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Perceptions of Conservation and Ecotourism in the Taita-Taveta County, Kenya

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PERCEPTIONS OF CONSERVATION AND ECOTOURISM IN THE TAITA-TAVETA COUNTY, KENYA

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Directed by: Jerry Daday, Douglas Smith, and Michael Stokes

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This is a qualitative study examining conservation attitudes and resource use of 63 individuals in Kasigau, Kenya. Community members described their perceptions of conservation, the resources that they use, the location and availability of these, their support for the protection of Mt. Kasigau, their likes and dislikes of plant and animal species, and their support of ecotourism in Kasigau. All individuals listed conservation behaviors and agreed that protecting Mt. Kasigau is important. Many recognized the mountain as the only source of water. Some resources were limited, especially at certain times of the year. All interviewed community members except one would like tourists to visit Kasigau and are interested in cultural exchange. There is an apparent difference between conservation and ecotourism attitudes in Makwasinyi and the other six villages which could be because Makwasinyi has a lower level of education and is isolated on the northeastern side of the mountain. Gender differences between males and females were also present as each gender uses different resources coupled with a division of labor. The main theory that evolved was rational choice theory. People of Kasigau are trying to sustain their livelihoods and will pick conservation activities due to their benefits and chance they will increase income. When developing a community-based conservation model, these attitudes, education level, and gender differences must be considered to make a plan the whole community can agree on and from which it will benefit.

CHAPTER I INTRODUCTION

Many natural wildlife and plant habitats are being threatened due to encroaching human populations. Numerous conservation strategies have been put in place to try to protect these habitats. Some more common solutions are to designate protected areas, fence off existing protected areas, educate citizens about the problem, or change the law so it is illegal to use the land, wildlife, or plants found on it. Often these solutions do not provide any source of revenue for the local population, and, unfortunately, none of these solutions take into account the feelings of the individuals who are affected.

The most common reason for a plant or animal to become endangered is loss of habitat (Wilcove et al. 1998). This habitat could have been cleared for living space, commercial operations, agriculture, or the resources could have been used for basic survival. The populations around many protected areas are extremely poor on a global scale. These are the same people who have used the land and resources on it for generations. For any conservation program to be successful it must take into account the livelihoods of the people to whom it applies.

When conservation programs are put in place they often do not take into account how individuals will obtain food, water, or their income if they are reliant on any natural resources in the area. This is the reason that examining attitudes of those living next to national parks and protected areas to understand their culture, source of income, source of food, and natural resource use is important (Forgie, Horsley, and Johnston 2001; Salafsky et al. 2001).

I examined conservation attitudes of villagers surrounding Mt. Kasigau, Kenya, a part of the Taita Hills, in Southeastern Kenya. I used qualitative interviews with 63

informants to analyze beliefs about resource use, conservation of flora and fauna, and ecotourism. Interviewees were asked which resources they use, where they obtain each resource, which wildlife and plants they use, and if they feel protecting Mt. Kasigau is important.

CHAPTER II LITERATURE REVIEW

Resource Dependence and Conservation Attitudes

Most studies analyzing rural households and environmental change use economic data as a measure for change. This is problematic because economic data do not take into account a large portion of natural resources on which Africans depend (Cavendish 2000). It can be hard to consider natural resources into account when estimating wealth because there are so many resources available that comprise income. Cavendish (2000) found environmental income accounts for 35% of total income for families in Zimbabwe.

Water is the most important resource available, particularly in forest reserves, because trees in forests can trap more water than those in the dry scrub brush. While it is not valuable, its scarcity leads to many struggles. Catchment forest policy began developing in the 1980s to protect these important water sources (Rodgers 1993). Many other resources are available from forests such as honey, medicine, vegetables, and wood. These have a higher economic value than wildlife so hunting is not as extensive of a problem in forest reserves (Rodgers 1993).

Many of these traditional are now within the borders of parks and protected areas. Several surveys have shown roughly the same number of people support protected areas and wildlife while the others believe wildlife are a nuisance and that protected areas should be used for agriculture; the same results were found in both Africa and the U.S. (Harcourt, Pennington, Weber 1986). These studies also showed a correlation between respondents' levels of education and likelihood of supporting protected areas, with lower-educated individuals less likely to show support. (Harcourt et al. 1986). In many studies, conservation areas continue to be supported if benefits are high, especially if individuals

have received meat from rangers (Infield 1988; Lewis, Kaweche, and Mwenya 1990). Infield (1988) found in areas in South Africa with land shortage, twice as many people supported giving land set aside for conservation to individuals who needed it but they did think only part of the land should be de-gazetted (Infield 1988). A gazetted area is one announced as protected by a government official in a national report. These reports are used to announce upcoming meetings, voting information, official government business, and legal changes. Gazettement can include land, water catchments, and monuments. More individuals also thought the primary purpose of the protected area was to provide reed grass instead of using it for tourism; but this is because many respondents felt they would receive grasses and meat from the protected area at some point in the future (Infield 1988). Infield also found some respondents did not hunt because they were afraid of wild animals; while most believed if hunting were allowed, wildlife would disappear. Even some individuals who supported hunting recognized regulations must be put in place to prevent overharvest (Infield 1988). This shows individuals can recognize the importance of wildlife conservation and the benefits they could receive if wildlife is protected.

In Belize, Alexander (2000) examined attitudes toward a primate sanctuary that protects black howler monkeys; comparing people with sanctuary memberships who live adjacent to the sanctuary and other community members who are not members of the group but still have interactions with tourists. Both members and non-members overwhelmingly supported the sanctuary, with 92% of members showing support and 84% of non-members showing support (Alexander 2000). Ninety-six percent felt it was important to protect the monkeys and also important to protect resources for future

generations (Alexander 2000). Non-members were more likely to believe the sanctuary was created for tourism but this is likely because the sanctuary managers made opportunities to benefit from tourism available to members of the sanctuary (Alexander 2000). Protection of howler monkeys was likely supported because community members recognize the individual troops and new births within the troops. Hunting or timbering within the sanctuary was also not widely supported. Forty-six percent thought hunting in the sanctuary should be allowed while 49% supported timbering. When asked about the collection of firewood, 90% of respondents felt this activity should not be restricted because decaying wood along the roadside is what is usually collected (Alexander 2000). Community members thought the primate sanctuary was an appropriate size, though 49% wanted to use the land for agriculture without restriction (Alexander 2000). This suggests community members might try to use any activity possible for income, not realizing agriculture, hunting, timbering, and resource conservation cannot all be supported on the same section of land.

In the studies discussed, residents outside protected areas did show some type of support for protected areas. This type of support varied depending on the type of activities people were previously able to do inside the protected area. The most resentment toward protected areas was when individuals were told they could no longer hunt inside the boundaries and were not given another alternative to this activity. Another example of this is telling individuals they cannot collect firewood from inside a protected area without providing them another location for firewood collection. To obtain the most support for any conservation area, livelihoods and traditional use must be taken into account or community members will be less likely to support these projects.

Resource ownership

Natural resources can be "owned" in four different ways when examining property regimes: (1) state owned and controlled property such natural parks, (2) private owned property, (3) common property, where some group such as a tribe, village, or family own property together; it excludes non-owners, (4) open access, where there is no property and it belongs to the first person to exercise control on it (Bromley and Cernea 1989). Mt. Kasigau is a state owned property, family communes around the mountain are privately owned, ranches managed by the community are common property, and all other land is open access. Open access occurs when a management system breaks down or because the resources have never been incorporated into a social system.

Gender Roles

Fuelwood collection is almost always limited to women and children. In some cases, as fuelwood becomes more scarce women are spending four times longer at each collection than they previously did (Flintan 2003). Women have a large knowledge of local plants and flowers, often collecting them for medicinal purposes as well (Flintan 2003). Men dominate in collecting larger timber used for building and also collect plants for cultural ceremonies (Flintan 2003). Both genders are involved in honey production; men usually extract honey from the hives and women sell the honey at markets (Flintan 2003). Women dominate labor around the house so their work load stays the same year round as they perform chores. Men's' workloads tend to change throughout the year with the largest amount of work occurring at certain times during the agricultural season (Flintan 2003). In most African cultures, men are the landowners and even after a man's death it can be hard for his wife to inherit the land (Flintan 2003). In Kenya, men decide

all land use issues so a woman must get her husband's permission before planting trees or changing anything else about the land (Flintan 2003). Women also usually have less access to education or health care (Flintan 2003). Because of a woman's large daily workload, she often does not have time for conservation activities. For women to participate, their workload must be adjusted and the conservation project must interest them (Flintan 2003). Ideas to reduce workload are to provide a new income generating activity, microfinance or loans, and training. Training is less successful with women because of their daily work load (Flintan 2003). Projects which plant fuelwood seedlings have been successful when women felt responsible for the nursery; however when men were given seedlings, women were unwilling to water them which led the project to fail (Flintan 2003).

Mt. Kasigau

Mt. Kasigau is a government-gazetted forest with 202.3 hectares protected by Kenya Forest Service (Stakeholders 2005). In Kenya, the Minister of Forestry and Wildlife chooses which land will be gazetted or de-gazetted and publishes it in the Kenya Gazette with information about the land in question and what change is being made. The Minister is allowed to gazette any government land, declare and alter the boundaries of a forest, and declare a forest will cease to be a forested area (Matiru 1999).

In Kenya, there are a few types of gazetted lands. Land gazetted by the Kenyan government is managed by a government organization while land gazetted as trust land is managed by local authorities. There is also a difference between a national park and forest reserve. National parks are the highest level of protected land. They are enacted by parliament and are not allowed to be used by humans for hunting or gathering

(Rodgers 1993). They are at least partially fenced and monitored by Kenya Wildlife Service. National parks are usually created to protect large game living on the land. It is important to understand these types when making comparisons between Mt. Kasigau and other places described in the literature because Mt. Kasigau is a forest reserve and not a national park. However, many of the same rules apply. The government prevents settlement on forest reserves but can allow various other types of exploitation, such as regulated commercial timber production (Rodgers 1993). Forest reserves are usually smaller, unfenced, and monitored by Kenya Forest Service; though sometimes, only one ranger monitors the entire forest (Rodgers 1993). Forest reserves are sometimes created to protect the forest itself, other times they are created to protect a watershed, which is the case for Mt. Kasigau. These forest reserves usually have unique wildlife that are less dangerous than those found in national parks. Forest reserves on trust land are usually assigned protection from the district council in the region in which they are found.

Mt. Kasigau forest reserve is a unique area surrounded by seven villages. All villages rely on water coming from Mt. Kasigau, and for many, this is their only water source. Understanding the ecology, uniqueness, and wildlife that visit Mt. Kasigau and the surrounding villages will help with implementing any type of conservation effort.

Mt. Kasigau is a disjunct peak of the Taita Hills of Kenya, which are part of an International Union for Conservation of Nature (IUCN) biodiversity hot spot —the Eastern Arc Mountains. Although many authors have looked at species richness in the Eastern Arc Mountains, very few studies have been carried out in the Taita Hills specifically (Brooks, Lens, Barnes, Kageche Kihuria, and Wilder 1998). There are at least 13 species of plants and nine species of animals endemic to the Taita Hills, while

another 22 species of plants and three species of animals are endemic to the Eastern Arc Mountains (Beentje and Ndiang'ui 1998). More than 90% of the forest on which much of this biodiversity is based has been lost from the Taita Hills, which has endangered many plant and animal species (Beentje and Ndiang'ui 1998). Beentje and Ndiang'ui (1998) estimated fewer than 294 hectares of forest remain in the Taita Hills (Mt. Kasigau was not included in this estimate). Brooks et al. (1998) estimated 400 hectares remain. This is down from an earlier estimate of at least 2020 hectares in the 1970s (Beentje and Ndiang'ui 1998). Clearly, the Taita Hills have lost at least 85% of their forest coverage and patches even lost 99% of coverage from 1962-1985 (Brooks et al. 1998). It is estimated forests now cover only 0.12% of the Taita Taveta district (Himberg 2004).

Mt. Kasigau has similar biogeographical characteristics to the other Taita Hills and is the sole remaining forested mountain in the range, with 203 hectares of evergreen forest under Kenya Forest Department protection (Kalibo and Medley 2007). As a result, it has become a safe haven for species now extirpated from the remainder of the region. Many surveys of the Taita Hills do not include Mt. Kasigau in their study. In a 1998 survey conducted by Beentje and Ndiang'ui, Mt. Kasigau is not even mentioned, and Brooks et al. (1998) did not visit Mt. Kasigau due to time and safety but recommend a similar study be conducted on the mountain in the future.

Loss of forested land in the region is mainly due to cultivation for agriculture (Himberg 2004). As the human population increases, so does the need for farmland. The Kasigau region serves as a corridor between Tsavo East and Tsavo West National Parks so wildlife frequently passes through the area. Often, this causes conflict between humans and wildlife because animals passing through will stop to feed on crops.

Elephants are the biggest problem reported and have caused damage to thousands of dollar's worth of crops and several human deaths in the last year (Kagwa 2011). Other species such as leopards are responsible for killing livestock at night. Surrounding forests are facing pressure from the charcoal industry as illegal operations are found on many community-owned ranches in Kasigau.

Mt. Kasigau is still covered in trees but this could be due to the steep incline and frequent rock faces that would make the mountain difficult to farm or harvest trees from. Despite the wildlife conflicts, locals place value on Mt. Kasigau and realize it has valuable resources. Two studies found locals value the mountain for rain collection and water conservation (Himberg 2004, Kalibo and Medley 2007). Previous studies have also discovered untouched forests which are preserved because they are considered sacred by the local culture (Himberg 2004).

To find a solution to conservation of Mt. Kasigau, first we must determine how local people perceive their environment by asking how they define conservation and if they recognize wildlife habitat loss or its consequences as a pressing problem. It is also important to see what species of wildlife they value as part of their livelihoods or that have a positive contribution to their environment. My study employs qualitative interviews with local community members in villages surrounding Mt. Kasigau to evaluate their perceptions of the environment and land use practices. Locals were asked about their relationship with ecotourism in the region.

Participatory Development and Community-Based Conservation

The purpose of participatory development is to engage agents of donor agencies to help local actors execute projects and goals that in turn, are successful. With this

approach, donors spend time in a certain location implementing projects instead of sending money and expecting implementation from someone else. Traditional, donor-based projects look at effective conservation of natural resources and not the relationship between people and their natural resources. This often makes participatory development a better model in rural conservation (Campbell and Vainio-Mattila 2003). Community-based conservation has two main goals, (1) to enhance biodiversity, and (2) to provide incentives, mostly economic, for local people (Campbell and Vainio-Mattila 2003). Community-based conservation focuses on identifying the benefits of conservation for local members of the community so that they will take ownership of conservation and support conservation-based initiatives after donor agencies leave (Campbell and Vainio-Mattila 2003). Parks and protected areas emphasize the separation between locals and wildlife that can conflict with the long standing traditions of the people (Campbell and Vainio-Mattila 2003). The downside to community-based conservation models is that most do not specify what it means to participate in a project. Many studies found individuals did not actively participate, partially due to their education level (Campbell and Vainio-Mattila 2003). Participation must be specifically designed for the project to be successful; otherwise, some communities might not gain any more rights than they had before the plan was implemented (Campbell and Vainio-Mattila 2003).

Ecotourism has been criticized for having negative effects in some cases but when developed on a local, grassroots level it often has positive effects (Forgie et al. 2001, Watkin 2003). Development of ecotourism can change the livelihoods of the local people because they can rely on tourism income instead of selling illegal charcoal or trying to grow enough crops to sell and make a profit. Mt. Kasigau has unique scenery to offer

tourists. Its cloud forest conceals many floral and faunal species not present in the national parks of Kenya. After examining local livelihoods, one potential solution could be ecotourism.

Ecotourism, according to the International Ecotourism Society, is "Responsible travel to natural areas that conserves the environment and sustains the well-being of local people" (Watkin 2003). Ecotourism provides a means for local people to benefit from wildlife and the environment and requires a change from mass tour operators to community-based tourism (Watkin 2003). Community-based ecotourism provides an opportunity to involve communities in conservation that has many advantages such as: self-regulation, local knowledge, assisting sustainability, building capacity, sharing responsibility, accelerating change, and building trust (Forgie et al. 2001). In community-based initiatives, citizens are stakeholders and have an important role in the decision making process, making them more involved (Forgie et al. 2001).

The introduction of community-based ecotourism only works in areas where modest changes can have a substantial impact; implementing it over a wide area is not easy (Kiss 2004). One example is protecting a small corridor. In South Africa, a small ecotourism project was set up along the Mzamba and Mnyameni Rivers. Tourists could to ride horses along the rivers, camping at different sites. This was a community-based project as residents served as guides, cooks, and cleaners (Ntshona and Lahiff 2003). Community members with tents or horses were also able to rent out these resources for use in the project. Besides individuals benefitting from tourism, a certain amount of money from each tourist was placed in a village fund to be used for community-based projects.

All individuals involved in the project noticed an increase in wealth; however, horse owners did not receive as much as they would like. They considered quitting the project but realized it could not continue without them (Ntshona and Lahiff 2003). Horse owners also realized their horses benefitted from the veterinary care provided by the project (Ntshona and Lahiff 2003). One argument against community-based ecotourism is that only a handful of individuals benefit. In this study, community funds were used to build schools, classrooms, and purchase equipment for soccer clubs (Ntshona and Lahiff 2003).

The Biodiversity Conservation Network tested community-based small projects in Asia and the Pacific (Salafsky et al. 2001). These projects all proposed to do something to conserve the environment such as establishing an ecotourism lodge, distilling essential oils, producing jellies, or harvesting timber (Salafsky et al. 2001). These projects were tested using three factors: their financial viability, stakeholder benefits, and a community of stakeholders to analyze threats to biodiversity (Salafsky et al. 2001). They found communities with strong, organized leaders, and noncash benefits such as community confidence were significantly associated with conservation (Salafsky et al. 2001). The goal of these projects is to cover the cost of conservation; this is difficult to achieve but can be done within a few years (Salafsky et al. 2001).

Kenya has a prospering tourism industry. Between 1995 and 2009, Kenya had an average of 851,000 tourists a year (KMT 2010). The two Tsavo National Parks in the Voi region near Mt. Kasigau draw an average of 242,500 tourists a year (KMT 2010). In 1994, the Kenya Ministry of Environment and Natural Resources developed a plan to conserve forests by developing ecotourism (KMENR 1994). Ecotourism is introduced to

combine conservation and economic development of local communities (Himberg 2004). The Kasigau region of Kenya began developing ecotourism in 2001 as a collaboration among five villages in the region and outside supporters (Himberg 2004). Each village has a banda, or hut used for visitors to rent while they stay in the area. Because community-based organizations already exist in the Taita Hills, Himberg (2004) predicts ecotourism in the region will be successful. In Kasigau specifically, nature-oriented visitors keep interest in forest research (Himberg 2004). Himberg (2004) also suggests skull caves could be attractive to visitors but all development must go through local elders to be successful.

A similar project to those outlined above could be implemented near Mt. Kasigau because this area also serves as a corridor between Tsavo East and Tsavo West National Parks. Mt. Kasigau has more villages surrounding it but it would be easy to charge tourists a small fee to climb the mountain, which could then be put in community funds in all the villages, similar to the project analyzed by Ntshona and Lahiff (2003). It is possible Kasigau can develop a model like the one explained by Salafsky et al. (2001) using some profitable handicrafts community members already sell.

Very recently, stakeholders in the Taita-Taveta district have begun developing an integrated tourism plan for the area (Reuben Mwaluma, pers. comm.) Currently, local individuals are able to serve as guides for tourists climbing Mt. Kasigau. Other individuals sell handicrafts to tourists such as baskets, wooden spoons and stools. Agrotourism makes up less of the market currently but locally produced honey, meat, and eggs are available for purchase. Some handicrafts are already making profits which have been used to build a meeting space to make handicrafts in several villages. If this project

can use the guidelines outlined by Salafsky et al. (2001), it is possible it could become profitable and contribute to conservation much earlier than it would normally take.

Many studies have examined conservation attitudes of protected areas with high ecological and conservation values like Mt. Kasigau Infield 1988, Lewis et al. 1990). When developing a new conservation plan, it is important to look at case studies to see what has worked previously and what was not accepted by the community. I have outlined some of these case studies regarding conservation attitudes and effective ecotourism models. When looking at conservation attitudes, understanding the relationship between community members and their environment is important. The previous section has outlined this relationship in Kasigau and will be useful when analyzing informants' responses.

CHAPTER III STUDY AREA AND METHODS

Study Area

Kenya is located in East Africa along the Indian Ocean. It is bordered by Tanzania, Uganda, South Sudan, Ethiopia, and Somalia, which can be seen in Figure 1.

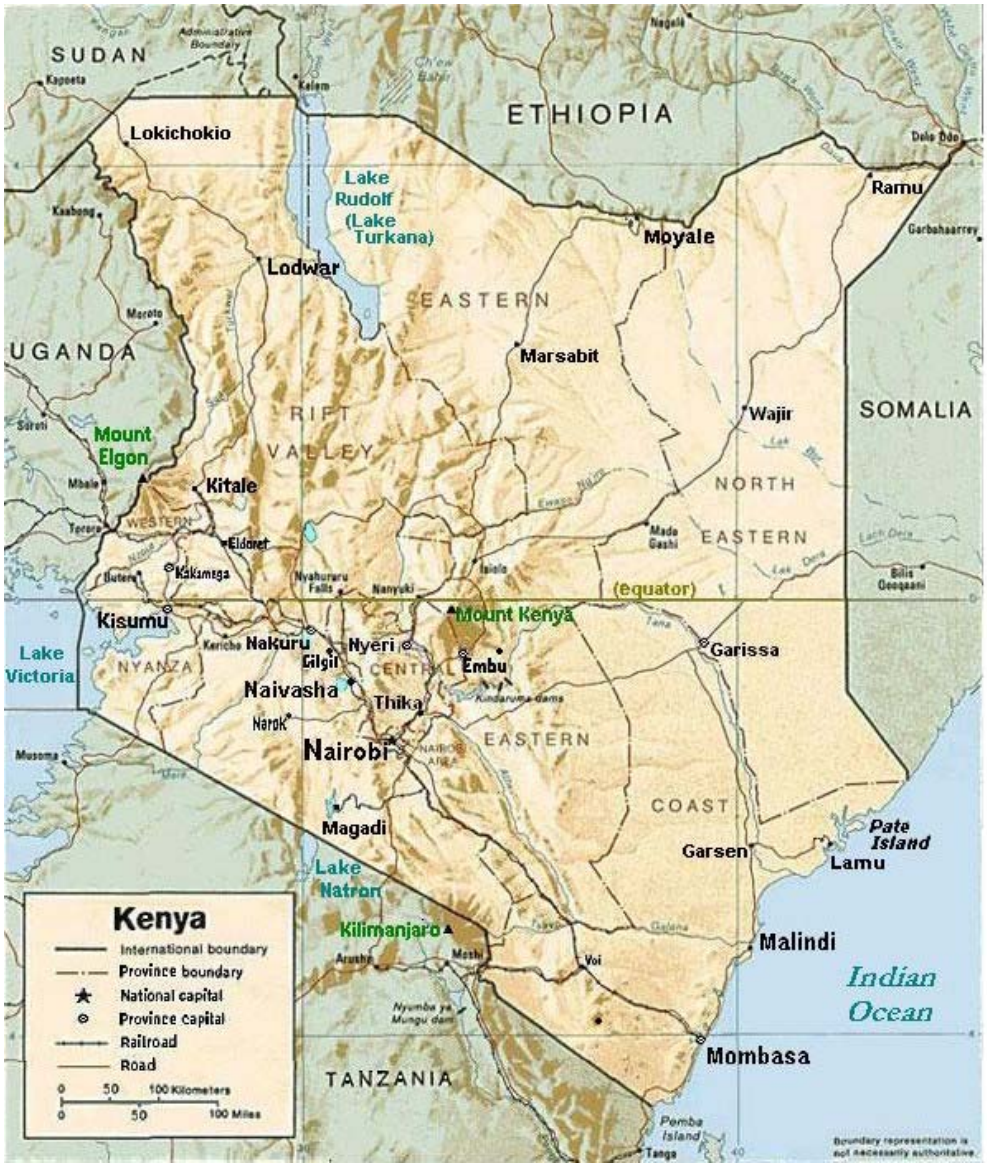

Figure 1. Map of Kenya, Kasigau is marked with a red star in the southeast corner of the country. (Nation Master 2012)

Kenya was made a British colony in 1920 and it did not gain independence again until

1963. The government is a republic where anyone 18 years or older may vote. Kenya is a capitalist country, unlike their Tanzanian socialist neighbors, so the economic attitude varies greatly between these countries. Kenya relies heavily on agriculture and tourism for income.

Africa is still one of the poorest areas in the world. The low income rate on this continent means they do not have as many exportable resources available so they are still under-developed when compared with many other areas of the world. Rural poverty in Africa is at 61.6%, almost double the average for all developing countries (UNDP 2011). An estimated 51% of Africans (excluding North Africa) lived on less than $1.25 per day in 2005, which is down 7% from a survey done in 1990 (UNDP 2011). Globally, this proportion fell from 42% to 25% in the same period (UNDP 2011). Kenya is one of only two African countries that saw an increase of individuals living below the poverty threshold, though it was a small increase of 2% (UNDP 2011). Kenya's literacy rate is 85%, which is behind thirteen African countries (UNDP 2011). Approximately 55% of Kenyans had access to an improved water supply in 2008 (UNDP 2011). Kenya's unemployment rate did decrease slightly throughout the period with a reduction of 2% (UNDP 2011). While Kenya has made strides in water supply and kept the poverty rate and unemployment rate stable, it is still behind many African countries in development (UNDP 2011).

Kasigau is in the Taita-Taveta County in the Coast Province of Kenya between 38° 37" and 38°42" E, and 3° 46" and 3°52" S. Kasigau has a population of 13,813 residents and 2,742 households (Kenya National Bureau of Statistics 2009). There are seven main villages surrounding Mt. Kasigau. Rukanga, Jora, Bungule, Makwasinyi, and

Kitege are all adjacent to the base of the mountain (Figure 2). Kisimenyi and Ngambenyi are located in bush land further from the base of the mountain. These villages are divided into two sub-locations, Makwasinyi and Rukanga. Makwasinyi sublocation is 415.2 km^2 and includes Makwasinyi, Kitege, and Kisimenyi (Kenya National Bureau of Statistics 2009). Rukanga sublocation is 1,106.5km^2 and includes Rukanga, Ngambenyi, Jora, and Bungule (Kenya National Bureau of Statistics 2009).

Figure 2. Location of villages around the mountain.

The road around the mountain is approximately 30 km, passing through the five villages closest to the mountain. It is a packed dirt road that frequently floods and washes away during the rainy season. Electricity is available in Rukanga, Kitege and Jora but has not yet reached other villages. Running water is not available in any village. There is one health center in the main village, Rukanga, and a dispensary in Makwasinyi. The chief's office is located in Rukanga where community meetings are held. Supplies provided by USAID to low-income families are also distributed from the chief's office.

The people of Kasigau are primarily farmers, growing crops on both private and communal lands. Crops grown include maize, pigeon peas, beans, and cassava. There are also fruit groves for mangos, oranges, and avocado. Most families keep chickens or goats, and community ranches are also common for livestock rearing. The women of Kasigau have formed basket-weaving associations in all villages. The baskets are sold to tourists and provide most of the income for these women and their families. Many villages have built infrastructure to use as a meeting place to support these activities. Men make stools and cooking tools out of locally available trees. Many community members also seek employment in the nearby mines looking for tanzanite. Young males frequently leave Kasigau to seek employment in a larger city like Mombasa. Some illegal charcoal burning and poaching also occur.

There are two main tribes in Kasigau. The Taita are the majority tribe while the Kamba tribe is found in the villages from the bush land, Kisimenyi and Ngambenyi. Taitas are a Bantu tribe living in the Taita Hills in southwest Kenya. The original Taitas were thought to be non-Bantu language speaking but no one is certain of the history (Bravman 1998). The second group of early inhabitants probably migrated from the

Ethiopian Highlands and was agro-pastoralists replacing their hunter-gathering predecessors (Bravman 1998). The Bantu language ancestors came from many directions over a long period allowing for a lot of diversity as the tribe developed (Bravman 1998). This wide tribe diversity allowed for conflict between groups (Bravman 1998). No lineage could establish political dominance in the Taita Hills; instead, critical resources became land, livestock, and people (Bravman 1998). The Taita have responded to agricultural changes well, implementing new technology as it develops (Bostock 1950). The Taita settled in a soil-rich area with ample rainfall and were able to grow many crops such as banana, sugar cane, cassava root, sweet potatoes, cow-peas, white beans, Indian corn and millet which was supplemented periodically with meat by hunting (Bostock 1950).

The early Kamba were a Bantu language speaking tribe (Tignor 1976). Kamba keep livestock but also farm when there is available land. Depending on which part of the country the tribe lived in, they vary from more livestock based agriculture to more crop based agriculture (Tignor 1976). The Kamba tribe of the bush land lost 50% of their tribe during a famine in 1899 (Tate 1904). Kamba are extremely proud of their livestock and many people died of starvation trying to save their herds of cattle during the famine (Tate 1904). Kamba will not ordinarily take meat for everyday purposes but are known to form large hunting groups during the dry season when their food source is only meat (Tate 1904). The Kamba tribe farms but their methods to improve crop yield are not as developed as other tribes (Tate 1904).

People live in flat bushland around Mt. Kasigau, which is known for its unique biodiversity. Vegetation on top of Mt. Kasigau is an evergreen forest that traps water

from the Indian Ocean causing cloud formations that provide a unique ecosystem to plants and animals of the region as well as a water source for the Kasigau community (Kalibo 2004). There is no permanent river in Kasigau so seasonal rains are extremely important to fill riverbeds. Most agricultural farms are found in a transition zone between bush land and the forested mountain (Kalibo and Medley 2007).

Research Methods

I used qualitative in-depth interviews with local community members to evaluate their perceptions of the environment and land use practices and their relationship with conservation. Locals were asked about their relationship with wildlife and plant use in the area, specifically which plants and animals they use and why. Individuals were asked about their resource use and ability to obtain enough of each resource, including their usage of Mt. Kasigau. The interviews also asked their opinions of ecotourism in the region, including positive and negative effects and what each individual's family can contribute to ecotourism. A non-random purposive sample was used to select the participant informants. The first several participants were selected by asking the local non-governmental organization, the Kasigau Biodiversity Conservation Initiative, for names of individuals in the community who may know about the topic and be willing to participate. I then asked the individual if I could interview them. After the first three interviews, I began use an availability sample and continued until I reached a saturation point. Usually this began by walking through the village looking for individuals who had the time and were willing to participate. I attempt to pick interviewees from different parts of town due to Kenya's large extended family size. Frequently, everyone in one neighborhood will be related and I wanted a broad spectrum of opinions. Most of the

time, interviews took place at the participant's home in a location they chose. Approximately half the interviews were inside and the other half were outside. An effort was made to interview equal numbers of males and females in each village. It was often difficult to find males at home during the day so in these cases I asked if there were houses in the area with a male present. I found it much easier to interview males at their houses in the evenings or to ask when I saw them in the center of town. On three occasions, I sat down on a bench in the center of town and asked villagers passing by if they were willing to stop for an interview. This generally worked well, and in Kisimenyi, I had so many interested parties that I eventually had to stop interviews there. Participation was voluntary and the interviewee was told he/she could stop the interview at any point. Several times, the interviewee was illiterate and did not wish to participate because he/she was confused by the informed consent document. In these situations, my translator thanked the individual for his/her time, asked if anyone else in the house was over eighteen and if not, proceeded to look for someone else. Approximately 25% of the time individuals were unwilling to participate. Most cited time as the reason they could not remain to be interviewed. I interviewed individuals until a saturation point was reached, which was achieved after completing a total of 63 interviews. Each individual was interviewed once for at least 20 minutes with the longest interview lasting 45 minutes. Most interviews were conducted in Swahili with the help of a local translator. I created the interview guide used in this research after making informal observations on a previous trip to Kasigau; several Kenyans with Bachelor's degrees from the University of Nairobi and one with a Master of Science degree from Western Kentucky University conducted the translation into Swahili and provided assistance in finalizing the interview

schedule. I selected several translators based on their desire to help with the research and based on their strong English proficiency. Four translators were used throughout the period due to their availability and locations of the interviews. Responses translated back to English were selectively transcribed during the interview. Any follow-up questions that I asked during the interview were also translated into Swahili and then back into English for me to transcribe. Three interviews were conducted in English and transcribed by myself during the interview. Interviews were conducted between July 2011 and December 2011.

Interviews took place in seven separate villages around Mt. Kasigau. In Rukanga, Jora, Bungule, Kitege, Kisimenyi, and Ngambenyi, between four and seven individuals were interviewed. Initially, six interviews were conducted in the village of Makwasinyi. However, I conducted an additional 22 interviews in Makwasinyi, thus bringing the total to 28, because responses in this village were different compared with the other villages in the Kasigau area. A summary of informants is listed in Table 1.

Several patterns emerged during and following data collection that will be systematically and inductively explored in the next chapter. These patterns will be explored in the next chapter. Makwasinyi is more isolated than other villages and because rangers from a conservation organization do not patrol the area surrounding the village, individuals from this village use their environment differently than individuals in villages on the other side of the mountain. Females are more likely to know plants used for firewood while males are more likely to list plants used for medicinal purposes based on gender roles common throughout most of rural Africa. Also, older individuals will cite more plants for medicinal uses than younger individuals. I expect highly educated

people to understand more about conservation than those who did not attend school and to understand their role in conserving the environment in the Kasigau community.

Summary of Informants

Table 1. Summary of Informants

	Rukanga	Kitege	Bungule	Jora	Makwasinyi	Ngambeyni	Kisimenyi	Total
Number of Interviews Conducted	7	6	6	6	28	4	6	63
# of Males Interviewed	3	3	3	3	15	1	3	31
# of Females Interviewed	4	3	3	3	13	3	3	32
Mean Age	42	33	45	40	40	42	49	41
Education								
None	1		1				1	3
Class 2						1		1
Class 3							2	2
Class 4				1	2			3
Class 5				1				1
Class 6		1		1	1	2	1	6
Class 7	2	1	1	1	8	1		14
Class 8	3	1	2	1	12		1	20
Form 1								0
Form 2		1						1
Form 3					1			1
Form 4	1	2	2	1	4		1	11

CHAPTER IV ANALYSES

Conservation Attitudes

It is clear from interviews that the people of Kasigau have a good grasp on conservation and have been educated about conservation issues in Kasigau. When asked what conservation means, all understood the word and most could relate it to the environment, though some related it to farming and economics. There has been a wide range of studies on conservation attitudes conducted with various results. The variation depends on the history of the region and the economic situation (Infield 1988). In cases where people do not care about conservation or a protected area, it is usually because the land for the protected area was taken away from their tribe (Infield 1988). Mt. Kasigau has never been inhabited by any tribe; which could be a reason villagers understand the importance of conservation. All participants could list things they do to conserve the environment. The statements below provide an overall representation of the conservation efforts of respondents who live in the villages around Mt. Kasigau. The sex (f=female, m=male), actual or approximate age, village and tribe for each respondent is provided in parentheses following each quotation.

> Protecting trees, planting more trees, indigenous trees. Digging terraces to reduce erosion. Protecting wild animals, they are dangerous to me but I protect them because they attract tourists. (F17, 33, Makwasinyi, Taita)

> Preserving the environment by digging terraces, building tanks for cattle to drink water in a special place far from the villages so they do not destroy the trees and road. (F5, 40, Bungule, Luyu married to Taita)

> I understand it better because if you conserve the forest, the weather will be changed in a good way. *How?* It will change the spread of desertification. (M18, 42, Kisimenyi, Kamba)

> We avoid the activities. By avoiding activities that lead to pollution. Cutting down trees, over grazing, cultivating in slopy areas, educating the community on the dangers of polluting the environment. (M2, 23, Kitege, Taita)

Infield (1988) found 63% of his respondents believed conservation was very important but only 9% thought their adjacent national park was very important. I found that most community members support conservation and most also understand the ecology of Mt. Kasigau, why it is important, and want to protect it. When asked what they used Mt. Kasigau for, most listed Mt. Kasigau as a source of water and realize they need to protect it. Many could explain the trees at the top of the mountain trap rain in the cloud forest, which then runs down the mountain providing water to the villages below. In forested conservation areas, respondents have expressed concern with the forest's impact on the climate and recognized it as a water source (Harcourt et al. 1986). Many also said Mt. Kasigau attracts tourists. These responses are also similar with responses found during a study near Kilimanjaro National Park in Tanzania. That study found 55% of individuals understood Mt. Kilimanjaro protected their water shed and 17% recognized the nation receives valuable foreign exchange from tourists (Newmark and Leonard 1991). Respondents in this study said the following when asked about the importance of Mt. Kasigau and the surrounding environment:

> Water. We depend on the mountain because big trees pull down the rain. It attracts tourists. (F14, Maybe 70, Ngambeyni, Kamba)

> The mountain gives knowledge because I have never seen some animals around but I found them when I went on the mountain. It gives us a source of water. (F23, 19, Kitege, Taita)

> For water and to preserve it. Not cutting the trees, the trees bring rain. (M16, 74, Makwasinyi, Taita)

> It is the source of water, there are trees there (our natural trees), there is some wildlife up there. A rainfall attraction. You know sometimes we find it is sort of a tourist site because most of the time people like going up there. (M21, 48, Makwasinyi, Taita)

When asked specifically if they feel that protecting Mt. Kasigau is important, all sixty-six informants in this study agreed it was. Individuals believe it is important to protect the mountain to protect the water source, the rare animals and plants, and is a source of tourism. These results are consistent with a study conducted outside national parks in Tanzania. This study found 71% of people living adjacent to a park or protected area believed the area should continue to be protected (Newmark et al. 1993). Several respondents in this study stated the following:

> Yes, because we have tourists coming to climb the mountain and we get money from the tourists when we take them up. We also enjoy climbing the mountain. (F7, 27, Rukanga, Taita)

> It is good to protect the mountain because if you protect the mountain then the source of water is safe. There are animals up the mountain like birds. (F8, 70, Rukanga, Taita)

> Yes, it's important. We get rainfall from the mountain and there is a variety of animals and birds on the mountain which visitors come to see. (F12, 42, Ngambeyni, Kamba)

> Yes, it is very important. Because it being the only source of water, we need to take care of it and also there are so many animals which are having their homes there so if we destroy it, we end up destroying everything, including the animals. (M2, 23, Kitege, Taita)

> Yes, it is good to protect the mountain because we get water from the mountain plus the tourists come climb the mountain. It also helps to pull down the clouds for rainfall. (M7, 42, Rukanga, Taita)

The most common reason in the existing literature given by individuals against parks and reserves are that parks attract wildlife that then destroy crops (Gillingham and Lee 1999). Gillingham and Lee (1999) also expected to find individuals opposed to protected areas

because they could not use resources inside; however, they found only 8% of respondents in their survey cited the loss of resources available because they are inside park boundaries as a reason they did not like the park. Eleven individuals in Kasigau did cite difficulty getting resources like trees because they now have to walk a long distance to find resources they once took from the protected forest on Mt. Kasigau or the local ranches that are now patrolled to stop poaching and charcoal burning. Below, respondents discuss how hard it is to find trees now:

> Not all, we don't get enough water or trees. Trees are far away. *Why don't you use the trees here?* Because the rangers are here. (F13, 25, Ngambeyni, Kamba)
>
> No, we don't get enough water. There is scarcity of trees, when I need firewood I have to go a long distance. For stones, I have to climb up the mountain to get them. (F7, 27, Rukanga, Taita)
>
> No. I get little water and walk a long distance. I get little firewood because there are many farms around and not many trees. I have to walk up the mountain to get stones. (F8, 70, Rukanga, Taita)

While most people believe that protecting Mt. Kasigau is important, many community members still reported taking trees and stones from the mountain. The people who take tree also believe it is important to protect it, thus representing a disconnect between beliefs and their actions. These results are similar to Newmark and Leonard's (1991) study near Kilimanjaro National Park. They found 84% of people opposed abolishment of Kilimanjaro National Park while only 63% felt poaching was against the law (Newmark and Leonard 1991). In their study, removing trees from inside the national park is considered poaching. They believe the reason for this disconnect is local people need firewood and building materials, so they do not consider it illegal to take them from a national park (Newmark and Leonard 1991). This is also confirmed by Infield (1988)

who found individuals thought only part of the park should be de-gazetted which indicates a conflict between support for conservation and pursuit of basic needs. Ten out of sixty-six respondents in this study said they take trees from Mt. Kasigau. Below, I have paired responses from these people comparing where he/she obtains each resource and how he/she feels about protecting Mt. Kasigau. Statement 1 is where they obtain resources; statement 2 is the response when asked if he/she feels it is important to protect Mt. Kasigau.

Respondent M30, 20, Makwasinyi, Taita

1. Trees come from the middle of the mountain
2. Yes, if the mountain is destroyed there will be soil erosion.

Respondent F9, 42, Makwasinyi, Taita

1. Trees come from the mountain. *How far up?* 3 hours up the mountain, *which kind of trees?* evergreen trees.
2. Yes because it has important resources like different species of birds and butterflies. There are some important snakes up there to be protected.

Respondent M8, 53, Kitege, Taita

1. Trees come from the mountain, water comes from a kiosk a kilometer from here, stones are on the mountain, sand from the river bank 300 m from here.
2. It is important to protect the mountain because it provides the water. Tourists come climb the mountain and see a variety of species of animals like butterflies, birds like the taita-white eye up there.

Respondent M9, 36, Kitege, Boran

1. Trees come from the mountain.
2. It is good to protect the mountain because there are lots of benefits from the mountain like tourists coming, water, trees, and animals on the mountain like butterflies.

Respondent M10, 57, Makwasinyi, Taita

1. We get enough trees from the mountain.
2. Yes because it provides water, trees, species of animals like butterflies and it attracts tourists.

Respondent M12, 73, Jora, Taita

1. Stones are far up the mountain. Water comes from the bore hole. Trees, some are from around here, some are up the mountain. Mzuzi is 1 ½ hours up the mountain.
2. Very, because if the mountain is protected, the source of water is protected which is important to our lives.

Respondent M23, 51, Makwasinyi, Taita

1. Trees come from up the hill (the small ones near the bottom) and in the bush. Stones come from the hills.
2. Very much because it brings everything to us. M23, 51, Makwasinyi, Taita

Respondent M27, 40, Makwasinyi, Taita

1. Stones are available everywhere, trees are mostly from the mountain (the lower part) since the lower trees have been cleared by elephants.
2. It is 100% important to manage the mountain. I am proud because of the nature of the hill, many people from different countries like it. It is a source of water. We protect it because we have an idea to get a sponsor to build a hotel up there. M27, 40, Makwasinyi, Taita

Respondent M28, 55, Makwasinyi, Taita

1. Trees come from the forest (the upper part).
2. Yes, because there are many products planted there like sweet potatoes and also it is a source of water.

Most of the people who say they take trees from the mountain are from Makwasinyi. Interestingly, 11 of 28 people interviewed in Makwasinyi also reported using wildlife though it is prohibited. I interviewed more respondents from Makwasinyi than the other villages, but this was done as I noticed a trend in the original six interviews completed in Makwasinyi. As seen from the examples provided below, only three other individuals report using animals for meat from the 35 interviews conducted in all other villages. These three are each from different villages; one from Rukanga, one from Kitege and one from Kisimenyi. The other responses are from individuals residing in the village of Makwasinyi.

Giraffe has good meat, dik dik has good meat. (F7, 27, Rukanga, Taita)

> Giraffe has good meat, gazelle has good meat, wildebeest has good meat, dik dik has good meat. (F9, 42, Makwasinyi, Taita)
>
> Dik dik for meat, leopard skin used for belts, drums. (F15, 43, Makwasinyi, Taita)
>
> Dik dik and gazelle for meat. (F16, 22, Makwasinyi, Taita)
>
> Antelope for meat, ndanda for meat. (F19, 36, Makwasinyi, Taita)
>
> Giraffe for meat, gazelle for meat. (F26, 19, Makwasinyi, Taita)
>
> Dik dik for meat, nose (looks like a sheep) for meat. (F31, 30, Makwasinyi, Taita)
>
> Dik dik for meat. (M15, 47, Makwasinyi, Taita)
>
> Gazelle, dik dik, giraffe because I like the meat. (M9, 36, Kitege, Boran)
>
> Pofu, wildebeest has good meat, giraffe has good meat. (M10, 57, Makwasinyi, Taita)
>
> My grandfather uses elephants as a source of food so I like them, dik dik, zebra, there are some others but I don't remember their names. (M19, 65, Kisimenyi, Kamba)
>
> Birds for meat (dove, weaver). (M24, 20, Makwasinyi, Taita)
>
> Elephant is used to get money because they are a tourist attraction, dik dik for meat. (M27, 40, Makwasinyi, Taita)
>
> Dik dik for meat, antelope for meat. (M30, 20, Makwasinyi, Taita)

In a survey of Tanzanians, Newmark et al. (1993) found groups who previously relied on bush meat were more likely to support the abolishment of national parks; however, I found these people still wish to protect Mt. Kasigau's forest reserve. The most likely reason for this is that Mt. Kasigau brings water and they do recognize the importance to protect it for this reason. Infield (1988) found even individuals who supported hunting still recognized some type of control needed to be in place to protect wildlife. He also found individuals were less likely to support de-gazetting part of the park when this option was paired with a statement about destruction of wildlife (Infield 1988). This

could be similar for the Kasigau community because they recognize the importance of wildlife toward tourism and probably cannot make the connection between poaching and tourism without it being clearly explained.

Newmark et. al (1993) also found the community with the lowest economic benefit was the most likely to support abolishment of the national park because they are not receiving as many benefits, mainly in the form of tourism, as other communities. This could be the reason residents of Makwasinyi are more likely to poach or cut down trees. Makwasinyi is located on the far side of the mountain so they rarely see tourists. This village only has a couple restaurants and shops so many items like clothing and vegetables are not available for purchase.

Other informants said they like the taste of meat but they cite the prohibition as the reason they no longer use wild animals as a food source. A few of these individuals would still use wild meat if given the chance; however, more than 75% of individuals were strongly opposed to the use of bush meat due to the prohibition. The Kenya Wildlife Service (KWS) does allow villagers to take meat once an animal dies. During my time, one elephant died on the community ranch and all locals were invited to collect meat. People who receive benefits like this are less likely to support hunting because they believe the animals need to be protected so they will have meat in the future (Infield 1988). Community members who do not benefit from KWS bush meat are more likely to support hunting because they believe it is the only way they have access to the meat.

> We took Dik dik and giraffe a long time ago but now with the rangers around, we don't. If an elephant or something dies, they do allow us to take the meat from it. (F12, 42, Ngambeyni, Kamba)

> Now law prohibits killing wild animals but I like giraffe the most because the meat is soft. Gazelle tastes good but these days we go to the butchery because it is prohibited. The elephant meat was good (*from one KWS killed last week*). (F4, 49, Bungule, Taita)
>
> If permitted, giraffe has good meat, pofu has good meat, antelope has good meat. (M5, 40, Jora, Taita)
>
> There are so many wild animals which we use for food like dik dik, impala, wildebeest, buffalo, giraffe, all have nice meat but they are prohibited now. Before KWS came in we killed them for food and they were very good. (M32, 60, Bungule, Taita)

I believe the village of Makwasinyi is more likely to take trees from the mountain or poach wild animals because they are isolated on one side of the mountain that is about 20 km from where Kenya Wildlife Service rangers and Wildlife Works rangers usually patrol. Kenya Wildlife Service is called to the Kasigau area to protect the community from elephants. They are only present when crop raiding elephants are seen around the villages. These rangers camp on Kasigau ranch, which is near the village of Ngambenyi, far from the village of Makwasinyi.

Wildlife Works rangers are sponsored by a British organization. The organization sells carbon credits to foreigners to offset forest damage in Kenya. Wildlife Works rangers primarily drive around the community owned ranches (including Kasigau ranch) looking for charcoal burners to protect the trees. Members of the Kasigau community are encouraged to apply for Wildlife Works ranger positions after completing a fitness test. Some studies have found a community that uses local individuals to enforce poaching laws is more effective than one that uses government law enforcement alone (Topp-Jørgensen 2005, Lewis et al. 1990). These programs are effective because they produce jobs for the local community and catch poachers who are often outsiders, taking advantage of an opportunity. I believe Wildlife Works rangers in the Kasigau area have

reduced poaching and charcoal burning efforts because they can effectively patrol a larger area than KWS rangers alone.

Many community members said they did not take trees from the mountain or wild animals because there was now a prohibition. Only three community members were fearful of rangers, two of these women are from Ngambenyi, the community closest to the rangers' camp. Jora, where the third woman is from is the second closest village to the rangers' camp. Here are their responses about where they obtain resources:

> Trees come 20 kilometers from here in the bush. *Why don't you take them from here?* Because the rangers are here protecting the trees. (F12, 42, Ngambeyni, Kamba)

> Soil is all around, trees used to come from here at the ranch but now there is a prohibition so I go further (20 k away) to the bush. (F14, Maybe 70, Ngambeyni, Kamba)

> No, I fear. *What do you fear?* There was an announcement about not killing wild animals from the rangers so we don't take them, we protect them. (F6, About 33, Jora, Taita)

In Kasigau, there are several important natural resources as seen above but it appears these resources are treated differently by the local people. In all of my interviews, no one suggested another community member was stealing water; however, trees and wildlife are easily stolen. To explain this we need to look at ownership of each resource. Trees on Mt. Kasigau are state property, as well as all wildlife found in Kenya. Interestingly, water running down Mt. Kasigau is not considered state property; instead, a common property system is used for all residents of the Kasigau area. Pipes carry water down the mountain to communal water stations. These stations are kept locked and there is a schedule for which stations will be unlocked for water access each day. During the dry season, this access is limited to once every 2-3 days. Individuals pay one Kenyan

shilling per watering can or bucket, which can usually hold about 20 liters. This payment is used to maintain the water pipes and stations. In the village of Bungule, there is always water year round so this is where individuals can come to buy large amounts of water such as 100 L drums. There are several vehicles which transport water from Bungule to the other villages if you pay for this service. The only way to access water without visiting a communal water point would be to climb the mountain and take it from the source. This source is at least a two hour climb from the base of the mountain and it would be nearly impossible to carry large amounts of water down from here. This water point does allow open access to individuals climbing the mountain as it is the last place to get water before climbing a few more hours to the peak. The largest group of trees in the area is on Mt. Kasigau, which is state owned. There are trees in farms and nurseries which are privately owned. There are also trees on community-owned ranches but these ranches allocate plots for certain purposes such as planting crops or grazing livestock so trees cannot be removed unless allocated for that purpose. Any other tree not on the mountain, private property, or a community-owned ranch is open access; however, open access trees tend to be far from the villages.

Human-Wildlife Conflict

Besides being asked which wildlife they use, all participants were also asked which wildlife they like and which they do not like. This was asked to see if there are certain animals of which individuals are more receptive. The conservation status of certain animals could be affected if they are disliked by the community and the community is unwilling to protect them. Favorite animals were usually picked because they had a gentle nature, had a pleasant color pattern, or stayed far away from the

villages. Least favorite animals were picked because they commonly destroyed crops, killed livestock, or in some cases, are known to kill humans. In a study near Kilimanjaro National Park, 69% of individuals reported problems with wildlife (Newmark and Leonard 1991). It is estimated farmers in Taita-Taveta District, Kenya living along forest boundaries lose 30% of harvestable crop to wildlife (Himberg 2004). Farmers are not compensated for their loss so sometimes a negative attitude toward conservation emerges (Himberg 2004).

In Kasigau, the most common complaint was lodged against the elephant, which migrates through the villages between Tsavo East and Tsavo West national parks looking for food and water. Elephants in the region have been known to pull water pipes up all around the mountain in search of water. Elephants also cause the most damage when they crop raid due to their size. Elephants are also known to attack people who unknowingly get in the way. In the last year, there have been at least two elephant related human deaths and at least three individuals have been seriously injured. Listed below are some reasons individuals from Kasigau dislike elephants:

> Elephants destroy the crops and farms. (F8, 70, Rukanga, Taita)
>
> Elephant can kill someone and destroy crops. (F18, 20, Makwasinyi, Taita)
>
> Elephants are violent when destroying food from the farm. (M8, 53, Kitege, Taita)
>
> Elephant because if it enters the garden, all trees and plants are damaged. (M15, 47, Makwasinyi, Taita)
>
> Elephant because it destroys our food and kills people. That's the animal which I don't want to see around. (M23, 51, Makwasinyi, Taita)
>
> Elephant because this big animal is so bad to have around. It is so huge it eats many many kilos and it cannot fill itself up where it lives so it comes to our place here and damages our properties. (M32, 60, Bungule, Taita)

While elephant is disliked by many members of the community due to its destructive nature, other community members list elephant as one of their favorite animals because they recognize the elephant can draw tourists. Other animals like giraffe and zebra are also recognized as popular animals for tourists.

> Elephant are the biggest animals I've ever seen and they are good attractions for tourists. (M17, 21, Makwasinyi, Taita)
>
> Elephant because tourists come and watch the animal. (M8, 53, Kitege, Taita)
>
> Elephant because it is a tourism attraction and they also bring foreign currency. (M19, 65, Kisimenyi, Kamba)

It is interesting that although the elephant causes economic strain when it crop raids and often creates a difficult situation for people walking in their farms, some people do see its economic benefits. Most studies have shown people who experience costs associated with conservation are less likely to support protected areas (Infield 1988, Lewis et al. 1990, Kideghesho et al. 2007). Tourists do enjoy seeing elephants when visiting Kasigau but often the elephants are too close to the villages for comfort.

Other common crop raiders include vervet monkeys and baboons. In Kilimanjaro National Park, monkeys were listed as the most common crop raiders by 44% of the respondents (Newmark and Leonard 1991). Monkeys are more frequent raiders in Kasigau but elephants do more damage each time they raid so they are blamed more often (Kagwa 2011). Here are a couple responses about the type of damage primates cause:

> The baboons, they get into your farm and end up destroying the whole thing and sometimes they get into your house and can do some damages. (M2, 23, Kitege, Taita)

> Monkeys destroy fruits like mangos. (F8, 70, Rukanga, Taita)

Community members who keep livestock complain lion attack and eat livestock, followed by hyena and leopard. Large predators eating livestock were commonly mentioned during the interviews; however informal surveys done in Kasigau have found a very low threat of this as many large predators are no longer in the area. Here are some respondents concerned with large predators:

> Lions are harmful because they catch livestock. (F8, 70, Rukanga, Taita)
>
> Lions are dangerous and attack livestock, leopard same as lion. (F12, 42, Ngambeyni, Kamba)
>
> Lion can attack livestock and can kill a human, (F18, 20, Makwasinyi, Taita)
>
> Lions and hyenas attack domestic animals like cows and goats. (M8, 53, Kitege, Taita)
>
> Hyena because it comes at night and breaks the boma to kill livestock. (M15, 47, Makwasinyi, Taita)

It is interesting people do not like lion and choose it over other animals like hyena or leopard. Twenty-three community members said they did not like lions, 12 did not like hyenas, and only six said they did not like leopards. During the study, there was only one report of a lion sighting, which was still around 80 km from Kasigau. During informal surveys by Western Kentucky University throughout the last several years a Cheetah is the only large predator spotted near the villages. One woman in Makwasinyi lost one of her goats to a leopard in November 2011 and there are other reports of a leopard seen on the mountain. However, leopard was mentioned far less than lion.

> The environment is good because trees provide fresh air. I have planted some trees to make the environment better. I get water from a nearby source. There is a leopard who disturbs me at night and recently I lost one goat. *When?* 11/10/11 (*5 days ago*). *How do you know it was a leopard, did you see it?* Yes, it had spots. (F17, 33, Makwasinyi, Taita)

Other animals were cited even if they did not damage crops or destroy livestock because community members fear them. Common examples of this include buffalo, snakes, and scorpions that are all dangerous to humans. Here are some of the responses when individuals were asked which wildlife they do not like:

> Buffalo is angry when you meet it in the forest it will pick you up and murder you, snake is poisonous if it bites. (F12, 42, Ngambeyni, Kamba)
>
> Buffalo looks ugly and is dangerous. (M11, 57, Makwasinyi, Taita)
>
> Some snakes because some bite with poison. (F11, 42, Jora, Taita)
>
> Snakes because they are very poisonous. (F25, 28, Makwasinyi, Taita)
>
> Yes, there are but I don't know their names. Like snakes, lizards, crocodiles. I avoid them because I fear them, they are dangerous. (F32, 40, Bungule, Taita)
>
> The snakes, they go and they bite you and you'll just die because of the poison. (M2, 23, Kitege, Taita)
>
> Buffalo is an angry animal. When I graze animals in the bush I am always watching for buffalo. Snakes because some bite and have poison so when they bite there are expenses with getting medicine. (M6, 34, Rukanga, Taita)
>
> Yes, I don't love snake, scorpion, spider, they are very poisonous if they bite you you end up dying and I fear them very much. (F29, 19, Makwasinyi, Taita)

Invertebrate perception studies have been conducted and most have found people have a negative attitude toward invertebrates due to fear or dislike (Kellert 1993, Öhman 1986). A previous reptile study in the Kasigau region found traditional conceptions of snakes include fear, loathing, and hostility (Wojnowski 2008). Kenyans do have a more logical reason to fear snakes than some. There are venomous snakes in Kenya and a few do

contain enough venom to kill a person; however, attacks on a person are rare because the snake does not want to waste venom on something it cannot eat. There are many non-venomous snakes in Kenya that are killed unnecessarily out of fear. Many of these non-venomous snakes provide unrecognized benefits. There are snake species, like the Cape File Snake (*Mehelya capensis*), which feed on venomous snakes such as the Black Mamba (*Dendroaspis polylepis*) and Puff Adder (*Bitis arietans*) (Wojnowski 2008). Many other snakes in the Kasigau area are beneficial to farmers because they prey on rodents who destroy crops (Wojnowski 2008). If community members could learn to recognize helpful species, it would help the snake population and the farmers.

Gender Roles and Natural Resource Use

I asked all participants which natural resources are important to them. The results show difference between men and women suggesting different gender roles with respect to the use of natural resources. As in most tribal cultures, women in Kasigau fulfill the childrearing role while men take on the role of economic provider for the family. Traditional gender roles are changing in Kasigau as females in their teens and twenties are allowed to hold jobs if do not attend school. Usually their mother is still home to take care of the house work and they return home once a week to help. This arrangement is also more likely accepted if there are other daughters in the family who can take on the extra work load that occurs if one daughter leaves. Women are the ones who wash, cook, and carry water so they are more likely to cite water as an important natural resource for the community because they use it for washing and cleaning. Men also listed water, but usually said drought prevented them from getting enough water for crops instead of saying they do not get enough water to clean or cook. Ten men said there was not

enough water for crops or tree nurseries while only eight men said they had to walk a long distance for drinking water. Men were more likely to list gemstones as a resource because they are primarily the ones who leave the home to mine and earn money; eight of 31 men listed gemstones while only one female said the same. Other studies of gender roles in Africa have found married women take on the traditional reproductive roles (taking care of children, cleaning etc.); while women who serve as the head of the household take on both productive (earning an income or ploughing) and reproductive roles (Peter 2006). Below is an example of resources important to females and males in Kasigau. She mentions water for household chores while he lists the importance of gemstones and crops.

> Water, trees, mountain, stones. Trees are important because they provide shade, charcoal, timber. Stones help for construction. Water is helpful for washing utensils, cooking, drinking, washing clothes. (F7, 27, Rukanga, Taita)

> Water for cooking, washing utensils, for life, trees, mountain gives trees which we build our houses from and we get water from the mountain, gemstones are sold for money, farms because it grows crops like corn, beans, wheat, mango trees, green grams, avocados. (M9, 36, Kitege, Boran)

This trend was also similar when interviewees were asked which resources were difficult to obtain. Women usually listed water as the resource they found hard to get because they must walk long distances to a central water point. I also found women complained more about the availability of water during the dry season. Here are some of their responses:

> No. I get little water and walk a long distance. I get little firewood because there are many farms around and not many trees. I have to walk up the mountain to get stones. (F8, 70, Rukanga, Taita)

> Sometimes there is a scarcity of water so we have to walk some distance. (F9, 42, Makwasinyi, Taita)

> No. Water comes from Bungule or Rukanga. We depend on shops for food because there isn't enough on the farm. There are enough trees. (F12, 42, Ngambeyni, Kamba)
>
> No, water comes from Bungule. (F14, Maybe 70, Ngambeyni, Kamba)
>
> We do not get enough resources because we don't have enough water. There are enough gemstones but not enough money for equipment so we mine gemstones manually which produces very little money. (F4, 49, Bungule, Taita)

While obtaining water every dry season is difficult, most women interviewed during the rainy season did not report these difficulties; instead, they said water was easily available from the streams and water kiosks in town that seems as if their problems are forgotten when plenty of rain is falling.

> Yes, I can go to this stream and take stones and sand to sell. (F15, 43, Makwasinyi, Taita)

Men also listed water as difficult to obtain, but they were more likely to mention that they struggled throughout the dry season when there was little rain, not throughout the year. This was the case no matter when the men were interviewed. These informants were interviewed during the rainy season:

> Sometimes it is difficult to get water when there is drought. It is also difficult to get others like trees and charcoal. (M25, 54, Makwasinyi, Taita)
>
> Yes, but the problem is rain. (M23, 51, Makwasinyi, Taita)
>
> During the dry season the water is little, there is not enough for the community. We only get water every two days. (M16, 74, Makwasinyi, Taita)
>
> Yes but it is difficult because the land does not receive a lot of rain. Because of the little rainfall, elephants come and destroy things looking for water. (M19, 65, Kisimenyi, Kamba)

Men commonly listed gemstones as a resource difficult to obtain, saying they do not have the proper equipment to mine the gemstones and that the mines are far from Kasigau

(approximately 50 km). Eight of thirty-one men listed gemstones while only one female included gemstones in her list. Below are responses from some of the men:

> No, sometimes it is difficult to get gemstones because we need equipment to get them. When it floods we can't get gemstones until the water is removed from the caves. (M3, 36, Bungule, Taita)

> Gemstones are difficult because we don't have the equipment so we drill manually. (M6, 34, Rukanga, Taita)

> No, it is difficult to get minerals like gypsum, green granite because there are no machines to extract them. (M30, 20, Makwasinyi, Taita)

> Gemstones come from koranze 75 kilometers from here. M9, 36, Kitege, Boran

Women can be responsible for up to 50% of artisanal mining in Africa, which includes salt, gemstone, diamond, gold, clay, and stone mining (Hinton et al. 2003). In Kasigau, gemstone mines are prominent which is more physically demanding than other types of mining. Some women go to mine but they usually sift through dust on the ground looking for gemstones instead of carving them out of the rock. Even if appropriate technology were available in Kasigau to extract gemstones effectively, women probably still would not participate. Most women are not able to make the long trip to the mines because they have children to care for; though some single women do camp at the mines cooking food because it is a good opportunity to make money.

Gender roles were also apparent when participants were asked about species of trees they like to use. Women listed the firewood they collected while men were more likely to list plants used for medicinal purposes.

Shortage of firewood is the main cause of forest degradation in Africa that can then lead to a decreased water supply and degradation of the watershed (Weber 1987). Firewood and charcoal are very important resources for every household in the Kasigau

community as these are the only fuel sources locally available. Cooking gas is available in the nearest large town, Voi, which is more than two hours away using public transportation. However, carrying the tank through town is difficult and there is a fee charged for bringing it back to the village so the process is not easy. Illegal charcoal burning has been a concern of KWS and the Wildlife Works rangers because the people making charcoal are not local and earn a profit by selling it after they have destroyed trees that is a real environmental concern. Members of the Kasigau community are allowed to produce enough charcoal for personal use if the trees are gathered from certain appropriate areas. Overall, the charcoal industry has expanded across East Africa and now some farmers are only planting trees used for fuel that would not have been profitable several years ago (Arnold et al. 2002). Pharmacies with limited supplies are available in Kasigau; otherwise, modern medicine is obtained from Voi. Many families do not have enough money to make the trip to town or money for modern medicine so traditional medicine is still common, though not as common as it once was. The poorest households are more likely to use forest resources because they do not have money to pay for advanced technology (Kaimowitz 2003). Here you can see the species of trees and what they are used for by both women and men:

> Mchimari *(Acacia nilotica),* for firewood, iti *(Acacia mellifera),* for firewood, mdomoko (*Grewis tephrodermis*), for firewood, mshogareka (*Terminalia prunoides*) for timber, msaghano (*Terminalia spinosa*) for building. (F8, 70, Rukanga, Taita)

> Mkulu (*Diospyros mespiliformis*) for firewood, mshogareka (*Terminalia prunoides*) for firewood, mnau *(Manilkara mochisia),* for firewood. (F11, 42, Jora, Taita)

> Mklifi (*Afzelia indica*) for medicine (malaria cure when drank), mvumu (*Fiscus thonningii*) for medicine (stomach ache), mshiga *(Lannea schweinfurthii),* (boiled branches increase blood in the body when drank), mkigondo (*Cassia abbreviata*) (helps clean kidneys from bacteria). (M5, 40, Jora, Taita)
>
> Mwganjecka (*Zanthoxyllum chalybeum*) for medicine what type? Sneezing. Mklifi (*Afzelia indica*) for malaria, mkigondo (*Cassia abbreviata*) for pain, kipapa for wounds. (M6, 34, Rukanga, Taita)
>
> Mkigondo (*Cassia abbreviata*) for stomach ache, headache, malaria, kikorio (*Boscia coreacea*) helps keep the water clean when you pound the roots and stir with water for 20-45 minutes and the water is clean, mshishoti (*Grewia villosa*) for firewood. (M13, 32, Ngambenyi, Kamba)

Community members of both genders realize trees need to be replaced when used and a few have started tree nurseries on their land. This is a good way to generate forest-based income because these trees can be used for food, firewood, medicine, or even sold for profit (Kaimowitz 2003). Some of their ideas are seen below:

> I can make a tree nursery and transplant them from there to the farm which helps conserve soil erosion. (F20, 60, Kisimenyi, Kamba)
>
> Moving around the bush to find small trees to take to a nursery at the house. Trees for timber. (F22, 64, Kisimenyi, Kamba)
>
> I have a tree nursery but I don't have enough water to give the seedlings. (M7, 42, Rukanga, Taita)
>
> We only find seeds and take them to a nursery. (F23, 19, Kitege, Taita)
>
> I have a nursery in my farm so I grew them big enough to construct a house. (M6, 34, Rukanga, Taita)

Gender role studies have shown women are typically more concerned with environmental health (Tindall et al. 2003). Women are the ones raising the children so they are more likely to notice environmental concerns that could affect their children's health. The women of Kasigau are more likely to notice water and firewood shortages because they are the ones waiting in line for hours to get water or walking a long distance

to collect firewood. In more developed cultures, women are taking on more environmental activist roles and are also more likely to make changes in their personal life to conserve the environment (Tindall et al. 2003). Generally, female leadership in Kasigau goes against traditional culture norms but as the culture progresses to modernity, women could end up leading the environmental charge in Kasigau.

Income and Gender Roles

In the tribal setting of Kasigau it is common for women to work on their personal farm alongside their husbands. This is an activity she can do to help bring food and income into the family without leaving the homestead. In Tanzania, a livelihood study has shown in 81% of farming households, women and men work together (Monela et al. 2001). Women are included in all aspects of the farm, including planting, weeding, harvesting, and raising livestock. In forested woodlands like Kasigau families can derive 50% of their income from forest-based products such as honey, wild fruits, charcoal, and firewood (Monela et al. 2001). Women in Kasigau do not make charcoal but will collect wild fruits and firewood. Only a handful of farmers in Kasigau make honey today but at one time there was a women's bee co-op in one village so both sexes participate in this activity. Other forest-based income activities include removing raw materials from the forest to create something else. In Kasigau, carved wooden spoons and stools are often made by men while women collect sisal to weave baskets. In Tanzania, Monela et al. (2001) found 40% of women interviewed participated in some type of petty business. In Kasigau, many women are in basket cooperatives present in all villages around the mountain. Women can weave at home or come together at a central meeting spot several

times a week to keep each other company while weaving. These baskets are then sold. When asked what informants could sell to tourists, here are some of their responses:

> Give a gift like baskets, chickens, watermelons. (F15, 43, Makwasinyi, Taita)
>
> Baskets (she makes ropes, not baskets), necklace (she makes them with a group of 25 women who make beads). (F22, 64, Kisimenyi, Kamba)
>
> Wood carvings of elephant or giraffe, bow and arrows. (M8, 53, Kitege, Taita)
>
> When I harvest honey I give it as a gift. (M5, 40, Jora, Taita)
>
> It depends on what we have at the moment; pots, stools, and drums. (M28, 55, Makwasinyi, Taita)

Tourism

All respondents except one said they want tourists to visit Kasigau. Community members recognize tourists can increase economic growth because they spend money in the local community, pay guides to take them up Mt. Kasigau, purchase locally made products, and may even offer to pay school fees for families who cannot afford it. The only person who did not want tourists to visit said tourists do not provide enough cash and therefore should not visit. This is also supported by other studies conducted around national parks that have found most people would rather use the national park for tourism than to use the same land for agriculture (Newmark et al. 1993). Infield (1988) found that locals like tourists to visit their park so it spreads their tribe name throughout South Africa. These individuals were unable to connect tourism with economic revenue and employment (Infield 1988). The people of Kasigau have already recognized these connections; their responses are seen here:

> Yes, because we get money from them when they come. They go see animals on the mountain. I am a basket weaver and when they come, they buy baskets. We get school scholarships from them. (F12, 42, Ngambeyni, Kamba)

> Yes, I like them because I am a basket weaver so they are customers to me. (F32, 40, Bungule, Taita)
>
> Yes, we want the tourists because we want to exchange the dollar with our money. When we take them up the mountain we get money. (M5, 40, Jora, Taita)

Economic benefit is not the only reason members of the Kasigau community want tourists to come. Many enjoy sharing ideas with tourists on how they can improve their community. Others have learned new information from tourists and have even made lasting friendships. Many community members mentioned learning about new plants and animals on the mountain. There have been several researchers in Kasigau studying the ecosystem and it is hard for the community to make the distinction between a true tourist and a researcher or aid worker. To them, everyone is a *mzungu*, or white person. Some things tourists provide to the community are seen below:

> Yeah. I think there is a lot to learn around here and also when they come we can share ideas about our countries and they can learn from us. Also when the tourists come we can make friends and it can enhance the interaction with other countries. Also sometimes you get some income, they enhance the development of some businesses. (M2, 23, Kitege, Taita)
>
> Yes, when they come there is an exchange of ideas, how to live, and business like weaving of baskets. When they come, there are bandas around the village so the tourists get accommodation from the villages. Sometimes they pay school fees. (F11, 42, Jora, Taita)
>
> Yes, when they come they develop our area. They help in medicating needy children, the help build schools. (F19, 36, Makwasinyi, Taita)
>
> Yes, because when they come and sleep in the banda they pay and we get something from it. They buy baskets from basket weavers. They come climb the hill and take a guide which they pay. The come to improve our standard of earnings. (M16, 74, Makwasinyi, Taita)
>
> Yes, so they can come. When we don't know the names of animals they come and tell us this snake is called this, this tree is called this. We learn more if they come. *What about tourists instead of researchers?* Yes to come and enjoy it. (F29, 19, Makwasinyi, Taita)

> Yes because if they come up the mountain they can research their things then after they go back they give me something. When tourists go up there, it keeps the mountain alive because they care about the mountain. (M15, 47, Makwasinyi, Taita)

Beyond asking if tourists were welcome in Kasigau, I also wanted to see what types of things community members could provide to tourists if some type of community-based ecotourism model was used. The only type of infrastructure for ecotourism in Kasigau currently is a banda (traditional African hut) found in each of the five villages around the base of the mountain. Tourists may rent out these bandas during their trip to Kasigau. Ecotourism development can be expensive when infrastructure building costs are taken into account so it must be thoughtfully planned (Weber 1987). Baskets were the primary thing individuals in Kasigau and the community could provide. These baskets are made of sisal, a locally available plant. Plants or purchased dyes are then used to dye the sisal into a variety of colors. Each tribe has their own unique style of baskets they prefer making. Each village has its own organization where women meet at a certain location and weave baskets with each other. Western Kentucky University's Students for Free Enterprise (SIFE) has worked with the basket women in the past, buying baskets and selling them in the U.S., then returning the money to Kenya. People of Kasigau recognize their baskets are unique and something tourists are willing to buy. Other gift items included carved stools and cooking spoons, handmade ropes, necklaces, and traditional pots. Others could offer chickens, goats, scones, and traditional meals. Communities as a whole could offer traditional dances, drums, and farewell parties. Other community members were willing to welcome tourists into their homes or had

ideas to build a hotel nearby. Some said they would serve as guides up Mt. Kasigau, others suggested all they could do would be to welcome tourists.

When asking this question, I was expecting to hear innovative ideas that would draw tourists to Kasigau if community-based ecotourism were developed. Most of the ideas were gifts they could sell to tourists while I expected to hear more people say tourists could stay in their house, or that they could provide food, transportation, or information.

CHAPTER V CONCLUSIONS

Individuals in Kasigau have been taught about the long-term benefits of conservation. This is apparent when listening to individuals talk about what they do to conserve their environment. All community members support the protection of Mt. Kasigau, especially if they have received benefits from conservation programs. Community members recognize the nationwide prohibition on wildlife is to protect these animals for future generations. Even in cases of human-wildlife conflict, villagers of Kasigau still wish to protect dangerous animals like the elephant, even after they have destroyed a field full of crops. The people of Kasigau also recognize these animals provide revenue to the government because tourists come to visit them. This is similar to Infield's (1988) results that found locals thought reed grass was being protected for tourists, but these community members also believed they would benefit from the protected reed grass in the future. Infield (1988) also found individuals were more likely to support protected areas if they received benefits. In Kasigau, an elephant was killed by Kenya Wildlife Service rangers that did present individuals with an opportunity to obtain bush meat. Informants mentioned this instance as a reason the prohibition of wildlife was not too difficult to handle.

Most families in Kasigau rely on agriculture as a main source of income as almost everyone is a small-scale subsistence farmer. Still, the individuals in Kasigau are clearly capitalists, always looking for a way to earn additional income for their survival and that of their families. The Kasigau community has also seen the revenue tourists can bring to the area and are interested in ecotourism. A properly developed community-based ecotourism model would likely be successful in Kasigau if using the guidelines outlined

by Forgie (2001), Watkin (2003), and Salafsky et al. (2001). These types of initiatives stress the importance of including the community in planning and implementing projects. It is also important to include all types of community members instead of taking all ideas from a single group. Many women are already selling handicrafts like baskets, and community-owned bandas have provided some additional income. Unfortunately, these bandas are not rented frequently and there is not enough money coming in to support all villagers.

When looking at resource ownership and use, a common property system for water in Kasigau is working extremely well and the only complaints are the infrequency of water during the dry season. Resources controlled by the state, such as trees and wildlife, are not as well protected and there are more cases of community members stealing one of these items. This difference could be because the common property water system is still allowing access to the resource they need for a small fee, whereas for trees, they are denied access unless it is open access, which can be a long walk from the village. Another reason water might not be stolen is because of the difficulty stealing it since all water points in the villages are kept locked and the unlocked water source is a ways up the mountain.

Rational Choice Theory

Support for protected areas, the prohibition against wildlife, agricultural decisions, and ecotourism models can all be explained by rational choice theory. Studies of conservation attitudes span across many different disciplines. Perceptions are sociological, conservation aspects are biological, farming is agricultural, and risks associated with payouts are economical. These aspects make it difficult to find an

appropriate theory without drawing from multiple disciplines. Rational choice theory offers a framework that does this. Friedman and Hechter (1998) note that "Rational choice models always rely on conceptions of actors as purposive and intentional ." Actors are conceived to have given preferences or values and will act according to these preferences (Friedman & Hechter 1988). Opportunity costs play a large role in choices of the actors as they may pick a choice that does not satisfy their values to reap maximum benefits (Friedman & Hechter 1988). The rational choice model comes with many variations since social institutions and opportunity costs can affect the outcome. While opportunity costs vary individually, people with the same social characteristics often have approximately the same opportunity costs, and therefore it is possible to identify patterns of behavior based on these characteristics.

Information is another element in rational choice theory; originally, it was assumed actors had the appropriate amount of information from which to base a decision. However, recently, the quality and quantity of information has been considered. Using this theory, the nature of social outcomes relies on the underlying preference of the individual. For example, if people are trying to maximize their wealth, they will choose social outcomes with the highest economic reward (Friedman & Hechter 1988). This is where the study of economics becomes applicable. In economics, the rational choice theory has the same name and follows the same basic concept. The difference between the two theories is what topics they stress; each discipline emphasized topics that apply the most to their discipline. For example, sociological rational choice theory uses preferences and values to explain a decision, whereas economical rational choice theory uses only economics to explain a decision (Ulen 1999).

In Kasigau, the sociological and economical sides of rational choice theory are equally important as introducing ecotourism to assist with conservation efforts will span both disciplines. Rational choice can be used to explain conservation attitudes, which are affected by resource availability and economic security. Usually community members will pick the choice that maximizes pay out while minimizing risks. Though it is important to note, in Kasigau, the maximum pay out may not be economic reward but instead may be access to resources such as water and trees. This could happen if protection of Mt. Kasigau is not providing economic benefits and individuals would rather have access to the resources they once had. Before individuals will choose conservation over use of natural resources, an alternative resource must be available that is more economically viable than the one they are currently using. During the interviews, informants were asked questions about conservation efforts. One respondent said while she was afraid of dangerous wildlife, she protects them because they attract tourists. A perfect example of this idea is the elephant. Elephants in Kasigau are extremely dangerous and do cause crop damage. For these reasons, killing elephants to protect one's self or farm would be rational; however, in Kasigau, many people do support elephant presence because they recognize the economic benefits from tourism. Many individuals are willing to kill other dangerous animals because there is no rational benefit seen to keeping them. This is the case for snakes, which are feared because some species are dangerous. Individuals in Kasigau do not recognize the benefits of some snakes so fearing all snakes is rational. In addition, tourists would not be willing to visit Kasigau to see snakes. Rational choice was also apparent when informants were asked if they wanted to protect Mt. Kasigau. While respondents could use Mt. Kasigau for firewood

and construction materials, most recognize water as the most important benefit; secondly, they recognize tourism as an economic benefit. Some members in the Kasigau community also realize the benefits of tree nurseries and replacing harvested trees so there will be forest products and an income source in the future. These are examples of a rational choice made to help protect the environment over a long time signifying individuals in Kasigau recognize long term benefits over short term costs such as crop destruction.

Rational Choice and Makwasinyi

All villages followed the same patterns about conservation and resource use except Makwasinyi, isolated on the far northeastern side of the mountain significantly off the main road. Makwasinyi has less shops and restaurants than other villages; fruit, vegetables, and used clothing cannot be purchased. Tourists also rarely travel to this side of the mountain. Individuals in Makwasinyi are usually less educated than other villages because their closest high school is more than 12 kilometers away. This year, a high school was built in Makwasinyi so this might change as students can stay at home and continue past 8th grade. Makwasinyi is also not regularly visited by the Kenyan Wildlife Service (KWS) rangers. The most elephant crop damage takes place in Ngambeyni, on the opposite side of the mountain so KWS usually sets up a camp on a community ranch in Ngambenyi (Kagwa 2011). More cases of poaching wildlife and trees from Mt. Kasigau and the surrounding area were mentioned in Makwasinyi than in any other village. I believe this is due to resource availability as well as the residents of Makwasinyi lack of fear of being caught by KWS compared with individuals in other villages. Clearly, the infrequent visits by KWS to Makwasinyi do not represent a threat or a real cost to the residents of this village, well within the framework of a rational choice model. Villagers in Makwasinyi are not engaging in more deviant or criminal activity relating to deforestation and poaching compared with the residents of other villages. They are simply less likely to see benefits of conserving wildlife and Mt. Kasigau because they do not receive benefits from tourism and they are not subjected to the immediate costs associated with these deviant and illegal activities. The path up Mt. Kasigau is extremely steep so visitors usually do not choose to start their climb from this

village. If tourists do not visit their side of the mountain, they have no reason to protect the mountain and to receive any potential benefits from ecotourism. Villagers in Makwasinyi did recognize the importance of protecting Mt. Kasigau for water that is necessary for their self-preservation. However, these beliefs did not prevent them from taking trees off the mountain. These trees represent an immediate benefit of having firewood and timber, and this may be more important to the people of Makwasinyi than having a water source for a long period. The costs of being caught by KWS and not being able to draw tourists do not apply to the people of Makwasinyi like they do in other villages.

Culture can also explain Makwasinyi's likelihood of using trees and wildlife in the area. Makwasinyi is more culturally homogenous than other villages as every informant interviewed here was part of the Taita tribe. Culture provides materials to construct strategies of actions but these actions can still vary greatly within the community (Swidler 1986). When cultural resources are central in life, they anchor strategies of action that individuals have developed (Swidler 1986). People do not take advantage of opportunities that help them abandon other ways of life because they cling to cultural values and are reluctant to change (Swidler 1986). Introduction of environmental laws have been met with resistance across the world and this is the case in Kasigau as well. Even in other villages not known to poach, individuals said they like the taste of meat because their grandfather hunted wildlife and shared meat with them. Using trees for firewood is a long-standing part of the community tradition throughout most of Africa, not just in Kasigau. Alternative fuel sources like propane are not available in Kasigau and their expense makes them cost prohibitive. Before a regulation preventing

community members from removing trees from certain areas is made, officials should determine if appropriate resources are available outside these areas. In Makwasinyi, they have the forested mountain and then an open plain with relatively few trees below. Conservation laws must be sensitive to culture and attempt to slowly incorporate change. Most villages seem to have adapted to the new laws, except Makwasinyi. Makwasinyi's isolation, small availability of resources available, and education level can likely explain why they are slower to adapt to cultural change. Individuals in Makwasinyi are choosing the short-term benefits even if there are long-term costs because they have not been educated on the benefits of conservation. This is consistent with Harcourt et al.'s (1986) findings that people with a lower education level are less likely to support protected areas. If non-governmental organizations focused more time and programs in Makwasinyi, this community might see the long term benefits of conservation like the rest of the villages have already moved toward accepting.

Agriculture vs. Ecotourism

Rational choice can also apply to agriculture. Although a farmer's risks are high in Kasigau, he will continue farming until he has another option as farming currently produces the highest reward. Ecotourism is another option available to people of Kasigau but would not provide a regular source of income unless it is developed further. The community of Kasigau enjoys having tourists visit and some members are interested in developing an ecotourism model. However, taking on a new project like this might have many risks involved for members of these villages. Risks can be weighed using risk management techniques; "Risk management involves choosing among alternatives that have uncertain outcomes and varying levels of expected return" (Economic n.d.). Risk

management requires evaluation of tradeoffs based on expected returns and other variables (Economic n.d.). Crop production in Kasigau has many risks associated with it like drought and damage from wildlife but farmers might find it to be the safer income compared with a new idea that initially has higher startup costs, such as ecotourism. Farmers will use rational choice theory to determine if it is more beneficial to continue in agriculture or try ecotourism. In Kasigau, most individuals are interested in taking a risk on ecotourism because they recognize it could have long term payouts.

Conservation Attitudes and the Theory of Reasoned Action

Much of this study examined attitudes toward conservation and resource use. Many studies have used attitudes to predict behavior. In Kasigau, individuals understand the ecology of Mt. Kasigau and all of the informants would like to protect it because of its importance as a water source. Individuals have different reasons for wanting to protect the mountain; some realize it is the only source of water and others realize the mountain is an important resource in itself because it draws tourists and researchers. It is hoped these attitudes will influence behavior, specifically when looking at the protection of Mt. Kasigau. Using attitudes to predict behavior is part of the theory of reasoned action.

The theory of reasoned action suggests that individuals are rational and make use of the information available (Ajzen and Fishbein 1980). Ajzen and Fishbein are the authorities on the theory of reasoned action; and believe that they can predict behavior by looking at individual attitudes. The goal of reasoned action is to predict and understand an individual's behavior by identifying and measuring the behavior of interest (Ajzen and Fishbein 1980). An individual will usually act according to his or her intention but this is

not always the case (Ajzen and Fishbein 1980). Intention is measured by two factors: first, the attitude toward the behavior, and second, the person's perception of social pressures to perform the behavior (Ajzen and Fishbein 1980). A person can have a certain attitude that does not match the societal norm, and in this case, each individual must decide if his/her beliefs or society's beliefs are more important (Ajzen and Fishbein 1980). Only a few beliefs can determine a person's attitude, and these beliefs can change (Ajzen and Fishbein 1980). This theory is useful when applied to respondents' attitudes toward conservation. I asked individuals what they did to conserve their environment and showed positive actions toward conservation. I did not ask about perceptions of social pressures to perform conservation behaviors, and therefore, intention cannot be completely measured. However, responses suggest conservation actions are highly supported. Interestingly, this theory does not seem to explain the phenomena of individuals in Makwasinyi who believe protecting Mt. Kasigau was important while simultaneously taking trees from the mountain itself. I asked informants if they protecting Mt. Kasigau was important; this measured their attitude toward the behavior of conservation, which is the first step when looking at intention in the reasoned action framework. I did not measure the second factor to calculate intention, which would have required me to ask informants if they felt it was right for other community members to take resources from the mountain. I still cannot completely measure intention but the normal pattern attitudes usually follow does not match the intention of individuals removing trees from Mt. Kasigau. This is where rational choice theory might not be an appropriate fit for Makwasinyi because people believe one thing and act in a different way. This is why it is important to use culture to explain conservation attitudes in areas

like Kasigau.

Gender Roles

Gender roles in Kasigau are directly related to resource use and conservation. Women are more likely to use trees for firewood and collect water so they are more likely to be interested in conservation programs affecting access to these resources, whether the proposed plan would help or hinder resource availability. The same applies for men and access to gemstones or trees used for building. They are going to be more interested in helping to develop a conservation plan that will benefit them. This is why it is important to know how the community functions when developing any type of community-based conservation plan. This idea can be used when developing an ecotourism plan; women would likely be interested in a plan that incorporates handicraft sales and cooking while men would be more interested in a plan that uses guides to take tourists up Mt. Kasigau. Any plan should incorporate aspects to benefit the community as a whole, not only a single part.

Analyzing gender and resource use challenges the feminist theory. Feminist theory requires male domination to be valid (Jackson 1994). Jackson (1994) instead argues for gender analysis, which emphasizes the importance of analyzing both men and women in relation to each other. Gender differentiation says men and women of the same household relate to resources in different ways but these relationships are not fixed. Rather, income and relationship in the community can also have an effect (Jackson 1994). Agarwal (1992) introduces feminist environmentalism to explain gender analyses. Agarwal (1992) says there is a division of labor by gender and class that affects environmental change and the way individuals respond to this change. As a whole, this

perspective includes struggles for resources with powerful groups that control access to them (Agarwal 1992). Agarwal continues to explain his idea from the feminist and environmental fronts:

> "On the feminist front there would be a need to challenge and transform both notions about gender and the actual division of work and resources between the genders. On the environmental front there would be a need to challenge and transform not only notions about the relationship between people and nature but also the actual methods of appropriation of nature's resources by a few" Agarwal (1992).

The idea of feminist environmentalism is supported by Jackson (1994) and Rocheleau and Ross (1995).

Poor families rely more on community natural resources than other families so they are the most likely to be affected by environmental degradation (Agarwal 1992). This is particularly true for single women as they are dependent on the environment for resources and they are also the sole income provider for the family (Agarwal 1992). As a whole, women and children notice environmental change first because they are the primary individuals accessing natural resources by collecting water and firewood (Agarwal 1992). Limited access to these resources have increased the work load of women, causing them to walk farther and look harder to collect enough resources for survival (Agarwal 1992). This increased work load also reduces the time they can spend in the field tending to crops causing income reduction as well (Agarwal 1992). Nutrition also suffers as women turn to cooking quick foods that require less fuel than more nutritious ones (Agarwal 1992). In Kenya, beans are nutritious but take hours to cook so

it is much quicker to make less nutritious corn porridge. Women can look at the environment on a larger scale and realize forests must be protected to safeguard the water source, even if selling trees to a logging company would temporarily benefit the community (Agarwal 1992).

While focusing on women's resource use and labor responsibilities can be helpful in conservation and management, it is useless if not placed within the context of the larger picture of resource use, including men's labor responsibilities (Leach 1992). Men and women use resources in different ways that can be addressed separately; but addressing them jointly is more effective, building on shared interests to create a helpful solution appropriate for all members of the family (Leach 1992). Different incentives can be set for each group that prevents one age group or gender from capitalizing on the benefits (Leach 1992). In the Dominican Republic, a foundation set up different associations for community members to join. Some of these associations had a higher entry fee or required a certain number of trees planted for timber before the individual could join (Rocheleau and Ross 1995). These types of associations do not benefit the community as a whole because they exclude the poorest families who are already struggling to find a good source of income. This could change if the women's association was set up by the same foundation and could have some say in the wood producer's association (Rocheleau and Ross 1995).

Another interesting aspect found when completing surveys is that responses varied between the wet and dry season. During the dry season, women mentioned how far they had to walk for water and how it was not available every day. During the wet season, most women said they had no trouble getting resources at all. This suggests

people of Kasigau do not remember their hardships throughout the year. When it is raining and crops are growing, life is good and drought is forgotten. Men were more likely to specify that water availability was fine during the wet season but scarce during the dry season, showing they had a broader and long term approach toward resource management. This could be important to consider when developing a conservation plan.

Developing a plan

Residents of Kasigau are open to the development of community-based ecotourism and conservation; however many individuals do not seem to understand the traditional definition of a tourist. Throughout interviews, it became apparent most villagers consider a tourist any white person (mzungu in Swahili) that comes to the village. By definition, a tourist is one who travels for pleasure (Tourist 2012). There are Kenyans who come to climb Mt. Kasigau but these individuals do not seem to be considered tourists by local standards. Many times, when I asked why an individual wanted tourists to visit Kasigau they would say tourists teach them about the mountain. There have been several universities researching in Kasigau for a number of years so this has become the village definition of a tourist. University of Miami, Ohio has completed multiple studies in Kasigau, as well as Western Kentucky University. Both of these universities have organized community events and helped to raise funds. Western Kentucky University has been purchasing baskets to sell in the U.S. for five years. Many individuals associated with these universities have also paid school fees for children from poor families. In interviews when it seemed clear the informant was talking about a previous researcher who had come, I had my research assistant explain the difference between a researcher who stays for a longer period of time to study and a tourist who

might only visit for a few days to climb the mountain. Most of the time, this explanation was not understood. It is clear that the presence of Western Kentucky University in Kasigau could be biasing results and this should be considered when developing a conservation and ecotourism plan.

A plan should be developed using previous literature and ideas obtained from this study, keeping in mind gender differences and WKU's presence in the community. Community members recognize that protecting Mt. Kasigau and the surrounding area is important because it provides water, attracts visitors and provides a small source of income. Individuals are also interested in protecting wildlife to attract tourists. Community members would like to develop a program that will bring tourists to certain areas of Kasigau where seeing elephants is easy. Villages would like to offer traditional meals and dances so tourists can experience the true culture of Kasigau. Appropriate conservation attitudes and actions are already present in most of Kasigau and with mountain guiding and handicraft sales; there is some infrastructure for ecotourism. It would not take much additional work to encourage these people to continue conserving the environment, especially if a new source of revenue is produced. The village of Makwasinyi has the most work toward effective conservation strategies. However, education and examples of conservation benefits will likely help this community make great strides until it has the same conservation attitudes as the rest of the villages.

The discipline of Sociology is extremely important in case studies of conservation attitudes and natural resource use. Infield (1988), Cavendish (2000), Gillingham and Lee (1999), Harcourt et al. (1986), Himberg (2004), and Salafsky et al. (2001) have all stressed the importance of including individuals living near protected areas when

developing conservation and ecotourism models. Without the study of sociology to examine people's behaviors and attitudes toward conservation development, no model would ever be successful. The case studies have had some success and have included locals at every stage of the planning, seeking their input and assistance with the project. Since each protected area is unique, the best way to develop a conservation or ecotourism plan is to use these case studies in combination with an attitudes and behavior survey in the community where research is conducted. Rational choice theory does provide a good basis for these attitude analyses but will never fit every community's needs. With each of these studies, sociology can help provide generalizations about each community but villages in different parts of the world must be compared separately as they each have their own needs and culture.

Future Studies

The community of Kasigau is open to tourism but with the strong bias from universities present in Kasigau it is unclear if foreign tourists are open to the idea of traveling to Kasigau. I had originally intended to measure this by passing out surveys to tourists staying at lodges around Tsavo East National Park; however, I did not receive enough responses. One issue was a language barrier as my surveys were printed in English and there were many European tourists in Kenya not familiar enough with English to understand and complete the survey. An ecotourism model will not work unless tourists are already interested in visiting Kasigau. This is an area that should be thoroughly examined before investing in an ecotourism project.

Another study could determine if individuals of Kasigau are willing to travel to towns adjacent to the national parks to sell handicrafts. Voi is located right outside of

Tsavo East National Park and individuals from Kasigau travel to Voi daily. It could be economically efficient to sell handicrafts to tourists in Voi and travel back to Kasigau at night. This could also be a way to introduce Kasigau to tourists and encourage them to visit the mountain.

Another interesting study would be to examine the effectiveness of monitoring and patrolling looking for poachers. The people living near community-owned ranches which are patrolled regularly by Kenya Wildlife Service and Wildlife Works seem to fear getting caught cutting down trees more than individuals in Makwasinyi. The monitoring program set up by Wildlife Works has only been in operation for a few years. If it is already successful, similar success might be seen in Makwasinyi if there was regular monitoring on that side of the mountain.

Along the same lines, it would be interesting to compare the success of a common property system for water usage and the state property systems for tree and wildlife use. Is water treated differently because it is not as easy to steal or is a common property system which limits some access to a resource but does not limit total access more effective in communities like Kasigau?

APPENDIX A INTERVIEW GUIDE

First, I am going to ask you some background questions.

A. Demographics

How old are you?

What is your highest level of education?

What is your occupation?

Where do you live?

What tribe are you from?

B. Mt Kasigau General

What do you use Mt. Kasigau for?

Do you believe it is important to protect Mt. Kasigau? Why?

C. Environmental/conservation knowledge

What can you tell me about your natural environment?

Do you understand what conservation means?

What can you tell me about conservation?

D. Resource Use

Which resources are important to you? Why?

Are you able to obtain enough of each resource for personal use?

Where do you obtain each resource?

E. Species Use

Which plants/trees do you use/like? Why?

Are there particular plants/trees you do not like? Why?

Which wildlife do you use/like? Why?

Are there particular animals you do not like? Why?

Do you know what a bushbaby is? Describe.

Have you had any interactions with bushbabies?

F. Ecotourism

Do you want tourists to visit Mt. Kasigau? Why?

Have you had any interactions with tourists already? If yes, did you enjoy the interaction? Why or why not?

What can you or your family personally offer tourists?

What can this community offer to tourists?

REFERENCES

2005. Stakeholders Workshop on the Conservation and Management of the Taita Hills Forests. Workshop report. Taita Hills Safari Lodge. February 7-10.

Agarwal, B. 1992. The gender and environment debate: lessons from India. Feminist Studies 18:119-158.

Alexander, S. 2000. Resident attitudes towards conservation and black howler monkeys in Belize: the Community Baboon Sanctuary. Environmental Conservation 27:341-350.

Arnold, M., Köhlin, G., Persson, R., and Shepherd, G. 2002. Fuelwood Revisited: What has changed in the last decade? CIFOR Occasional Paper No. 39.

Beentje, H.J., and Ndiang'ui, N. 1988. An ecological and floristic study of the Taita Hills, Kenya. Utafiti 1:23-66.

Bravman, B. 1998. Making Ethnic Ways: Communities and Their Transformations in Taita, Kenya, 1800-1950. Heinemann Publishing.

Bromley, D.W., and Cernea, M.M. 1989. The Management of Common Property Natural Resources: some conceptual and operational fallacies. World Bank Discussion Papers 57. The World Bank. Washington D.C.

Brooks, T., Lens, L., Barnes, J., Kageche Kihuria, J. and Wilder, C. 1998. The conservation status of the forest birds of the Taita Hills, Kenya. Bird Conservation International 8:119-139.

Campbell, L.M. and Vainio-Mattila, A. 2003. Participatory Development and Community-based Conservation: Opportunities missed for lessons learned? Human Ecology 31:417-437.

Cavendish, W. 2000. Empirical Regularities in the Poverty-Environment Relationship of Rural Households: Evidence from Zimbabwe. World Development 28:1979-2003.

Economic Research Service. n.d. Managing Risk in Farming: Concepts, Research, and Analysis. United States Department of Agriculture. Accessed May 12, 2010 from <http://www.ers.usda.gov/publications/aer774/aer774a.pdf>.

Flintan, F. 2003. 'Engendering' Eden, Volume II. Women, Gender and ICDPs in Africa: Lessons Learnt and Experiences Shared. International Institute for Environment and Development. Wildlife and Development Series, No. 17, June 2003. London.

Forgie, V., Horsley, P., and Johnston, J. 2001. Facilitating community-based conservation initiatives. Science for Conservation 169. New Zealand Department of Conservation.

Gillingham, S. and Lee, P.C. 1999. The impact of wildlife-related benefits on the conservation attitudes of local people around the Selous Game Reserve, Tanzania. Environmental Conservation 26:218-228.

Harcourt, A.M., Pennington, H. and Weber, A.W. 1986. Public attitudes to wildlife and conservation in the Third World. Orxy 20:152-154.

Himberg, N. 2004. Community-based ecotourism as a sustainable development option *In* Taita Taveta, Kenya. In Pellikka, P., Ylhäisi, J. & Clark, B. (Eds.), Taita Hills and Kenya, 2004 – seminar, reports and journal of a field excursion to Kenya. Expedition reports of the Department of Geography, University of Helsinki 40, 87-95.

Hinton, J.J., Veiga, M.M. and Beinhoff, C. 2003. Women and Artisanal Mining: Gender roles and the road ahead. *In* Hison, G. (Ed.) "The Socio-Economic Impacts of

Artisanal and Small-Scale Mining in Developing Countries. Swets Publishers. Netherlands.

Infield, M. 1988. Attitudes of a rural community towards conservation and a local conservation area in Natal, South Africa. Biological Conservation 45:21-46.

Jackson, C. 1994. Gender analysis and environmentalisms. *In* Redclift, M. and Benton, T. (Eds.) "Social Theory and the Global Environment" pp:113-149. New York.

Kagwa, S.K. 2011. Spatial Distribution of Human Elephant Conflict (HEC) and Characterization of Crop-raiding Elephants in Kasigau Region, Kenya. MSc Thesis. Western Kentucky University. Bowling Green, Kentucky.

Kaimowitz, D. 2003. Not by Bread Alone…Forests and Rural Livelihoods in Sub-Saharan Africa. *In* Oksanen, T., Pajari, B., and Tuomasjukka, T. (Eds.) "Forests in Poverty Reduction strategies: Capturing the Potential." EFI Proceedings No. 47 pp:45-63.

Kalibo, H.W. 2004. A participatory assessment of forest resource use at Mt. Kasigau, Kenya. Master's Thesis. Miami University. Oxford, OH.

Kalibo, H.W., and Medley, K.E. 2007. Participatory resource mapping for adaptive collaborative management at Mt. Kasigau, Kenya. Landscape and Urban Planning 82:145-158.

Kellert, S.R. 1993. Values and Perceptions of Invertebrates. Conservation Biology 7:845-855.

Kideghesho, J.R., Røskaft, E., Kaltenborn, B.P. 2007. Factors influencing conservation attitudes of local people in Western Serengeti, Tanzania. Biodiversity Conservation 16:2213-2230.

Kiss, A. 2004. Is community-based ecotourism a good use of biodiversity conservation funds. TRENDS in Ecology and Evolution 19:232-237.

(KMT) Kenya Ministry of Tourism. Visitor Arrival and Park Statistics. Accessed October 6, 2010 from <http://www.tourism.go.ke/ministry.nsf/pages/facts_figures>.

Leach, M. 1992. Gender and the Environment: Traps and Opportunities. Development in Practice 2:12-22.

Lewis, D. Kaweche, G.B., and Mwenya, A. 1990. Wildlife Conservation Outside Protected Areas – lessons from an experiment in Zambia. Conservation Biology 4:171-180.

Matiru, V. 1999. Forest Cover and Forest Reserves in Kenya: Policy and Practice. IUCN Follow-up Report.

Monela, G.C., Kajembe, G.C., Kaoneka, A.R.S., and Kowero, G. 2001. Household livelihood strategies in the Miombo Woodlands of Tanzania: Emerging trends. Tanzania Journal of Forestry and Nature Conservation 73:17-33.

Newmark, W.D., and Leonard, N.L. 1991. Attitudes of local people toward Kilimanjaro National Park and Forest Reserve. *In* "The Conservation of Mt. Kilimanjaro." IUCN. Gland, Switzerland. pp:87-96.

Newmark, W.D., Leonard, N.L., Sariko, H.I., and Gamassa, D.M. 1993. Conservation attitudes of local people living adjacent to five protected areas in Tanzania. Biological Conservation 63:177-183.

Ntshona, Z. and Lahiff, E. 2003. Community-based eco-tourism on the Wild Coast, South Africa: The case of the Amadiba Trail. Sustainable Livelihoods in Southern Africa Research Paper 7. Institute of Development Studies. Brighton, U.K.

Öhman, A. 1986. Face the Beast and Fear the Face: animal and social fears as prototypes for evolutionary analyses of emotion. Psychophysiology 23:123-145.

Peter, G. 2006. Gender roles and relationships: Implications for water management. Physics and Chemistry of the Earth 31:723-730.

Rocheleau, D., and Ross, L. 1995. Trees as Tools, Trees as Text: Struggles over resources in Zambrana-Chacuey, Dominican Republic. Antipode 27:407-428.

Rodgers, W.A. 1993. The conservation of the forest resources in Eastern Africa: past influences, present practices, and future needs. *In* Lovett, J.C. and Wasser, S.K. (Eds.) "Biogeography and Ecology of the Rain Forests of Eastern Africa. pp. 283-333. Cambridge University Press. New York.

Salafsky, N., Cauley, H., Balachander, G., Cordes, B., Parks, J., Margoluis, C., Bhatt, S., Encarnacion, C., Russell, D., and Margoluis, R. 2001. A systematic test of an enterprise strategy for community-based biodiversity conservation. Conservation Biology 15:1585-1595.

Tate, H.R. 1904. Notes on the Kikuyu and Kamba Tribes of British East Africa. The Journal of the Anthropological Institute of Great Britain 34:130-148.

Tignor, R.L. 1976. The Colonial Transformation of Kenya: The Kamba, Kikuyu, and Maasai from 1900 to 1939. Princeton University Press, New Jersey.

Tindall, D.B., Davies, S. and Mauboulès, C. 2003. Activism and Conservation Behavior in an Environmental Movement: the contradictory effects of gender. Society and Natural Resources 16:909-932.

Topp-Jørgensen, E., Poulsen, M.K., Lund, J.F., and Massao, J.F. 2005. Community-based monitoring of natural resource use and forest quality in montane forests and miombo woodlands of Tanzania. Biodiversity and Conservation 14:2653-2677.

Tourist. 2012. *In* Merriam-Webster Dictionary Online. Accessed 1 June 2012 < http://www.merriam-webster.com/dictionary/tourist>.

Ulen, T. 1999. Rational Choice Theory in Law and Economics. Encyclopedia of Law and Economics Online. Accessed 27 April 2012 <http://encyclo.findlaw.com/0710book.pdf>.

United Nations Development Programme (UNDP). 2011. Assessing Progress in Africa toward the Millennium Development Goals. MGD Report.

Watkin, J.R. 2003. The evolution of ecotourism in East Africa: From an idea to an industry. IIED Wildlife and Development Series No. 15. Summary of the Proceedings of the East African Regional Conference on Ecotourism Organized by The African Conservation Centre, Nairobi, Kenya.

Weber, A.W. 1987. Socioecologic Factors in the Conservation of Afromontane Forest Reserves. *In* Marsh, C.W. and Mittermeier, R.A. (Eds.) "Primate Conservation in the Tropical Rain Forest." Alan R. Liss Inc. pp:205-229.

Wilcove, D.S., Rothstein, D., Dubow, J. Phillips, A. Losos, E. 1998. Quantifying threats to imperiled species in the United States. BioScience 48:607-615.

Wojnowski, D. 2008. Traditional and Scientific Conceptions of Snakes in Kenya: Alternative Perspectives for Teaching. Ph.D. dissertation. Kent State University. East Liverpool, Ohio.