefore, the Guji are the ones who give meaning to the area in which they live and vice versa. This view about land is related to the findings of Turton (2011:168) in his study of the people in the Omo lowlands:

> When they see a tree they are most likely to see it as good for making fire sticks or milk containers, axe handles or dueling poles, or as a good shade tree, or a rapid encroacher on grazing land. They are too close to their physical surroundings, too 'implicated' in them and have too much practical knowledge of them, to see them in formal rather than functional terms.

Conservationists, on the other hand, analyze changes on biodiversity status using indicators without regard to their values to the local people. For example, among others, conservationists consider Nech Sar National Park as a priority conservation area mainly since it is a shelter for the endemic Swayne's hartebeest categorized as ENDANGERED (EN) by the IUCN (IUCN SSC Antelope Specialist Group 2008). Given the fact that this species is endemic to Ethiopia and the park is one of the only three sites in the country where the species exists, there appears to be a national urge to protect the species where it is found. But how the protection of this species in the park can compensate the ensuing loss of grazing land for the pastoralists has remained unclear to the people. Based on his four decades of study on the lower Omo Valley of Ethiopia, Turton (2011) concludes that conservationists give more attention to nationally defined objectives to justify conservation value and thereby mobilize support to coercive state to implement conservation objectives.

The understanding about the resource dynamics in Nech Sar National Park and the differences in valuing the resources between the conservationists and pastoralists can be taken as opportunities and challenges to integrate their knowledge systems and practices. From the results presented and related discussions so far, we can generalize that the Guji appreciate loss of biodiversity in their particular ways. This perception can serve as an entry point for

[10] Interviews with K03 on 02/07/2010, Nech Sar National park

conservationists to initiate collaborative works. In other words, conservationists should be capable of capitalizing on the common understanding on appreciation of the problem of resource degradation. However, more work on communication between the parties is needed to reduce the prejudices developed over the long time of failed communications and mistrust. As Bickford et al. (2012:75) state "the exchange of knowledge can be two-way, as these communities are bonded with the 'wilderness' through their traditional knowledge, lifelong experiences, livelihoods and even human-animal conflicts. At the same time, programs should endeavor to address the needs of the community in a way that links with biodiversity conservation."

Contested Explanations of Biodiversity Degradation in Nech Sar National Park

In a conventional conservationist's view, the Guji are held accountable for loss of biodiversity in Nech Sar National Park. The justification follows a logical view that the people need natural resources for their livelihoods. It also follows that unless they have other options to depend on to fulfill their needs, their presence inside or adjacent to the park makes it difficult, if not impossible, for conserving resources since their livelihood needs overlap with conservation objectives. A statement by a university office holder (an ecologist by profession) is a good example of the general view among conservationists regarding people and protected areas in Nech Sar National Park: "the residence of people within the park is a real threat to biodiversity conservation."[11] This idea is not a recent development as it is apparent in reports of earlier observers. One report[12] summarizes the effects of the concentration of large numbers of livestock observed along the lake shores and the Sermelle River Valley as: (1) overuse of the grasses, resulting in considerable loss of grazing source for wild animals; (2) trampling damage, causing destruction of the standing crop and soil compaction; (3) erosion; (4) competition between livestock and wildlife for food; and (5) dissemination of diseases to wild animals, and vice versa.

Loss of wildlife in the park was also associated with the local people. The same report cited above claims that villagers hunt wild animals such as Greater Kudu, Bushbuck, Reedbuck and Hippopotamus as well as the rare Swayne's hartebeest for food. Earlier observations by conservationists also indicate that

[11] K017 interviewed on 25/10/2010, Arba Minch

[12] Kirubel Tesfaye. 1985. Nechisar National Park Preliminary Report. Ethiopian Wildlife Conservation Organization. Addis Ababa, Ethiopia.

pastoralists had been hunting the Swayne's hartebeest (Bolton 1971); "*much of the grassland was degraded by cattle*" (Bolton 1973:107). The Guji are still blamed for overgrazing and trampling and disease transfer between the domestic and wild animals in Nech Sar.[13] The latest findings of Hasan et al. (2011) also show that woody species encroachment, unpalatable forbs, and bare land cover were significantly higher in the highly grazed and fire-suppressed part of the grassland plain. Similar conclusions were made about the impact of people and their livelihood strategies on wildlife in other protected areas of Ethiopia claimed to become even worse with an increase in population (Almaz 2009, Andeberhan 1982, Borghesio and Giannetti 2005, Yosef and Afework 2011, Stephens et al. 2001, Vial 2010, Vial et al. 2011).

The pastoralists, on the other hand, explain the reduction in the quality and quantity of the grasses with the breakdown of their traditional lifestyle in which they used to move over a large area (beyond Nech Sar and its surroundings) in search of grazing lands and water for their cattle. Formerly, the pastoralists used to travel up to the Abulo and Alfacho areas as well as Segen Plains far in the south of the Nech Sar in order to give more time for the grass recovery. They used to return back to Nech Sar when the grass has fully recovered. Here is an answer to explain how limitation of the seasonal movement contributed to overgrazing and then to the growth of woody plants: "The high cattle population has overgrazed the area. This has given space for trees to grow."[14] The increase in population, ethnic federalism/regionalism and strengthening of park control over their movement forced the people to be confined to a small area within which they use the grazing lands in Nech Sar continuously. In the informal interviews, the respondents indicated that confinement of the cattle to limited lands had resulted in overgrazing. About 60 percent of the interviewed Guji believe that the breakdown of transhumance and traditional rangeland management practices are the major causes for degradation of biodiversity in this park. Only about five percent of the interviewees take overgrazing as a cause for expansion of invasive trees to the grassland plains. Prohibition of the traditional use of fire as a management tool was also mentioned as the main reason for increasing cover of invasive species in the grassland plains. In this case, the informants made reference to their historical use of fire in the grasslands before the rain in order to facilitate growth of the new grass. A Guji informant associated the use of fire with control of invasive woody species in the grasslands in this way: "We use fire to

[13] Freeman, Dena. 2006. Natural Resource Management in and around Nech Sar National Park: a situation analysis. Final Report. Forum for Environment. Arba Minch, Ethiopia.

[14] S117 interviewed on 09/10/2010, Nech Sar National Park

kill trees and bushes at the early stages of their growth or before germination in order to facilitate the growth of grasses."[15]

Existing evidences confirm that enforcing settled life on pastoralists disrupts the traditional ecological knowledge of land management practices and affects the grazing land cover negatively. For example, sedentarization of pastoralists was reported as one of the causes for the negative trends in land use/land cover changes in the Northern Afar rangelands of Ethiopia (Diress et al. 2010); in Borana area of Southern Ethiopia, the impeding of mobility as a traditional strategy of rangeland management increased livestock pressure and degraded grazing pastures (Homann 2005, Solomon et al. 2007).

Explaining in spiritual terms is also among the encounters in discussions about the resource trends in the Nech Sar National Park. In the minds of the Guji, changes in the status of grasses, trees, wildlife, and other resources are linked with the nature of relationship with the supernatural world. This connotes that the problems are beyond the outcomes of the direct use, management and conservation directly applied to the natural resources. It appears that more importance is given to spiritual attachments by the elderly. For example, in an informal interview an elder stated: "I think this disaster is happening since our elders are not doing traditional rituals against all kinds of evils anymore."[16] Such a belief is something which can neither be proved nor disproved by conventional methods. Its effect on the relations between conservationists and local people is however significant.

Pastoralists persistently attribute availability of the existing wildlife to their intergenerational caring culture because of some special attachments. For example, when zebras gather in the Nech Sar grassland plains and tend to stand still in groups, the Guji perceive that as a sign of the possibility to rain. The laughing of hyenas also conveys its own message interpreted by the 'wise-men'. Here is a statement which contrasts with the conservationists' view of local people as destructive to wild animals: "We adapted to live together with the animals. Killing the wild animals is not allowed in our culture. If anyone violates this, we traditionally whip the person."[17]

Based on interviews and observations during the field research in Nech Sar in 2010, we conclude that the relationships between people and wildlife differs between carnivores and herbivores. There are also differences in the views towards the different animals within these broad categories. We observed that

[15] S117 interviewed on 09/10/2010, Nech Sar National Park

[16] S120 interviewed on 11/10/2010, Nech Sar National Park

[17] Interview with k03 on 02/07/2010, Nech Sar National Park

zebra used to come and graze near Guji villages. It was also common for us to see the villagers going their way passing by the zebra herds with little reaction to the animals' presence. However, this is not the case when it comes to many of the carnivores and some big herbivore mammals. The case of carnivores is related to their occasional attacks on cattle and other domestic animals. For example, about 100 percent of Guji sample households interviewed disliked hyena. Their justification is that hyenas are many in number and attack their cattle more frequently as compared to other carnivores. Moreover, the oral information has it that buffalo had been locally eliminated by killing from Nech Sar in the early 1970s, before the park was established. This implies the need to conduct deeper investigations and move beyond the panacea of taking local people as ultimate care-takers of the whole biodiversity in Nech Sar. On the other hand, the difficulty of the exclusionary conservation approach as a "park" has been well-documented in other studies (see for example Asebe 2011, Asebe 2012, Girma and Stellmacher 2012). It is also important to be cautious that conservation interventions which undermined the traditional ecological knowledge for about four decades have negatively affected the intimacy of nature and local people in the area. This has negative implications not only on the continuity of the unwritten traditional ecological knowledge but also the positivity of people-nature relations. The level of tolerance mainly towards carnivores is low as shown with an example above of the negative views towards hyena. Generally, the situation now calls for integrated approaches rather than relying on any of the conservationists or traditional ecological knowledge holders.

Contrasting Perceptions on the Park Management

Many conservationists focus on a national park as an area of biodiversity protection. Other park objectives are often considered of lower importance particularly if their repercussions on biodiversity are minimal, if not none. The Guji pastoralists in Nech Sar National Park claim the grassland plains of the park as their ancestral grazing land. Conservationists consider that area as the core conservation zone. Such parts of a park are generally considered as *non-touchable* – consumptive human use is fully prohibited. In other words, allowing human use in this part of the park is taken by conservationists as equivalent to missing the main purpose for which the park was established. Such an argument among the conservationists is made in reference to the Swayne's hartebeest, zebra, kudu, and other grazers for which this area constitutes their main habitats. Generally, conservation needs are at the top of the management objectives defined in the conventional conservation approaches. This is also supported by the Ethiopian wildlife conservation policies and laws. On the contrary, the demands of the Guji

center around the resources needed for their cattle, which are the main sources of their livelihoods. Access to grazing pasture and Abaya and Chamo lakes remain critical issues. When compared with Sermelle River water, the lake water is preferable to the local people most importantly to have healthy cattle due to its salty nature. All decisions and actions that appear to be unfavorable to their cattle are unacceptable to the pastoralists since cattle are the main sources of their livelihoods. Cattle contribute to the Guji households through: (1) direct consumption (milk and milk products, and, sometimes, meat); (2) income generation from direct sale (about 74 percent of income generated); (3) income from sale of milk and milk products; and (4) higher social status as the size of the cattle increases.

Other needs of the people common to the fellow citizens in many rural areas of Ethiopia are infrastructure (e.g. roads), health facilities, school and clean water. The park authorities argue that social facilities can be provided only when they settle outside the park boundaries. Hence, the park authorities have been planning for resettling the people to other areas in order to implement the national wildlife conservation policy. Here comes a conflict between the ancestral claims of the people against the conservation objectives of the park.

The local people have not been participants in the Nech Sar National Park management process since its designation in 1974 (Desalegn 2008). The conservation objectives defined by assuming that the people can be easily resettled outside the Nech Sar National Park had still remained a cause for contested co-existence of the park and people (Taddesse 2009). The antagonistic park-people relations have limited the capacity of the park authorities to the daily struggle to enforce the exclusionary conservation approach. The biologists and natural resource managers alike are not engaged in the technical management of the park given the urgency of illegal park resource uses as defined by the national wildlife conservation law.

Conclusion

Our findings showed that both the pastoralists and conservationists are concerned with the long-term conservation of biodiversity in Nech Sar National Park. However, there are differences in explaining the trends and approaches to management which contributed to stumbling of the path to sustainable biodiversity use, management and conservation in the park. For conservationists, the park is an area for *in situ* biodiversity conservation whereas for the Guji people it is an area for multiple uses with cultural and socio-economic values.

Transdisciplinary approaches in which local people and researchers work together with other stakeholders beyond data collection is useful in minimizing the gap in knowledge and perception. The Adaptive Collaborative Management (ACM) model is a promising approach for bridging the knowledge gaps since it has the potential to facilitate co-learning which involves building of a common vision through two-way communication of knowledge and experiences, learning from each other and collective/joint action.

However, ACM may not be effective on its own without other supporting provisions. There should be a favorable policy framework flexible to accommodate contextual differences. Conservation policies should recognize and work within the context of diverse socio-economic and cultural profiles of people who live inside and adjacent to protected areas throughout the country, Ethiopia. Bringing the policy down to the day-to-day life of people-nature interaction is the other aspect which should be considered seriously. In this regard, practical supports are needed from the governmental and non-governmental bodies concerned with biodiversity conservation in the country. The tense situation in Nech Sar National Park calls for urgent measures. Any delay without practical actions under this condition will only increase the level of tension, conflicts between conservationists and local people and loss of biodiversity.

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