

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Environmental Studies Undergraduate Student
Theses

Environmental Studies Program

Fall 12-2018

A Systems Perspective of Changes Within Pastoralist Populations in and Around Sibiloi National Park, Kenya

Cody Willnerd

University of Nebraska - Lincoln

Follow this and additional works at: <https://digitalcommons.unl.edu/envstudtheses>



Part of the [Environmental Education Commons](#), [Natural Resources and Conservation Commons](#), and the [Sustainability Commons](#)

Disclaimer: The following thesis was produced in the Environmental Studies Program as a student senior capstone project.

Willnerd, Cody, "A Systems Perspective of Changes Within Pastoralist Populations in and Around Sibiloi National Park, Kenya" (2018). *Environmental Studies Undergraduate Student Theses*. 249.
<https://digitalcommons.unl.edu/envstudtheses/249>

This Article is brought to you for free and open access by the Environmental Studies Program at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Environmental Studies Undergraduate Student Theses by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

A SYSTEMS PERSPECTIVE OF CHANGES WITHIN PASTORALIST POPULATIONS IN AND AROUND

SIBILOI NATIONAL PARK, KENYA

by

Cody Willnerd

AN UNDERGRADUATE THESIS

Presented to the Faculty of
The Environmental Studies Program at the University of Nebraska-Lincoln
In Partial Fulfillment of Requirements
For the Degree of Bachelor of Science

Major: Environmental Studies
With the Emphasis of: Environmental Education

Under the Supervision of Dr. Matthew Douglass

Lincoln, Nebraska

December, 2018

A SYSTEMS PERSPECTIVE OF CHANGES WITHIN PASTORALIST POPULATIONS IN AND AROUND
SIBILOI NATIONAL PARK, KENYA

Cody Willnerd, B.S.

University of Nebraska, 2018

Advisor: Dr. Matthew Douglass

Abstract

In recent years, pastoralist settlement around Sibiloi National Park in Kenya has increased illegal grazing within the park's boundaries. This issue stems from a myriad of causes, such as; food aid, sedentism, better access to healthcare, lack of grazing land, increase in number of droughts and increase in number of livestock head. The region has a significant lack of research on the topic and a systems perspective will be constructed in this research paper. The systems perspective will be constructed with the use of past literature and interviews answered by those who live in the East Turkana region. Findings have found that sedentism has been made popular due to foreign aid that has poured into the region. This sedentism has created conflict with competing tribes due to settlements being created near tribal boundaries. Sedentism has also contaminated water sources and overgrazed grasslands. Seasonal movements have also changed due to sedentism, and tribal authority has decayed. Foreign aid has helped with the increasing population of the Dassenach community, which is one of the largest pastoralist tribes in East Turkana. The size of livestock herds have also grown in number. These increases have pushed wildlife out from their native habitats thus diminishing their numbers within the park.

Introduction

The purpose of this study is to gain a systems understanding of the impacts that the Dassenach Tribe has on Sibiloi National Park in Northwestern Kenya. Sibiloi National Park has seen a dramatic increase in pastoralist settlement, a form of lifestyle that relies on livestock and seasonal movement, in recent years. These populations, though normally highly mobile, have become increasingly concentrated within the park boundaries. Semi-permanent settlements have become common-place throughout the park and high stocking rates of cattle and goats are having a noted impact on vegetation coverage.

The Dassenach have been in the Omo Basin Region for the past several decades following forceful removal from their homeland of the Ilemi triangle in Ethiopia. Since they have moved into a new area that has less grazing land, they have encountered hardships adapting their previous lifestyle to the land they currently occupy. Because of the pressures that are being put onto the herd sizes due to the lack of grazing land, many pastoralists have turned to agropastoralism, a mixture of pastoralism and agriculture, around Lake Turkana. The Dassenach have adopted flood recession agriculture, a type of flood-based agriculture where residual moisture of seasonally flooded areas is used as irrigation. According to the article “Transboundary Survival Systems: A Profile of Vulnerability”, the Dassenach converted to fishing and agropastoralism to make ends meet and to put food on the table. Another article that has covered the adoption of fishing over pastoralism in Northwestern Kenya is called “Emerging resource use conflicts between Kenyan fishermen, pastoralists and tribesmen of Lake Turkana”. This article outlines the conflicts that have arisen from the dwindling resources in the area. Frequent droughts, loss of livestock, and loss of seasonal floods have made the ethnic groups of Lake Turkana turn to conflict and fishing for their livelihood. This change of lifestyle, along with pastoralism and agriculture, has lead to extreme stresses on the environment and its occupants. The scope of how much damage has been done to the ecology of the park needs to be further explored now that the Dassenach are using every natural resource it can use to sustain their population. In the article “Policy and Practice in Kenya Rangelands: Impacts on Livelihoods and Wildlife. Studies in Human Ecology and Adaptation Staying Maasai” it is found that indigenous land management and conservation strategies are important for long term resilience for the tribe.

The way these pastoralist land management systems work, according to the article “Contemporary pastoral commons in East Africa as OECMs: A case study from the Daasanach community” is that all grazing grounds are communal, however, there are enforcers within the Dassenach community that make sure tribal pastoralists are following the natural resource utilisation values. There are seasonal movement patterns that are understood within the Dassenach community. These movements are highlighted in the article “Evaluating livestock mobility as a strategy for climate change mitigation: Combining models to address the specificities of pastoral systems” that these seasonal movement patterns made by the pastoralists are important because they increase the contribution of rangeland to feeding systems and also contributes to the non-renewable energy balance within the system.

Changes to these seasonal movements and patterns can arise from the change to the climate. These changes can have lasting negative effects on the pastoralist communities, especially with competing tribes. In the article “Livestock Raiding and Rainfall Variability in Northwestern Kenya” there has been a correlation found between the climatic seasons and livestock raiding conflict. It has been found that drier months and droughts cause a significant increase in violence.

e between competing tribes. This is due to lack of grazing land and lack of water. There are outlying tribes within Marsabit district that do not follow this pattern of violence. In the article “Rain and Raids Revisited: Disaggregating Ethnic Group Livestock Raiding in the Ethiopian-Kenyan Border Region” that the tribes that lie within the Borana of Marsabit Mountain and Borana Plateau have more livestock raiding during the wet seasons than other pastoralist tribes in Marsabit. Because of this, the researchers of this journal suggested that when considering livestock raiding patterns one must not only regard climate but also ethnic differences within the tribes and their interactions with each other.

Wildlife has been affected by being pushed out of their native habitat, with many species becoming absent from the park. This is not only regulated to Sibiloi National Park. In the article “Extreme Wildlife Declines and Concurrent Increase in Livestock Numbers in Kenya: What Are the Causes?” Kenya has seen a decrease of 68 percent of wildlife populations between the years of 1977 and 2016. It was found that the species

most affected by this decline were the warthog, lesser kudu, Thomson's gazelle, eland, oryx, topi, hartbeast, impala, Grevy's zebra, and waterbuck. Marsabit county, the county that Sibiloi National Park lies within, has seen an increase in livestock biomass. Specifically; sheep, goats, camels, and donkeys have risen in population within the county. Cattle numbers have decreased by 29.7%.

Negative effects on wildlife haven't been limited to life on land. Damage has been done to the fish populations of Lake Turkana. The article "Predicting Species' Vulnerability in a Massively Perturbed System: The Fishes of Lake Turkana, Kenya", goes into detail about the outside pressures that will, and currently are, taking effect on the fish population. According to the article, the construction of Gibe 3 Dam in Ethiopia will reduce the lake's flood cycle, which will affect the fish breeding cycles and migration. The construction of plantations and irrigation from the Omo river will lower the water table in the lake. Climate change will also be a factor, as it has been found in the Omo basin there will be a decrease of precipitation in the coming decades, causing an even larger decrease in water levels in the lake. This will cause a shrink in habitat thus impacting the fish breeding caused by seasonal floods. The lack of water input into the lake will cause the lake to split into two halves. The northern half will become predominantly freshwater, which can cause an increase in biodiversity, while the lower second half will become more saline. This would be attributed to a lack of major rivers connecting themselves to the southern half of the lake, thus having a substantial impact on the fish species and populations that currently reside here. The change in Lake Turkana could impact the migration patterns of the tribes that live around the lake. In the coming decades, more tribes will move to the northern half of the lake. This movement may cause more conflict and population density, while the southern lake will have a decrease in population due to a lack of clean water and food.

As of recently, however, it has reached a tipping point with the recent construction of the Gibe 3 Dam in Ethiopia. The Gibe 3 Dam was built in the lower Omo Valley in southern Ethiopia in 2008 and started operating in 2016. This was a highly controversial dam, drawing sharp criticisms from environmental groups and NGOs. The construction of the dam, according to the article "Gilgel Gibe III: Dam-Induced Displacement in Ethiopia and Kenya", displaced many villages and households in and around the dam. Those displaced usually did not

have a planned area to move to due to the lack of a migration plan on Ethiopia's part. When the villagers eventually settled, they did not have access to healthcare, proper compensation for the loss of their home, land and livestock, and at some times did not have access to clean drinking water. Their migration was due to an increase of submerged land from the dam, increase of wild animal attacks as their habitat disappeared, and limited access to natural resources, such as; grazing land, wells, cropland, etc. The article also states that there are chances that the shoreline of Lake Turkana will change. The northern shore will shift southwards, creating a land bridge within Kenya to the south of where the Dassenach currently live. This will force the Dassenach to follow the new shoreline south into Kenya. There will also be a reduction of flood waters, damaging the flood recession agriculture many of these groups rely on.

With all the systems that are interacting with each other in this specific issue, it is key to begin forming a systems perspective. This process can aid in forming a more inclusive way of protecting natural areas in Kenya and in Africa while also serving pastoralists who rely on these areas for grazing land, food, and water. In the article "Towards a home-grown approach to strategic environmental assessment: adapting practice and participation in Kenya," Kenya is one of the first sub-saharan countries to adopt an assessment of policies that were implemented towards the environment. In this assessment, it tells us that Kenya should adopt its own policies, and to not adopt what has already been done in other countries, but to build its policies that work best for the country and its inhabitants, such as the pastoralists. There must be a middle ground between ecological sustainability, and the sustainability of rural pastoralists and agriculturalists. This means that there needs to be an increase in public participation in the discussion of implementing environmental policies. The strategic environmental assessment has found that there has been a increase in public participation. The increase in participation allows a better understanding to be formed as to what the needs are for these people to survive and how the current conservation systems work and affect these people in their day to day lives in Kenya.

Another proposed method in solving the issue of conservation in eastern Africa is the implementation of ecological tourism. In the article "Tourism-conservation enterprises as a land-use strategy in Kenya" it is found that tourism benefits communities by increasing the skillset of the locals and increasing education awareness of

conserving nature as an alternative land use. However, there are issues that come along with the introduction of ecological tourism within a local economy. One that was stated was that these communities that base themselves on ecological tourism have to depend on external donor funding. If donor funding ceases, then initiatives will end within the reserve. Other issues that can occur in the communities are the unequal distribution of wealth among individuals in the community and internal conflicts among community members. Tourism is still a very valid way to solve the issue of rural development, but it also has its own drawbacks.

Another section of the issue that needs to be explored is how the NGOs and the Kenyan government decide which areas are the most affected from pressure due to pastoralist interventions. The article “Expanding Kenya’s protected areas under the Convention on Biological Diversity to maximize coverage of plant diversity”, covers the methods used to decide which areas are most likely to be in danger. A database of compiled vegetation-plot data was created, covering over 2000 plots and almost 1900 plant species. With this database, they can see where the vegetation bands and where the highest diversity of plant species are located. They have found that the highest diversity is in eastern and northeastern Kenya. Although this may not directly help in solving the research question, this program may be used to track the impact the pastoralists in Sibiloi have had on vegetation in the park. A problem that arises from governments working on issues like this current one, however, is that they do not have a grounded view of the problem.

There will need to be a view of this research question through a grounded theory perspective. Grounded Theory, according to the article “Grounded Theory Methodology in Information Systems Research”, is designed to allow researchers to create a theoretical account of the information of the topic at hand while also grounding the information in empirical observations or data. In short, it allows researchers to create a foundation of a system that can be further researched.

As said, the study will look at several different systems and how they interact with each other. There is the grazing of the livestock that is owned by the Dassenach, and the Gibe 3 Dam that has stopped the seasonal floods, which are vital for the agropastoralism that is used by the tribes scattered around Lake Turkana. The dam will lower the lake’s water levels, which will cause the lake to be cut in half, with the lower half becoming

more saline and the northern half being more fresh which will increase biodiversity in the region. There is the overfishing of Lake Turkana, the changes that come about from Climate Change, and loss of precipitation. Even the methods that are being used in conservation currently do not work to benefit both the environment and the people who live in Kenya today. Gaining a systems perspective in this issue will allow the Kenyan government, or NGO's, to see how all the systems are interacting and how to properly solve the problem. It could also help in bettering a migration management program that is already in use in Ethiopia due to the Gibe 3 Dam and other construction projects of the future.

Materials and Methods

This research will use qualitative data gathering in the form of informal interviews with pastoralists, park rangers, NGO workers, and government officials. There will be a literary review of past scientific articles and journals about the environmental impacts that have been caused by the recent pastoralist settlement in the Sibiloi National Park.

Considering that this is a broad research topic, the paper's intent is to find a systems perspective on the current issue at hand. To make sure that the systems perspective is grounded, interviews will need to be performed. These interviews will allow a comparison to the research articles in the literature review with the thoughts and observations of the people who live in the area.

The interviews will be conducted at the Sibiloi National Park in Northwestern, Kenya. There will be a use of contacts in the field. The method of communication with others will be done as opportunities arise with guidance from locals familiar with the area. This is a pilot study so there will be a rational subgrouping approach to the sampling. There will also be finding of members of specific stakeholder groups to engage. From those stakeholders, names will be gathered and there will be a determination on who to interview based on the number of groups and representatives. Questions will be asked to the interviewees about living in the park and landscape changes in the park. There will be questions asked on their opinions about current land conservation

practices. The interviews will take 20-30 minutes, which will include time discussing their ability to leave the study at any time and other protocols for the IRB, followed with the answering of questions.

The estimated total of interviewees will be 20. This is due to the timeframe of being in Kenya and being able to reach out to the intended groups for this project. All interview participants will be adults.

The interviews and perspective of the research participants will be compared to the material that was reviewed during the pre-review before the trip. Any differences will be stated and understood. This analysis will be done through the technique called “grounded theory”. Grounded theory is an inductive approach where open ended questions on a theme are used to gradually uncover underlying connections and tensions.

The protection and confidentiality of participants will be important in this study. All interviews will be conducted in secure, private areas away from any overhearing. Names will also be omitted from the final research paper.

Results

The time spent in Kenya yielded a total of 36 interviews from a diverse background of opinions and experiences. Two of the interviews were with Koobi Fora Field School instructors, five were from Kenyan Wildlife Service rangers and members, and 28 were from Dassenach tribes people. One interview was from the Catholic mission stationed in Illeret.

The topics the interviews covered included land use, water, Lake Turkana, wildlife, cultural practices, conflict, lifestyle, livestock, vegetation, and personal opinions on day to day life.

The results of the paper took the form of a systems diagram. This diagram highlights the connections of the systems and stakeholders that are a part of the changes within Sibiloi National Park and the tribes surrounding it. With these connections shown in a diagram format, it is easier to find underlying tensions and previously unknown instigators of change.

hospitals, traveling to Illeret every two months to create communication between the KWS and the Dassenach community. The KWS has also included the communities in the creation of park management plans. This is a change in KWS strategy in dealing with the Dassenach tribe. About five years ago, there was a string of aggressive confrontations between Dassenach pastoralists and KWS rangers. It resulted in the burning of bomas, a local term for households, and the forceful removal of Dassenach from the park. A local from Illeret who participated in the talks between the KWS and Dassenach during that time was interviewed. The interviewee explained the situation before the confrontation occurred. They explained that the warden of the park had a belief that the Dassenach people had no right to be in the park due to laws imposed by Kenya. It was during this time that many Dassenach were in the park, with one Kenyan Wildlife ranger describing it as “chaos”. With the many cattle that were grazing within the park, Nairobi pushed the warden of the park to enact strong arm tactics in removing the Dassenach people from the park. Retaliation from the Dassenach were made in the form of ambushes towards KWS rangers and revenge killings against wildlife species that are protected within the park’s borders. It seems that from this time period, the trust between KWS and Dassenach was tarnished.

As of this past year, however, a new warden has arrived to oversee the park. The process of dealing with illegal grazing and settling within the park has been described as “diplomatic” by the KWS employees. This process works as such; the first part is to talk to the elders or chief of the fora, a local term for a settlement, that is found within the park. An ultimatum is created by the KWS where the fora must move outside of the park within 10 days. If the fora remains after the 10 day limit, they are forcefully removed by rangers. Although large confrontations and forceful removals are rare to occur, conflict between pastoralists and the KWS still do. In 2017 four rangers were shot by Dassenach pastoralists as retaliation. Their fates were not explained, but it was said that one is confined to a wheelchair.

These confrontations seem to be happening less and less. A KWS ranger said that the number of cattle in the park has greatly decreased within the last five years. Others who are not related to the KWS organization stated that the KWS do not fully patrol the full extent of the park, but instead only patrol roads in the southern

part of the park, away from the Dassenach territory. However, the warden of the park has stated that there is a northern KWS base in Sibilo. The thoroughness of patrols could be due to the lack of resources given to the KWS by the Kenyan government. The KWS stated that the resources given to them increased over the years, but more is desired.

The issue with the KWS being confined to patrolling the roads is that the Dassenach pastoralists know the area very well and avoid the roads as much as they can. This makes the discovery of foras difficult for the rangers, and the true scale of illegal grazing is unknown to the Kenyan Government.

The lack of resources given to the KWS is also detrimental to the dramatic increase of the Dassenach population and of livestock population in East Turkana. When asked if the population of Dassenach and livestock has increased over the years in general, every interviewee said that the populations of both have dramatically increased. The causes to this increase seem to be multifaceted.

The increase of the Dassenach community in East Turkana can be attributed to several key reasons. Firstly, there has been a decline of infant mortality within the tribe. An increased presence of NGOs, specifically Malteser, has caused higher levels of healthcare in the community. The introduction of healthcare also comes with an increase of hygiene being pushed as a habit to be adapted in Illeret and the surrounding areas. While in Illeret, there are many images on Malteser water towers depicting scenes of locals washing hands and properly using the bathroom in hygienic ways. Healthcare has also aided in giving medication to those ill with waterborne diseases. Interviewees asked about sickness caused by water said that they would go to the clinic to get medicine that would aid in their sickness. After taking the medication they would go back to drinking the contaminated water.

Another possible cause of the increase in Dassenach population is the migrations coming from the Omo Basin towards the north. This area is the most populated Dassenach area, with many of the people using a mixture of agropastoralism due to the Omo river flowing into Lake Turkana and the rich grazing land there. However, due to the construction of the Gibe 3 Dam, as highlighted in the article “ Gilgel Gibe III: Dam-Induced Displacement in Ethiopia and Kenya” many people could possibly be displaced and could

migrate down into East Turkana. Interviewees were asked if they have seen migration of Dassenach from the Omo Basin into Illeret. Some said that very few, if any, have migrated here. Some said there had been some migration down south. It remains to be seen and studied if the Dassenach population in the Omo Basin is truly moving down into East Turkana.

Finally, the last reason for the increase of population in Dassenach is the use of foreign aid, specifically food aid. The introduction of food aid has been said to have been carried out by Malteser, who no longer has a contract in Illeret. This aid has been given out mostly to the people of Illeret, specifically pregnant women and children. In an interview, it was stated that aid increases during droughts and during hard times. There was even a point in time where livestock receive food aid. Foreign aid also comes in as money, with many households receiving money to pay for food and education. Some interviewees stated that the money is not used for those purposes but are instead used for alcohol. Foreign aid has also come in as education, with three schools and several nurseries being constructed in Illeret.

All of these have caused the change in seasonal movement of pastoralists in the region. With the introduction of food aid, permanent wells and healthcare, many Dassenach are beginning to live in clustered foras, close to wells constructed by NGOs and to schools and health clinics. They also stay close to where food aid is given. This sedentism is detrimental, especially to contamination of these water wells. With the increased number of people and livestock around these wells, the contamination rate will increase due to possible contamination points.

Instead of foras moving due to the seasons, they are staying in place. In lieu of this change, the younger men are tasked to take the livestock out to grazing land East and South of Illeret. This development of the community has caused a change in culture within the tribe. Traditional authority, made by the elders and chiefs of foras, would dictate and enforce grazing rotations with the tribe. However, in recent times these grazing rotations have been ignored by the younger generation and traditional authorities are losing their influence. This has also eroded the ethics of conservation as many of the younger pastoralists do not think of the future and the preservation of grazing land for future use. It has been stated that the chiefs of the Dassenach are planning on a

wave of punishment and enforcement on these pastoralists that are not following dictations and regulations set by the chiefs. It seems that it may be too late as it has been said that grazing land has become less and less as livestock numbers continue to grow.

The causes of livestock growth through the years cannot be attributed to one single reason, same as the increase in population of the Dassenach community. The first possible contribution to this sudden increase in livestock could simply be that there are more Dassenach in the area now. As stated previously, there have been a noticeable increases in the Dassenach population. More people mean more pastoralists, more pastoralists mean more livestock.

Another possible reason for the increase of livestock populations lie within the culture of the Dassenach. For this tribe, the amount of livestock one holds exemplifies one's wealth. The more livestock one have, the more wives one can purchase. Livestock can also purchase weapons, more food from Illeret and general safety from starvation. It is akin to people of western countries pursuing more wealth in money. Since there is no strong currency in East Turkana, many of the tribes hold livestock to show their wealth. In the past, communities of Dassenach would share a pool of livestock and share its benefits with each other. A family would contribute one or two cattle to this pool. Now, there is no pool between these communities. Instead, a family could have several head of cattle and many goats. The communal pool practice seems to be out of style as people seem to be pursuing personal wealth.

Finally, the last reason is that the Dassenach have found out, or think, that the land they live on can sustain this population of livestock. This is detrimental because many families can have large amounts of livestock during the wet season and see that their animals are healthy and fat and they have plenty of food to eat. Because of this they will not sell their heads. But when the dry season comes around, large amount of livestock will die off due to the lack of grazing land. No matter what the cause is, there is a large amount of livestock in the Dassenach community and it is increasing with more and more people pursuing pastoralism. This is un-indicative of the article "Transboundary Survival Systems: A Profile of Vulnerability" which stated that many Dassenach are moving towards an agropastoralism lifestyle. Based on interviews conducted, many

Dassenach have stated that agriculture is not pursued, at least not in East Turkana, with most people either tending to livestock or fishing in Lake Turkana. Although some Dassenach people are fishing, this is not done as a source of food. It is instead used for monetary reasons and for trading.

With there being an increase in livestock numbers, this has taken a toll on the vegetation cover and wildlife that inhabit the region. Every interviewee who was asked about the changes in vegetation said that the areas that were once bushy are now filled with trees while the areas that were once filled with trees are now bushy. This can be attributed to two main causes, first being that overgrazing caused by livestock that has contributed to the reduction of retention of moisture in the soil has increased the amount of bushy vegetation over tree vegetation. Another cause of the change in vegetation is the construction of bomas, which are made from the acacia trees that make up East Turkana.

This change in vegetation, especially the lack of grazing land, has caused conflict with competing tribes. The tribes that the Dassenach compete with are the Gabbra, who are to the east of them, the Amar, who are to the north, and the Turkana, who mostly conflict with the Dassenach over fishing spots on Lake Turkana. Interviewees were split over the question of “is there more conflict now than there was before?” Those that lived out east in the Karari stated that conflict is occurring now more than ever. When the interviews were taking place in the Karari, Gabbra footprints were found only several miles from the permanent well occupied by the Dassenach. It was expressed that they were expecting a cattle raid from the Gabbra because of this. However, those in Illeret were stating that conflict has actually decreased between tribes. It can be hypothesized that the reason for this discrepancy is because the Elmasich well in the Karari is located near tribal boundaries. This may cause confrontations between the two tribes over water and land. Those at the well have seen the damage conflict has had on their community and believe that it is happening more than ever because of that. It was also said that the Gabbra have used all of their grazing land out in the east and have moved west towards grazing land that has been properly managed by the Dassenach tribe.

Conflict can also be happening more often because cattle raiding is becoming more necessary in increasing personal wealth. Interviews have stated that wives are costing more now, which requires men to have more cattle or any other livestock to purchase the wives.

While in Illeret, it was told during an interview that the Gabbra tribe had power within the government several years ago. This allowed the tribe to cause cattle raids within the Dassenach tribe and get away with it without repercussions, causing the Gabbra tribe to be more bold in their actions and to cause more conflict with the Dassenach. The Gabbra have recently lost power in the local government and this was given as a reason for the pattern of current conflict to decrease.

Overgrazing by livestock has decreased the available grazing land to wildlife, such as; topi, grevy's zebra, gazelle and other herbivores. This has dramatically decreased the number of animals in and around the park, with many interviewees describing the rapid change of wildlife numbers noticed in their childhoods to now. Even those around the Koobi Fora Base Camp have noticed a significant change in wildlife populations in the past decade. With the decline of herbivore populations come the decline of predator populations such as lions, hyenas and cheetahs. One KWS ranger had noted that the lion population has decreased from 600 lions in the park ten years ago to about 2 lions in the park.

This decline in wildlife species isn't only attributed to overgrazing by livestock. Poaching seems to be an issue, albeit an insignificant one. Cases of revenge killings made by impassioned pastoralists recently removed from the park are very few, with revenge usually taken against the rangers instead of wildlife. Poaching is instead taken in the form of subsistence and of traditions. During times of drought, Dassenach would either kill one of their livestock for food, or would go out and kill wildlife for food. As for traditions, Dassenach would have men kill lions for their hide to be worn as a sign of manhood. This practice is being stopped by the KWS and is being replaced by reusing old lion pelts instead of killing lions for new ones. Finally, several Dassenach interviewees have stated that with the introduction of firearms in the community, many younger men used wildlife as target practice. It is not known if this has had a significant impact on

wildlife numbers, but it was stated in interviews that it changed the perception of wildlife from appreciation to recreational killing.

Steps have been taken, by NGOs such as PACIDA, and the Kenyan Wildlife Service, to educate the Dassenach community on the importance of wildlife and conservation. Many of the interviewees stated that the younger generation have been adopting this appreciation and have started changing habits and thoughts towards wildlife. Although, the older generation have not picked up on this education as well as the younger generation has.

Conclusion and Summary

The Dassenach tribe is undergoing rapid change because it is becoming connected to a global world. Very little research has been done to understand the stakeholders in this change and the implications of such a change. This study was done to begin forming an idea of the systems that are at work by reviewing past literature and conducting semi-formal interviews with those who live in East Turkana.

It was found that there are indeed rapid changes happening within the Dassenach community and in and around Sibiloi National Park. There has been a dramatic increase in size of the Dassenach community and an increase in the number of livestock herds. This has decreased the coverage of grazing land. It has caused intense competition with neighbor tribes and may have changed the climate in the region. This change of vegetation and number of livestock has also dramatically decreased the number of wildlife in and outside of the park.

Although much has been discovered and understood, many questions remain to be answered. Future studies in the region will need to look at the following questions:

- How will Climate Change affect the pastoralist land systems around Lake Turkana?
- What are the long term effects of development around the Omo Basin?
- How can Dassenach definitions of drought be used to track true climate changes in the area?
- What are the interaction patterns between wildlife and pastoralists in the park?
- What are the drivers towards cultural degradation in the Dassenach tribe?

- Are there other factors that affect the frequency of conflict?
- What are the long term effects of biodiversity loss in a semi-arid landscape?
- How can NGOs adopt a system that works along with what is needed by the pastoralist communities?

References:

1. Carr, Claudia J. "Transboundary Survival Systems: A Profile of Vulnerability." *River Basin Development and Human Rights in Eastern Africa — A Policy Crossroads*, 2016, pp. 53–74., doi:10.1007/978-3-319-50469-8_4.
2. Benoit Hazard, Christine Adongo. "Green Grabbing", pastoralism and environmental dynamics in Northern Kenya.: An assessment of conservation models and practices in Marsabit County. *Les cahiers d'Afrique de l'Est*, IFRA Nairobi, 2015, Varia Kenya, pp.40-62.
3. Beirne, Jonny. "Gilgel Gibe III: Dam-Induced Displacement in Ethiopia and Kenya." *World Academy of Science, Engineering and Technology, International Journal of Humanities and Social Sciences* 2.1 (2015).
4. Gownaris, Natasha J., et al. "Predicting Species' Vulnerability in a Massively Perturbed System: The Fishes of Lake Turkana, Kenya." *Plos ONE*, vol. 10, no. 5, May 2015, pp. 1-24. EBSCOhost, doi:10.1371/journal.pone.0127027.
5. Wiesche, Manuel, et al. "Grounded Theory Methodology in Information Systems Research." *MIS Quarterly*, vol. 41, no. 3, Sept. 2017, pp. 685-A9. EBSCOhost, libproxy.unl.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=124643931&site=ehost-live.
6. Walker, Heidi, et al. "Towards a Home-Grown Approach to Strategic Environmental Assessment: Adapting Practice and Participation in Kenya." *Impact Assessment & Project Appraisal*, vol. 34, no. 3, Sept. 2016, pp. 186-198. EBSCOhost, doi:10.1080/14615517.2016.1176409.
7. Scherer, Laura, et al. "Expanding Kenya's Protected Areas under the Convention on Biological Diversity to Maximize Coverage of Plant Diversity." *Conservation Biology*, vol. 31, no. 2, Apr. 2017, pp. 302-310. EBSCOhost, doi:10.1111/cobi.12792.
8. Yongo, E. O., et al. "Emerging Resource Use Conflicts between Kenyan Fishermen, Pastoralists and Tribesmen of Lake Turkana." *Aquatic Ecosystem Health & Management*, vol. 13, no. 1, Jan-Mar2010, pp. 28-34. EBSCOhost, doi:10.1080/14634980903578308.
9. Homewood, K. (2009). Policy and Practice in Kenya Rangelands: Impacts on Livelihoods and Wildlife. *Studies in Human Ecology and Adaptation Staying Maasai?*, 335-367. doi:10.1007/978-0-387-87492-0_9

10. Mwamidi, D. M., Renom, J. G., Fernández-Llamazares, Á, Burgas, D., Domínguez, P., & Cabeza, M. (2018). Contemporary pastoral commons in East Africa as OECMs: A case study from the Daasanach community. *Parks*, 24(SI). doi:10.2305/iucn.ch.2018.parks-24-sidmm.en
11. Vigan, A., Lasseur, J., Benoit, M., Mouillot, F., Eugène, M., Mansard, L., . . . Dutilly, C. (2017). Evaluating livestock mobility as a strategy for climate change mitigation: Combining models to address the specificities of pastoral systems. *Agriculture, Ecosystems & Environment*, 242, 89-101. doi:10.1016/j.agee.2017.03.020
12. Ogutu, J. O., Piepho, H., Said, M. Y., Ojwang, G. O., Njino, L. W., Kifugo, S. C., & Wargute, P. W. (2016). Extreme Wildlife Declines and Concurrent Increase in Livestock Numbers in Kenya: What Are the Causes? *Plos One*, 11(9). doi:10.1371/journal.pone.0163249
13. Ember, C. R., Adem, T. A., Skoggard, I., & Jones, E. C. (2012). Livestock Raiding and Rainfall Variability in Northwestern Kenya. *Civil Wars*, 14(2), 159-181. doi:10.1080/13698249.2012.679497
14. Ember, C. R., Skoggard, I., Adem, T. A., & Faas, A. (2014). Rain and Raids Revisited: Disaggregating Ethnic Group Livestock Raiding in the Ethiopian-Kenyan Border Region. *Civil Wars*, 16(3), 300-327. doi:10.1080/13698249.2014.966430
15. Lamers, M., Nthiga, R., Duim, R. V., & Wijk, J. V. (2013). Tourism–conservation enterprises as a land-use strategy in Kenya. *Tourism Geographies*, 16(3), 474-489. doi:10.1080/14616688.2013.806583