



Local livelihoods and institutions in managing wildlife ecosystems: The case of Babile Elephant Sanctuary in Ethiopia



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ABSTRACT

This paper analyzes inherent incentives and institutional challenges in managing elephant sanctuary ecosystems, using the case of the Babile Elephant Sanctuary in Ethiopia. The study was based on the data collected from local communities experiencing different livelihood systems and experts from the local state authorities. A total of 35 interviews were conducted for an in-depth case study. Results show that historical and socio-political factors have undermined the effectiveness of state-based institutions in managing the ecosystem. The welfare loss of local communities relying on the ecosystem has resulted in a dispute between the state managing the ecosystem and those holding customary rights to the delineated land. Absence of adequate compensation for the crop damage by elephants has made the local people to regard the state intervention as unfair action. The study suggests the need to search for institutional frameworks that can transform hostile relationship into a mutually beneficial one. Such condition may ensure humans' peaceful co-existence with the wildlife without destroying the habitat and constraining sustainable livelihoods.

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Introduction

With increase of human population, the demand for limited natural resources has increased. This situation intensifies conflicts between conservation authorities and local people who generate their livelihoods from these resources. Competition over land resources between local people and wildlife has made rule enforcement challenging and led in some cases to violent conflict as rule enforcers put restrictions on resource use in protected areas (EWCO, 2006). As a result, conservation laws, reserves, parks and wildlife sanctuaries² have often come to be regarded as imposed restrictions that stand against local interests (IIED 1994). This phenomenon correlated with human population increase results in killings of the animals as revenge, which in turn caused shrinkage of habitats (Brashares 2010). In many parts of Africa, conflict between local people and wildlife is probably the major challenge to conservation efforts because the attitudes of the people living adjacent

to wildlife habitats towards conservation are strongly influenced by problems associated with the external effects of wildlife which has been a source of long standing grievance from local communities (Newmark 1996; Newmark 2002). Local communities which are incapable to control the losses and damages caused by wildlife are more likely to develop a negative attitude towards wildlife as well as to the rules and regulations governing wildlife conservation (Newmark & Hough, 2000; Newmark 2008).

In contrast, a number of studies have indicated that people who perceived benefits and enjoy unrestricted access to natural resources usually support wildlife conservation efforts and protected areas (Infield, 1988; Fiallo & Jacobson, 1995). For the conservation of wildlife resources to be effective, attitudes of the local communities towards the conservation program and the resource to be protected must be studied so that the communities' perceived needs and aspirations can be taken into account. Conservation policies and strategies in which conservation is viewed in isolation from human activities and economic interests have proven a failure (Brown, 1998; Sekhar, 2003). In such conservation policies and practices, institutional and social dimensions in managing natural resources are often neglected (Stankey et al., 2005). Nevertheless, conservation realities are overwhelmingly social, cultural, economic and political in nature. The successes or failures of conservation projects are directly dependent on the extent to which these realities are appreciated (Wolmer, 2005; Selman, 2004). A

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² In this case, a sanctuary means an area designated to conserve one or more species of wildlife that require high conservation priority.

firmly held view is that natural resource management and conservation cannot be merely viewed with instrumental reasoning (passive participation of local people); but rather they have to be a product of a social discourse shaped and influenced by social process, institutions, livelihood related human activities and social organizations (Upreti, 2002; Pimbert & Pretty 1997; Leach, Mearns, & Scoones, 1999).

In Ethiopia, conservation practitioners and policy-makers generally take a top-down paradigm in understanding human and environmental relation and the outcome is that governance of protected areas has encountered enormous challenges. This is highly pronounced in some studies (Demel, 1995) where resource management failed to take account of human dimensions, resulting in the development of negative attitude that in turn affected local people's cooperation and involvement in conservation. For example, the Babile Elephant Sanctuary has long standing history of institutional challenges towards conservation management related to social dimensions. Almost forty years ago, the work of Stephenson (1976) drew attention to the need to analyze the underlying institutional context relating to sanctuary ecosystem management while taking account of the views held by different local interest groups. Given significant changes in the condition of natural resources in the Babile Elephant Sanctuary ecosystems and the continuing dilemmas in the resource management, this study examines the human-wildlife competition for space considering the interaction between local livelihoods and institutions in governing the sanctuary. The study specifically emphasizes the attitudes of users pursuing different production systems where the state considers communities' farmland expansions into the territory as unlawful settlement and as illegal acts of encroachment.

Perspectives and policies in biodiversity conservation

The dominant argument

The dominant explanatory model underlying biodiversity conservation policies has been that local land use practices are detrimental to soil, water, vegetation and habitat conservation in general. This is seen as an accelerating threat attributed to the impacts of a growing human population (Barrett, 1995; Jeffrey et al., 2003; McSweeney, 2005) and for the rangelands of the eastern Africa in particular due to spreading agropastoral land use resulting in habitat conversion (Enghoff, 1990; Homewood, 2004). In this region of the continent, despite millennia of coexistence with the African environment, the Indigenous Peoples were not active participants in the colonial discourse related to conservation (Anderson & Grove 1987). The dominant theme in species conservation is that human actions are causes of extinctions. It has been based on this premise that the measure to separate humans from other species has been taken. Such an exercise can be judged from a welfarist point of view where conservation generates negative externalities. These externalities can be extreme under circumstances where resources are scarce. In such conditions, negotiation between the affected and affecting becomes unsuccessful (Harris, 2006).

A new form of regional planning that encompasses a feature of land-use categories is indicated, including trans-boundary contexts. A broad approach that links protected areas with agricultural communities is far more likely to succeed than plans that are narrowly based solely on conservation areas (Barrett & Arcese, 1998). In such approach, ecological, economic, and socio-political issues are addressed together. The existence of multiple tenure systems and the fugitive nature of resource use provide an incentive for "landowners" to cooperate and integrate their conservation goals at a level greater than the management unit. The

community-based natural resource management approach at this stage remains speculative and experimental as tentative steps are made to shift the paradigm from regulatory to community empowerment based on embedded incentives. This process depends on changing attitudes, institutions, behaviors and relationships among actors with common goals (Campbell & Vainio-Mattila, 2003; Mehta & Kellert, 1998; Mehta & Heinen, 2001).

There is a growing consensus among conservationists in that the western national park model involving fencing and fines has failed to protect wildlife in Africa (IIED, 1994). As a result, there has been a search for viable and sustainable alternatives as lasting solutions over the last three decades. This alternative was to establish a negotiated agreement between communities living adjacent to the reserved areas and the conservation authority that promised co-operation, partnership and equitable distribution of costs and benefits attached to the reserve. Prior and clear understanding of the dynamic and complex relationship between wildlife and local people is essential (Brown, 1998). This gives a space to apply the concept of community-based natural resource management where the focal unit for joint management is a local community and where the state can share rights and responsibilities with local communities. A continuum between two extremes – community participation in protecting the park without actually involving them in park management and a complete transfer of ownership of the resource to the local people at the other end – is often practiced. Between these two extremes are joint management models, where representatives of the state, acting within the terms of negotiated contracts, manage the resource together with one or several communities. In general, multiple interests and actors within communities should be examined to make conservation for development successful (Agrawal & Gibson 1999; Borrini-Feyerabend, Pimbert, Farvar, Kothari, & Renard 2004).

Actors and institutions

The Ethiopian Wildlife Conservation Authority as a protected area authority was established and formally recognized as an autonomous body in 1965 (Negarit Gazeta, 1970). Its responsibilities during that period included establishing nine national parks, four wildlife sanctuaries, seven wildlife reserves, and controlled-hunting areas by adopting and implementing a range of hunting and conservation policies (UNESCO, 1964). The proclamation considered all national parks as conservation areas excluding potential users from all kinds of uses (settlement, exploitation of natural resources, grazing of livestock and mining). However, there can be exceptions when such uses have a positive effect for the management of the wildlife and conservation. The imperial government imposed restrictions on uses of previously unregulated natural resources (Moore, 1982; Turton, 1987).

The legal restrictions persisted during the socialist regime (1975–1992) where change in property rights to land has become more stringent as all natural resources were declared to be state property and the government declared itself as the sole entity with full authority to take all necessary measures for their conservation (Negarit Gazeta 1980; Moore, 1982)³. The proclamation established the administrative authority for managing conservation areas and forest reserves and set out offences and penalties in connection

³ The Wildlife Conservation Regulations (No. 416) of 19 January 1972 were issued by the Minister of Agriculture pursuant to the authority vested in it by Article 4 of Game Proclamation No. 61 of 1944 and Article 10 of the Wildlife Conservation Order No. 65 of 1970. These regulations constitute the main body of rules on wildlife management and conservation, and make provision for the creation of national parks, sanctuaries and controlled hunting areas. The Forest and Wildlife Conservation Proclamation No. 192 of 5 September 1980 allows for the demarcation, registration and administration of state forests, national parks and wildlife reserves.

with protected areas. This prohibited certain destructive practices in state and protective forests by preventing unauthorized grazing. The regulation of 1968 specified that exploitation of state forests are reserved to the authority itself, to villagers and local inhabitants under cutting permits and to concessionaires under sales contracts. In other words, the proclamation stipulated the view that the use, conservation and afforestation must be carried out with prior approval of the park management. There were parallel penalty codes for contravening rules or regulations to protect illegal entry into the reserve.

With the downfall of the socialist government in 1991, Ministry of Natural Resources Development and Environmental Protection was formed in the political context where the country was redrawn into regional states. The effect of these changes was that all protected-areas and management responsibilities were transferred to the regions in which they were located, with the exception of the Awash National Park. In 1996, the federal government decentralized some of its authority to the regional governments. This situation evoked further contest on the control of the reserve as it is located at regional boundaries. The emerging contestation have further complicated the governance of resources. In connection to this, studies (e.g. Jacobs & Schloeder, 2001) have underlined that in the peripheral areas where land use conflicts are common, meaningful conservation of wildlife biodiversity becomes difficult to attain.

Eventually, a proclamation was enacted in 2007 underlining the development, conservation and utilization of wildlife resources of the country (FDRE, 2007). The proclamation places restrictions on the following actions around national parks, sanctuaries and wildlife reserves of the country:

- preserving or transferring of any weapons; hunting or fishing;
- propelling any vehicles, aircrafts or boat;
- taking, distributing, destroying, damaging, defacing any natural or man-made objects;
- undertaking agricultural activities or preparing land for cultivation;
- allowing the grazing and watering of domestic animals;
- allowing the passage or keeping of any domestic animals;
- planting, cutting, chopping, removing, taking, damaging or transferring any plant species, and
- setting or attempting to set a fire.

Research methods

Description of the case

The Babile Elephant Sanctuary was established in 1970 in the peripheral areas of eastern Ethiopia. The sanctuary is located 45 km east of the City of Harar, the capital of Harari National Regional State. Geographically, it is situated between latitudes of 8°22'30" and 9°00'30"N and longitudes of 42°01'10" and 43°05'50"E and the elevations range from 850 m to 1785 m. The greater proportion of the Sanctuary (77.7%) is located in the Somali National Regional State while the remaining 22.3% is found in the Oromiya National Regional State. Topographically, it is predominantly characterized as flat to gentle slopes, comprising about 84% of the total Sanctuary area while the remaining 16% consists of complex valleys and deep gorges (Yirmed, 2010). For instance, the Yerer and Gobeles Valleys dissect the sanctuary where the elephants rely on the rivers in the valley as water sources. With 6892 km² in size, the sanctuary is the largest sanctuary in the country that offers protection to elephants (Fig. 1). There are other elephant sanctuaries in the country protecting elephants including Gambella National Park (5061 km²), Geralle National Park (3858 km²), and Omo National

Park (3566 km²). One can find elephants in relatively larger national parks of Ethiopia.

A wide range of wildlife species inhabit the sanctuary serving as tourist attraction reserve including the African elephant (*Loxodonta Africana*), Black-manned lion (*Pantehra leo*), Leopard (*Panthera pardus*) and Hamadryas baboon (*Papio hamadryads*)—the only endemic sub-species in the sanctuary. It is regarded to be the only safe haven of large elephants in East Africa (Yirmed, Renfree, & Short, 2012). Elephants are best seen when they flock from November to March. The sanctuary is also a shelter for the black-haired *Panther Leo Roosevelt* (or Abyssinian Lion) and a range of antelopes and birds. Since its establishment, the sanctuary has undergone significant socio-ecological changes and has been subject to diverse conservation policies of the three successive regimes. At present, various local, regional and non-governmental actors interact and express their diverse and competition interests on the sanctuary. These actors use legal and administrative jurisdiction to create their influence in the management of the resources.

Through these regimes, human interference and multi-actors involvement in the sanctuary have changed ecological and biophysical aspects of the sanctuary, the situation that gradually restricted safe corridors for the elephants' movements pushing them to destroy field crops and other property of local people (Yirmed, Marilyn, Roger, & Richard, 2006). This happened in a situation where changes have occurred in the vegetation conditions of the sanctuary over the years. Stephenson (1976) and Yirmed et al. (2006) categorized the natural vegetation in the Babile elephant sanctuary and its surroundings as roughly two types. Acacia savanna or woodland vegetation form major habitats for elephants and are the densest and extensive in the valley bottoms, but they become increasingly sparse as one moves southwards. Fig. 2 shows the nature of change in the distribution of vegetation types in the sanctuary over the last four decades while Fig. 3 provides estimates of the area covered in three different periods by each vegetation type. In each case, land covered by acacia has been declining since 1972 while that of bush land and rocky habitat has increased, indicating gradual degradation of the sanctuary ecosystem.

Data collection and analysis

The study attempts to identify the impacts of changes in livelihood and natural systems of the case study area and the reasons for changes. To achieve this, we conducted selected interviewees with different categories of the target society including elders, youth and knowledgeable persons representing agropastoral and pastoral communities. Farmers growing crops in the area were also involved in reflections since they are affected by the dynamics mainly because elephants destroy their crops. Diverse socio-economic groups were involved in the study to generate multiple attitudes, worldviews and positions toward elephants and examine the underlying challenges in the elephant sanctuary management. A total of 35 key informants were interviewed in 2010 between March and September including 3 settlers in the sanctuary, 4 local leaders and elders, 6 farmers, 6 herders, 2 scouts, 2 ex-scouts and local government employees (3 experts, 5 field workers and 4 staff protecting the sanctuary)⁴. There were 13 villages inside the sanctuary and 5 adjacent to it. However, in the newly re-demarcated sanctuary, there are 19 villages; that is 6 new villages were added bringing about expansion of the sanctuary. Hence, at present, there

⁴ Settlers are residents in the sanctuary and are mainly herders without being engaged in crop farming. There are also other herders who did not settle in the sanctuary. The scouts are like guards, who are armed and protect the elephant from poaching and report regularly to the state employees working in the office at Babile town.

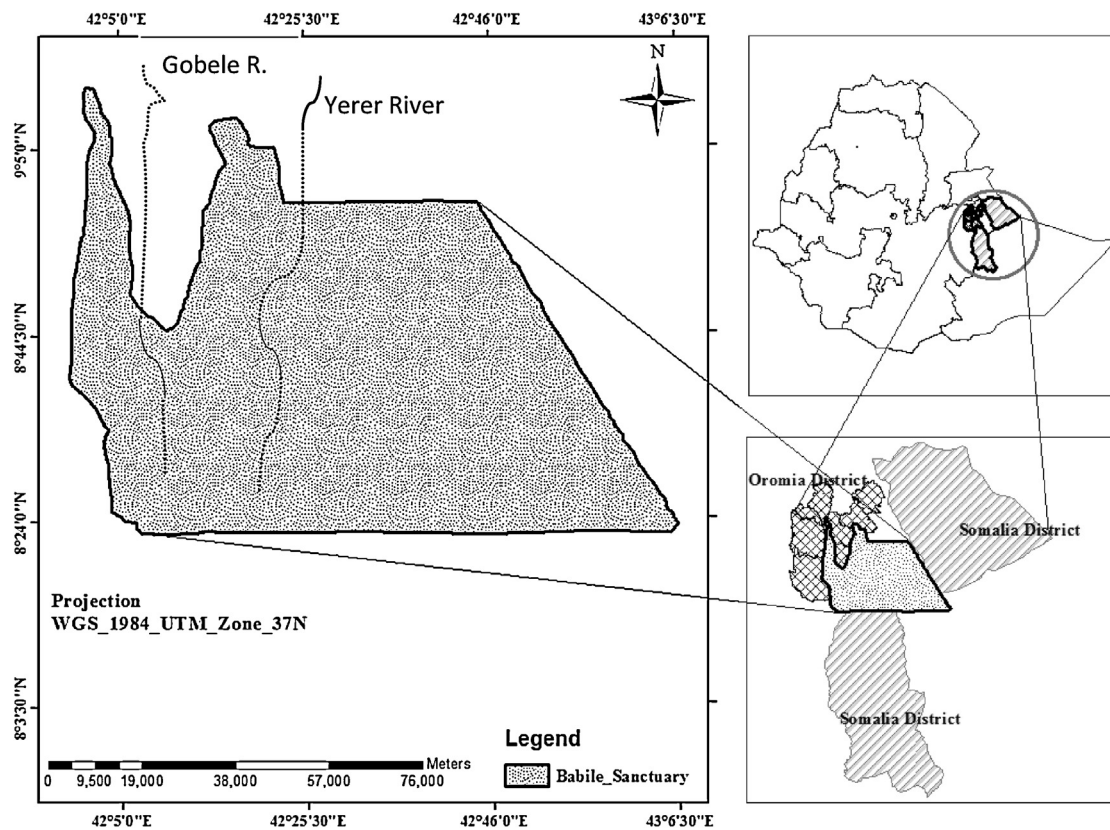


Fig. 1. Location of the study area.

are 36 kebeles⁵ inside the sanctuary and 27 adjacent to it. The same types of questions were used to identify the views, attitudes and experiences of all groups. The questions generally covered among other things the influence of land reform on the management of the sanctuary, principal causes of degradation of the sanctuary, views regarding the feasible management options for the sanctuary (state, joint management, privatization and community-based) and comparison of views regarding the impacts of diverse institutional arrangements during different regimes. The experts responsible for the management of the sanctuary were also involved in the study to gain understanding on the extent to which they involve the community, the functioning of the established environmental club, possible options for preventing encroachment (raising awareness, strict rule enforcement and resettlement) and legal measures introduced to punish poachers and deter further destructions.

Moreover, the interviews engaged the respondents to reflect on the influence of the sanctuary on human settlement, governance of the resource in the sanctuary in the past and the present, and to gain multiple views and thinking on the movement of elephants and human relations. During the interviews emphasis was given to the nature and effects of interactions between the state and the local people with regard to property right were emphasized. Secondary data such as historical events, study reports and official archives and government proclamations were also reviewed to gain understanding about the institutional and policy dimensions of resource control and management, and patterns of changes through time. In addition to interviews, three focus group discussions were conducted among four social groups namely, elders and traditional leaders, women, youth and adult pastoralists in order

to explore the history of property right regimes and institutional arrangements adopted in managing wildlife ecosystems. The discussions and reflections were carefully transcribed. Then attempts were made to develop insights about the major concerns that dominate the perceptions of the respondents. Data was then analyzed through content analysis. Comparative data analysis was used to categorize similar views and mutually reinforcing issues into general themes and to categorize different ideas into categories of perspectives. To increase the validity of the assertions and positions held and the experienced shared, triangulation was used, mainly when comparing the views held by the local state authorities and that held by the representatives of the local people who lay claim to the land under the elephant sanctuary.

Results and discussion

Evolving institutions in managing the ecosystem

Discussions and references to various historical accounts indicate the complexity of institutions in managing the ecosystem which has affected local livelihoods. To start with the imperial regime, most of the sanctuary ecosystem and adjacent land with its natural resources was governed by feudal lords (locally named as *Fitawurari*) and governors appointed by the monarch. Local people were ignored and the resource was under the ownership of monarchies and landlords where wildlife and other natural resources in the reserve were under custodianship and ownership of imperial regime. Although the sanctuary was demarcated and delineated without considering local interests, it was generally labeled as if it were decided in the name of public interest. As a result, the local people who in the past had indigenous and relatively freer access to the protected areas fell under the subordination of monarchical

⁵ Lowest administrative units in Ethiopia.

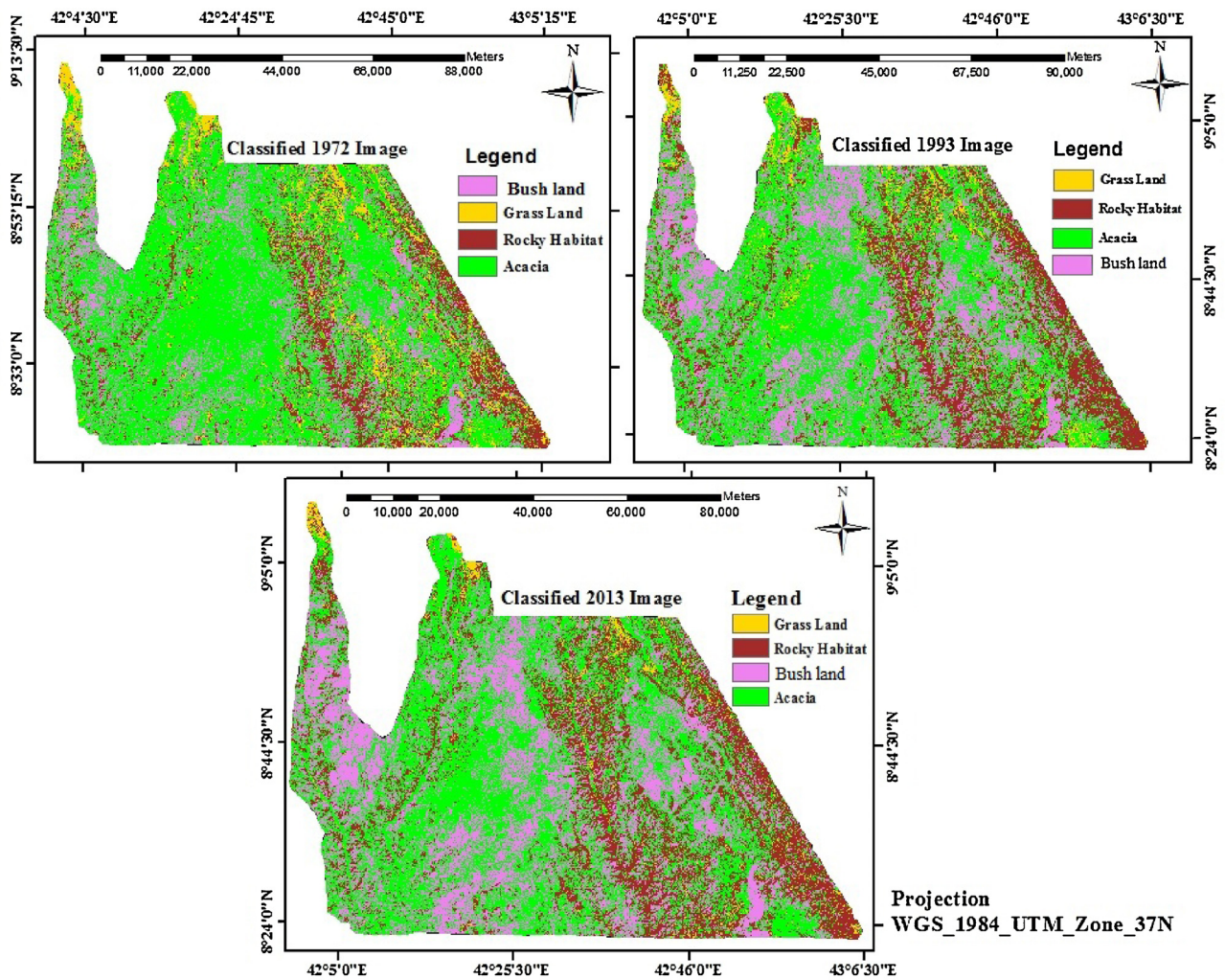


Fig. 2. Distribution patterns of vegetation conditions between 1972 and 2013. (This figure was prepared using satellite images taken at different periods (multi-temporal remote sensing data)).

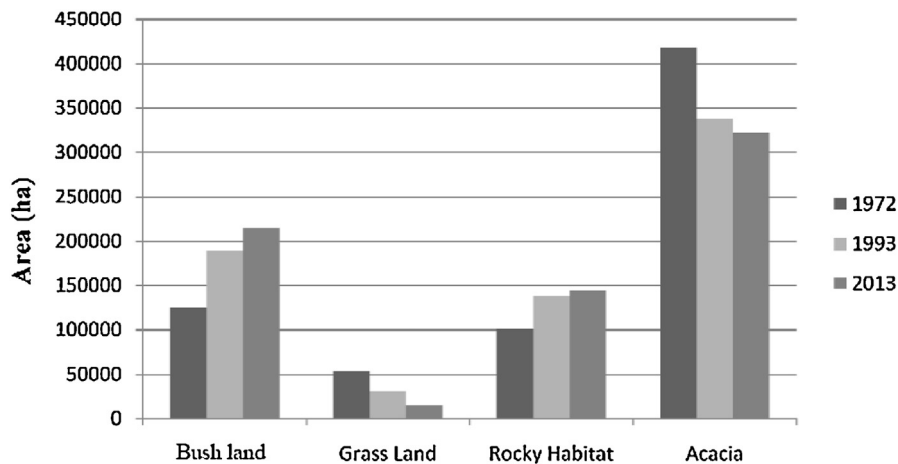


Fig. 3. Area coverage of different vegetation types at different times (in ha).

Source: Produced using satellite Images. (Two sources of information (remote sensing driven classification map and reference test information) and confusion matrix were used to estimate the area under each vegetation category; and overall classification accuracy is 93.75% (Based on Jensen, 2004)).

regime. They became direct victims of the rules, restrictions and regulations adopted to advance the interests of the latter where the resource was meant to expand recreational areas during the leisure time of the rulers.

Subsequent to the collapse of the imperial regime, residents inside and around the sanctuary who used the resource by default had reclaimed unrestricted access to the area they had been denied access and began to cultivate the lands and encroached into the

nearby marginal forestlands. The land under the administration of the landlords and royal families was nationalized by the 1975 rural land proclamation and the land designated under the clan leadership was taken over by individuals. The institutional change at the national level has caused change in governance of the sanctuary where peasant associations became agents of the government to handle land related issues. The peasant associations assumed power to distribute and administer the lands and other resources outside the wildlife habitat, but there was institutional vacuum where the forest area and wildlife habitat was seriously depleted and remained de facto open access although the national legislation maintained the previously enacted law to protect conservation areas. For the local people, the protected area was a source of firewood, charcoal, raw materials for construction of fences and houses. And such right of subtractive use has been enjoyed for generations.

Before the 1975 land reform, land was under the local clan chiefdoms and landlords where local people graze their camels and cattle paying fees managed access to resources and disputes over such accesses through customary resource management; individuals had use rights in exchange for certain fees to the landlord. In contrast, the land reform has prevented sustainability of customary land management as land was put under the control of the socialist state. The shift in property rights from communal to the state and the removal of payment of fee has locally created a de facto open access since peasant associations⁶ lacked the capacity to enforce environmental protection law. These associations had allocated part of public grazing land reserved for dry seasons to meet the increasing farm land demand of the growing population in the area. Simultaneously, villages were established by settlers who came from other areas in search of farmlands. This created a condition where outsiders joined resident farmers and competed for the same scarce resources.

The rules and regulations of the current regime are those inherited from the socialist regime. Little or no change took place except new proclamation on conservation and development of protected areas that allows some rights to use some resources from the protected areas. An important change in this case is the removal of elite capture problem (where elite members of the society exclude others and use water for themselves) that persisted during the imperial regime. The local administrators of the current government allow the right to use water resources in the sanctuary for irrigated farming. As a result of this, some of the community members have been able to increase their income from growing high value fruit (e.g. mango and banana) and vegetable crops (e.g. carrot, onion and cabbage). Average landholding among residents of the upper part of the sanctuary is 1.4 ha. Interviews with key informants show that property rights to land to grow such crops have been transferred from father to son based on patriarchal line. Some of these lands were acquired through distribution by the state and customarily by clan leaders. In the society, daughters are not entitled to inherit land since they leave their patrilineal community when they are married. It is important to note that all land certification measures improving the security of land rights do not consider re-demarcated areas around the sanctuary to overcome further settlement in the sanctuary.

The legal means to enforce rules and protect property rights is vested in the court. Thus, the law enforcement procedure passes through three tiers of governance *kebele*, *woreda* and zone. As the sanctuary's coverage extends into two neighboring regional

governments, the wildlife habitat is jointly administered through the collaboration of Somali and Oromia national regional states. Sanctioning by the scout is used as a rule enforcement strategy and to identify those committing an offensive act (e.g. killing animals). In 1997, official record reveals a total of 6 offences on poaching elephant and resulted in a penalty for one year imprisonment. Between 1997 and 2000, 99 individuals were presented to the regional court due to charcoal trafficking. Each was sentenced to two to five years in prison. This has produced behavioral change where poaching elephants was reduced in the subsequent years. Insights from interviews with scouts indicate that they discourage illegal poaching through monitoring on daily basis.

However, enforcing rules become weak since those caught by the scouts while cutting trees are sometimes left without being convicted and punished. This situation is believed to pose a negative impact on wildlife and habitat conservation as it lowers the reliability of the scouts in enforcing the existing regulation and since it increases disobedience. Another factor that weakens the rule enforcement effort is friendship and kinship between the scouts and those committing an offence. The scouts that monitor the sanctuary are largely recruited from local areas. The main challenge is that the relatives and close friends of the scouts are freed from conviction. The respondents' views indicate that kinship makes rule enforcement non-neutral. This is contrary to the common assumption regarding the importance of decentralization of governance to protect areas where such policy targets indigenous residents to benefit (Hillman, 1993). This particular case revealed that the central challenge in decentralization is developing an effective mechanism in monitoring.

Interface between institutions and livelihoods

Before the creation of Babile Wildlife Conservation area as an Elephant Sanctuary, the surroundings vast land was originally known as a hunting site for local people. At present, the sanctuary habitats in general and natural vegetation of the Yerer valley in particular are being exploited in a destructive and unsustainable manner. The entire area has already encountered a looming threat of deforestation and environmental degradation due to the intrusion of large number of farmers and their livestock. The rangeland of the Yerer–Daketa valley has shrunk by about 65% since 1976 (Yirmed et al., 2006). The expansion of agricultural activities southward to the inner most part of the sanctuary had continued for the last 30 years. Communities in the vicinity of the valley are engaged partly in pastoralism and use the valley for livestock grazing and for cultivating sorghum, maize and peanuts (Demel, 1995).

The effort to grasp the interface between institutions and livelihoods requires sufficient understanding of the different types of land uses and users and paying attention to prevailing institutional arrangements. The focus group discussions revealed that there are different land resource uses with different attributes and property rights structure including grazing lands and crop lands. The data shows that these uses are linked to locations of local users. Other types of uses also exist: construction, provision of energy for cooking and heating, medical care (traditional veterinary services), fencing of homes and as livestock shelters.

These uses intensify as human and livestock population increases in the ecosystem of the sanctuary. An important example is women's engagement in selling cactus at Harar and Babile markets. Thatch grass along the river valley has also been exploited and being used for making livestock shades. Institutions governing different types of uses and the nature of users vary depending on conditions. The timing, technology used, purpose of use and the quantity of resource units harvested are usually determined by operational rules devised by those holding the collective-choice rights (or state authority) of management and exclusion over the

⁶ Peasant Associations (PAs) were created in 1975 to implement the program of land distribution and to provide an organizational structure in rural areas. PAs are also charged with the responsibility of using and preserving natural resources (soil, water and forests) in their areas of jurisdiction.

resource system. However, the quantity and timing of using the resource for grazing (and browsing) purposes remained uncontrolled by the sanctuary authorities. This caused an open-access situation to occur. For instance, for grazing, users do not request the permission of authorities. The respondents made clear that other types of uses such as cutting trees for fuel wood and construction are difficult to control if entry for grazing is not restricted or made at least conditional. The type of uses and the possibility that users might change their behavior while they are supposed to use the area for grazing create ambiguities on the part of rule enforcers and temptation to cheat on the part of users. This condition designates the challenge to enforce rules in multiple tenure systems (Sjaastad & Bromley, 2000).

The other dimension of resource attributes is the allocation of water for different purposes: for livestock, for wildlife and for irrigated farming especially along the river banks. There is deep concern and dilemma between short-term need to address food security through diversification (various crops and livestock) and sustainability of resource use to manage the sanctuary. In this semi-arid area, water is an essential resource for the survival of local people and to maintain their diverse livelihoods. Sources of water in the area are hand-dug wells, digging stream beds, ponds, and reservoirs. Livestock get water from shallow wells and seasonal streams during the wet season and from deep hand-dug wells during dry seasons. Wells are dug up to eight meters deep and that requires enormous labor for excavating the soil and lifting water. The relatively wealthier members of the communities with large herd sizes need more labor to lift water, but members of poorer households may supply such labor in exchange for food or promises of a future calf. Absence in river-basin management and water-use rules tends to induce competition and challenge to future availability of the water resources for the wildlife. The nature of resource use system described here indicates that pursuing all forms of livelihoods would threaten the sanctuary ecosystem since certain livelihoods necessitate destructive use of other resources from the sanctuary. This has an implication for the type of water management institutions needed to preserve the sanctuary. Such institutions should restrict investment in water development that affects the ecosystems and water availability for the wildlife.

Compost-making, provision of improved cereal and oil seeds to improve food security is an important agricultural extension service common in the ecosystem. However, crop damage by the elephants from the sanctuary is a threat to increasing benefits from farming⁷. The Agriculture and Rural Development Office of the Babile district has received multiple reports by farmers of repeated crop damage by elephants. In response to the complaints, the office has allocated annual budget for crop damage compensation scheme to create an amicable relationship between the local community and the elephants. This is an important measure that promotes mutual-coexistence of the wildlife sanctuary and the surrounding agropastoralists and farmers. In-kind compensations such as provision of seeds for free and participation in the productive safety-net program⁸ are some of the schemes introduced to neutralize the external effects of wildlife conservation. However, the respondents' views suggested that there is no clear rule of compensation. There are complaints that some of the damages caused by elephants on the property of local people remained uncompensated by the

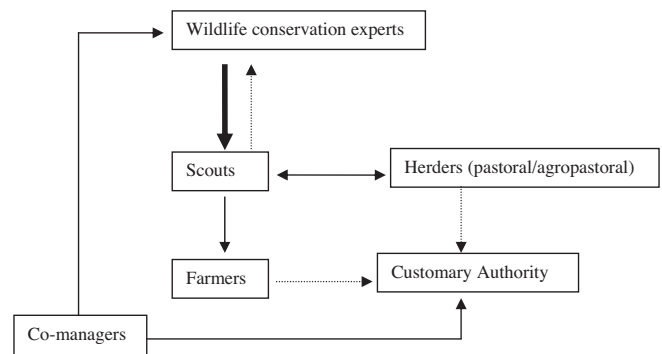


Fig. 4. Governance structure of the sanctuary.

authorities of the elephant sanctuary although they took the initiative to estimate the extent of damage. Inconsistency in rules and delay in compensation process developed grievance among those who begin to regard the sanctuary as harbor for their enemies which destroy their livelihoods. As a result, farmers and agropastoralists try their best to keep away the elephants from their plot. When elephants raid their farms unexpectedly, the agropastoralists become intolerant and shoot the elephants to revenge the damaged they have caused on their crops.

Strategizing for better ecosystem management

In the absence of clear rules on access to the sanctuary for grazing and browsing purposes, there are indigenous management mechanisms that contribute to the resilience of the ecosystem. Field observation shows that although there are no operational rules working on the ground, indigenous people consider resource conservation in their management strategies. Livestock graze on the densely bushed hillside during the wet season, but are allowed to browse along the river side and on croplands during the dry season to prevent degradation of the grazing commons in the sanctuary. In this case, indigenous grazing land management in the management plan enhances sustainable resource use and encourages community sense of ownership.

A better management of the sanctuary ecosystem can be realized by combining the management plans of the sanctuary authorities and the local communities. This is largely linked to the national and international efforts made in utilizing indigenous knowledge to induce adaptive management mechanisms of the pastoral and agro-pastoral communities so that they can use the natural resource base as a source of forage for their herds in a sustainable manner. This condition can be achieved through nurturing and taking into account indigenous practices in the management plan geared towards co-management.

It is, therefore, useful to look at the nature of existing governance structure that would support co-management. Wildlife conservation experts make use of information from scouts to make administrative decision. The scouts provide regular feedback to the experts over the behavior of farmers and herders, specifically on how they use natural resources within the sanctuary. Though the scouts are recruited by the experts as the ultimate governing unit to implement wildlife policies on the ground, they also negotiate with herders. The scouts are even being manipulated by the herders themselves on conditions under which they make use of the grazing and water resources. The key role of customary authorities including elders and clan heads in resolving disagreements between the scouts and the herders/farmers is critical in the management of the sanctuary (Fig. 4).

The nature of the relationship between the scouts and herders is different from that of farmers. For instance, while farmers'

⁷ Our interviews show that farmers recognize the area presently cultivated was once elephants' roaming area. Their action is a question of survival and they feel that they better tolerate the damage. A farmer was explaining the tolerance of the elephants to the local community 'a person who does not know his limit is killed by the elephants.'

⁸ This involves participation of the poor in rangeland rehabilitation where they receive grain in return for labor contribution.

resource use behavior involves destruction of the sanctuary ecosystems through expansion of farm lands, that of herders requires fugitive resource use involving grazing, which is believed to be non-destructive if monitored effectively. Discussions with the key informants indicated that more sustainable management institutions can be created by introducing of a co-management approach. In such a case, recognizing and empowering customary authorities, having adequate knowledge of the condition of the sanctuary and the capability to influence local action by farmers and herders are essential first step. The co-managers constituting representative of customary authorities and wildlife conservation experts would be instrumental in transforming conflictual relationships between local people and conservation authority into a cooperative scenario. The respondents emphasized during interviews that co-management helps in designing and enforcing institutions of resource use and in the protection of the sanctuary by providing space for the elephants. On their part, experts viewed that the engagement of customary authorities would pave the way for the local people to comply with state law and communicate emerging local interests, which helps the co-managers to reconcile conservation and local development needs. The specific problems associated with excessive grazing and use of water from the sanctuary can be monitored through introducing operational rules designed by the co-managers. The influential position that the customary authorities have in constraining undesirable behavior could be exploited in such a setting. For example, institutional designs following a co-management approach have proved to be successful in managing National Parks in Australia, where the hunting rights of the Aboriginals was respected while wildlife in certain part of such parks is still kept intact for tourism through ensuring the good will of the hunters (Bauman & Smyth, 2007). This indicates how co-management generates a win-win solution.

Moreover, development interventions after the national reform (or business re-engineering process⁹) have been reconsidered to include the biodiversity and wildlife extension and transfer of the land use administration to be implemented at the regional level. This is a new reform that clearly assists the conservation of the wildlife sanctuary. An important component in this wildlife extension is the creation of environmental clubs¹⁰ with active involvement of the scouts and the support of the non-governmental organizations. In this case, the scouts have three main duties: awareness creation and environmental education, tourist guidance and protection of wildlife and monitoring and conservation of habitat and biodiversity. As an activity, wildlife and habitat conservation education had contributed significantly in persuading the local community to support wildlife conservation. The wildlife ward underlined that wildlife extension was conducted occasionally when the scouts carry out monitoring daily. They mobilize local community and funding agencies for environmental education.

Initiatives by the NGO 'Menschen fuer Menschen' in activities such as area closures and agro-forestry contributed to the conservation of the sanctuary ecosystems. The major activities are enclosures and hillsides flood and erosion control practices and moisture conservation structure such as micro basins that have been extensively applied. There were cultivation of various multipurpose tree species¹¹ with both economic and ecological importance in terms of recovery of local species, prevention of flood and erosion and mitigating changes in the micro-climate.

Key informants have expressed their witnesses of the reappearance of once disappeared wildlife such as leopard, rabbits and others. Observation of the local residents over the past 15 years reveals the restoration of springs and the return of wildlife which abandoned the sanctuary. A related study on Sariska Tiger Reserve in India shows that such a result of conservation generating direct benefit to the society can influence their attitude towards management of the ecosystem (Sekhar, 2003).

Another reason for introducing co-management arrangement as an alternative is the size of the sanctuary ecosystem that puts a limit to sole dependence on scouts for monitoring purposes. As the sanctuary is the largest¹² conservation area in the country, monitoring cost becomes too high. The authority experienced a high staff turnover due to poor incentive schemes such as low salary losing nine out of sixteen of its staff in one year recently that made the remaining scouts ineffective in their task of monitoring. The placement of beacons as a means to designate the boundary of the sanctuary can rarely be respected as a rule enforcement strategy as monitoring becomes difficult. Although the sanctuary has been legally recognized, it does not have an official map (as re-demarcation is not yet finalized). In addition, it fails to receive public recognition (compared to Awash and Semien Mountain national parks). As a result, enforcing property rights at local level remains a critical challenge and has become the source of ambiguity.

Supply of technologies reducing direct dependence of users on the natural resource contributes to better management of the ecosystem. For example, residents observe that using improved cooking stoves in the area has reduced the wood consumption that contributed indirectly to reduction of women's work load. This has been largely reinforced by the participation of women in the credit and saving scheme of the Menschen fuer Menschen which has increased women's access to cash through involvement in income generating activities such as dairy product marketing, poultry production and petty trading of fruits (e.g. mangoes) and vegetables (e.g. cabbages, shallots and green peppers). The income earned from such activities is said to have reduced women's collection of wood as source of cash. This facilitated the restoration and preservation of the sanctuary ecosystem. Between 2005 and 2007, 670 members participated in the scheme and earned 1.3 million Ethiopian Birr (76,470 US Dollars). Discussion with experts indicates that there is also a plan to extend this to a level of cooperative in the years to come.

Such local actions complement the national legislation associated with the proclamation enacted in 2007 as outlined in Section 2.2 (FDRE, 2007). Nevertheless, adoption of this set of regulations requires participation of local beneficiaries in the re-demarcation of the sanctuary where local elders and religious leaders as community representatives take part in the process of re-demarcation (EWCO, 2006). In addition, discussion with the conservation experts who are responsible for monitoring the management process indicates that the views of the beneficiaries did not influence the process because the idea of re-demarcation was not sufficiently discussed with the wider community. This seems to have increased the risk of resistance towards the regulations outlined in the proclamation. A delegation of members from the federal Ministry of Agriculture and Rural Development and various offices at different levels has classified the land use as cropland, grazing land, strict protected area and reserve. An interview with a scout involved in the placement of beacon that serves as a signal beyond which certain actions are not allowed indicated that the area regarded as a reserve can also be used for cultivation by

⁹ This is an organizational reform implemented nationwide to improve efficiency within state ministries at all levels.

¹⁰ Environmental clubs are civil society organizations that support wildlife conservation.

¹¹ The dominant tree species used include *Acacia Saligna*, *Jacaranda*, *Gravillea Robusta*, *Millea ecuadorensis*, and *Corida Africana*.

¹² The elephants move over these wider areas following their seasonal foraging and vegetation pattern.

farmers depending on conditions while other places considered as a strict elephant sanctuary are used only for livestock grazing. Beacons are used as a rule enforcing strategy and monitored by the scouts. This decision is contradictory to the decision of the regional land use administration and planning that undermines keeping a buffer zone that becomes a source of conflict.

So the sanctuary management established a buffer zone between the restricted conservation area and land used for agricultural purposes, but the local communities still do other activities inside this buffer zone other than grazing. The idea is that the buffer zone can be used only for grazing in which the elephants would not directly destroy the crops as soon as they move out of the sanctuary. Up to 3 km buffer zone was proposed though the committee did not accept the proposal. Hence, the beacon was placed at this distance. The presence of a buffer zone, instead of a strict boundary, prevents the elephants from moving within the restricted area and from having direct contact with farmers' crop fields. The buffer zone serves as a middle ground between the farmers and elephants. This indicates that contradictory decisions at local level between the Regional Bureau of Agriculture and the conservation authority create a dilemma for action among resource users. Such legal pluralism is often found to be a source of confusion, conflict and inefficiency in designing institutions for sustainable management of the commons (Meinzen-Dick & Pradhan, 2001).

Despite this controversy at administrative level, mixed views are held at local level among farmers in favoring conservation of the elephant sanctuary. Though a few farmers tend to shoot elephants when their crops are damaged, others recognize the rights of the animal to live in the ecosystem. The latter group's view is embedded in socio-cultural belief system of the society which provides a substantive justification for the survival of creatures in their habitat. This eco-centric view in the culture can be taken up as an opportunity to conserve the sanctuary and improve ecosystem management. In the contemporary literature on environmental and resource economics, resource use systems that undermine destructive behavior increases the likelihood of eco-centric view (preservation of resource units from any human interference) to perpetuate (Tietenberg & Lewis, 2009).

A more appealing strategy is to reinforce such an attitude through sharing conservation benefits to local people. A study from India indicates that there is a correlation between benefits obtained from wildlife tourism and other sources. Experiences showed that support for protected area management such policy creates incentives for conservation and induces behavioral and attitudinal change at local level (Sekhar, 2003). This is an intervention strategy that overcomes the protracted conflict between local people's livelihoods and biodiversity conservation policy (Brown, 1998). While the competition for space between and among communities of multiple land-use systems on the one hand and between them and the wildlife on the other hand is evident, the inherent nature of institutional weaknesses in terms of enforcing rules and introducing incentive-driven conservation to promote attitudinal change at local level remain the underlying challenge in managing the sanctuary ecosystem.

Conclusions

This study presents the human-wildlife competition for space to ensure survival under growing relative resource scarcity due to population pressure and the impact of change in the micro-climate. The state's benefit through generating revenue from wildlife conservation and interest to conserve biodiversity poses a threat to local livelihood causing the development of hostile relationship between the wildlife and local communities through time. This indicates the need to search for institutions that transform the

relationship into a mutually beneficial one that ensures peaceful co-existence of humans with the wildlife. The analysis shows that the use of the sanctuary for grazing is less competitive with the conservation objective of the sanctuary since such land use has little negative impact on the sanctuary compared to expansion of farming along the river valley inside the sanctuary as farming negatively affects the resilience of the ecosystem. Despite this, the use of the sanctuary as a grazing space may create an opportunity for transfer of certain diseases from animals to humans (zoonoses) and perhaps from livestock to wildlife. In any case, the institutional ambiguity created due to legal pluralism, multiple resource users and intersectoral competition (tourism versus agriculture) has threatened local livelihoods as well as the sustainability of elephant sanctuary ecosystem. Attention has been given to the income that the local government earns from tourism in the area that has been increasing while the local interests are undermined. The same problem prevails in other national parks in the country such as the Awash National Park where violent conflict often occurs between herders and scouts (Jemal, Bogale, & Hagedorn, 2008). This suggests the need for creation of management institutions that should keep a balance between local livelihoods and conservation of the sanctuary so that the benefits from tourism support development efforts at the local level.

Insights from the results indicate that the need to introduce co-management as a governance structure for the sanctuary and designing and enforcing institutions that promote collective action where resource users and conservation experts open up a space for recurring consultation. An increase in human population and a parallel increase in demand for natural resources such as grazing land, charcoal production and water would put a threat to the sanctuary unless such institutional mechanism is introduced. The involvement of non-state actors working on conservation and development in the area should be reinforced as such initiatives may complement state efforts in investing in rehabilitation of degraded area. This in turn may improve farmland productivity and reduce the expansion of farming. This strategy coupled with other institutional strategies set to reduce welfare loss of farmers due to the damage of crop fields by the elephants may help in making co-management sustainable. The result of this study has important policy implication for the conservation of the sanctuary and for realizing sustainable local livelihoods. The effort to develop a favorable attitude among the local people towards co-management should meet important preconditions including training to enhance local understanding and development of eco-tourism that benefits the local people through generating revenue from tourism activities. This process assists in making the nature to become part of the culture which will ensure and increase community's commitment in protecting the wildlife in the sanctuary.

Appendix A. Appendix: List of Questions

A. Key informants interview guide

1. Status of natural resources in spectrum of policy shifts and impacts of dynamic policies changes on management of the sanctuary:
 - a) pre land reform policy (pre-1975)
 - b) after policy of land reform
 - c) collectivization (producers' co-operative)
 - d) villagization
 - e) current policy
2. What do you think are the major causes of natural resource degradation in the sanctuary (e.g. the wildlife, grazing areas, farm plot fertility, bush cover in the hill slopes)?

3. How long has the community been in existence in the area? When did different social, ethnic and cultural groups settle in the community? How has community changed over time and what has caused those changes?
4. Any specific concern of the community came-across at different events about the significant degradation of the sanctuary (e.g. who own the land and who should respond to its degradation?)
5. In your view, what can the community do in the future and how important is collective action, given the seriousness of the problem (especially, the commons: grazing land, hill slopes, etc.)? Which of the following management system would you recommend and why?
 - a) exclusive state control
 - b) joint management between the state and community
 - c) privatization
 - d) exclusive community control
6. How do you judge community participation and attitude towards wide life conservation activities?

B. Interview guide for focus groups discussions

1. What do you think are the major causes of natural resource degradation in the area?
2. Considering the rate of resource degradation in the sanctuary what do you think should be done to reverse it in a way it supports wildlife and the existing human and livestock population?
3. Would you please indicate level of importance of the above institutions (external and local institutions) in addressing the sanctuary management?
4. If there is no any local/community based organization targeting natural resource management, would you suggest having one? How can local institutions tackle the problems? What capacities and incentive are needed?
5. Common conflicts on use of common resources and consequences; how did you resolve such conflict?
6. Can you elaborate the impact of Derg's (socialist regime) policy on the sanctuary management?
7. Do you know anything about the activities of the sanctuary management activities of the conservation experts in Babile? Please elaborate.
8. Would you please comment on the following issues related to the management of the sanctuary?
 - Expansion of agriculture and cropping patterns and their impact
 - Population increase (wildlife, livestock and human) and their interaction with natural resources
 - Diverse benefits from the commons in the sanctuary for different households within and outside the sanctuary
 - Consequences of the sanctuary degradation on economic and social well-being of the community
 - Possibilities to mobilize community level cooperation, given the difference in interests and benefits from the commons
 - Types of external support needed (local government and NGOs) to enhance the management of the sanctuary

C. Interview Guide for Wildlife Conservation (state actors)

a) Boundary of the Sanctuary

1. Is there clear demarcation between local farm holding and the sanctuary? Yes/no.
If yes, how was it established and what were the challenges in the demarcation process? Can you tell me the demarcated area in sq. km?
2. How was the zoning of the sanctuary made to overcome possible conflicts?

3. Could you indicate the number of villages included in the newly demarcated sanctuary?
4. Does the local community encroach into sanctuary? Yes/no. If yes what are the reasons?
5. What measures have been taken to stop community encroachment? Community level discussion/awareness, legal enforcement, resettlement and others specify.....
6. If the local community cut trees for different purposes, what measures are taken to protect such an erosive activity?

b) Managements

- How does the sanctuary management involve the local community in wildlife conservations and its related problems?
- Does the sanctuary management has structures or committees at the community level? Please explain.
- What are their functions? Describe briefly.
- What are their limitations/constraints in the conservation of the sanctuary?
- What are the solutions for these constraints?

c) Environmental Educations and Clubs Established

1. Does the sanctuary authority give environmental educations and awareness creation of wildlife conservations? Is there any program arranged? If yes,
 - How frequent the education given to the community?
 - Is there monitoring mechanisms on effect of environmental education?
2. Do the sanctuary authority have established environmental or wildlife clubs or associations at community level or school levels? If yes, how do they function? What hampers the establishment/functioning of environmental clubs?
3. Did you come across cases of poaching of the elephants in the sanctuary? Yes/no. If yes, how were the cases often brought to the court? What legal measures were taken? What were the challenges faced in the legal process? Please describe.

References

- Agrawal, A., & Gibson, C. C. (1999). *Enchantment and disenchantment: The role of communities in natural resource conservation*. *World Development*, 27(4), 629–649.
- Anderson, D., & Grove, R. (1987). *The scramble for Eden: Past, present and future in African conservation*. In D. Anderson, & R. Grove (Eds.), *Conservation in Africa: People, policies and practice*. Cambridge, UK: Cambridge University Press.
- Barrett, C. B. (1995). *Are integrated conservation-development projects (ICDPs) sustainable? On the conservation of large mammals in sub-Saharan Africa*. *World Development*, 23(7), 1073–1084.
- Barrett, C. B., & Arcese, P. (1998). *Wildlife harvest in integrated conservation and development projects: Linking harvest to household demand, agricultural production, and environmental shocks in the Serengeti*. *Land Economics*, 74(4), 449–465.
- Bauman, T., & Smyth, D. (2007). *Indigenous partnerships in protected area management in Australia: Three case studies*. Canberra, Australia: Australian Institute of Aboriginal and Torres Strait Islander Studies.
- Borrini-Feyerabend, G., Pimbert, M., Farvar, M. T., Kothari, A., & Renard, Y. (2004). *Sharing power. Learning by doing in co-management of natural resources throughout the world*. Ceneza, Tehran: IIED and IUCN/CMWG.
- Brashares, J. S. (2010). *Wildlife declines in protected areas*. *Science*, 329, 402–403.
- Brown, K. (1998). *The political ecology of biodiversity, conservation and development in Nepal's Terai: Confused meanings, means and ends: An Analysis*. *Ecological Economics*, 24(1), 73–87.
- Campbell, L. M., & Vainio-Mattila, A. (2003). *Participatory development and community-based conservation: Opportunities missed for lessons learned?* *Human Ecology*, 31(3), 417–437.
- Demel, T. (1995). *Floristic composition of Daketa Valley Southeast Ethiopia: An implication for the biodiversity*. *Mountain Research and Development*, 15(2), 183–186.
- EWCO (Ethiopian Wildlife Conservation Organization). (2006). *Assessment report on threat to the Babile Elephant Sanctuary and the possibility of boundary re-demarcation*. Ethiopia: Addis Ababa.

- Enghoff, M. (1990). *Wildlife conservation, ecological strategies and pastoral communities: A contribution to the understanding of parks and peoples in East Africa. Nomadic Peoples*, 25(27), 93–107.
- Federal Democratic Republic of Ethiopia (FDRE). (2007). *A proclamation to provide for the development, conservation and utilization of wildlife*. In No. 541. 2007. Ethiopia: Addis Ababa.
- Fiallo, E. B., & Jacobson, S. K. (1995). *Local communities and protected areas: Attitudes of rural residents towards conservation and Machalilla National Park. Environmental Conservation*, 22, 241–249.
- Harris, J. M. (2006). *Environmental and Natural resource economics: A contemporary approach*. New York: Houghton Mifflin Company.
- Hillman, J. C. (1993). *Ethiopia: Compendium of Wildlife Conservation Information, Vol. 1: NYZS*. New York Zoological Park, Bronx, NY: The Wildlife Conservation Society—International.
- Homewood, K. M. (2004). *Policy, environment and development in African rangelands. Environmental Science and Policy*, 7, 125–143.
- IIED. (1994). *Whose Eden: An overview of community approaches to wildlife management*. London, UK: IIED.
- Infield, M. (1988). *Attitudes of a rural community towards conservation and a local conservation area in Natal, South Africa. Biological Conservation*, 45, 21–46.
- Jacobs, M. J., & Schloeder, C. A. (2001). *Impacts of conflict on biodiversity and protected areas in Ethiopia. Biodiversity support program*. Washington, D.C.: World Wildlife Fund.
- Jeffrey, K., McKee, Paul, W., Sciuilli, C., David, F., & Thomas, A. W. (2003). *Forecasting global biodiversity threats associated with human population growth. Biological Conservation*, 115, 161–164.
- Jemal, H., Bogale, A., & Hagedorn, K. (2008). *Welfare loss for pastoralists due to wildlife protection areas: The case of Awash National Park, Ethiopia. Quarterly Journal of International Agriculture*, 47(3), 217–238.
- Jensen, J. R. (2004). *Introductory digital image processing: A remote sensing perspective (3rd ed.)*. New Jersey: Prentice Hall.
- Leach, M., Mearns, R., & Scoones, I. (1999). *Environmental entitlements: Dynamics and institutions in community-based natural resource management. World Development*, 27, 225–247.
- McSweeney, K. (2005). *Indigenous population growth in the lowland neotropics: Social science insights for biodiversity conservation. Conservation Biology*, 19(5), 1375–1384.
- Mehta, J. N., & Kellert, S. R. (1998). *Local attitudes toward community-based conservation policy and programmes in Nepal: A case study in the Makalu-Barun Conservation Area. Environmental Conservation*, 25(4), 320–333.
- Mehta, J. N., & Heinen, J. T. (2001). *Does community-based conservation shape favorable attitudes among locals? An empirical study from Nepal. Environmental Management*, 28(2), 165–177.
- Meinzen-Dick, R. S., & Pradhan, R. (2001). *The implications of legal pluralism for natural resource management. IDS Bulletin*, 32(4), 10–17.
- Moore, G. (1982). *Forestry, wildlife and national parks legislation in Ethiopia*. Rome: FAO, Assistance to Forestry Research, Phase II. FO: DP/ETH/78/012.
- Negarit Gazetta. (1970). *An order to provide for the establishment of a Wildlife Conservation Organization*. In No. 65 of 1970, Order no. 4. Addis Ababa: Negarit Gazetta., 5 November.
- Negarit Gazeta. (1980). *A Proclamation to provide for the Conservation and Development of Forest and Wildlife Resources*. In No. 192. Order no. 17. Negarit Gazeta., 5 September 1980.
- Newmark, W. D. (1996). *Insularization of Tanzanian parks and the local extinction of large mammals. Conservation Biology*, 10, 1549–1556.
- Newmark, W. D. (2002). *Conserving biodiversity in East African forests: A study of the Eastern Arc Mountains*. In *Ecological studies no. 155*. New York, NY: Springer-Verlag.
- Newmark, W. D., & Hough, J. L. (2000). *Conserving wildlife in Africa: Integrated conservation and development projects and beyond. BioScience*, 50, 585–592.
- Newmark, W. D. (2008). *Isolation of African protected areas. Frontiers in Ecology and the Environment*, 6(6), 321–328.
- Pimbert, M., & Pretty, J. (1997). *Diversity and sustainability in community based conservation*. In *Paper presented to the UNESCO-IIPA regional workshop on community-based conservation*. Available at: (<http://www.iucn.org/themes/ceesp/Publications/TILCEPA/MPimbert-UNESCOCommunity-Diversity.pdf>).
- Sekhar, U. N. (2003). *Local people's attitudes towards conservation and wildlife tourism around Sariska Tiger Reserve, India. Journal of Environmental Management*, 69(4), 339–347.
- Selman, P. (2004). *Community participation in the planning and management of cultural landscapes. Journal of Environmental Planning and Management*, 47(3), 365–392.
- Sjaastad, E., & Bromley, D. W. (2000). *The prejudices of property rights: On individualism, specificity and security in property regimes. Development Policy Review*, 18, 365–389.
- Stankey, George, H., Clark, Roger, N., Bormann, & Bernard, T. (2005). *Adaptive management of natural resources: Theory, concepts, and management institutions*. Washington, D.C.: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.
- Stephenson, J. G. (1976). *Report on the harar elephant dilemma*. Addis Ababa: Ethiopian Wildlife Conservation.
- Tietenberg, T., & Lewis, L. (2009). *Environmental and natural resource economics (8th ed.)*. New York: Pearson Education, Inc.
- Turton, D. (1987). *The mursi and national park development in the Lower Omo Valley*. In D. Anderson, & R. Grove (Eds.), *Conservation in Africa: People, policies and practice*, Cambridge (pp. 169–186). Cambridge: Cambridge University Press.
- UNESCO. (1964). *Saving the wildlife of Ethiopia. Recommendations of a UNESCO mission. Oryx*, 7, 247–250.
- Upreti, B. R. (2002). *The management of natural resource conflict: Case studies from Nepal. European Bulletin of Himalayan Research*, 22, 37–60.
- Wolmer, W. (2005). *Transboundary conservation: The politics of ecological integrity in the Great Limpopo Transfrontier Park. Journal of Southern African Studies*, 29(1), 261–278.
- Yirmed, D., Marilyn, B. R., Roger, V. S., & Richard, F. B. (2006). *The undisclosed facts about the relic elephant population in the Horn of Africa*. In *Proceeding: Biological society of Ethiopia, 16th annual conference and workshop* (pp. 43–56).
- Yirmed, Demeke. (2010). *The ecology and conservation of the relic elephant population in the Horn of Africa*. Australia: University of Melbourne (PhD Thesis; in relation to the coverage of the Sancturay in Oromia and Somalia).
- Yirmed, D., Renfree, M. B., & Short, R. V. (2012). *Historical range and movements of the elephants in Babile Elephant Sanctuary, Ethiopia. African Journal of Ecology*, 50(4), 439–445.