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The Human Population Growth and its Ecological Consequences on Kenya and Tanzania

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The Human Population Growth and its Ecological Consequences on Kenya and Tanzania

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Professor van Buren

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The Human Population Growth and its Ecological Consequences on Kenya and Tanzania

Introduction

The world population is growing at an alarming rate. The rapid growth in population numbers and density along with the steady increase in the rates are causing issues in many countries (Miller 1986). Although every country is experiencing many consequences of the growth, the countries of Kenya and Tanzania in East Africa seem to be suffering immensely. Not only does the increasing human population in these third world countries create an overarching competition for natural resources such as food, water, and land, the growth also has detrimental effects on the surrounding environment, wildlife populations, ecotourism, and traditional African cultures.

The Causes of the Growth

Over the recent years, improved health care drastically cut death rates, increased birth dates, and quintupled the human population since 1950 (Western 1997, Ouma 2010). Now more than ever, HIV/AIDS patients are getting the care they need and are living longer, healthy lives. This is mostly due to the access to antiretroviral treatment, which is lessening the toll of AIDS throughout the countries. Whereas before the access proper medications and treatments, the life expectancy of a person positively diagnosed with HIV/AIDS was dire. Now, however, patients can add about thirty-forty years to their life expectancy (Stibich 2009). Statistics have shown that the prevalence of HIV/AIDS has slowed down from thirteen percent in 2001 to almost eleven percent in 2002 to seven percent in 2003 (Nyong’o 2005). This allows for more people to live longer, which ultimately lowers the death rate.

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Although education has taught some women the importance of family planning, many women continue their tradition of having as many children as possible; the more children a woman has, the more respect she gains from her community (Mati 2002). Before the improvements in health care, one in every fourteen children died before their first birthday, and sixty percent of infants die during their first month of life. Now, thanks to various health interventions such as childhood immunization, and prevention and effective treatment of malaria, these numbers are dramatically shrinking. The decreased infant mortality rate and the increased maternal care now allow children to live longer and mothers to survive childbirth. These are the primary reasons why the population growth is so prevalent in these countries.

In Kenya, the human population increased from sixteen million people in 1980 to thirty-six million in 2009, with estimates at roughly eighty-five million by the year 2050, refer to Figure 1 (Kenya Population 2010). Likewise the human population in Tanzania grew from about eighteen million people in 1980 to forty million people in 2009, with estimates similar to that of Kenya in 2050, refer to Figure 2 (Tanzania Population 2010). In Kenya, the population growth rate steadily increased from 2.5 percent in 1948, peaking at 3.8 percent in 1979 (Mati 2002). This is one of the highest growth rates every recorded. Although the rates have declined since then, the current annual growth rate of about 2.64 percent per annum is still considered very high (World Development 2010). Population growth rates in Tanzania increased from 2.50 percent in 1999, to 2.91 percent only a decade later in 2009 (World Development 2010). The primary reason for the growth in human population in Kenya and Tanzania is the improved health care and education.

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The purpose of this paper is to discuss the effects of the rapid human population growth in Kenya and Tanzania. This paper is broken into three parts, the effects of the human population on the environment, on the wildlife, and on ecotourism. Each section explains the problems that
are occurring within each topic as well as some solutions to combat these problems. Spring semester of 2010, I lived and studied in both Tanzania and Kenya, and I witnessed these struggles first hand. From the intensive classes I took, many field exercises, field research, and interviews with local community members, I gained a significant amount of knowledge that inspired me to write this paper.

**Part I. Effects on Environment**

The increase of the human population and activities associated with that increase poses detrimental effects on the environment. As the human population enters into the villages and group ranches in Tanzania and Kenya, more and more habitats are ruined and degraded by humans looking to build homes, farms, tourist lodges, roads, and curio shops. Human encroachment into natural habitats causes many negative effects such as deforestation, habitat fragmentation, and edge effect. People are settling down more now than ever before, and as a result, more people depend on agriculture for their immediate livelihoods. Increased agriculture, along with overgrazing by domesticated livestock, exhausts the low quality soil. Roads, which are continually being built to bring people closer together and make transportation easier run straight through the middle of many vital habitats, bringing disruptive, noisy vehicles that pollute the environment. The land simply cannot support the amount of people, along with their needs and use of the land while supporting a healthy ecosystem at the same time.

**A. The Soil and Agriculture**

Over the recent years, agriculture has expanded rapidly. Whether it is for subsistence farming or trying to keep up with the increasing economy, agriculture has become one of the leading land use practices throughout Kenya and Tanzania. Approximately eighty percent of Kenya’s workforce and seventy five percent of Tanzania’s workforce are employed by and
dependent upon agriculture (The World Factbook 2010). However, the soil is an ecological factor in these areas that does not favor agriculture by any means. There are many characteristics about the soil that clearly show this. For example, the soil has a very poor quality. It has a poor texture, weak van der waals forces holding it together, and weak soil chemistry. This makes it difficult to support growing and thriving plant species. The soil is also made up of very rocky, volcanic particles, and can be very clay-like. Consequently, there is much run off water and poor water retention, which can lead to frequent erosion (Robertson 1996). The lack of rainfall in the area makes the dehydrated soil even more desiccated. The rainfall is very unpredictable and scattered, and the soil cannot efficiently support or use the rain to its full potential. The soil also lacks organic material and nutrients and has an increasing salinity and sodicity. This makes the soil unfavorable for non-halophytic plants, and makes the soil more susceptible to erosion (Gachimbi 2002). In Kenya, less than twenty percent of the country’s landmass is made up of sufficient soil fertility and rainfall to be considered naturally arable, compared to the other eighty percent that is not (Miller 1986).

The soil quality is already in such poor quality and exhausting the soil by farming only makes it worse. Unfortunately, farmers in the areas have no other choice. If they do not have their farms, they do not eat, and they do not collect revenue. This poses a serious problem to the soil and the rest of the ecosystem. Eventually, the soil will become so baron that will dry up and turn into a desert, a process known as desertification. Desertification has both direct and indirect impacts on the ecosystems and people (Millennium Ecosystem Assessment 2005). Entire layers of topsoil can be easily washed away when storms come through the region due to these dry, loose soils. Also, droughts and loss of land productivity can cause many people to migrate out of the areas. The land becomes useless, and people move onto other land to begin the detrimental
process all over again on healthy soil. Not only do the people exhaust the soil, but their livestock do too. Together, agriculture and overgrazing have negative effects on the environment.

**B. The Consequences of Overgrazing**

Overgrazing is another serious issue that arises from human encroachment and sedentary lifestyles. Overgrazing occurs when large amounts of livestock consume plants and trample soils so that the land is no longer able to support vegetation growth. Livestock populations of sheep, goats, and cattle can alter almost every aspect of soil structure and function, both above and belowground (Roberson 1996, Dean et al. 1994). When the vegetation is overgrazed, the soil becomes even more dry and loose. If there are no longer any plants to hold the soil in place, reduced biomass, soil depletion, and soil erosion will occur (Dean et al. 1994). The decrease of plant and litter cover has a dwindling effect on everything else in the ecosystem (Dean et al. 1994). For instance, the herbivores (and carnivores who prey on herbivores), pollinators, seed dispersers, detrivores, fungal symbionts, and fossorial animals will also decline in the area (Dean et al. 1994). This could be very detrimental on the ecosystem because there would be no microbiology cycles and nutrient cycles to enrich the soil with organic matter and promote the regeneration of mineral plant nutrients (Millennium Ecosystem Assessment 2005). As a result, many animals would either die off or be forced to leave due to food shortage (Roberson, 1996). Another concern for overgrazing is that some herbivores favor some plant species over others. When the valuable plants are eaten, the ignored plants have a competitive advantage over the area, and spread all throughout the rangelands. Therefore, future rangelands would no longer be viable for livestock and wildlife populations (Dean et al. 1994).
C. Deforestation in the Environment

People in third world countries are not industrialized or technologically advanced, and so basic needs such as shelter, food, health, and wellbeing are supplied in the form of natural raw materials (Okello 2010). As the human population increases, so does the demand for food and shelter, hence the stress on the environment. When it comes time to build a home, many materials are needed. An area must be cleared and supplies are needed to support the structure of the home. Trees are cut down, bushes and shrubs are ripped up from the ground, and valuable plant species are destroyed. Degradation of the land caused by human activity is known as deforestation. Deforestation is very damaging to the entire ecosystem, and has very dangerous consequences. Some of these horrendous consequences include the desiccation of previously moist and healthy soil, soil erosion, a dramatic increase in temperature, less carbon dioxide and nitrogen exchange, an increase in desertification, and a drastic decline in the recycling of water, just to name a few (Innes 2010). These effects lead to many other problems within the ecosystem. The fauna and flora species can no longer thrive in these conditions, and eventually the entire ecosystem, which was once very vibrant and healthy, will eventually crash.

D. The Problem of Habitat Fragmentation

Habitat Fragmentation is another main issue of conservation that is greatly influenced by the human population. A habitat is a place that is specific to a particular species that has all the resources needed by the species and usually has one or more vegetation types (Franklin et al. 2002). Kenya and Tanzania have a vast amount of habitats to support over one thousand species that live in these countries. Some of these habitats include open savannah grasslands, lowland forests, bush land, shrub land, lakes, and mudflats. Habitat fragmentation is the disruption of a large, intact, continuous habitat into smaller units. Studies from the 1970’s showed that habitat
fragmentation due to human encroachment and a rising human population resulted in a lack of water, pasture, and botanical resources for the wildlife, livestock, and humans (Campbell et al. 2000). Habitat fragmentation is usually a direct result of deforestation and the construction of roads. Although roads are very helpful for human transportation, they have severe effects on the environment.

A major condition that affects a habitat the most is edge effect, which is a term used to describe the negative influences of a habitat edge on interior conditions of a habitat or on species that use the interior habitat. The edge, or the part of the habitat that is located most closely to the roads, is greatly influenced by the activity, but it also extends all the way into the habitat, contaminating almost every aspect of a nearby habitat. Everything from temperature, plant species, the amount of carbon dioxide, oxygen, and nitrogen in the air, to soil composition is altered by edge effect. Pollution is also a main concern because the more roads that are around, the more vehicles, exhaust, garbage, and disturbance that enters into an area. This also adds to the negative outcomes of edge effect.

E. Solutions

Since the environment is essential to the livelihoods of the people and wildlife species living within an area, it is imperative that measures are taken to assure that the resources it supplies will continue to be there for generations to come. The easiest way to help replenish the environment would be to plant more trees. Local people can participate in this by also preventing the cutting down of trees around their properties. Government officials can become more involved with these issues by providing structured and well-enforced land and water (natural resource) management plans. Stricter policies and consequences of these policies will make people think twice about degrading the land.
To combat the problem of overgrazing, the first step would be to assess what a sustainable herd size is and limit families to that amount. Extra cattle could be sold and the money can be invested in a bank. In this way, the family’s savings are not held up in cattle and cannot be destroyed by drought or other problems such as disease. Another recommendation would be to set aside certain areas of land that cannot be grazed for a long a certain amount of time. This not only gives the land a chance to regenerate, but also assures resources during times when pasture is already stressed. Roads have already caused damage, but more restrictions on the amount of vehicles that pass through important habitats can be managed to help the situation. Roads can also be improved and better maintained with more speed limits and more patrolling by rangers and police officers.

In all of these situations, education is a key factor in remediation. If the locals understand the causes and effects of degradation, soil exhaustion, deforestation, overgrazing, habitat fragmentation, edge effect, and pollution, they will be in a better place to begin working on solutions. Locals need to be made aware of sustainable practices, and given the skills and opportunities to use them. Education can be instituted through public schooling, private institutions, and government organizations. In general, communities do not believe they have the ability to make these changes on their own. The government needs to be more open and willing to work with community members to solve the problems with the environment.

**Part II. Effects on Wildlife**

In the words of Rodger Yeager and Norman N. Miller, wild animals represent a mixed blessing for Kenya and Tanzania (Miller 1986). This is a statement is probably more fact than opinion, since everyone who has ever lived in Africa would most likely agree. While the wildlife provides unbelievable benefits to the countries of Tanzania and Kenya, the wildlife also create
many conflicts with the ever-increasing human population. What used to be a place where humans and animals lived in peace and harmony, has slowly transformed into a place of cutthroat competition for land, water, natural resources, and survival. Unfortunately, this mutual encroachment and conflict between people and animals stands as one of the largest obstacles Kenya and Tanzania face today.

A. Inside Protected Areas

The survival of Kenya and Tanzania’s abundant and diverse meta-populations of large wild mammal species heavily depends on the establishment and successful management of various protected areas. Declining populations of threatened and endangered wildlife species have influenced the Kenyan and Tanzanian government to establish safe havens for these animals. In Kenya, fifty-two national parks, game reserves, and other protected areas compromise eight percent of Kenya’s total landmass, refer to Figure 3 (Okello 2004). Likewise, in Tanzania, seventy-eight national parks, game reserves, and other protected areas comprise approximately twenty percent of the country’s total landmass, refer to Figure 4. Although Tanzania has reserved more territory to biodiversity conservation and preservation than Kenya, Kenya generates the larger number of funding groups, highly supportive nongovernment organizations, and individuals devoted to protecting the wildlife than Tanzania (Miller 1986).
Fig. 3. Kenyan National Parks and Major Game Reserves (Miller & Yeager 1986)

Kenyan Park and Reserve Names in Fig. 3.

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<thead>
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<tbody>
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<td>1</td>
<td>Sibiloi National Park</td>
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<td>2</td>
<td>Marsabit National Reserve</td>
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<td>3</td>
<td>Losai National Reserve</td>
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<td>4</td>
<td>Samburu National Reserve</td>
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<td>5</td>
<td>Shaba National Park</td>
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<td>Meru National Reserve</td>
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<td>Bisandi National Reserve</td>
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<td>8</td>
<td>Rahole National Reserve</td>
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<td>9</td>
<td>Kora National Reserve</td>
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<td>10</td>
<td>North Kitui National Reserve</td>
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<td>Arawale National Reserve</td>
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<td>12</td>
<td>Boni National Reserve</td>
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<td>13</td>
<td>Dogori National Park</td>
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<td>14</td>
<td>Kiunga Marine Reserve</td>
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<td>15</td>
<td>Tana River Primate Reserve</td>
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<td>16</td>
<td>Malindi/Watamu Marine Park</td>
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<td>17</td>
<td>Shimba Hills National Reserve</td>
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<td>18</td>
<td>Tsavo National Park</td>
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<td>19</td>
<td>Sourth Kitui National Reserve</td>
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<td>20</td>
<td>Ngai Ndethya National Reserve</td>
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<td>21</td>
<td>Amboseli National Park</td>
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<td>22</td>
<td>Maasai Mara National Reserve</td>
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<td>23</td>
<td>Nairobi National Park</td>
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<td>24</td>
<td>Lambwe Valley National Reserve</td>
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<td>25</td>
<td>Ol Donyo Sabuk National Park</td>
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<td>26</td>
<td>Mwea National Reserve</td>
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<td>27</td>
<td>Mt. Kenya National Park</td>
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<td>28</td>
<td>Aberdare National Park</td>
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<td>29</td>
<td>Lake Bogoria National Park</td>
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<td>30</td>
<td>Saiwa Swamp National Park</td>
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<td>31</td>
<td>Mt. Elgon National Park</td>
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<td>32</td>
<td>Nasalot National Reserve</td>
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<td>33</td>
<td>Sourth Turkana National Reserve</td>
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NOTE: In addition to four other parks and reserves, 18 local sanctuaries for endangered flora and fauna, and seven forest reserves.
Fig. 4. Tanzanian National Parks and Major Game Reserves (Miller & Yeager 1986)

Table: Tanzanian Park and Reserve Names in Fig. 4.

<table>
<thead>
<tr>
<th>Number</th>
<th>Park/Reserve Name</th>
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<tbody>
<tr>
<td>1.</td>
<td>Serengeti National Park</td>
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<td>2.</td>
<td>Maswa Game Reserve</td>
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<td>3.</td>
<td>Ngorongoro Conservation Area</td>
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<td>4.</td>
<td>Lake Manyara National Park</td>
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<td>5.</td>
<td>Arusha National Park</td>
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<td>6.</td>
<td>Kilimanjaro National Park</td>
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<td>7.</td>
<td>Mkomazi Game Reserve</td>
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<td>8.</td>
<td>Mikumi National Park</td>
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<td>9.</td>
<td>Selous Game Reserve</td>
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<td>10.</td>
<td>Ruaha National Park</td>
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<td>11.</td>
<td>Rungwa River Game Reserve</td>
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<td>12.</td>
<td>Uwanda Game Reserve</td>
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<td>13.</td>
<td>Katavi Plain National Park</td>
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<td>14.</td>
<td>Ugalla River Game Reserve</td>
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<td>15.</td>
<td>Gombe Stream National Park</td>
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<td>16.</td>
<td>Rubondo Island National Park</td>
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<tr>
<td>17.</td>
<td>Iharamulo Game Reserve</td>
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<tr>
<td>18.</td>
<td>Rumanyika Orugundu Game Reserve</td>
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</table>

NOTE: There are also nine other game reserves and fifty game controlled areas. National parks and game reserves are managed by the national government, while controlled areas are administered by regional authorities.
In all of these protected areas, the ecosystem is protected and conservation is key. However, the protected areas themselves are too small and scattered to completely secure the protection of these animals (Western 1997). Animals that are confined to small places only a tiny portion of their historical range, and the wildlife cannot properly regulate their populations. This process, known as insularization, leads to even more competition and an overabundance in some wildlife species. Wildlife managers help out with this “regulation” by culling, or exterminating the excess animals for the better good of all the other species. According to Dr. Moses Mokanjio Okello, a devout wildlife researcher in Kenya and Tanzania, “culling is an acceptable wildlife technique to control locally abundant species to balance the needs of habitats and other animals…Culling in parks and reserves is meant to balance species in [these] insularized environments, but must be done based on scientific knowledge and inquiry” (Okello 2010).

Despite all the efforts to protect the unique species of Kenya and Tanzania, populations of large mammal species in national parks have dropped by fifty-nine percent since 1970. This is partly due to illegal hunting and poaching, but a majority of it is due to the increasing human population and the expansion of human settlements (Goma et al. 2010).

B. Outside Protected Areas

Since the areas usually do not have any type of fencing around them, animals are able to travel in and out of the parks as they please, following migration patterns and natural resource distribution during the wet and dry seasons. In fact, up to seventy percent of the wildlife is found outside of protected boarders, preferring nearby dispersal areas (Norton-Griffiths 1997). However, these dispersal areas are not safe for large mammal populations. These dangers include human wildlife conflicts, illegal hunting and poaching, and bush meat trade. Laws and
regulations have been established, but the enforcement of these rules is not strong enough, and it is easy for people exploit and harm these animals.

D. Human-Wildlife Conflicts

While I was living in Africa, I had the incredible opportunity of interviewing several farmers from the Chemuchemu village of northern Tanzania and farmers from the Kimana Group Ranch of southern Kenya who struggle with human-wildlife conflicts on a day-to-day basis. From speaking with these people, it was evident that there are many problems that community members face with the wildlife, especially with their farms and livestock. Although these villagers live in different countries, they faced similar problems with the wildlife. Consuming crops, destroying farms, and preying on livestock by the wildlife seem to be the largest human-wildlife conflicts in this area.

One of the most prominent practices for land use in the Chemuchemu village and the Kimana Group Ranch is farming. These community members grow food to support their families, and they also occasionally sell excess food at the markets as a source of income. Since a great amount of their resources have already been taken over by the human population, the wildlife become desperate for food and thus make their way towards human settlements. Herbivores, such as elephants, dik-diks, guiny fowl, and wild pigs consume all of the fresh vegetables that farmers work so hard to grow, while carnivores such as lions, hyenas, honey badgers, jackals, and leopards prey on valuable livestock and sometimes even people. Elephants not only consume crops, but they also trample everything in their path to get to the food source. Since elephants can weigh up to eleven hundred pounds it is very easy for elephants to cause long term damage and unevenness of the soil with every step they take. Also, since an adult elephant can eat anywhere from three hundred and seventy to six hundred and sixty pounds of
vegetation a day, depending on the amount of food available, and the size and sex of the elephant, a single elephant can often devour an entire farm in one serving (Estes 1991). The wildlife consume and destroy the only source of food and income for poor, subsistence farmers, resulting in many negative attitudes toward the wildlife.

The losses associated with human-wildlife conflicts are very substantial. The wildlife consume and ruin the only source of food and income for the farmers. Many of these farmers do not have much money, and replacing livestock or waiting until the next agricultural season for more crops is not an option for them. In fact, forty percent of the population in Kenya and thirty-six percent of the population in Tanzania is below the poverty line (The World Factbook 2010). In 2004, livestock predation accounted for a loss of about $8,749 per annum in a Kenyan ranch, and a $15,418 loss per annum for Indian-trans Himalayan communities (Kissui, 2008).

When the wildlife come into the farms, there isn’t much the community members can do. Usually, the farmers either chase away the wildlife or kill them. Lion populations suffer immensely from human retaliation and possess many extinction risk traits. Lions are currently considered “vulnerable” by the ICUN, who suspects a thirty percent decline in lion populations in the next two decades. Between the years of 1990 and 2004, roughly six hundred lions were killed due to retaliation, and most of these killings were linked to previous lion attacks on livestock. Guinea fowl and wild pigs, on the other hand, are usually hunted and consumed by the farmers; it has been said that their meat is extremely delicious.

Human-wildlife conflicts have severely altered some of the attitudes and perspectives of the community members toward wildlife conservation. Many community members are very stern about their negative opinion of wildlife. Many farmers despise the wildlife populations and think
they are nuisances. Also, farmers do not directly receive any benefits from the wildlife, causing even more intolerance of large mammal populations.

E. Illegal hunting, poaching, and smuggling

Not only do large mammal species have to keep an eye out for angry farmers once they leave a protected area, but they also have to be on the lookout for illegal hunters who want to sell the animals’ body parts for a profit. Hunting, poaching, and smuggling are ongoing problems that Kenya and Tanzania are trying to desperately to end, but illegal auctions of wildlife products, and false official certification of animal products for export are not making matters any easier (Miller & Yeager 1986). Since Kenya and Tanzania lie at the center of a thriving regional and international trade in wild animal products, it is very easy for hunting, poaching, and smuggling to persist in these areas (Miller & Yeager 1986).

The increase in population, the establishment of settlements closer to wildlife protected areas, and the growth in the number of roads and development areas provide more opportunities for illegal wildlife corruption to occur. The more humans encroach on wildlife habitats, the more poachers and smugglers gain access to the innocent animals. The wildlife is killed illegally for the economic gain of people who do not care for the wellbeing and preservation of Kenya and Tanzania’s unique wildlife species. While some people hunt for economic income, some hunt for fun and pride, such as the Maasai Morrans (warriors), and others hunt out of anger due to human-wildlife conflicts (Coupe et al. 2002).

In the 1970’s, during the height of poaching and smuggling, Kenya and Tanzania lost a significant amount of rhinos and elephants for their horns and tusks. Rhino population numbers were so low that rhinos were at risk of extinction. Rhino horns and elephant tusks are very valuable. In China, for example, the value for a rhino horn, ounce for ounce, is higher than gold
(Miller & Yeager 1986). Some poachers are paid up to $8,500 to kill a rhino, and the estimated price for the retrieved seven kilo horn can be as much as $250,000 (Goma et al. 2010). The price for ivory elephant tusks increased from $7.44/kg in 1970 to $100/kg by the end of the decade (Estes 1991). This inflation caused elephant populations to decline by as much as eighty percent both inside and outside of national parks (Estes 1991). Both sources of ivory, horns and tusks, are used for ornamental purposes, but rhino horns are also used for medicinal use. In countries such as China, Japan, Malaysia, Indonesia, and India, it is believed that the powder from grinding up rhino horns is an effective way to reduce fevers (Miller & Yeager 1986). According to Dr. Okello, “any animal whose meat or other product become valued by man, for [real, imagined, or superstitious reasons] are at risk” (Okello 2010).

F. The Serengeti Highway

The most controversial event that is tearing apart the countries of Kenya and Tanzania is the approved construction of a national highway running through the middle of the Serengeti National Park. This highway, which was promised by Tanzania’s newly elected president, Jakaya Mrisho Kikwete, and approved by the Tanzanian government, is expected to make travels quicker and easier for humans, especially to hospitals and other towns, and could also increase the chance of someday getting electricity and cell phone service (Gettleman, 2010). The national highway is expected to link the town of Arusha in eastern Tanzania to the South and the two towns on the shores of Lake Victoria, Mwanza and Musoma, which are found in western Tanzania (Kipkore 2010). However, this “ill-conceived project…would destroy the integrity of a priceless world heritage that has been protected by the people of Tanzania since the birth of their country” (Bwana 2010 Alert). The Serengeti highway would also have detrimental effects on
wildlife populations, which would ultimately, “cause grave danger to and their entire tourist industry” (Bwana 2010 Alert).

Fig. 5. The Serengeti Highway and alternative route (Bwana 2010 Case)

According to Tanzania’s 10-year management plan developed in 2005, these areas are considered “low use” and “wilderness” zones, refer to Figure 6 (Bwana 2010 Alert). In other words, they are subject to minimal disturbance, where only walking safari tours are permitted, and they are considered vital areas that are extremely important for migration patterns. Located just below the Kenya/Tanzania boarder and very close to the Maasai Mara National Reserve in Kenya, this highway would bisect the most vital migration routes for over two million animals each year, refer to Figure 6 and Figure 7 (Africa 1994). The northern parts of the Serengeti
National Park and the adjacent Maasai Mara have a permanent year-round water source, which wildebeest and zebra herds are critically dependant upon during the dry season (Africa 1994). The Mara also provides rich pastures and humble homes for herds of zebras and wildebeests for several months until the rains return to the drought stricken plains where the animals originally came from (Africa 1994). Over a quarter of a million wildebeests die naturally from the grueling two thousand mile roundtrip migration, but adding an obtrusive obstacle such as a high-speed highway for gas guzzling trucks and vehicles is only going to make things harder and more exhaustive for these animals (Africa 1994). If the highway is built, it is estimated that the population of wildebeests would decline from 1.3 million animals to about two hundred thousand animals (Bwana 2010 Alert).
**Fig. 6.** The Different Zones in the Serengeti National Park proposed for the 10-year plan.

**Fig. 7.** Map of the wildebeest migration in the Serengeti
Some other effects associated with this highway are an increased amount of poaching and illegal hunting, more habitat fragmentation and destruction, pollution from trucks and vehicles, loss of human life and wildlife from accidents, and more disturbances throughout the entire ecosystem. There are absolutely no positive results of the Serengeti highway for the wildlife. In fact, the wildlife populations are expected to suffer so much in the Serengeti National Park that the tourism industry will consequently suffer as well. The Serengeti alone attracts more than one hundred thousand visitors each year, producing millions of dollars in park fees and helping drive Tanzania’s billion-dollar safari business (Goma et al. 2010). Going through with the highway will result in a drastic loss of tourism revenue, and a high unemployment rate (Bwana 2010 Alert). Although President Jakaya Mrisho Kikwete promises the Tanzanian people many benefits, ultimately, an overwhelming majority of people are sure to suffer just as much as the wildlife from the construction this “highway to hell”.

F. Solutions

There are many ways wildlife managers can help these situations in Kenya and Tanzania. Managers, researchers, scientists, and community members have been working together to come up with solutions to these problems daily, but more efforts and direct action is needed. The most prominent wildlife management strategies that must be done include community involvement, creating more protected areas, enhanced security, human-wildlife mitigation, enhanced awareness and education on biodiversity and conservation, and establishing more policies to prevent illegal poaching and secure wildlife populations.

There are many different ways to help mitigate the conflicts between humans and the wildlife. Physical barriers, such as wooden fences, electrical fences, stonewalls, moats, and trenches are seen to be effective, as long as they are built properly and maintained (Muruthi
However, this can be very expensive. Chemical repellents have been used to stop animals from consuming crops, but often fail to prevent wildlife from preying on livestock (Muruthi 2005). One way to prevent this problem is by “providing an alternate source of food or water in an attempt to lessen competition with people for crops or water sources.” This method of divisionary tactics has been very effective in reducing encounters between livestock and wildlife (Muruthi 2005).

The government can also set up an insurance plan for farmers, compensating them for losses due to human-wildlife conflicts (Muruthi 2005). This has the potential to be very effective in preventing human-wildlife conflicts. Using economic incentives is a very popular method for changing people’s negative behavior and perceptions about wildlife (Kuriyan 2002). If the community members learn about the wildlife and receive benefits for them, they will be less inclined to harm the wildlife if a problem does arise. Also, if they receive compensation payments due to loss, they will also be less inclined to take direct action against the wildlife.

Heightened security both inside and outside of protective areas would also be an adequate solution to prevent poaching and illegal hunting. Fortunately, poaching and trophy hunting has declined since its peak from 1970 to 1976 due to domestic and international pressure (Miller & Yeager 1986). There are now greater difficulties getting elephant tusks and rhino horns out of the country. This affects Somali poachers in particular, when they are hunting in Kenya. As many as seventy countries have agreed to sign a treaty that restricts trade of any endangered species (Miller & Yeager 1986). Stricter consequences have been administered to those who violate laws and regulations. An antipoaching program allows managers and wildlife rangers to participate in deadly shootouts against poachers using sophisticated weapons (Miller & Yeager 1986). This negatively affects the cost-benefit calculations of poachers, and it makes people
think twice about harming the wildlife (Miller & Yeager 1986). More programs like this are necessary to insure the survival of wildlife populations in the future.

In terms of the highway, the only possible solution that will benefit both humans and animals is to build the highway around the southern part of the Serengeti instead of the northern section where the highway was approved to be built. This alternative highway, which was proposed by the Frankfurt Zoology Society, will still allow people a cheap and accessible way to get to hospitals and other towns while preserving the most famous migration route in the world (Bwana 2010 Case). The southern highway would service over five times as many people as the northern route would, and as for cost, the southern route would only require two hundred and thirty-seven miles of tarmac, compared to the northern route, which would require two hundred and sixty-one miles of tarmac (Bwana 2010 Case). The southern highway would be successful only if it does not interfere with the wildlife populations and migration routes in Tarangire National Park, which is in southern Tanzania (Bwana 2010 Case). Also, the indigenous Hadza people and their ways of life would also have to be respected, because they live in this area as well (Bwana 2010 Case). According to the Frankfort Zoological Society, this can all be done with the right planning and much support from donors (Bwana 2010 Case)

Part III. Effects on Ecotourism

Not only are Kenya and Tanzania influenced by their own human population growths, these countries are also undergoing substantial changes due to the increase of foreign human populations who are attracted through tourism. Each year, millions of tourists eager to experience different cultures, take photos of the wildlife, go on safaris, and shoot animals pile into these countries, accompanied by their wallets and credit cards. Tourism brings these countries an overwhelming amount of money, and provides many jobs for generous amount of
people. However, the tourism industry is also exhausting on wildlife populations and the environment.

The most valuable assets to Kenya and Tanzania are their large wild mammal populations. The wildlife populations are a major economic and strategic source for the nation (Rodgers, 2003). The wildlife can be used for viewing and photographing purposes while on safari, or for trophy hunting. National parks, reserves, and game reserves are well populated, and charge a small fee for entry. Unfortunately, a majority of local people makes a profit off of the wildlife through illegal trade, bush meat, and hunting. The landscapes and historical sites are also major assets to these countries. Some of these places include Mount Kilimanjaro, Mount Kenya, and Olduvai Gorge. The last major asset is the cultures of the local people. Africa is composed of one hundred and twenty-six tribes of people, each tribe having its own unique attributes, values, and rituals. These are the main attractions in Kenya and Tanzania that attract millions of tourists from all over the world.

Tourism provides many job opportunities for many individuals. For example, a tourist lodge, or hotel, requires owners, managers, maids, chefs, maintenance people, drivers, and visitor hop-keepers to provide the best care and service for the foreigners who wish to stay at their facilities. Curio shops along the side of roads require people to run and manage the shops, artists to provide the paintings and wooden carvings that are to be sold in the shops, and safari drivers to bring tourists to the shops. It is no wonder why hundreds of thousands of people rely on tourism for their daily livelihoods.

When tourists come into Kenya and Tanzania, they leave behind more than a billion dollars in revenue, which is nearly ten percent of the continent’s $9.5 billion income from tourism (Dominion). In Kenya, tourism income grew from KS 27 million (Kenyan shillings) in
1972 to KS 713 million in 1992, representing an average growth rate of over twenty percent per annum (Coupe et al. 2002). In Tanzania, tourism has grown by over ten percent in the past decade, from $65 million in 1990 to $735 million in 2001 (Rodgers, 2003). The wildlife itself earns the country over $700 million annually.

A. Effects of Tourism on Ebony Trees

Although tourism brings many benefits, it also causes serious problems. Kenya and Tanzania are known for their beautiful and intricate carvings of wildlife and cultural themes, which are very popular among tourists. Many of the wooden carvings that are sold in curio shops are made from the black wooded ebony tree, or *Dalbergia Melanoxylon*, which is considered an endangered in the plant world (Saoshiro 2009). An estimated 60,000-80,000 wood carvers in Kenya make their living from this industry alone (Saoshiro 2009). Approximately 50,000 ebony trees in Kenya, and 20,000-30,000 trees in Tanzania are cut down each year. Kenya also imports many of its ebony resources from Tanzania (Saoshiro 2009). While the wood carving industry generates $20 million a year in Kenya, it only generates $1.5 million in Tanzania (Saoshiro 2009). It is estimated that the remaining supplies of ebony in Tanzania will be depleted in twenty to thirty years, unless regenerative measures are taken.

B. The Effects of Tourism on the Wildlife

There are also many problems with the wildlife. Many animals are affected by the intrusion of the human population into their natural habitats in national parks and game reserves. For example, lions and cheetahs suffer immensely. Lions are considered to be one of the biggest trophies for hunters around the world. When hunters come to these countries, they want to kill the biggest, strongest lion with the nicest mane. These lions, which are highly targeted, happen to be the lions with the most valuable genes. In lion society, it is an exhausting task to produce
offspring and to have them survive till adulthood. Once lion cubs are born, they are usually in danger of other males lurking in the area who wish to kill them. Invading male lions kill the cubs of other males, a process known as infanticide because they wish to mate with a female; a female who is nursing her young has a suppressed sexual receptivity, and when the cubs are killed, the females are quick to regain this back (Alcock 2009). So, chances are that if a dominant male lion is hunted and no longer around to protect his cubs from other male lions, his offspring will be killed and his valuable genes will be lost forever. This has devastating effects for lion populations. However, since trophy hunting is worth $200 million a year, the countries are going to continue to allow hunting to occur (Goma et al. 2010).

The situation with cheetahs is slightly different. Cheetahs are the only cats that hunt regularly during the daytime. When noisy vehicles filled with tourists come into the national parks, they distract and disturb the cheetahs’ hunt. Tourists cause the prey species to be more alert, making it very difficult for cheetahs to hunt successfully. When conducting several field exercises in Amboseli National Park, I witnessed this first hand. The presence of tourists is very damaging on these animals. There were many other animals that seemed to be bothered by human presence as well. There were countless times when rogue elephants flailed their ears and trumpeted loudly at safari cars in frustration in order to get the cars to go away. When I was in Serengeti National Park, I saw a lone leopard sitting in a tree that was so disturbed by the people, that she simply walked away from all the commotion, looking back occasionally to make sure no one was following her, refer to the picture, refer to Figure 8.
Fig. 8. A photo I took of a leopard resting in a tree that is surrounded by tourists in Serengeti National Park

C. The Effects of Cultural Tourism on the Maasai Tribe

The Maasai tribe, who live in both north-central Tanzania and southern Kenya, have a very unique culture that is known all around the world. The Maasai are known for their elongated earlobes, elaborate beaded necklaces, bracelets, and belts, shoes that are made out of old tires, and their outfits that consist of several draped sheets, refer to Figure 9. Historically, the Maasai tribe consists of nomadic people who often move around according to where forage and water opportunities are available (Barrett et al. 2001). The Maasai tribe relies mainly on their herds of livestock to determine where and when to travel to different locations. However, the growth of rural towns and human activity has made it difficult for some Maasai to continue with their migratory way of life due to many restrictions of where they can bring their livestock. This restricted mobility has influenced many members of the Maasai tribe to settle into permanent
residences (Barrett et al. 2001). In the Maasai Mara Reserve in Kenya alone, Maasai settlements have increased from 44 to 2,735 since 1950, causing an even higher demand space and greater destruction of natural habitats (Goma et al. 2010) Traditionally, it was believed that “no Maasai would defile the land by farming” (Western 1997). However, the Maasai soon discovered that participating in agriculture is an easier way to increase income and support a family. In these ways, the traditions of the Maasai culture have changed drastically from the increase in human population. However, not only are the Maasai facing problems with the increasing population in their own countries, they are also facing problems from the increasing populations of tourists entering their countries.

Fig. 9. A photo I took of Maasai women in a cultural Manyatta in Tanzania.

The rise in tourism has greatly impacted the lives and culture of the Maasai. The creation of roads, tourists’ interest in the pastoralist lifestyle, the competing economy, and western influence has all had a strong affect on the way the Maasai people live and act on a day-to-day basis. The Maasai has resorted to “sell” their culture for survival, exploiting their heritage more than ever to curious tourists. Several times a day, insatiable tourists, equipped with cameras and video recorders, are “welcomed” into Maasai Cultural Manyattas to interview, learn about, and
question the Maasai way of life, refer to Figure 9. The Maasai women dance, sing, welcome strangers into their homes, and answer questions all day long in exchange for economic revenue. What seems like a very bothersome and exposed way of life is unfortunately a major source of income for many Maasai people.

While I was living in Tanzania, I had the privilege of interviewing a local Maasai Mama who lives in one of these Manyattas. Her name was Ester, and she was a 49-year-old mother of four, refer to Figure 10. This allowed me to further my knowledge about the effect of tourism on such a cultured, valued, and modest community such as a Maasai Manyatta. Ester explained that she grew up during a very traditional time and much has changed since then in a surprisingly positive way.

![Fig. 10. Ester and I outside of her home in Tanzania.](image)

Through the changes in business, gender roles have changed dramatically, both culturally and financially. Women have much more independence than they used to, and no longer have to depend on their husbands for money. Women are able to make their own money, both through
entrance fees of tourists in their village, and through handcrafted beadwork that is sold in the gift shop. Women now have more responsibilities and can afford to provide for their children and put them through school. Ester is the proud owner of several cattle and goats, which was unheard of for a woman to be back in the day when Ester was a child. Also, the new tarmac roads have brought many people together, and have allowed for intermarriages to occur between tribes, which was also unheard of. For the Maasai, there are many positive and negative results from tourism.

**Solutions**

In Kenya, a “GoodWood Campaign” was launched in 1997 that aimed at promoting sustainable use of the ebony tree by encouraging and funding research, replanting efforts, and promoting alternative woods such as mango, neem, and jacaranda for wood carvers to use (Soashiro 2009). Also, teaching consumers about the endangerment of the ebony tree is also one of the campaign’s initiatives. In Tanzania, you now need an official permit to cut down a black wood tree (Saoshiro 2009). This allows officials to keep records on local extraction rates. Although several efforts are being made, more need to be done to completely restrict people from cutting down any of the ebony trees.

In terms of protecting the wildlife against the negative consequences associated with tourism, one solution would be to limit the amount of vehicles and tourists that enter into protected areas. This would decrease the disturbance levels for the animals. Tourist vehicles should not be allowed to crowd around animals for long periods of time either. Managers and park rangers could do more patrolling to ensure this. Managers can also reduce the amount of roads in the parks to provide more privacy for these animals. Perhaps only eco-friendly vehicles should be allowed into the parks as well to decrease the exhaust on the environment.
One great tourism idea that is becoming extremely popular is providing hot air balloon rides for tourists over the National Parks. This is a perfect way for tourists to view the animals without harming the environment and disrupting the wildlife, and it is also a good way to gain revenue from tourism. Another strategy would be to try and take the attention off of the animals and towards other attractions, such as the landscapes. For example, hiking, camping, and mountain climbing are all very exciting activities that Kenya and Tanzania can surely provide. These attractions will also bring in revenue, provide jobs for the local communities, and entertain many tourists.

The Maasai tribe should embrace the positive effects of tourism, while preserving their culture at the same time. The African Wildlife Foundation is doing a fantastic job helping the Maasai participate in the tourist industry, while trying to preserve their culture at the same time. The AWF teaches local communities management techniques and accounting practices, and is a strong supporter of empowering women and conserving wildlife (African Wildlife Foundation 2010). Efforts from other companies similar to the AWF should reach out to more Maasai communities. Parents can also play a major role in saving the Maasai culture. They can teach their children the same traditions and ways of the Maasai culture the same way their parents and grandparents had taught them. Although many Maasai are becoming more educated and reaching out for jobs other than the traditional livestock herder, those who do not go to school should make sure that they continue to pass on their traditions.

Conclusion

The increasing human population growth has many negative effects on the counties of Kenya and Tanzania. Improved health care and education has made their population numbers grow exponentially, and these numbers are only going to increase even more as time goes on. If
population rates continue to rise at the same rates, more problems will eventually occur, and Tanzania and Kenya will be in a state of total disarray. The countries must stabilize this growth before overpopulation consumes every last resource the countries have. Consequences of this growth have already had detrimental effects on the environment, the wildlife, and local people, and they are just going to get much worse if the population is not regulated.

Many efforts have been made to control the population thus far, but more efforts are needed to really make a difference. Kenya and Tanzania can try to stabilize their populations by reducing fertility rates, persuading family planning, making education available to everyone, and widening the availability of contraception through family planning clinics. It is widely believe that family planning would slow the population rates, especially the use of contraceptives, but this plan requires more commitment from the governments. More nurses and available birth control options are necessary for this to happen, but unfortunately this is very expensive.

For this reason, funding from foreign nations would do wonders for Kenya and Tanzania. Although the governments in these countries are very corrupt, and aid money from other nations mysteriously disappears all the time, there are other options for foreign countries to help without giving money directly to the government. A great way these countries can insure their money is being put toward good use is to invest their money into projects that will build schools and hospitals that will educate people about the importance of family planning, and the importance of the wildlife and environment that surrounds them. Foreign countries could also send over trained nurses and supply various forms of contraceptives for these countries.

Community involvement and commitment is the key to solving any issue, especially in the countries of Kenya and Tanzania. If everyone could understand just how many problems are actually occurring due to the rapid growth in human population, maybe the people of Kenya and
Tanzania will have more incentive to make a change. Although it will still be a long time before the population is stabilized, it is essential that the growth be stopped. The environment, the wildlife, and even the people are depending on it.
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