How Beneficial is Tourism? An Analysis of the Economic Impact of Tourism in Il N'gwesi, Kenya

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Abstract

This paper is a study of the economic effects of tourism in Il N'gwesi, Kenya. This group ranch has been greatly influenced by tourism and conservation efforts in recent years; it neighbors several conservation and tourism centers and in 1996 members set aside 80% of their communal land for a conservation area and initiated a community run Eco Lodge. This paper studies the potential negative effects of tourism in Il N'gwesi as well as the variables that impact conservation friendly and unfriendly expenditure decisions. A statistical analysis reveals that group ranch members perceive that there has been inflation in the prices of land, food, and goods and services. However, close to 100 percent of households do not believe that the inflation is due to the Eco Lodge. A statistical analysis of the perceptions of wildlife and conservation reveals that there is no significant difference in how households value wildlife and conservation, regardless of whether they have suffered from wildlife damage or not. Probit models were used to evaluate how respondent characteristics and employment type influence household choice of expenditure. It was found that tourism employment does not impact the household's decision to purchase livestock and that the higher the household values conservation the more likely they are to purchase livestock. Providing people with economic incentives to make conservation friendly decisions does not appear to be working in Il N'gwesi.

1. Introduction

Promotion of ecotourism and pro-poor tourism ventures has been very popular in recent years. However, sound analysis of their economic impact on the communities and conservation has been lacking. Little information is available about the success of providing people with economic incentives in the form of employment to promote conservation friendly actions. Another criticism of previous tourism studies is that they do not account for the possible negative economic effects of tourism. Wall (1982) suggests that to properly analyze the effects of tourism,

three factors need to be analyzed: economics, environment, and socio-cultural factors. Thus, to properly analyze the economic impact of tourism on Il Ngwesi, this paper looks at three topics: opinions about inflation and its causes, opinions about wildlife and conservation, and expenditure choices.

This paper is a study of the economic effects of tourism in Il N'gwesi, Kenya. Il N'gwesi is a Maasai group ranch located near Mt. Kenya which is primarily comprised of semi-pastoralist livestock herders. This group ranch has been greatly influenced by tourism and conservation efforts in recent years. In addition to neighboring several conservation and tourism centers, in 1996 members set aside 80 percent of their communal land for a conservation area and initiated a community run Eco Lodge. The Eco Lodge provides benefits to the community in the form of secondary school scholarships. Since its opening, the Eco Lodge has won various awards such as the Equator Initiative Award and is touted as a USAID success story.

Lewa Wildlife Conservancy is a privately run conservation area and tourist destination that borders Il Ngwesi. Lewa created the Northern Rangelands Trust, a NGO that works with 15 group ranches (including Il N'gwesi) to develop support programs. They have partnered with Ol Pejeta, a private conservation area, tourist destination, and cattle ranch in the area to develop a Community Livestock Grazing program with Il N'gwesi. Essentially, Lewa quarantines participating Il N'gwesi household's cattle and then Ol Pejeta purchases the healthy cattle at a guaranteed price. This price is often higher than competing offers, but is not necessarily so. The end goal of Lewa, NRT, and Ol Pejeta is conservation. They believe that if households have higher or more consistent incomes from livestock or employment, then they will choose to keep fewer livestock. With fewer livestock, the rangeland will improve and become more beneficial for the wildlife and therefore tourism.

2. Literature Review

Ecotourism is a form of tourism that emphasizes nature and the culture of the surrounding area. Ecotourism often markets itself on reducing the negative environmental impact of tourism, maintaining the culture of the surrounding communities as well as promoting economic growth and creating employment opportunities in the surrounding area (Randall, 1987). The positive forces of ecotourism may serve as a conservation incentive for the surrounding communities. However, true economic incentives are needed for the conservation effects to be possible. This is particularly true in isolated areas where the government has little control over the regulation of their conservation policies (Wunder, 2000).

A negative economic impact of tourism is inflation. An increasing number of tourists in the area leads to an increase in the price of local goods (Vanasselt, 2000). This inflation has the potential to greatly hurt residents. Additionally, ecotourism managers must monitor the level of inflation in prices of local goods and land in order to avoid unrest in the surrounding community (Brandon, 1993).

Wildlife and Conservation

The Maasai and migratory wildlife have been the subject of much debate in recent years. Wildlife is important to Kenya because it is a source of large amounts of revenue; between 1948 and 1968 the income from wildlife based tourism increased 20 fold and in 2006 tourism accounted for 45 percent of foreign currency (Tourism Trust Fund, 2007). This is a significant form of income and through the efforts of conversationalists and from the government's own self interest, migratory wildlife has been the focus of national, regional, and international institutions (Norton-Griffiths, 1995).

Wildlife is important to Il N'gwesi because over 70 percent of Kenya's wildlife can be found outside of the designated parks and game reserves (Radney et al., 2006). Additionally, each of Il N'gwesi's six neighborhoods shares a border with a conservancy. This means that wildlife human interactions are frequent in Il N'gwesi and these contacts occasionally lead to property damage or livestock and human injury or death. Currently the communities are compensated for a human death only and the time and effort needed to receive compensation is typically extensive (Nyamwaro et al., 2006). In Il N'gewsi no respondents stated that they had been compensated for the loss of a human life.

The conflicts between the Maasai and wildlife have been studied extensively. Due to the current conflicts between the Maasai people and the wildlife it might appear that the Maasai have negative attitudes towards wildlife. This is not proven true, due to the fact that the two groups coexisted peacefully for hundreds of years. The problem lies with the general unwillingness to compromise on wildlife and conservation policies. The Maasai currently feel that even though the wildlife are damaging their property and are sometimes a threat to livestock and human lives, they have limited opportunity to act on this problem, due to the focus on conservation. (Nyamwaro et al., 2006).

Expenditure Choice

There has been much research completed on the relationships between income from different forms of employment and agriculture. There are dissenting viewpoints on how incomes from off-farm and farm sources interact with each other. One view is that there is a de facto competition and weighing of tradeoffs between the resources invested in farm or off-farm activities (Reardon et al., 1994). Another view is that agricultural investment cannot be made by simply participating in agricultural production. Off-farm income is needed to increase farm

inputs; agricultural investment cannot be done by simply focusing on agriculture (FAO, 2002). Additionally, education increases income; an educated person is more likely to invest off-farm profits into production of cash crops, thereby likely increasing farm income (Reardon et al., 1994). Although there are disagreements over exactly how farm and off-farm incomes are related, it is clear that they are related.

There is much known about the link between employment and agriculture as well as which factors influence household expenditure choices. However little research has been done on what influence a job type has on the household expenditure choice. This is particularly true when looking at the differences in expenditure choices between tourism and non-tourism employment. Do they pay for household expenses? Or do they use the additional cash to purchase more livestock?

3. Survey Location

Il N'gwesi is comprised of six neighborhoods: Ethi, Chumvi, Leparua, Nadungoro, Ngare Ndare, and Sanga. The neighborhoods vary greatly in size, population, infrastructure, natural resources, and neighborhood centers. The Il N'gwesi neighborhoods are shown in Map 1. The land of Ethi, Chumvi, and Ngare Ndare is privately owned land; households bought and have title to their land. Leparua, Nadungoro, and Sanga are communally owned, Il N'gwesi group ranch land. There are roughly 600 group ranch registered members. To be a member you must be a widow or be a male at least 18 years old. The neighborhoods are not restricted to group ranch registered members; around 60 percent of the population is group ranch registered members. The non-group ranch registered members are often Maasai, but this is not always the case.

-- Map 1 Here --

The Il N'gwesi neighborhoods vary in size. There are around 50 group ranch registered members in Ethi. There is a primary school and a few members grow food crops on a small scale. The center is one of the most developed in Il N'gwesi with two butcheries, a vocational school, and a clinic. Ethi is about a 15-minute drive to Timau, a small town, making it the closest neighborhood to a town. There are 141 members in Chumvi and a sizable portion of the population are not group ranch registered members. There is a primary school and a few members grow food crops on a small scale. There is also a market for sheep and goats that is held bi-monthly. There are 90 members in Nadungoro. There is a primary school but there is no community center to speak of. It is the closest neighborhood to Dol Dol, a large bi-monthly cattle market and very few people grow crops. There are 150 members in Leparua. It encompasses a large land area and there are two primary schools. There is no significant center and the majority of Leparua is arid and nearly impossible to grow crops.

Ngare Ndare is home to approximately 33 group ranch registered members. There is a primary school and a clinic in the area. It is a very cosmopolitan area; roughly 24 percent of the population is a registered member and the large majority of the non-members are also not Maasai. There is a lot of water in Ngare Ndare and many members grow small scale food crops. There are roughly 83 members in Sanga but there are no primary schools or center. Due to security concerns, we did not interview many households in Sanga. For the purposes of this analysis, Sanga was removed from the dataset.

4. Data

Data Gathering

From August through November 2007, 218 household surveys were conducted in Il N'gwesi. The authors wrote the surveys after an extensive literature review, an analysis of pre-

existing household surveys, as well as a review by Kenyan residents and former enumerators. The surveys were conducted by one of the authors, a Purdue colleague, and a team of three enumerators. The survey was written in English and orally translated into Maa or Kiswahili by the enumerators.

Households were randomly sampled from each of the six neighborhoods and roughly 50 percent of the Il N'gwesi group ranch registered members were sampled. Over 23 percent of all households in the Il N'gwesi neighborhoods were surveyed. A household was defined as an economic unit; a household is all relatives whom the household monetarily supports or receives monetary support from. If a person was not a relative, they were only counted as a member of the household if they lived on the property at least a year. Given this definition, there can be more than one group ranch registered member in a household. Data was gathered on location, employment, respondent and household characteristics, livestock, community involvement, and opinions about wildlife and the Eco Lodge.

Location

The Il N'gwesi neighborhoods are quite distinct from each other. The authors expect that the differences in terrain, access to other areas, education, and community centers would cause households to make different expenditure choices. Of the interviews conducted, 10 percent of the households were in Ethi, 19 percent were in Nadungoro, 28 percent were in Chumvi, 32 percent were in Leparua, and 11 percent were in Ngare Ndare.

Employment

Tourism employment is any type of wage or self employment that is related to tourism and/or conservation. This is employment such as working at the Eco Lodge or surrounding tourist locations as a tour guide, driver, or security personnel or selling arts and crafts to tourists.

The most popular employer is Lewa, which borders Leparua, Sanga, and Ngare Ndare. We expect that households that receive income from tourism will be more likely to make "conservation friendly" expenditure choices. Non-tourism jobs are any type of wage or self employment that is not related to tourism or livestock herding. These can be jobs such as working for the police or military, trade, and teaching. The average number of households which held tourism and non-tourism jobs in 2006 was 40 and 31 percent, respectively.

Household and Respondent Characteristics

Information about the gender and age of the respondent and the number of children in the household was recorded. Sixty-nine percent of the respondents were female. Women are responsible for the care of the home; thus, it is thought that women will be more likely to spend money on household expenses than men. Cattle are highly valued in Maasai culture due to their socioeconomic value. However, new opportunities are becoming available through increased educational opportunities. The authors expect that there is a quadratic relationship with age and expenditure choice; older and younger people are more likely to purchase livestock than middle aged people. The average respondent age was 41 years.

Primary education became free in Kenya in 2003. At this time many children began attending school, regardless of their age. Thus, it is very possible to have children ages 13-18 still in primary school. We expect that the greater the number of children under 18 in the household the more likely the household is to spend money on educational expenses. There are an average of 3 children who are under 18 years old in the household.

The Eco Lodge provides scholarships to secondary school N'gwesi group ranch member students. Additionally, the group ranch set aside 80 percent of their communal land for conservation and tourism in 1996. The sacrifices they have made and the benefits they had

received are believed to impact spending decisions; we expect that members would be less likely to make "non-conservation friendly" expenditures. Eighty-six percent of the households surveyed were group ranch registered households.

Community Involvement

Involvement in the community is becoming an increasingly important factor of social capital. There are many definitions of social capital but nearly all of them encompass the idea that social bonds, collective action, and social norms are a significant portion of the creation of sustainable livelihoods (Pretty and Ward 2001, Cramb 2005). The relationship between social capital and conservation has been explored in the past (Cramb 2005, Pretty and Smith, 2004, Pretty and Ward, 2001, Schwartz, 2006). We believe that the greater the number of community organizations that the household participates in, the less likely the household is to make "non-conservation friendly" expenditures. The average number of community organizations that a household participated in was 0.30.

Opinions about Wildlife, Conservation, and the Eco Lodge

Tourism and conservation have a large impact on Il N'gwesi and residents have differing opinions about the benefit that these forces have had. We expect that the greater the household values wildlife, conservation, and the Eco Lodge the more likely they will be to make conservation friendly expenditures. The average household is neutral about how important conservation is to them and would not agree that their household has a higher income due to the Eco Lodge.

Livestock

Livestock is an integral part of life for many residents. We expect that if a household sold livestock or their products that they would be more willing to purchase livestock than a

household that has not. Livestock is comprised of cattle, sheep, goats, donkeys, poultry, and bees. Ninety-one percent of households had sold at least one head of livestock or livestock products in 2006.

5. Methodology

Based on the above descriptions testable hypothesis were developed. Given that there were three equations and 14 independent variables, the hypotheses are expressed in table form to aid in ease of comprehension (Table 1). A basic statistical analysis was used to analyze whether community members perceived any inflation and the differing opinions about conservation and wildlife.

-- Table 1 Here --

Three probit models were used to analyze the factors that influence expenditure choice. As seen in Alexander and Mellor (2005), households will choose a particular expenditure choice first if it maximizes their utility; if the household perceives that they will receive more utility from purchasing this item first instead of purchasing any other item first: $E[U_1]>E[U_0]$. The household's conviction about the expected utility of purchasing livestock, livestock inputs, or household items first is a function of location, employment, household and respondent demographics, community involvement, opinion about wildlife, conservation, and the Eco Lodge as well as sale of livestock and livestock products ($E[U(x_1)]$ where x represents the explanatory variables). Households make their expenditure choices based on the expected utility of expenditure (a latent variable), $y^*=E[U(x_1)]-E[U(x_0)]$. This leads to the following equation: $y_t^* = \mathbf{x}_t + \varepsilon_t$ where y_t^* is the household's belief about the expected utility of the expenditure choice, $\mathbf{x}_t$ is the vector of explanatory variables for expenditure choice, and ε_t is the error term. Expenditure

is a binary variable; if the household feels that this expenditure choice will maximize their utility then they will choose that expenditure choice first. This is seen in the equation below:

$$y_t = \begin{cases} 0 \text{ if } y_t^* \leq 0 \\ 1 \text{ if } 0 \leq y_t^* \end{cases}$$

Respondents were asked to rank what they spend their money on for five types of income earning activities: livestock herding, Eco Lodge employment, Eco Lodge spin-off activities, wage employment, and self employment. The four most common expenditure choices were: buy more livestock, buy livestock inputs, pay for household expenditures, and pay for education. We chose to omit educational expenses from the analysis, because we believe that education is influenced by more demographic variables than household, livestock, and livestock input expenditures. Thus, the models for livestock, livestock inputs, and household expenses would not be an appropriate model for educational expenses.

We looked at the first expenditure choice for each of the income generating activities. Buying more livestock is viewed as a "non-conservation friendly" expenditure choice. The other income choices are viewed as "conservation friendly" or "conservation neutral" expenditure choices. The equations are below. Information about the variables is found in Table 2 and 3.

-- Table 2 Here --

$$LVSK=\beta_0+ \beta_1 NAD+ \beta_2 CHU+ \beta_3 ETH+ \beta_4 NGA+ \beta_5 MEM+ \beta_6 TEM+ \beta_7 NEM+ \beta_8 GEN+ \beta_9 AGE+ \beta_{10} AGE^2+ \beta_{11} KID+ \beta_{12} LVS+ \beta_{13} CON+ \beta_{14} COM+ \beta_{15} ELH+\varepsilon \quad \text{(Equation One)}$$

$$INPUT= \beta_0+ \beta_1 NAD+ \beta_2 CHU+ \beta_3 ETH+ \beta_4 NGA+ \beta_5 MEM+ \beta_6 TEM+ \beta_7 NEM+ \beta_8 GEN+ \beta_9 AGE+ \beta_{10} AGE^2+ \beta_{11} KID+ \beta_{12} LVS+ \beta_{13} CON+ \beta_{14} COM+ \beta_{15} ELH+\varepsilon \quad \text{(Equation Two)}$$

$$HOUSE= \beta_0+ \beta_1 NAD+ \beta_2 CHU+ \beta_3 ETH+ \beta_4 NGA+ \beta_5 MEM+ \beta_6 TEM+ \beta_7 NEM+ \beta_8 GEN+ \beta_9 AGE+ \beta_{10} AGE^2+ \beta_{11} KID+ \beta_{12} LVS+ \beta_{13} CON+ \beta_{14} COM+ \beta_{15} ELH+\varepsilon \quad \text{(Equation Three)}$$

-- Table 3 Here --

6. Results

Inflation

Respondents were asked if there had been a change in the price of land, food, goods and services, and wages since the Eco Lodge was founded. The results are summarized in Table 4.

-- Table 4 Here --

As can be seen from Table 4, less than three percent of respondents felt that there had been a decrease in the prices of land, food, and goods and services as well as wage rates. Approximately 70 percent of respondents indicated that there was inflation in the price of land, food, and other goods and services. Less than half of the respondents perceived that there was an increase in wage rates. Respondents were also asked if they perceived that the change in prices was due to the Eco Lodge. The results are summarized in Table 5.

-- Table 5 Here --

Of the respondents who believed that prices of land, food, and goods and services had increased since the founding of the Eco Lodge, less than 5 percent thought that this increase was due to the Eco Lodge. As can be seen from the above two tables, around 70 percent of respondents perceived an increase in prices and nearly all of respondents did not perceive that this increase was due to the Eco Lodge.

While much of the literature suggests that an increase in the number of tourists can have negative inflationary impacts, this is not the case for food and other goods and services in Il N'gwesi. This could be because the Eco Lodge does not purchase any if its supplies from Il N'gwesi. Additionally, the Eco Lodge is isolated from the populated areas of Il N'gwesi;

tourists who visit the Eco Lodge would not have any need or ability to go to the neighborhood centers.

However, members do not perceive that the increase in the price of land is not due to the Eco Lodge. As previously mentioned, Il N'gwesi set aside 80 percent of their land for conservation and the founding of the Eco Lodge. As a result, members had to move to a different location, in some cases moving from communal to privately owned land. At the current time it is unclear why members would perceive that the increase in land prices was not due to a force which reduced their land by 80 percent.

Wildlife Damage

Respondents were asked if they had experienced any wildlife damage since the founding of the Eco Lodge in 1996. Only damage to economic assets such as the house, fence, crops, grazing land and/or damage or death to livestock or humans was recorded. Fifty-three percent of respondents had experienced wildlife damage since the founding of the Eco Lodge. Respondents who experienced wildlife damage were asked if they thought that the damage was due to the Eco Lodge and fifty-three percent of these respondents indicated that it was. Further analysis was completed to see if wildlife damage had any impact on how respondents valued conservation of rangeland and wildlife; the results are summarized in Tables 6 and 7.

-- Table 6 Here --

Table 6 reveals that there is little difference in how respondent's value conservation of the rangeland and wildlife regardless of whether they experienced wildlife damage or not. A t-value of -0.0014 confirms that there is no significant difference in opinions about conservation between those who have suffered from wildlife damage and those who have not.

Table 7 also reveals that there is little difference in how respondent's value conservation of the rangeland and wildlife regardless of whether they thought that the damage was due to the Eco Lodge improving the situation for wildlife or not. A t-value of 0.0719 confirms that there is no statistical difference between the two groups.

-- Table 7 Here --

Table 8 shows how respondents perceive wildlife depending on whether they have had wildlife damage or not. Thirty-nine percent of the respondents who had wildlife damage stated that wildlife was a nuisance, as compared to 25 percent of respondents who had not had any damage. Forty-three percent of the respondents who had wildlife damage stated that wildlife was a nuisance, as compared to 27 percent of respondents who had not had any damage. Thirty-seven percent of the respondents who had wildlife damage stated that wildlife was a nuisance, as compared to 49 percent of respondents who had not had any damage. However, t-values of 0.1557, -0.2483, and 0.1363 for nuisance, necessary part of nature, and necessary for tourism, respectively confirm that there is no statistically significant difference between how respondents perceived wildlife depending on whether they had had wildlife damage or not.

-- Table 8 Here --

Table 9 reveals how respondents perceive wildlife depending on if they think their wildlife damage is a result of the Eco Lodge improving the situation for wildlife or not. Forty-four percent of the respondents who thought their wildlife damage was not due to the Eco Lodge stated that wildlife was a nuisance, as compared to 35 percent of respondents who did not think it was due to the Eco Lodge. Twenty-one percent of the respondents who thought their wildlife damage was not due to the Eco Lodge stated that wildlife was a nuisance, as compared to 33 percent of respondents who did not think it was due to the Eco Lodge. Fifty-six percent of the

respondents who thought their wildlife damage was not due to the Eco Lodge stated that wildlife was a nuisance, as compared to 42 percent of respondents who did not think it was due to the Eco Lodge.

-- Table 9 Here --

T-values of -0.1396, 0.1222, and -0.2363 for nuisance, necessary part of nature, and necessary for tourism, respectively confirm that there is no statistically significant difference between how respondents perceived wildlife depending on whether they thought their wildlife damage was due to the Eco Lodge or not. This means that it is no more likely for households who thought the damage was due to the Eco Lodge to think that wildlife is a nuisance, necessary part of nature, or necessary for tourism than households who did not think that that the damage was due to the Eco Lodge. Therefore, damage and the belief about the cause of the damage do not have an impact on the respondent's opinions about wildlife.

Expenditure Choices

Probit models were used to analyze which factors influence expenditure choice. Leparua is the location in the intercept. The results for livestock expenditures are summarized in Table 10. The McFadden pseudo R^2 is 0.2014, a respectable value for this type of analysis. Nadungoro, Chumvi, and Ngare Ndare are significantly different location from Leparua. If the respondent lives in any of the above three locations, then the household was less likely to purchase livestock than households in Leparua. This makes sense, as the soil in Ngare Ndare and Chumvi is much richer than in Leparua. Additionally, a higher percentage of the residents in Leparua participate in the Community Livestock Grazing Program with Lewa and Ol Pejeta. Thus helps to explain the result that households from Nadungoro, Chumvi and Ngare Ndare in

Leparua are less likely to choose to purchase livestock as their first expenditure choice than household from Leparua.

The dummy variable for selling livestock or livestock products in 2006 was also significant; if a household sold livestock or products then they were more likely to buy livestock than households which had not. This result was expected by the authors. Households that are making money from livestock would be more likely to purchase more livestock than households that are not making any money from livestock.

The conservation variable is also significant. The higher a household values conservation, the more likely they are to purchase livestock. This result is also expected due to the Community Livestock Grazing program with Lewa and Ol Pejeta. The economic concepts of supply, demand, and incentives reveal the desired relationship between livestock and conservation is highly unlikely. We would expect that households which are told about the merits of conservation and receive consistent livestock prices as a result of conservation goals would highly value conservation and at the same time want to purchase additional livestock to continue to capture the benefits from conservation.

-- Table 10 Here --

Age squared is also significant and the coefficient is positive. This reveals that preference for livestock expenditures increases with older respondents. It is interesting to note that neither tourism employment nor non-tourism employment are significant. If a household is receiving income from activities that rely on conservation, they are no less likely to purchase livestock than households which are not dependent on conservation for their living.

-- Table 11 Here --

Table 11 contains the variables which influence expenditures on livestock inputs. The McFadden pseudo R^2 is 0.2188, a respectable value for this type of analysis. Nadungoro is the only location which is significantly different from Leparua; households in Nadungoro are less likely to spend their money on livestock inputs than households in Leparua. This result is somewhat unexpected because Nadungoro and Leparua share many of the same attributes. However, this result could be explained in that observation revealed that a much higher percentage of residents in Leparua are participating in a livestock-selling program with Lewa and Ol Pejeta than residents in Nadungoro. There are strict health standards for the cattle purchased in this program. Therefore, Leparua residents would have a greater incentive to purchase livestock products than residents in Nadungoro. If a household is an Il Ngwesi group ranch registered member, then they are less likely to purchase livestock products than if they are not a member.

The greater the number of children under 18 that are in the household, the more likely the household is to purchase livestock inputs. This makes intuitive sense. The greater the number of dependent children in the household the more household and educational expenses the household will incur. Thus, it is likely that while the household may not have enough money to purchase additional livestock they have a vested interest in keeping their existing livestock alive and healthy to feed their children.

The greater number of community organizations that family members are involved in, the less likely the household is to purchase livestock inputs. This can be explained in that many community organizations are self-help groups which provide livestock inputs. Therefore, households that participate in these activities have less of a need to purchase livestock inputs

first. The more a household feels that the Eco Lodge has increased their household earnings, the more likely they are to purchase livestock inputs.

Information about household expenditures is in Table 12. The McFadden pseudo R^2 is 0.2018, a respectable value for this type of analysis. Households in Ethi are less likely to purchase household items as their first expenditure choice as compared to households in Leparua. Ethi's distinction could be explained by its proximity to a town. Households that live farther away from town have less access to stores. Thus it seems that they make infrequent trips to the store and buy all of the resources they can afford. As soon as they receive another income stream their first priority is buying household items from the store in town. In contrast, households in Ethi have comparatively much greater access to stores with household items. Thus, household supplies are not as high of an immediate priority when they receive an income stream because they have easier access to make this purchase at other times in the month. Households in Nadungoro and Ngare Ndare are more likely than households in Leparua to pay for household expenses as their first expenditure choice.

-- Table 12 Here --

The greater the number of household members with tourism employment, the more likely the household is to pay for household expenses as their first expenditure choice. The higher the household values conservation, the less likely they are to make household expenditures their first choice.

The greater the number of community organizations that household members participate in, the more likely the household is to pay for household expenses as their first expenditure choice. This makes sense. As previously mentioned, most of the community organizations are women's self-help groups. These organizations often provide household items for their members

on an annual basis. Therefore, the more a household is involved in groups that emphasize provision of household items; the more likely the household is to make household items their first expenditure choice. Additionally, these organizations are often empowering and could lead the women to have more control of their household expenditures that would also lead to an increase in purchasing household expenditures.

Age squared is significant, but age is not. This reveals that there is not a linear relationship between age and household expenditures, though there is a quadratic relationship. This reveals that as the respondent gets older, they are less likely to pay for household expenses as their first expenditure choice.

7. Conclusion

The results reveal that group ranch members perceive that there had been inflation in the prices of land, food, and goods and services. However, close to 100 percent of households do not believe that the inflation is due to the Eco Lodge. This has positive implications for the Eco Lodge, as inflation is said to be a factor that causes unrest in the surrounding communities.

The analysis of perceptions of wildlife and conservation reveal that there is no significant difference in how households value wildlife and conservation, regardless of whether they have suffered from wildlife damage or not. This is an important finding in that it reveals that the way households value wildlife and conservation is not dependent on if the household experienced damage due to wildlife in the past.

The results for the expenditure analysis were, for the most part, expected. One interesting result is that tourism employment does not have any impact on the household's likelihood to purchase livestock; tourism as a source of revenue to the household (conservation paying the household) does not have an effect on a household's willingness to purchase livestock

as their first action with the income. This has important implications for proponents of providing economic incentives for conservation. In Il N'gwesi, incentives in the form of employment have no impact on the household's decision to purchase livestock with the income. Additionally, the greater a household values conservation, the more likely they are to choose to purchase livestock as their first expenditure choice. It appears that the goals of the project founders are not being met; indeed it is having the opposite effect as intended.

Opinions about conservation could be analyzed with an ordered probit model to more accurately determine what variables impact feelings about conservation. At this point it does not appear that tourism has been a source of inflation in the community and wildlife damage does not have any impact on how people value conservation and wildlife. However, providing people with economic incentives to make conservation friendly decisions does not appear to be working in Il N'gwesi.

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Map 1

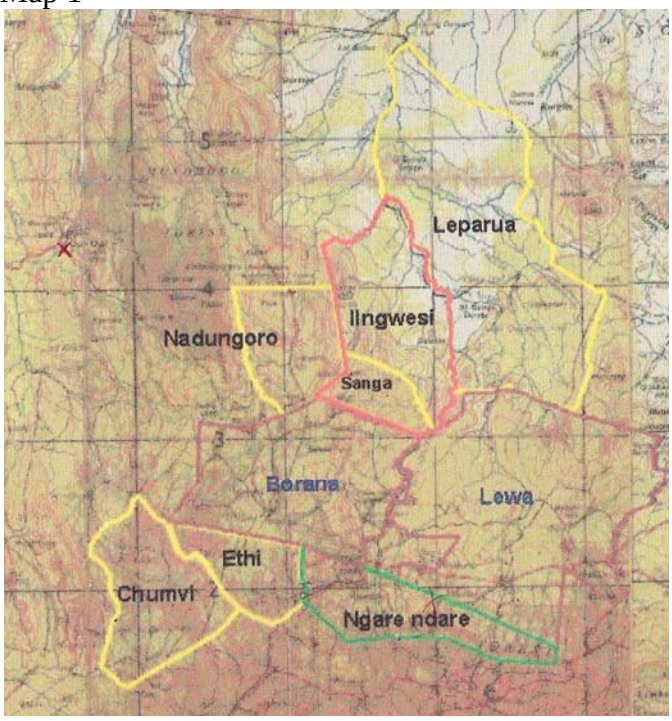

Table 1: Hypothesis

	First Expenditures		
Variable	Livestock	Livestock Inputs	Household
NAD	-	-	?
CHU	-	-	-
ETH	-	-	-
NGA	-	-	?
MEM	+	+	?
TEM	-	-	?
NEM	+	+	?
GEN	+	+	-
AGE	-	-	-
AGE^2	+	+	-
KID	-	-	+
LVS	+	+	-
CON	-	-	?
COM	?	-	-
ELH	-	-	?

Table 2: Description of Variables

Variable	Description
NAD	Live in Nadungoro=1; 0 otherwise
CHU	Live in Chumvi=1; 0 otherwise
ETH	Live in Ethi=1; 0 otherwise
NGA	Live in Ngare ndare=1; 0 otherwise
MEM	An Il N'gwesi group ranch registered member=1; 0 otherwise
TEM	Number of people in household with tourism employment in 2006
NEM	Number of people in household with non-tourism employment (excluding livestock) in 2006
GEN	Male=1; 0 otherwise
AGE	Age of the respondent
AGE^2	Age of the respondent squared
KID	Number of children under 18 in the household
LVS	Have sold livestock or livestock products in 2006=1; 0 otherwise
CON	Conservation of wildlife and rangeland is important to household; Strongly disagree=1,Neutral=3,Strongly agree=5
COM	Number of people involved in community organizations in 2006
ELH	Household has a higher income as a result of the Eco Lodge; Strongly disagree=1, Neutral=3, Strongly agree=5

Expenditure Choice	
LVSK	Purchase livestock is the first expenditure choice with income
INPUT	Purchase livestock inputs is the first expenditure choice with income
HOUSE	Pay for household expenses is the first expenditure choice with income

Table 3: Descriptive Statistics

Variable	Mean	Standard Deviation
AGE	41.12	14.41
KID	3.06	1.78
CON	2.96	1.81
COM	0.30	0.53
ELH	1.57	5.57
	Fequency	Percent
NAD	30	19
CHU	45	28
ETH	16	10
NGA	18	11
MEM	138	86
GEN	50	31
LVS	146	91
TEM	64	40
NEM	50	31
Expenditure Choice		
LVSK	47	29
INPUT	33	20
HOUSE	82	51

Table 4: Perception of Inflation

Category	Increase	Decrease
Land (price of)	68.21%	2.31%
Food (price of)	71.10%	2.31%
Other goods/services (price of)	72.83%	1.16%
Wages (rate)	43.93%	0.58%

Table 5: Reason for Perceived Inflation

	Due to Eco Lodge?	
Increase After Eco Lodge	Yes	No
Land (price of)	1.69%	98.31%
Food (price of)	4.88%	95.12%
Other goods/services (price of)	3.97%	96.03%
Wages (rate)	13.16%	86.84%
Decrease After Eco Lodge	Yes	No
Land (price of)	50.00%	50.00%
Food (price of)	25.00%	75.00%
Other goods/services (price of)	0.00%	100.00%
Wages (rate)	0.00%	100.00%

Table 6: How Damage Impacts Willingness to Conserve

Valuation of Conservation		
Type of Damage	Important	Unimportant
No Damage	48.53%	47.06%
Yes Damage	49.51%	46.60%

Table 7: How Cause of Damage relates to Willingness to Conserve

Valuation of Conservation		
Source of Damage	Important	Unimportant
Not Due to Eco Lodge	41.67%	33.33%
Due to Eco Lodge	36.36%	58.18%

Table 8: How Damage Impacts Perception of Wildlife

Perception of Wildlife			
Type of Damage	Nuisance	Necessary part of Nature	Necessary for Tourism
No Damage	25.00%	42.65%	36.76%
Yes Damage	38.83%	27.18%	48.54%

Table 9: How Cause of Damage Impacts Perception of Wildlife

Perception of Wildlife			
Type of Damage	Nuisance	Necessary part of Nature	Necessary for Tourism
Not Due to Eco Lodge	43.75%	20.83%	56.25%
Due to Eco Lodge	34.55%	32.73%	41.82%

Table 10: Livestock Expenditures

Variable	Coefficient	Stand. Error
*INTERCEPT **	-1.4848473	0.69779881
*NAD ***	-0.6373111	0.37277841
*CHU ***	-0.5746597	0.34028193
ETH	-0.1448451	0.39521587
*NGA **	-1.013259	0.47718177
MEM	-0.396313	0.35720423
TEM	-0.1722221	0.19003748
NEM	0.15883574	0.19916198
GEN	0.02003018	0.27800961
AGE	-0.0008039	0.00056426
*AGE^2 ***	0.00018253	0.0000995
KID	-0.1243061	0.08757842
*LVS ***	0.86289675	0.53658307
*CON **	0.29192253	0.07382614
COM	-0.074577	0.24239737
ELH	-0.0078906	0.02360674

* Sig. at 5%, ** Sig. at 10%

Table 11: Livestock Input Expenditures

Variable	Coefficient	Stand. Error
INTERCEPT	-0.55353493	0.71341482
*NAD **	-1.01075195	0.4623736
CHU	-0.26168756	0.36112405
ETH	-0.2795446	0.41912851
NGA	-0.3730375	0.48751633
*MEM ****	-0.575086	0.38401598
TEM	0.29948525	0.20915556
NEM	0.06510466	0.23742714
GEN	0.26701877	0.3006387
AGE	0.00212914	0.0029483
AGE^2	-0.0000981	0.0001071
*KID ***	0.17554929	0.09099801
LVS	-0.77931822	0.55736138
CON	0.04576353	0.08311514
*COM ***	-0.51803271	0.31037968
*ELH **	0.21459946	0.09224521

* Sig. at 5%, ** Sig. at 10%, ***Sig. at 15%

Table 12: Household Expenditures

Variable	Coefficient	Stand. Error
INTERCEPT	0.01031892	0.62118843
*NAD **	0.60247839	0.34256596
CHU	0.23991135	0.31897989
*ETH **	-0.7130713	0.42509372
*NGA ****	0.62079424	0.39244214
MEM	-0.012335	0.33398333
*TEM **	0.45431841	0.19229973
NEM	0.09552948	0.18593937
GEN	-0.06076547	0.26809431
AGE	0.00019722	0.00054015
*AGE^2 ****	-0.00015154	0.0000951
KID	-0.08141937	0.0782963
LVS	0.58565474	0.45623656
*CON **	-0.16885101	0.06980378
*COM **	0.55012439	0.24422834
ELH	-0.01928949	0.06162457

* Sig. at 5%, ** Sig. at 10%, *** Sig. at 15%