

**NAIROBI UNIVERSITY/SCHOOL OF ECONOMICS**

**MASTER OF ARTS IN ECONOMIC POLICY AND MANAGEMENT**

**THE IMPACT OF CATTLE RUSTLING ON ECONOMIC  
DEVELOPMENT: AN ANALYSIS OF BARINGO COUNTY**

**By**

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Degree of Master of Arts in Economic Policy and Management.**

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## DECLARATION

**This research paper is my original work and has not been presented for a degree award in any other university.**

Signature.......... Date.....10/10/2023.....

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**This research paper has been submitted for examination with my approval as university supervisor.**



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## **DEDICATION**

I dedicate this research paper to my mother and siblings for their encouragement and moral support throughout my studies.

## **ACKNOWLEDGEMENT**

I'm grateful to God for guidance and strength throughout this journey.

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## **LIST OF ABBREVIATIONS**

**HDI** – Human Development Index

**HPI** – Human Poverty Index

**KNCHR** – Kenya National Commission for Human Rights

**RV** - Rift Valley

**ASAL** – Arid and semi-arid lands

**KNBS** – Kenya National Bureau of statistics

**UN** – United Nations

**UNDP** – United Nations Development Program

**UNESCO**- United Nations Educational, Scientific and Cultural Organization

**UK** – United Kingdom

**ICPALD** - Igad Centre For Pastoral Areas and Livestock Development

## ABSTRACT

This study is aimed at understanding cattle rustling and the impact it has had on the human condition of the people of Baringo and economic development as whole. It takes the asset-based approach and defines human security as an asset among other intangible assets and looks at how the loss of these assets, in addition to the physical assets lost during the cattle rustling, impact the county and specifically the living conditions associated with economic development through the human development index. The study uses existing secondary data from various online sources for the years 2010 to 2020. The data was analysed descriptively. The study analyses the data using a multiple regression model and shows that there is a strong relationship ( $R^2 = 0.9997$ ) between insecurity, cattle ownership, education, and health on human development index in Baringo. The results also showed that livestock has a negative insignificant impact on economic development ( $\beta_1 = -0.00007$ ,  $P = 0.193566$  ( $P > 0.05$ )); Insecurity represented by cattle rustling has a positive but insignificant impact on HDI ( $\beta_2 = 0.000016$ ,  $P = 0.349$  ( $P > 0.05$ )); Life expectancy has a positive and significant impact on HDI in Baringo ( $\beta_3 = 0.0071$ ,  $P = 0.0017$  ( $P < 0.05$ )); Health facilities has a positive and insignificant impact on HDI ( $\beta_4 = 0.000026$ ,  $P = 0.165$  ( $P > 0.05$ )); Mean years of schooling has a positive insignificant impact on HDI ( $\beta_5 = 0.0094$ ,  $P = 0.223$  ( $P > 0.05$ )); Expected years of schooling has a positive and significant impact on HDI ( $\beta_6 = 0.0094$ ,  $P = 0.037$  ( $P < 0.05$ )); Adult literacy has a positive insignificant impact on HDI ( $\beta_7 = 0.00005$ ,  $P = 0.225$  ( $P > 0.05$ )). The study's conclusion is that Livestock held negatively and insignificantly affects HDI in Baringo county; cattle rustling as insecurity, health facilities, mean years of schooling and adult literacy all positively and insignificantly affects HDI, while Life expectancy and expected years of schooling positively and significantly affects HDI in Baringo county. The study recommended that the Baringo county government should refocus its efforts to rebuild both tangible and intangible assets of the community including education, health, and social security.

# CHAPTER ONE

## INTRODUCTION

### 1.0 Background of the study

This chapter explores what cattle rustling is, its origins and current trends and lays out the focus of the study at hand.

### 1.1 What is Cattle Rustling?

Cattle rustling is an activity performed by individuals, often from different communities, who organise and violently steal livestock from other persons, community, or group or from the pasture or homestead for the purpose of social, political or economic gain (Bunei, et.al., 2016). Various literature indicates that historically communities raided each other and stole cattle as part of an acceptable cultural practise, but that the practise has become more violent in the recent past (Osamba, 2000; Gumba et al. 2019; Kaimba et al. 2011; Greiner, 2013). The use of dangerous arms that were not used in the more traditional practise, destruction of property and loss of lives has changed the face of Cattle rustling. In recent years the definition has evolved to the act of violent community raids that usually involve firearms and leave behind a trail of destruction and loss of property and lives (Cheserek et al. 2012). The problem is not present in Kenya only, in describing the issue facing Nigeria, Aziz and Aliyu (2016) stated that cattle rustling has become this violent and horrific activity where communities are faced with murder, rape and community displacement.’ Further, Okoli et al. (2014), suggest that the version of cattle rustling currently experienced in the Northern parts of Nigeria is linked with the Boko Haram insurgence group. Closer home, the cattle rustling among the Karamojong of Uganda is well

documented, their excursions crossing borders to both Kenya and South Sudan. In discussing the Karamojong, Powel (2010) states that the region's economic development has been negatively impacted by the prolonged fights due to cattle, pasture and other assets and availability of weapons.' Manu et.al. (2014), in discussing cattle rustling in Cameroon, indicated that cattle rustling hampers the substantial contribution made by pastoralists to the economies of developing countries e.g., by supplying proteins to their communities.

The question of cattle rustling is not endemic to the African continent. There is documented evidence of the practise in the West including in Ireland, the U.S.A, Mexico, Chile, Australia, Israel among others, dating back hundreds of years. One document claims that cattle rustling between the Native Americans and Mexicans may have increased tensions that contributed to the America-Mexico war of 1846-1848. In recent years like 2019 for example, UK reported loss of cattle worth Millions of Euros (Hederson, 2020) and in the US cattle rustling persists in Texas and Oklahoma, which are two of the top cattle producers in the U.S.A (Wolf et.al, 2015) (both as cited in Mazuri et al. 2022).

Kenya's own history of cattle rustling dates to pre-colonial times, where it is believed to have been a practise used by communities as a way to stock their cattle for various purposes. During the colonial times the natives would routinely steal cattle from their white masters who held large stocks of cattle. The practise persisted after independence and we have seen raids between the communities continue to be an issue of significance despite the attention and condemnation the raids have brought, and despite the several attempts by the government to drive peace-building initiatives and end the menace. According to a pragya report, the borders between Baringo and its surrounding counties frequently experience spates of violent clashes and cattle rustling. These often lead to loss of human life, displacement, and destruction of property.

Various past literature has focused on the North Rift as the centre of the conflict with various studies done in Turkana, Pokot and Baringo.

### **1.1.0 Why is cattle rustling an issue?**

To better understand cattle rustling, we must first understand the importance of livestock to the affected communities. For people that live in the rural areas of most developing countries, livestock makes a significant contribution to their livelihoods (Cornelis et al., 2001). This statement is true of countries across the region and is true of the region where this study will focus. Livestock greatly influences the lifestyles of pastoralists in Kenya, with some of its most important being its contribution to socio-cultural and religious functions, and as a source of tangible capital and security against risks (Guliye et al. 2007). While the focus of this study is not on pastoralists specifically, many households across rural Kenya do completely rely on livestock for their livelihood. Livestock in general, and cattle specifically are a source of wealth and status symbol across many communities. The greater the number of cattle a farmer owns, the wealthier they are considered and the more highly regarded they are within the community. While cattle are considered a source of income for the household that rears them through sale of milk, beef and other by-products, they are also a source of employment to the community, where in many cases younger men are hired to herd the cattle, others are hired as security guards protecting the cattle, as farm hands to milk and sell products. Households depend on cattle income for school fees, medical expenses, dowry among many other uses. The several benefits of having large herds of cattle causes communities such as the Kalenjin, Pokot, Turkana, Maasai, Samburu, Keiyo among several other communities across Kenya and the continent in general to work hard to hold onto the cattle they have and seek ways to multiply the size of their herds, and to fight back when their cattle are forcefully taken.

To further illustrate the importance of cattle to households in Kenya, I have analyzed data from the 2019 Kenya population census and extracted the tables below which represent the total number of Kenyan households that rear livestock and depend on them either fully or partially for their livelihood and the second table shows the total number of livestock reared across the country.

**Table 1.1: Households that rear livestock** – the columns represent the number of households that rear the type of livestock heading the column.

<b>No. Of households</b>		<b>Indigenous Cattle</b>	<b>Sheep</b>	<b>Goats</b>
<b>Kenya (total)</b>	12,143,913	2,260,439	1,299,893	1,898,887
<b>Turkana county</b>	164,519	10,117	40,870	52,740
<b>West Pokot County</b>	116,182	51,874	40,004	48,267
<b>Samburu county</b>	65,910	29,629	34,813	34,279
<b>Baringo county</b>	100,465	45,272	37,159	45,686

Source: Volume - IV - Kenya Population & Housing Census – 2019

**Table 1.2: Number of Livestock**

<b>Total number of livestock</b>	<b>Indigenous Cattle</b>	<b>Sheep</b>	<b>Goats</b>
<b>Kenya (Total)</b>	13,005,664	19,307,445	28,011,800
<b>Turkana county</b>	320,425	1,053,756	1,990,929
<b>West Pokot County</b>	349,343	358,293	764,175
<b>Samburu county</b>	265,384	566,772	716,587
<b>Baringo county</b>	347,445	343,343	933,727

Source: Volume - IV - Kenya Population & Housing Census – 2019

The above data shows the significant number of households in Kenya that either partially or wholly rely on cattle as a source of livelihood. From the data on the first table, I have extracted the percentage of households that depend on livestock for their livelihood as in the next table.

**Table 1.3: Percentage number of households that wholly or partially depend on livestock in Baringo and the neighbouring counties. (Percentage calculated against total households in the county)**

<b>% No. of households that depend on livestock</b>	<b>Indigenous Cattle</b>	<b>Sheep</b>	<b>Goats</b>
<b>Turkana County</b>	6.15	24.84	32.06
<b>West Pokot County</b>	44.65	34.43	41.54
<b>Samburu County</b>	44.95	52.82	52.01
<b>Baringo County</b>	31.77	26.07	32.06



**Source:** Extrapolated from the Volume - IV - Kenya Population & Housing Census – 2019 data

From the data presented in this section, we can have a clearer understanding of the number of households that depend on livestock for their income and source of livelihood. Looking at indigenous cattle, sheep and goats we see quite a significant number of households, upwards of 30 percent in both Baringo, west Pokot and Samburu own cattle. The number of people that rely on cattle goes up when we factor in individuals employed by the sector, and those who directly use products like milk, beef, hides and other by-products like manure.

Using this analysis, it is clear that quite a significant number of households are directly impacted by cattle rustling.

### **1.1.1 Causes and Implications of Cattle rustling**

Causes of cattle rustling can be loosely clustered into three main groups: cultural, economic, and political.

There is a cultural aspect to cattle raiding that cannot be denied, that makes it a historical practise that was not actively prevented or controlled in the past, it was allowed to grow and mutate into the current worrisome and unwelcome practise that threatens livelihoods. Traditionally, one community's young warriors would visit another in the dead of night and steal their cattle in many cases as a rite of passage, and the other community would subsequently retaliate. Due to the practise being welcomed as a rite of passage, it did not carry the more sinister aspects that it does today, and cattle raiding was somehow a controlled practise carried out in small scale with little or no violence and it involved one community selecting the best cattle to replace stock lost in previous raids or lost to drought and diseases. (Schilling et al. 2012). Currently, rustling is still practised to increase the number of cattle a community has and as a form of retaliation.

Additionally, the conflicts may be due to scarce resources, Schilling et al. (2012) noted that productive assets like water, land and pasture are inexorably linked to cattle rustling. While the primary cause is clearly a lack of resources there may be an underlying cause in the political discourse of the time as explored by Greiner (2013) who argues that politics in Kenya and violent conflicts surrounding pastoralist areas are quite intimately connected. It is not implausible that local politics would play a role in increasing the number of raids, as there is evidence of conflicts in various regions in Kenya attributed to politics driven especially by tribalism. In their study, Cheserek et. al (2012) argue that cattle rustling is caused by availability of small arms, the turning of cattle raids into a for profit business, politics, poverty, traditional values, illiteracy, and women.

Existing literature indicates that there has been an increase in the use of firearms in the latest spates of cattle rustling, this implies that the locals in the areas where this is most prevalent are armed and use guns either to raid other communities or to try and defend themselves and their property when attacked. Use of arms generally increases the number of fatalities during a raid. Over the years, there have been multiple attempts at disarmament of the affected communities, the firearms collected are destroyed as in the Kenyan cases of the approximately 5,000 arms publicly burnt by the vice president in 2016 and 8,000 others destroyed by the then president in 2019 as reported in the local media. This means that there has been some very marginal success, which unfortunately implies that there are still a lot of firearms in circulation and in use as noted in a 2016 UN security study that indicated that the pastoral North-western part of Kenya alone has over fifty thousand illegal firearms in circulation. Government security forces seem to have exacerbated the issue of cattle rustling when deployed causing death among both the security forces and the locals. One of the more widely reported cattle rustling incidence

in Kenya involving the security forces in the last decade happened in 2012 where about 40 police officers were massacred in a raid at the Suguta valley.

According to a Kenya National Commission on Human Rights (KNCHR, 2017) report, between 2005 and 2015, 573 people lost their lives while 1,752 were injured, 589 houses were burnt and there was a loss of livestock worth about 478 million Kenya shillings due to cattle rustling in the North rift. The New Humanitarian (IRIN) reported that approximately 580 people lost their lives between January 2012 and January 2014 in cattle raids. Various local dailies and international media have continued to report on loss of life, destruction of property, and a high number of cattle being stolen in the last decade. The institute for security studies reported that 30 people were killed in West Pokot/Elgeyo Marakwet counties within the first five months of 2019. The institute also reported that cattle raiding in 2017 and 2018 involved fierce conflicts that left several people dead or seriously injured, and negatively impacted security and development in the region. In 2021, a school bus full of school children was attacked by cattle rustlers in Elgeyo Marakwet. REINVENT Project, a U.K.-funded initiative reported that in 2021, 16 people lost their lives following 19 livestock raids in Baringo county. And as of April 2022, 39 people have already lost their lives from about 12 violent livestock raids in the same area.

The KNHCR 2017 report indicated that in addition to loss of lives, there is an increase in destruction of property, that includes burning of schools, dispensaries, and homes. These numbers imply that the loss of life and destruction of property from raids is persisting, it also implies that a lot more wanton and needless destruction is being meted out by the perpetrators of the crime, which confirms the changing face of cattle rustling. The raids also led to internal displacement of approximately 18,000 people in Baringo and Turkana according to the 2017 KNHCR report.

The next table is an extract from the Kenya police crime statistics detailing cattle rustling data for the past 10 years.

**Table 1.4:** Police report of cattle rustling numbers for period 2011-2020

	<b>No. of cattle rustling raids</b>	<b>Rift Valley cases as % of total reported</b>	<b>Cattle stolen</b>	<b>People Injured</b>	<b>No. of People killed</b>
<b>2011-2013</b>	82				
<b>2014</b>	84	61.9%	18,251	48	35 (31 -Rift Val)
<b>2015</b>	56	-	24,830	3	24
<b>2016</b>	240	57%	4,547	28	30
<b>2017</b>	130	63.8%	4,077	17	20
<b>2018</b>	133	74.4%	10,726	58	28 (19 from RV)
<b>2019</b>	254	64.5%	13,404	58	48 (43 from RV)
<b>2020</b>	662	69%	29,265	94	56 (29 from RV)

Source: Kenya police crime statistics for 2011 - 2020

A major overarching side effect of cattle rustling is crime and general insecurity in the areas affected, which adversely affects the communities. According to the 2017 KNHCR report, the Kerio Valley Development Authority lost over 260 million in revenue in 2016 due to insecurity in the North Rift. Further, insecurity is likely to deter tourists from visiting lakes Bogoria and Baringo, which ultimately diverts expected revenue gains from tourism. Additionally, shops, markets, schools, dispensaries, and other social amenities remain closed due to high insecurity. Such closures have a negative impact on school going children since it

interrupts their learning, is likely to cause revenue loss due to lack of market access for buyers and sellers and access to other areas of business among other reasons. These closures have an adverse effect on education, health, economic activities, and the overall welfare of the community, which means over a period of time they will negatively impact economic growth and development of the region.

Furthermore, individuals in the community and other investors are unlikely to invest within the community where there is insecurity, in fact they are more likely to pack up and leave an area seeking safety for their families.

## **1.2 Statement of the Problem**

59 years after Kenya's independence, as the rest of the country moves towards attaining vision 2030, there is clear evidence that Baringo, West Pokot, Turkana among other North-Rift counties continue to lag behind their counterparts in South and Rift, Central Kenya, the coastal region among others, with little to no change in key economic development indicators like poverty reduction, increased education levels, increased provision of healthcare and life expectancy. Cattle rustling is prevalent in this region and having explored some of its impacts in the previous section, we can safely draw the conclusion that there is a likely causal relationship between cattle rustling and economic development. Cattle rustling is an ancient practise that has no place in a modern 21<sup>st</sup> century society, the insecurity, death, property destruction, crime, and general deterioration of the human condition that it leaves in its wake serves to worsen the lives of the people of this region and prevent development. According to Marube et al (2022), it is a serious policy issue because cattle rustling may impede the advancement of important decentralisation of political and economic governance strategies and implementation of vision 2030.

A review of the Kenya police crime situation reports for the period between 2015 and 2020, reveal that there have been several attempts by the government to rid the region of the menace through increase of security personnel and disarmament exercises, however the fact that there is evidence of an alarming upsurge in cattle rustling in the last four years (as evidenced in **Table 4**), implies that the attempts have been less than fruitful. Additionally, and even more alarmingly, based on the annual police reports, even though there is an increase in reported cases, there has been no change in how the police and government have responded to the issue since 2015. But it is quite clear that brute force employed in the past has not been successful.

It is important to note that there is a lot of literature on cattle rustling and its impact on socio-economic development of the North Rift region; the Karamojong community of Uganda, and emerging studies from other parts of Africa including Southern Sudan, Cameroon, and Nigeria among others, which speaks to the significance of the issue. A lot of the past Kenyan literature has been focused on socio-economic impact from a sociological and anthropological perspective; studying the direct impact on economic activities and relying on theories such as risk and uncertainty (Kaimba et al 2011); cattle complex (Osamba); queer ladder theory (Kabir, 2021); structural theory of conflict (Leparie, 2021), environmental resource scarcity, social cubism (Anyango, 2017) among others, largely confined to the sociological and anthropological aspects of the problem. Others have focused on conflict resolution and explored the worsening issue attributed to small arms and the lack of or competition for scarce resources, the suggested resolutions proposed in past research have focused on disarmament and increased policing. While there is a wealth of important knowledge, ideas and policy suggestions derived from these studies, it is also true that in Kenya at least, little has been done from a development economics perspective. The present research is therefore important because the emerging trends over the last

few years reveal that the policy and strategic interventions employed against cattle rustling and the ensuing insecurity, crime, and violence, have not been fully effective, which presents us with an opportunity to revisit and enrich the issue using an asset-based approach.

This study will view crime and insecurity from its impact on human security and explore policy suggestions guided by the asset-based approach. The asset-based approach fronted by McKnight and Kretzmann, has been applied by Khoabane and black (2012) in examining the question of cattle rustling in Lesotho and how it affects household capital, this study will use a similar approach to understand the loss of capital and the effects on the household's ability to make or increase their income. The human security concept as fronted by Mahbub to the UN has been utilized in several studies like in Nigeria to explore human security and its effects on economic development, also explored by Mabith in a study of the consequences of cattle rustling in South Sudan. This study will apply a similar approach to explore cattle rustling as a criminal activity that causes death and destruction hence preventing the people in this region from fully participating in activities towards improving their livelihoods.

### **1.3 Research Question**

The question for this research is:

What is the relationship between cattle rustling and economic development in Baringo county?

### **1.4 Objectives of the study**

The main objective of this study is to examine the effect of cattle rustling on economic development of Baringo county.

The specific objectives are to:

- a) Assess the impact of crime and insecurity caused by cattle rustling on human security in the region and its impact on the economic development
- b) Assess the effect of cattle rustling on loss of household capital in form of cattle and its impact on economic development
- c) Identify what policy suggestions can be drawn from the study findings.

### **1.5 Significance of the study**

Various studies carried out on the North Rift in the last two decades point to the issue of cattle rustling mutating into a dangerous problem that in spite of various attempts at solving, has persisted, and in some respects worsened. The presence of firearms in the region originating from South Sudan, Somalia, and other areas since the early 2000's is more cause for alarm. The evolution of a cultural practise into a militarised criminal and seasonal operation that leaves fear in its wake while communities rebuild and wait for the next attack should be impetus enough for the search for an immediate resolution. Therefore, studying how cattle rustling interferes with the human security in the region and with household capital will add to the body of knowledge and enhance our understanding of the impact it has on economic development from this perspective. Furthermore, with the devolution of governments to county level in early 2010's bringing with it a need for county budgets and revenue generation and allocation, such a study will be beneficial to the county government in identifying focus areas for strategy and planning.

Additionally, the findings will have policy implications, or at the very least shine a light on the challenges and disadvantages faced by this region. Lastly, the study is a contribution towards literature on the subject.

### **1.6 Geographical scope of the study**



Baringo county lies in Kenya's North Rift region with a population of slightly over 650,000 inhabitants majorly from the Tugen, pokot and Njemps (Ilchamus) peoples of the Kalenjin community. It is among the arid and semi-arid lands (ASALs) of Kenya, hence there are very few economic activities that the residents can rely on fully for their livelihood. Households engage in a mixture of small-scale subsistence farming and cattle rearing, quarrying, charcoal burning and bee keeping among others. The county also relies on tourism from lakes Baringo and Bogoria for revenue generation.

Baringo shares county borders with Elgeyo Marakwet, West Pokot, Turkana, Samburu, Laikipia, Nakuru and Kericho counties, all these counties except Nakuru and Kericho are also arid and semi-arid and plagued by cattle rustling as well.

The scope of this study is limited to the North rift, with particular attention paid to Baringo, firstly because my familiarity with the region will ease the research process and secondly, it is surrounded by areas that are prone to cattle rustling, hence the results from the study can be applied to the surrounding region. ICPALD in its policy series paper placed Elgeyo-Marakwet, Samburu, Turkana, West pokot and Baringo in its list of severe cattle rustling hotspots. This is in line with existing literature confirming that several raids occur within Baringo and the surrounding region several times a year.

### **1.7 Limitations of the study**

Getting the relevant data for the study was a bit of a challenge, the study collated data from various online sources to be able to have the required data points for the study, this is because there was no specific source that provided all the data. There was also a challenge especially on records regarding cattle rustling incidences, although the annual police reports

have records of annual numbers, the earlier years did not break down the data to county level.

This is a challenge for a lot of the country data as well, county level data is still hard to come by in some areas, a lot of sources still break down data to province level only.

## **1.8 Organization of the study**

The rest of the document is organized as follows: Chapter Two presents the literature review and theoretical framework on the subject. Chapter Three explains the methodology of the paper. Chapter Four discusses the results and chapter Five presents conclusions and policy recommendations.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

Cattle rustling as a subject has been widely studied from a variety of perspectives, with literature spanning the history of cattle rustling to causes, and prevention, others focusing on the resultant conflict and its resolution, and others focusing on the question of presence of guns and increasing violence and other emerging trends. The geographical scope of the various studies has also varied from the Kenyan North rift, South Sudan to Karamoja in Eastern Africa to the Southern and Western parts of Africa and beyond the continent. While this research may touch on a few of the mentioned topics, this will not be the focus of the research, rather this study focuses on an area where there is still a gap specifically how the cattle rustling issue has been a major cause of crime and insecurity and how this impacts the livelihoods of the people of the North rift in general and Baringo specifically from a development economics perspective.

The threat from cattle rustling is multifaceted, affecting multiple areas simultaneously, therefore this chapter explores only a portion of the available literature that has specific emphasis on the increase in crime, insecurity, and loss of capital, its impacts on human security and inevitably the economic security, literacy, health, and overall wellbeing of the affected households. This next section starts by exploring human security and looks at how cattle rustling affects the community and individuals' security.

#### **2.2 Cattle rustling as a human security threat**

One of the most used definitions of human security is based on UNDP (1994) which states that, the core vision of Human security is to “achieve freedom from fear, freedom from want, and freedom to take action on one’s own behalf”. It has also been defined as “safety from chronic threats like hunger, disease and repression, and protection from sudden and hurtful disruptions in the pattern of daily life.” This covers a broad spectrum of issues that if not attained threaten people’s livelihood, issues ranging from physical and quantifiable to psychological, which is the more qualitative dimension of life. Human security covers economic, food, health, environmental, personal, community and political aspects of security. According to the UNDP, “for most individuals, security is about their own immediate safety and protection from the threat of disease, hunger, unemployment, crime, social conflict, political repression and environmental hazards.” This is security at a micro or personal level, whilst security at a national or macro level is important, individuals can often be more concerned at a visceral level about their daily security, their daily struggles to make ends meet, to secure their families and to provide for their households. Therefore, we can safely conclude that for those who come in direct contact with it, cattle rustling is a security concern for them at a personal level because it’s a violent criminal activity which brings about personal and community insecurity through injuries, loss of life, internal displacement and destruction of property, then leads to income loss and disruption of economic security, leading to food and health insecurity due to loss of milk and beef from cattle and the inability to access health centres and markets, children are unable to attend school, consequently impacting education and literacy levels of the community thus affecting the human development and this subsequently propagates poverty within the community. This poverty inadvertently brings forth more crime, resulting in a spiral of poverty and lack.

Human security helps to shift focus of the decision makers from “National security” to security of the individuals or a more local perspective, by seeking to address the expansive number of issues that pose a threat to the security of and are of primary concern to an ordinary human being. Ordinary people want protection from hunger, disease, clashes and conflict, war, crime, terrorism, among others. Shifting the debate, analysis, and policy from national to individual centric in cattle rustling context implies that we break down the approach taken in policy and actions to deal with it to a basic level of how it affects an individual’s security. To borrow a quote by Pettman (2005) as cited in Akokpari (2007), who captures the essence of human security by stating that,

*“it is about young children who did not die of neglect, the serious epidemic that did not break out, the job that was not cut, the gun that was not run, the ethnic prejudice that did not result in violence, the dissident voice that was not made silent, the landmine that was not sold and installed, the woman that was not trafficked across the state borders and sexually abused, the agricultural product that was not dumped to the detriment of poor farmers, the short-term capital investment that was not allowed to wreck an infant industry, the addictive drug that was not produced and shipped, the refugee that was not forced to flee or remain abroad.”*

At the core of these sentiments are actual fears of ordinary individuals, and human security explores these fears with a view to remedy them and ensure a life free of threats of any kind to ordinary humans. Cattle rustling is one such threat, getting rid of it ultimately enhances human security and by extension quality of human life.

In discussing human insecurity in sub-Saharan Africa, Akokpari (2007) states that “over 40% of 800 million sub-Saharan Africans live below the poverty line, plagued by constant conflicts and instability”. He argues that “poverty and constant instability is not natural and that

the treatment received thus far has mostly been an attempt at curing the symptoms of the issue while failing to address the root cause of the human insecurity.” Using John Galtung’s violence argument he posits that the “human insecurity in the region has been brought about by violence in the form of direct violence, where one directly kills or maims another person and in the form of structural or social injustice violence, which is caused by an imbalance in power relations and life opportunities” Although he applies this argument to the maltreatment of the African continent as a result of globalisation, the debt crisis or the question of Africans fighting in wars they did not start, this very argument can be applied to the pastoralists communities across Eastern Africa and specifically Kenya, that have been marginalized over the years through unfavourable and unbalanced social and economic structures. And in the direct violence as evident in the number of people injured or killed during raids presently. Historical maltreatment of these communities has made it so that they are already behind their counterparts in multiple sectors, add to that a group of violent criminals that run amok every so often, brandishing weapons and killing and pillaging villages, and there is a high likelihood for the community to be left behind economically, socially and in every other way that adversely affects their livelihoods. Osamba (2000) agrees that banditry and cattle rustling have become endemic to the North Rift region of Kenya, affecting about 2 million people, he is of the opinion that there has been a tendency by government to ignore the welfare of pastoralists in its attempts to resolve cattle rustling, and argues that resolution of the problem must begin with alleviating the issues that face these communities, i.e., provision of social amenities among others.

It is important to view the threat faced by ordinary humans affected by cattle rustling from a human security perspective to allow for a wholesome treatment. For so long the government has responded to the cattle rustling menace as solely a national security concern

resolved by deploying state security agents and increasing policing within the communities, whilst also making attempts at disarmament programs, with only marginal success. The Kenya police reports cattle rustling as a national security issue, which may offer an insight into why the response to cattle rustling has been the same over the last decade, regrettably though this response can be viewed as another threat to the people in these communities especially where force is applied indiscriminately during security operations. A few studies from the North Rift (Osamba, 2000) have alluded to the fact that increased policing has in some instances negatively impacted the communities by increasing mistrust between the community and the security forces.

Additionally, there has been a tendency for the response to be reactive in these events as opposed to proactively acting to prevent the crime. This has been explored by a few scholars who have suggested additional measures that can be proactively employed including drought prevention mechanisms, disarmament programs among others. Akokpari tackles this in his remarks about treatment of the symptoms of the human insecurity issues in Africa while the actual root cause of the conflict is not actively identified and addressed. He advocates for identification of the actual root cause and its subsequent treatment.

Consequently, there is need to expand the response to cattle rustling, there is a need for a proactive approach where the government creates an enabling environment for these communities to thrive, to self-develop and to build their communities. In Kenya, the decentralization of governance to the county level is a great first step. But the counties should take up the mantle and be more proactive in building better structures that aid in levelling the playing field for its people, in improving the social and economic structures that have existed since independence and have contributed to marginalising the communities (Osamba, 2000) and

rebuilding them to better fit the people in this region. There is need for these people to have an equal footing and to be able to compete with their neighbours.

### **Note on Human Security Index:**

This is a relatively new concept only recently envisioned and released in early 2010's that attempts to measure human security around economic, environmental, and social fabric indices, according to Hastings (2008), "the Economic Fabric Index attempts to characterize financial resources, including protection from financial catastrophe, for everyone. The Environmental Fabric Index blends risk of environmental disasters, environmentally healthy living conditions, environmental sustainability, and governance. The Social Fabric Index blends diversity, education and information empowerment, food security, governance, health, and peacefulness". Although still in development, the HSI does cover a number of the issues borne from cattle rustling. There is work being done to complete the Africa HSI, once done this can be one policy tool that can be explored by the county governments to guide the policies made with regard to cattle rustling.

### **2.2.1 Crime as a precursor to human insecurity**

Existing literature confirms that cattle rustling trends in the last few decades have tended towards criminality more so than before, becoming an activity that causes injuries and loss of life, damage to property and social amenities, disturbance to livelihoods and overall insecurity. Insecurity of any kind within a community interrupts the lives of the people in the area as captured in the previous section; schools, hospital and marketplaces are closed or inaccessible, market demand and supply dwindle disrupting entire economies. The Kenya national police service has perennially classified cattle rustling as a threat to national security (NPS annual



reports, 2011-2020). What has made cattle rustling worse? Why is the current trend much more vicious compared to a few decades ago? This section looks at some of the reasons behind cattle rustling transforming into a criminal activity as explored in various literature.

The shifting face of cattle rustling from a cultural practise to an organized and violent criminal activity has largely been driven by availability of more sophisticated weapons and small arms sourced from neighbouring countries through Kenya's porous borders in the last few decades. Individuals arm themselves for personal protection as much as to perpetrate criminal activities. In either case we can infer that availability of the weapons worsens an already precarious situation. In proliferation of guns, Mburu (2002) discusses how much easier it is to acquire sophisticated and cheap guns in Africa today as compared to the past, these guns find their way into communities and directly promote criminal activities. The study finds that availability of these weapons increases the risk to security within communities and urges governments to treat these crimes as "seriously as they treat drug trafficking". Availability of firearms also increases the threat to security forces when deployed into the region during or after cattle raids, hence posing a bigger challenge to security forces in combing out the criminals and differentiating them from other individuals protecting their livelihoods. The situation is made worse by the fact that in majority of these cases the weapons are illegally acquired and possessed. The NPS police reports indicates that the number of officers killed on duty is going up, it is not a far stretch to assume that availability of weapons among the civilians that the security force is sworn to defend worsens the issue.

In *Guns, Land, and vote* (2013), Greiner discusses how political players influence cattle rustling, stating that "Political leaders can amplify tensions intentionally by spreading vague information and partial truths". The paper concludes that "much of the current violence in

pastoralist areas in Kenya is indeed primarily fuelled by politicized dynamics, whereby the motives of the raiders and those of local politicians form an unholy alliance.” This alliance allows free reign to criminals and the criminal activity then festers. Historically Kenyan politics has been intertwined with violent conflicts in multiple areas across the country, the culmination of which was evident in the 2007/8 post-election violence (PEV) where, political rhetoric added fuel to precarious simmering community animosity which blew up into clashes. It is therefore not farfetched to conclude that politics does in many cases instigate or at the very least turn a blind eye toward the deteriorating condition of crime and conflict in the region. A key political rhetoric among some Kenyan politicians is to pitch communities against each other while in discussions about distribution of resources, and land division or ownership. With pastoralists who fully depend on land, such discussions are likely to foster hostility towards the communities who are deemed to be “in competition” with them for the dwindling resources. Greiner further posits that “the administration restructure has created windows of opportunities for criminals to fester”. Land and borders have been an issue of debate in Kenya since independence, therefore the restructure of constituencies, counties and administrative headquarters does bring an upsurge in animosity between communities who are encouraged to believe that they have been unfairly treated in the division of land and resources, this worsens relations between communities sharing borders and amenities. The history of marginalization toward the pastoralist communities only feeds this negative situation, and the evidence of under-development fuels enmity and the inevitable conflict that arises between these neighbouring communities.

The issue is further exacerbated by commercialization of cattle theft, where big players have turned cattle rustling into a for profit activity where criminals are sourced, armed, and sent in to steal livestock which are then transported to urban areas where there is a ready market for

beef and other livestock products. When a lot of money changes hands, unscrupulous individuals are highly motivated to source for livestock to be able to cash in, in such cases the damage to lives and livelihoods becomes a secondary issue. Unfortunately, the low literacy level among the youth in this region make them an easy target for recruitment into criminal gangs by unscrupulous individuals, and this may be the easy explanation for the upsurge in criminal activities in the region. In *From bush to butchery* (2016), Bunei et al, posits that “cattle rustling has mutated into a form of organized crime”. The study further states that “cattle warlords take advantage of pastoralists in pursuing financial gain,” concluding that “established network of criminals exploit the “cultural” phenome that is ascribed to cattle rustling while using the same to obtain livestock for sale in urban areas. The study suggests that there is little motivation to end cattle rustling since the biggest beneficiaries are “wealthy businessmen, politicians and senior government officials who benefit from the lucrative venture, while weaponizing and funding the crime.” These key perpetrators remain far removed and untainted by the ill effects of the menace they bring forth to unsuspecting vulnerable individuals, especially women and children.

For the above reasons cattle rustling has become entrenched into communities, and even though there have been attempts to disarm communities, it remains a perennial concern, but how does the increase in crime affect the community? According to Schilling et al. (2012), “although violent conflict is one of the greatest challenges that pastoralists communities have to deal with, its influence on pastoral livelihoods in north-western Kenya has not been adequately documented. The “raiding pastoral livelihoods” schilling study delved deeper and explored the effects the conflict from cattle rustling has on the livelihoods of the Pokot and Turkana communities it studied,” arriving at the conclusion that cattle rustling causes loss of lives, property, reduction in livestock and overall insecurity among others. This paper takes a slightly

similar approach and goes beyond the reasons for cattle rustling being a criminal activity delving into how the insecurity and crime it brings forth affects the household and therefore the economy, this is briefly explored in the next section. Crime and insecurity are inextricably interlinked. A surge in criminal activity ultimately increases insecurity of an area, and unfortunately as we have seen in the preceding paragraphs, the main instigators driving crime and insecurity within the community do not bear the brunt of the consequences of the insecurity.

### **2.3 Brief review of impact of crime and insecurity**

As stated earlier the impact from cattle rustling is multi-faceted, this section reviews a few of the impacts on the livelihoods of the people, with a linkage economic development.

#### **2.3.1 Impact on Health and Access to health services:**

The NPS police annual data over the last 6 years places the number of deaths and injuries in Kenya at slightly over 500, though some studies have indicated that the police reports are at best, an under estimation of the actual numbers, the report still does manage to clearly reveal the increase in human loss due to the violence associated with cattle rustling in the last decade. KNCHR (2017) places loss of life in the North Rift at over 500 people with the injured at over 1,700 between 2005-2015. This confirms how dire the situation is becoming.

In addition to actual loss of life and injuries, the populace is quite often unable to access health centres, according to KNCHR (2017) “health services are provided by the world vision, the catholic church and in some cases, civil societies”, this is due to a limited number of medical professionals being available in the region. In some cases, the health centres are too far for people to attempt to reach without security, or do not have the necessary facilities. This has resulted in a high mortality for children being born, and higher levels of malnourishment in the

children of this region. An additional cause for the diminished health is the loss of milk and beef that is available when a household owns cattle, the loss through cattle rustling denies these households.

### **2.3.2 Internal displacement and lack of housing:**

The 2017 KNCHR report further states that, more than 500 houses were burnt in Baringo North between 2005 and 2015 resulting in several internally displaced persons. A study of one location covering a few villages indicated that more than 6,000 people lived as IDPs in the said Baringo villages as at the time of the inquiry. Additionally, the report indicated that more than 10 villages had been vacated due to insecurity.

Sheekh et. al (2012) in discussing Kenya's IDPs indicated that IDPs especially in the Northern part of Kenya are largely unaccounted for and have very few if any means of protecting and sustaining themselves, they lack access to basic education, security, healthcare among other amenities. The study puts forth cattle raiding as one of the reasons for the internal displacement. The study also compared government response in resolving the displacement issue where there are major cases of displacement as in the case of PEV and concluded that this zeal seems to be lacking when dealing with what is considered "smaller" cases of displacement, consequently, families displaced in the North Rift and other part of Northern Kenya due to ongoing insecurity do not usually receive the same level of assistance. There is therefore a need for a regional level response to displacement through political goodwill.

### **2.3.3 Interruption to Education and resultant Low literacy levels:**

One key impact from the upsurge in crime and insecurity has been school closures, low enrolment in schools, children dropping out, destruction of school properties during raids, low

number and high attrition of teachers among others. These contribute to low levels of literacy within the population in this region. In Baringo North KNCHR (2017) reported damages of over KES 2.7 million in eight schools, 12 schools were also reported to have been closed for up to 3 years in 2012-2014, one school was yet to be re-opened as at the date of the report. In East Pokot, 6 schools were closed between 2010 and 2016, and one was yet to be reopened as at the report date. In Baringo South damages of approximately KES 22.7 million was done to 3 schools.

According to a UNESCO report, literacy levels in Kenya in 2018 was at 81%, which allows us to infer that the level of illiteracy in Kenya lay just below 20%. According to the 2019 population census, the average school completion rate in Kenya was at 26.4%, dropout rate at 15.7%, and the rate of those who have never been to school (illiterate) lay at 16.3%. For Baringo county, school completion rate stood at 20.4%, dropout rate at 11.1% and illiterate at 25.8%. The average county numbers for Baringo however mask quite a huge discrepancy, the sub-counties of East Pokot and Tiaty where cattle rustling is most prevalent, had the following rates: completion at 2.4%, dropout at 1.4%, and illiterate at 77% for East Pokot, and completion at 2.7%, dropout at 2.4% and illiterate at 75% for Tiaty.

Granted, cattle rustling is undoubtedly not the only reason for these alarming rates and arguments can be provided for a multitude of other reasons for these rates, there is likely a connection between the dismal performance of these two sub-counties with the prevalence of cattle rustling. A similar trend can be observed in Samburu, Turkana, and West Pokot where the average illiteracy levels are at 56.2%, 39.6% and 68.7% respectively, there are sub-counties within each of these counties whose rates are almost as high as and in some instances higher than those of East Pokot and Tiaty in Baringo county. The differences between these North Rift

counties and the national average is quite astonishing and paints a clear picture of how far behind they are. One of the key vision 2030 goals for UNESCO is “education for sustainable development and global citizenship, which aims at ensuring learners acquire knowledge and skills needed to promote sustainable development through education.” The data of the North Rift sub-counties listed above reveals how far behind their counterparts they are to achieving this vision.

### **2.3.4 Loss of Household capital (stock) and income**

In the introductory portion of this study, we looked at the importance of cattle to Kenyan households and to the economy based on the number of households that own and rely on livestock. The importance of livestock to rural households in the developing economies is well documented, in their pro-poor livestock policies, Upton and Otte (2004) state that “livestock and their products are estimated to make up about a third of the total value of agricultural gross output and the share is rising largely due to a surging demand brought about by increasing populations”. Birch (2018) specifies the contribution of livestock to GDP in Africa at between 5% and 15% but goes further to indicate that the value of livestock is actually grossly undervalued and overlooked in Africa. Behke (2008) as cited in Schilling et al. (2012) argues that “livestock is a fundamental form of pastoral capital, besides functioning as a means of production, storage, transport and transfer of food and wealth.”

All this implies that livestock is a productive capital asset, and its ownership raises the wealth and income of households and therefore given the myriad of value add they bring, their theft can be debilitating to households. Further, households that own livestock contribute to the economy through sale of excess milk, beef, and other products, and additionally are a source of employment to the younger men in the community. Whenever there is a loss of any number of

cattle, the household loses the benefits that would otherwise accrue from the cattle. This loss is felt by the individuals employed as well as the community that benefited from the by-products. In an economy like Kenya's where a lot of families are "one disaster away from poverty" a loss of valued assets can and in many cases does lead to poverty. Over a period of time, as long as the theft of stock continues, there is likely to be a surge in fear and subsequently households will shy away from investing in livestock and while this immediately impacts the income and investment of the household, it can affect the national economy as a whole. Additionally, households start to favour selling of livestock even at lower prices to rid themselves of the "source" of their insecurity. Such decisions made in haste affects households that in many cases lose the only assets they have.

Khoabane and Black (2012), in discussing stock theft in Lesotho, "indicate that the value from livestock supersedes consumption and sale of products and suggests the use of livestock as a way to diversify the household's portfolio, where proceeds from sale can be used to put up buildings or expand shelter, storage, can be used for school fees or to cover medical expenses among others. They refer to livestock as "insurance" to poor households". Among the Kalenjin, Pokot, Turkana, and other Kenyan communities' livestock is also used for dowry. Khoabane and Black concluded that stock theft causes loss of wealth, reduction in overall consumption, ability to invest in human capital development of their children and production of other agricultural products.

In conclusion, there is an overall interruption to livelihoods that may not be as easily quantified in physical terms. The loss of cattle can be easily quantified in monetary terms as explored in the previous section, however there is more that is lost in these communities. The ability to be self-



reliant, the ability to go about their daily lives is interrupted. The most vulnerable members of these communities are the most impacted whenever there is a raid, and since this is a perennial concern, the situation is dire.

## **2.4 A look at some Key economic development Indices**

Multiple development indicators have been put forth to measure economic development, including human development index, index of human poverty (HPI), genuine progress indicators, among others.

**Human development Index (HDI):** This index measures development using factors like education and life expectancy (health) and income index in determining how well individuals are doing in an economy. According to the UN, “human development is about more than the rise and fall of national incomes. It’s about creating environments where people can develop their full potential and lead productive, creative lives in accordance with their needs and interest. People are the real wealth of nations.” Cypher and Gaetz (2009) reviewed HDI data spanning from 1990 to 2004 and concluded that a great majority of the countries with the least HDI based on the report are sub-Saharan African countries.” There are obviously myriad of issues that contribute to this, the book lists civil war and other conflicts as some of the reason for this and I would venture that cattle rustling is a likely contributor especially along the Horn of Africa.

**Human Poverty Index (HPI):** Introduced by the UNDP in 1997 and considers life expectancy i.e., probability at birth of surviving, illiteracy, access to safe water and underweight children in calculation of development within a region. It was developed to complement the HDI.

The indices help us to expand how we view the growth of the economy so that we do not assume a growth in GDP only to mean improvement in living standards and they speak to availability of the basic needs of life like food and shelter, healthcare, civil rights among others. This is very important if we consider that in 2021 the Kenyan economy grew by more than 7% according to the data released by KNBS, yet it can be fairly assumed that living standards did not improve at the same speed. As demonstrated, cattle rustling causes a lack of or blocks accessibility to some of these basic needs. From a number of studies reviewed, there is clear evidence that speaks to the reduction in quality of life due to the crime and insecurity brought about by cattle rustling. There is evidence of closure of schools which undoubtedly affects literacy levels in the community, inaccessibility to health centres and markets, and loss of income will affect source of food for multiple households consequently reducing life expectancy, further destruction of property and the wanton pillaging that occurs during the raids has caused internal displacement in several areas across the North Rift.

## **2.5 Conclusion: Overall Impact on Economic development**

Todaro et. al (2012) stated that “Development must be conceived as a multidimensional process involving major changes in social structures, popular attitudes, and national institutions, as well as the acceleration of economic growth, the reduction of inequality, and the eradication of poverty. Development, in its essence, must represent the whole gamut of change by which an entire social system, tuned to the diverse basic needs and evolving aspirations of individuals and social groups within that system, moves away from a condition of life widely perceived as unsatisfactory toward a situation or condition of life regarded as materially and spiritually better.” The World bank (2016) defined development as an all-rounded method of economic and social change that is based on intricate cultural and environmental influences and how they

interact. Consequently, anything that impedes improvement in the quality of life can be construed to be preventing economic development. Rostow (1952) and Harrod (1959) and Domar (1957), among other theorists came up with models of development, that largely classify structural changes, savings and investments as the source of economic development (Adofu, et al 2018).

The causality between cattle rustling and economic development is an interesting one, does low economic development cause cattle rustling or does cattle rustling precede poor economic development. It seems a chicken and egg question of what came first. Undoubtedly, the economic condition in the North rift played a role in the upsurge in cattle rustling, however as we have explored in the previous sections, cattle rustling has changed for the worse in the last few decades, while previously the poor state of the economy could have been slated as a key reason for communities seeking to steal cattle from their neighbours to boost their own wealth, the emerging trends disprove this notion. There has been a change in players and motives driving it that should give us pause, the beneficiaries are rarely the community perpetrating the crime, but rather the unscrupulous businessmen, politicians and even unsuspecting urban folk who consume beef from stolen cattle. The economic and social losers however remain the households whose cattle has been stolen, whose lives have been lost and whose sense of security and livelihood is interfered with.

It is important to state that improved human security by itself will not cause economic development but working to ensure human insecurity is resolved will “ensure a prevalence of a serene environment within which citizens can peacefully and meaningfully exercise the choices available to them in furthering growing the economy. Which involves attaining the necessary human instrumentalities to engage in agriculture, commerce, education, and other critical

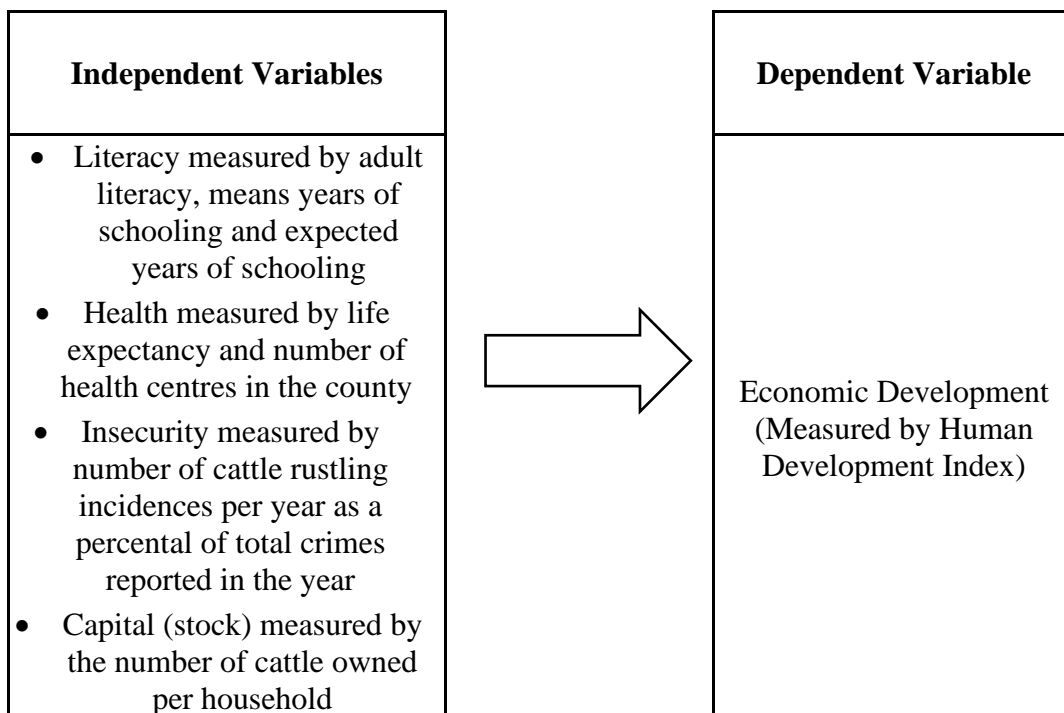
industries of development.” Human security cannot be enjoyed without development. There is a level of interconnectedness between the two, that cannot be ignored, human security flourishes where there is economic development and vice versa. Abdul phrases it quite well by stating that “insecurity retards development.”

The two economic development indices mentioned in the previous section helps to measure the impact of cattle rustling on economic development. This study uses HDI to measure development which covers life expectancy, education and per capita income.

## 2.6 Conceptual Framework

A conceptual framework is a model of presentation used to show the relationship between dependent and independent variables in a study. A conceptual framework may contain independent variables, moderating variables as well as the dependent variables

**Figure 2.1: Conceptual framework**



**Source: Author's computation**

## **2.7 Theoretical Framework**

This study will apply the asset-based approach which looks at assets owned by a household in an expanded way to include assets that are often not counted as assets because they are not physical assets. Multiple scholars (Meinzen-Dick et al-2011; Siegel-2005) among others have fronted the asset-based approach and expanded the definition of capital assets as we know to encompass the natural resources as capital, physical capital, human capital, financial capital, social capital and also political capital.

This definition expands the idea of capital to encompass both tangible and intangible assets; productive, social, and locational assets (siegel, 2005). Tangible assets include equipment, livestock, housing, human capital like education, health, and nutritional status while intangible assets include social capital and political rights. Other assets can be categorised as community or regional assets including infrastructure, educational and health facilities among others, (Siegel, 2005).

Siegel posits that the asset-based approach allows for easier understanding of rural poverty situation in Central America because the region sees huge discrepancies in distribution of resources, high exposure to natural, economic, and social risks. Carter et al (2006) as cited in Khoabane and Black uses asset-based approach to show a positive relationship between household income and assets.

In the asset-based approach, quantity, and quality of assets and how they complement each other determine the wellbeing and growth potential of the household. Consequently, as we

have explored in the previous chapters, the existence of a secure environment for the populace to look after their cattle, in land that is available without conflict and crime, availability and accessibility of essential amenities like markets, and demand for their goods can improve the wellbeing of these households. Therefore, insecurity is a risk that households have to contend with as it causes a reduction in their income, or complete loss when it comes with inaccessible markets. Cattle rustling and its resultant insecurity in this case can be considered an external influence on household welfare. The reaction of the household to the negative external influence determines the impact the external factor has on the household. In some cases, as we have seen, individuals in these households may not have much control as their livelihoods can be completely destroyed.

To explain these external factors, Siegel brings in the question of risk and how it interacts with household assets and posits that risk may affect households through their values and productivity. Further he indicates that to mitigate risk, households may reallocate their assets. His explanation of risk with respect to its impact on household assets directly opens up the discussion to the question of insecurity and cattle rustling and its impact on household assets since it is clear that it is the cause of the risk in our scenario. He concludes that the poor are more susceptible to risky events. It is true that communities and households that are already marginalised will have a more difficult time in managing their meagre assets when they are faced with risky events, they may not have the opportunity to diversify as he suggests.

To further explain how assets interact and complement each other, we can adopt the following standard output function, which includes both tangible capital assets and intangible asset:

$$Y=AF (X_1, X_2, X_3, \dots, X_7) \dots\dots\dots \{Equation 2.6.1\}$$

Where  $Y$  is the output,  $A$  is a constant,  $X_1$  is the tangible capital-cattle,  $X_2$  is security which is an intangible asset, and  $X_3$  - $X_7$  include human capital in the form of education and Life expectancy, and health centres are community assets). The implication of this is that the output is a function of the tangible and intangible assets owned by the household and the community.

A change in these factors either positively or negatively will affect the household positively or negatively. For instance, if we hold every other factor constant and reduce the level of security for the household, we expect there to be a downturn in the level of output from individuals and the households. As we explored in previous sections, currently the level of literacy and health within these communities is dismal, and the only other tangible capital asset (cattle) is constantly under threat. Households cannot diversify, they cannot build on their human capital due to insecurity.

The implication of the asset-based approach on economic development is that there is a need for communities to expand their asset base to be able to compete. This implies that there is need for the county government to come in. The only way these communities will have a level playing field is where they have the necessary amenities.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter looks at the design and methodology that was employed in this research study.

#### **3.2 Research Design and approach**

According to Saunders, Lewis and Thornhill (2009), the research design refers to the approach taken to solve the research problem under investigation, it is the approach taken to provide answers to the research questions. This study will apply descriptive and explanatory research to cross-sectional data and available information. The decision to use this design was informed by virtue of the fact that the information is already existing in the public domain.

This study is both qualitative and quantitative in nature.

#### **3.3 Data Sources**

This study will rely on existing secondary data obtained from Kenya bureau of statistics on literacy levels, household and livestock population, Baringo county government data on HDI, life expectancy, literacy and health facilities and ministry of health data on life expectancy, world bank data on HDI, mean and expected years of schooling. The data for crime reported over the years was sourced from the annual kenya police reports, and percentage breakdown for crime reported was extracted from crime research website.

Other secondary data was obtained from publicly available sources.



The researcher studied different reports, journals, research papers and visited multiple websites as part of the initial steps to determine relevance and usability of the available data.

### 3.4 Data processing and analysis

I analysed the information collected descriptively and also inferentially and sorted in tables for presentation as analysed and displayed in the next chapter.

#### 3.4.1 Model specification

This represents how the study goes about explaining the connection between the loss of the tangible and intangible forms of household capital - Literacy, Health, Cattle because of insecurity and the impact this has on economic development. The following dependent and independent variables are used:

<b>Dependent Variable</b>	<b>Description</b>
HDI (Dependent Variable)	This will be used to measure economic development and is sourced from HDI values for Rift valley for the period of 2010 to 2020
<b>Independent Variables</b>	
Livestock production per household (LivSt)	This is derived from data from the 2019 population census in Kenya and is the number of livestock owned for production per household in Baringo county.
Insecurity – (InSec)	This is based on NPS crime report statistics and is the percentage of cattle rustling when compared to other

	crimes reported in Baringo county for the period of 2010 to 2020
Life Expectancy (LifEx)	This variable will be used to measure the health status of the people of Baringo. Life expectancy defines how long a person is expected to live and is based on statistics from world Bank for Rift valley for the period 2010 to 2019
No. of health Facilities (HealF)	This has been adopted to measure access to health Services. This is based on data from Baringo county.
Mean years of schooling (MeaSc)	This variable will be used to measure access to education. Is the average years of total education received by people in the county based on world bank data for Rift Valley for the years 2010 - 2019
Expected years of schooling (ExpSc)	This variable will be used to measure access to education. It represents the total number of years in school that a child who has reached enrolment age can expect to receive if the existing enrolment factors remain constant through their life
Adult literacy rate (AduLt)	This variable will be used to measure access to education. It represents the percentage of the population ages 15 and older who can read either based on a test administered during the data collection or by their own confirmation, it's based on data from the Kenya population census and other Baringo data

**Source: Author**

This study applies the multiple regression model. The following equation represented the model adopted for this study:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \dots \dots \dots \text{{Equation 3.3.0}}$$

Where  $X_1, X_2, X_3, \dots, X_8$  represent the independent variables, represented as in the next equation

$$Y = \beta_0 + \beta_1 \text{LivSt} + \beta_2 \text{InSec} + \beta_3 \text{LifEx} + \beta_4 \text{HealF} + \beta_5 \text{MeaSc} + \beta_6 \text{ExpSc} + \beta_7 \text{AduLt} + \varepsilon$$

$\dots \dots \dots \text{{Equation 3.3.1}}$

Where:

Y – Is economic development, in this study it will be measured using HDI (Human Development Index)

$\beta_0$  – is the Y intercept

$\beta_1 - \beta_7$  – Are the coefficients of the independent variables

LivSt – represents Capital (assets in the form of cattle). This is measured by the number of cattle held in a household

InSec – Represents Security levels. This is measured by using the number of cattle raids experienced in the county. The higher the number of raids, the lower the security levels

LifEx – Measures life expectancy

HealF – This represents access to healthcare by the number of health centres available in the Baringo county as documented by Baringo county government.

MeaSc – Measures the mean years of schooling attained by the populace

ExpSc – this measures the expected years of schooling

AduLt - Represents the actual literacy rate for the county under study

$\varepsilon$  – Is the error term

$$Y = \beta_0 + \beta_1 \Delta \text{LivSt} + \beta_2 \Delta \text{InSec} + \beta_3 \Delta \text{LifEx} + \beta_4 \Delta \text{HealF} + \beta_4 \Delta \text{MeaSc} + \beta_4 \Delta \text{ExpSc} + \beta_4 \Delta \text{AduLt} + \varepsilon \dots \dots \dots \text{ \{Equation 3.3.2\}}$$

From this representation, the expectation is that an increase in insecurity should negatively impact the level of Y, and a decrease in the capital should also negatively impact Y, implying that, a reduction in literacy levels, life expectancy or security should bring down development. Increase or decrease in the level of security should also impact health, literacy and capital levels.

To measure economic development, this study adopts the indicator - Human Development Index (HDI). HDI is merged index combining economic and social parameters to evaluate development.

This is calculated by bringing together life expectancy measured by health index, years of schooling measured by education index and a decent standard of living seen through GNI per capita and measured by income index.

$$\text{HDI} = \text{Health Index} + \text{Education Index} + \text{Income Index} / 3$$

These indices are calculated as follows:

$$\text{Health Index} = \text{Life Expectancy} - 20 / (85 - 20)$$

Education Index = MeanSchYrs + ExpectedSchYrs/2

Income Index = Ln (GNIpc) – Ln (100)/Ln (75,000)-Ln (100)

Having introduced HDI, I used the following resultant equation to estimate the regression model parameters:

$$\text{HDI} = \beta_0 + \beta_1 \text{LivSt} + \beta_2 \text{InSec} + \beta_3 \text{LifEx} + \beta_4 \text{HealF} + \beta_5 \text{MeaSc} + \beta_6 \text{ExpSc} + \beta_7 \text{AduLt} + \varepsilon$$

Multiple Regression model assumes normality, homoscedasticity, linearity, multicollinearity, and independence of residuals.

Normality: In the multiple regression model, we assume a normal distribution of errors implying that a plot of the residuals will result in a normal curve. If the curve is not normal it's likely that the relationship between variables and significance test may be distorted.

Homoscedasticity: this assumption implies that variance of errors for the data we are comparing is even, if they are found to be unequal then the implication is that the data we are comparing is inaccurate or skewed

Linearity: we make the assumption of linearity as well, which means that the relationship between our independent variables and the mean of the dependent variable is linear. This means that if we are to plot the variables residuals the resultant plot shows a random scatter.

No multicollinearity: meaning that the variables being tested are not highly correlated.

Independent errors/Autocorrelation: it is assumed that the errors are not dependent on one another. The Durbin-Watson coefficient was applied in this study. The Durbin-Watson resultant statistic should lie between 0 and 4. With the mid-point of 4 proving lack of autocorrelation

among the residuals, positive autocorrelation is implied if the resultant statistic is between zero and the midpoint and negative autocorrelation is implied if it takes the direction above the midpoint.

## **CHAPTER FOUR**

### **RESULTS, INTERPRETATION AND DISCUSSION**

#### **4.0 Introduction**

This chapter looks at the analysis of the data. The objective of the study was to determine the effect of crime and insecurity due to cattle rustling on economic development in Baringo county. The study carried out a descriptive analysis of the data and presents the results in this section. These results relate to Baringo county for the period between 2010 and 2020.

#### **4.1 Descriptive Analysis**

Descriptive statistics describes properties of the variables that were used in this study. The result on the following table illustrates a summary of statistics for different variables that measures dispersions and measures of central tendency.

Mean allows for measurement of the concentration of the observation in the study. The minimum and maximum of a variable provides us with a range and helps in detection of anomalies.

##### **4.1.1 Descriptive statistics for HDI**

The descriptive statistics for HDI reveal that the highest HDI for the study period 2010-2020 is 0.595, and the lowest is 0.553 for the study period. The average annual value for HDI for the study period was noted as 0.576, while the standard deviation is 0.013.

**Table 4.1: Descriptive statistics for HDI**

<i>HDI</i>	<i>Value</i>
<b>Mean</b>	0.576636364
<b>Standard Error</b>	0.0041632
<b>Standard Deviation</b>	0.013807771
<b>Sample Variance</b>	0.000190655
<b>Kurtosis</b>	-0.974016038
<b>Skewness</b>	-0.313648756
<b>Range</b>	0.042
<b>Minimum</b>	0.553
<b>Maximum</b>	0.595
<b>Sum</b>	6.343
<b>Count</b>	11

*Source: Author's computation*

#### **4.1.2 Descriptive Statistics for the variables**

The results of this analysis indicate that the highest insecurity level for the study period was at 43 with the lowest at 1.76, implying that for the study period the highest number of reported incidence of cattle rustling was 43% of the total crimes reported for that year while the lowest was 1.76% of the total crimes committed in Baringo. The average level annually for the study period was 11.68 implying that for the study period cattle rustling accounted for an average of 11.68% of all the crimes reported in Baringo county. The standard deviation is at 14.55. For livestock production, the highest level is at 28.46 and lowest at 11.45, implying that the highest number of livestock owned per household for the study period was 28.46 and lowest number owned per household was 11.45 while average ownership per household for the period is 17.64 while standard deviation is 4.07. Life expectancy for the period of study had the highest value at 68.5 years and lowest level at 63.88 years, while the average number of years lived for the study period is 66.26, the standard deviation is noted as 1.49. The highest number of health facilities for the study period was 237 and lowest is 183, with average number of health facilities for the



county is 214.6, standard deviation was noted as 16.6. The maximum number of mean years spent in school for the population of Baringo county was 6.29 years, and lowest mean years is 5.8 years with the average number of years in school for the population is 6.05 and standard deviation is 0.15. For the expected years in school, the highest number of years was found to be 11.6 years while the lowest was 10.6. The average expected years of schooling was 11.22 and standard deviation was noted as 0.3. This implies that the population on average spent 6.05 years in school against an expectation of 11.22 years.

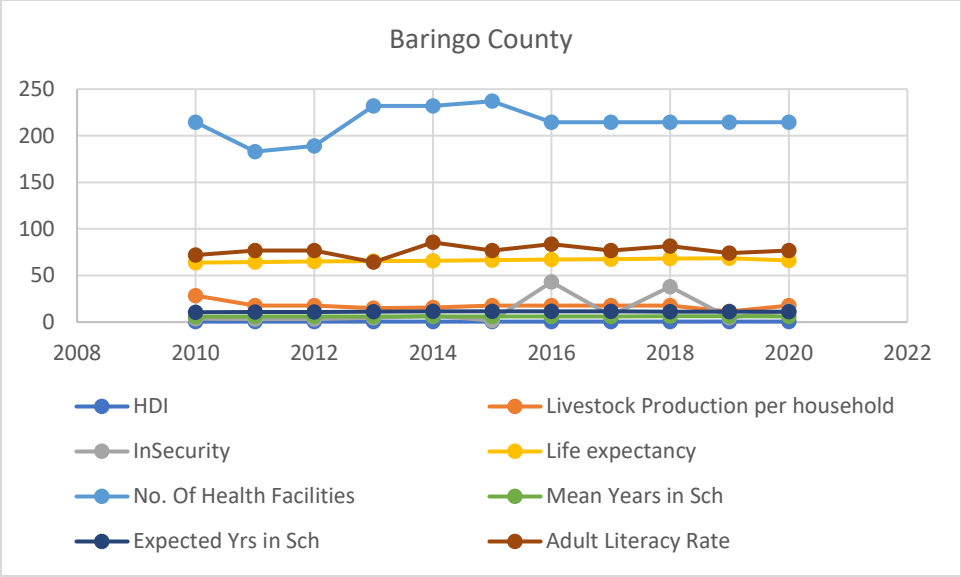
**Table 4.2: Descriptive statistics of variables**

	<i>Livestock Production per household</i>	<i>Security</i>	<i>Life expectancy</i>	<i>No. Of Health Facilities</i>	<i>Mean Years in Sch</i>	<i>Expected Yrs in Sch</i>	<i>Adult Literacy Rate</i>
Mean	17.6447235	11.68704034	66.26181818	214.6	6.057454545	11.22	76.84090909
Standard Error	1.229106637	4.389446469	0.452186241	5.010171472	0.046012916	0.090453403	1.740616638
Median	17.64	4.78	66.26	214.6	6.01	11.22	76.84
Mode	17.64	3.42	#N/A	214.6	6.007	11.22	76.84
Standard Deviation	4.076485542	14.55814698	1.499732097	16.61685891	0.152607578	0.3	5.772972293
Sample Variance	16.61773437	211.9396434	2.249196364	276.12	0.023289073	0.09	33.32720909
Kurtosis	5.937665505	1.861707302	-1.05804207	0.310028629	-0.71664986	0.219753086	1.42045606
Skewness	1.806175304	1.806982691	-0.02523582	-0.707407995	0.370027961	-0.814814815	-0.656327743
Range	17.01	41.23891433	4.62	54	0.467	1	21.3
Minimum	11.45	1.761085667	63.88	183	5.826	10.62	64.3
Maximum	28.46	43	68.5	237	6.293	11.62	85.6
Sum	194.0919584	128.5574438	728.88	2360.6	66.632	123.42	845.25
Count	11	11	11	11	11	11	11

*Source: Author's computation*

### 4.3 Trend Presentation

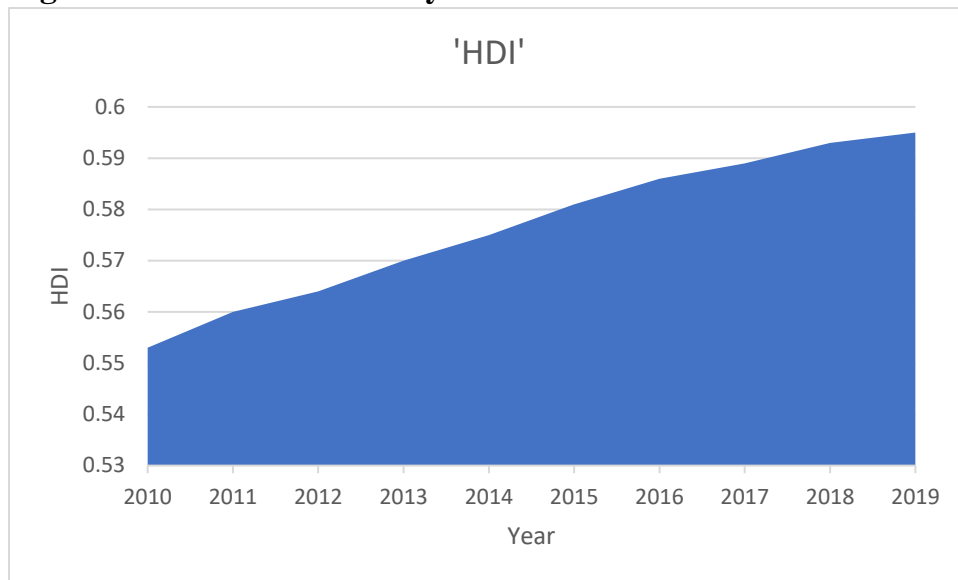
**Figure 4.3: trend analysis chart**



**Source: Author's computation**

I ran a trend analysis of the observations for the study period and note that though there are small spurts of increase and decrease, over the study period, the changes are not very significant. The largest increases and decreases are noted in adult literacy rate, no. of health facilities and in the level of insecurity.

**Figure 4.4: HDI Trend Analysis**



*Source: Author's computation*

The trend analysis largely indicates that the HDI has increased overtime.

#### **4.4 Covariance analysis**

Covariance refers to a relationship between two random variables wherein a change in one variable reflects a change in the other variable. It examines how the dependent variable, in our case human development Index (HDI) moves with the independent variables (Livestock Production per household, InSecurity, Life expectancy, No. Of Health Facilities, Mean Years in School, Expected Years in School and Adult Literacy Rate). The covariance can be positive, negative or no covariance can exist between the variables, depending on the direction of the relationship. The greater the resultant number, the more covaried a relationship between variables is. A positive number indicates a positive covariance while a negative number indicates a negative covariance.

**Table 4.5: Covariance Output**

	<b>HDI</b>	<b>Livestock</b>	<b>InSec</b>	<b>Lifex</b>	<b>HealthF</b>	<b>MeanSch</b>	<b>ExpecSch</b>	<b>AduLit</b>
<b>HDI</b>	0.000173							
<b>Livestock</b>	-0.03168	15.10703						
<b>InSec</b>	0.08961	-1.40896	192.6724					
<b>Lifex</b>	0.018722	-3.32262	9.431582	2.044724				
<b>HealthF</b>	0.073	-7.24163	3.834938	6.546727	251.0182			
<b>MeanSch</b>	0.001826	-0.33995	0.967009	0.201593	0.469327	0.021172		
<b>ExpecSch</b>	0.002882	-0.62464	1.44961	0.286273	2.745455	0.023418	0.081818	
<b>AduLit</b>	0.025264	-1.87399	39.90553	2.485562	-5.97927	0.190159	0.658182	30.29746

*Source: Author's computation*

Covariance analysis reveals that HDI and livestock production negatively covary with -0.03, implying that they move in opposite directions. While HDI and Insecurity, life expectancy, health facilities, mean yrs, expected years and adult literacy all covary positively with values as per the table above, meaning that they all move in the same direction at the rate indicated on the table.

#### **4.5 Correlation Analysis**

This measures the degree to which two or more random variables move. The correlation coefficient ( $r$ ) reveals the strength of a linear relationship between two variables. I examined the association between the dependent variable-economic development (HDI) in Baringo county, Kenya- and each of the independent variables. The difference between correlation analysis and covariance analysis is that covariance adjusts for the scale of the variables. If the resultant statistic is above 0.5 the relationship is strong, it's moderate if it's exactly 0.5 and weak if it's below 0.5.

**Table 4.6: Correlation Output**

	<i>HDI</i>	<i>Livestock</i>	<i>InSec</i>	<i>Lifeexp</i>	<i>HealthF</i>	<i>MeanSch</i>	<i>ExpecSch</i>	<i>AduLit</i>
<b>HDI</b>	1							
<b>Livestock</b>	-0.61917	1						
<b>InSec</b>	0.490364	-0.02612	1					
<b>Lifeexp</b>	0.994484	-0.59783	0.475179	1				
<b>HealthF</b>	0.34998	-0.1176	0.017438	0.288971	1			
<b>MeanSch</b>	0.953118	-0.6011	0.478785	0.968898	0.203584	1		
<b>ExpecSch</b>	0.76527	-0.56185	0.365104	0.699903	0.60581	0.562663	1	
<b>AduLit</b>	0.348635	-0.08759	0.5223	0.315794	-0.06856	0.237429	0.41804	1

*Source: Author's computations*

The results indicate that HDI and livestock production negatively correlate with a significant value of -0.6 indicating that as one increases the other decreases. Insecurity and HDI are positively correlated with a value of 0.49 meaning that the relationship between the two is positive and moderate. Life expectancy and HDI is significantly and positively correlated with a value of 0.99 implying that the two have a strong relationship. Health Facilities and HDI are positively but moderately correlated with a value of 0.35. Mean school years and HDI are strongly and positively correlated with a value of 0.95. Expected school years and HDI are also strongly and positively correlated with a value of 0.77. Adult literacy is only moderately but positively correlated with HDI with a value of 0.35.

#### **4.6 Dependence Analysis**

The dependency test reveals to us whether the variables affect each other, I run a T-test using expected values compared with the original data with null hypothesis as cross-sectional data is independent and the results are presented in the below table for the variables.

**Table 4.7: T-test results**

	<i>AduLit</i>	<i>ExpeSch</i>	<i>MeanSch</i>	<i>HealthF</i>	<i>LiFex</i>	<i>InSec</i>	<i>Livestock</i>	<i>HDI</i>
<b>Hypothesized Mean Difference</b>	0	0	0	0	0	0	0	0
<b>df</b>	20	20	20	20	20	20	20	20
<b>t Stat</b>	-0.18816	-0.48224	-3.44234	-1.83475	0.956006	0.05359	8.599799	11.85566
<b>P(T&lt;=t) one-tail</b>	0.426324	0.317435	0.001288	0.040732	0.175242	0.478897	1.87E-08	8.42E-11
<b>t Critical one-tail</b>	1.724718	1.724718	1.724718	1.724718	1.724718	1.724718	1.724718	1.724718
<b>P(T&lt;=t) two-tail</b>	0.852647	0.634869	0.002577	0.081463	0.350483	0.957794	3.75E-08	1.68E-10
<b>t Critical two-tail</b>	2.085963	2.085963	2.085963	2.085963	2.085963	2.085963	2.085963	2.085963

**Source: Author's computation**

**Table 4.8: Chi-Sq test of independence**

<b>Statistic</b>	<b>p-value</b>
CHISQ	6.06575E-12

**Source: Author's computation**

Ho: There is no dependence between the variables

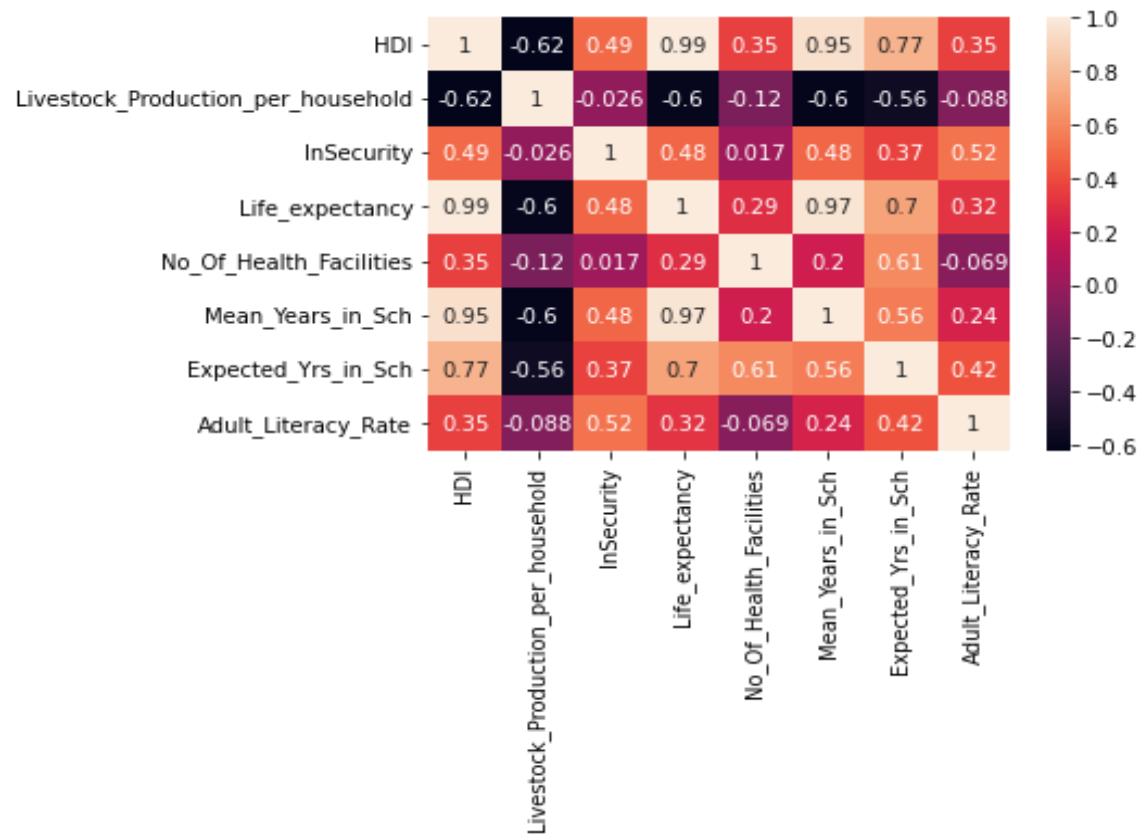
Comparing the resultant p-values from above tables and the critical value of the hypothesis

P(0.05), and that the null hypothesis is rejected where  $p < 0.05$  we can draw the conclusions that the Ho is rejected in the t-test analysis for Health facilities. The Ho is not rejected for all other variables and the Chi<sup>2</sup> results.

### **Spearman's rank correlation**

I also run a spearman correlation test to show the rank and direction of the dependency between the variables with below results. The rank takes values of +1 to -1 with +1 being indicative of a perfect relationship and -1 being indicative of a perfect negative relationship. The closer the resultant statistic is to zero the weaker the connection is between the variables being tested. Life expectancy, mean and expected years in school reveal the closest positive associations with HDI while livestock indicates the closest negative association to HDI.

**Figure 4.9: Spearman correlation rank**



**Source: Author's computation**

### 4.7 Causality Testing

I use the granger causality test to identify whether one variable causes another. Our hypothesis is that the X variables impacts the Y variable, therefore if our analysis returns the result that X granger causes y then our null hypothesis (that X does not cause Y) will be rejected and vice versa. Critical  $P > 0.05$ .

**Table 4.10: Granger causality test**

	<b>F</b>	<b>p-value</b>
<b>HDI does not granger cause LiveSt</b>	0.914044	0.370888
<b>Livestock does not granger cause HDI</b>	0.329338	0.584009
<b>HDI does not granger cause InSec</b>	1.276241	0.295819
<b>InSec does not granger cause HDI</b>	3.908505	0.088573
<b>HDI does not granger cause LifeX</b>	4.584628	0.069514
<b>LifeX does not granger cause HDI</b>	4.383321	0.074568
<b>HDI does not granger cause HealthF</b>	0.627534	0.454265
<b>HealthF does not granger cause HDI</b>	0.461135	0.518908
<b>HDI does not granger cause MeanSch</b>	1.488379	0.261971
<b>MeanSch does not granger cause HDI</b>	1.546599	0.253669
<b>HDI does not granger cause ExpeSch</b>	5.29113	0.054971
<b>ExpeSch does not granger cause HDI</b>	5.127635	0.057952
<b>HDI does not granger cause AduLit</b>	1.063657	0.336693
<b>AduLit does not granger cause HDI</b>	5.127635	0.057952

Source: Author's computation

From the above tabulation, it is evident that largely none of the resultant p-values are less than our critical p-value (0.05), and hence the data does not provide enough evidence for us to reject the null hypothesis. Resultant P-values for the relationship between HDI and expected school attendance and the relationship between adult literacy and HDI are only slightly above the critical p-values.

#### **4.8 Unit Root testing**

To analyse the stationarity of the data I used unit root tests. This analysis informs us whether the resultant statistics of regression are accurate or inaccurate because if there is non-stationarity the outcome is false regression. ADF was adopted for this test for all the variables adopted for the study period



**Table 4.11: Augmented Dickey Fuller Test Output**

	HDI	Livestock	InSec	LifExp	HealthF	MeanSch	ExpeSch	AdultLit
<b>Test Statistic</b>	-0.498598	-5.78139	-3.621091	-1.756002	-5.729704	-1.579232	-2.516437	-4.366835
<b>P-value</b>	0.89229	0.000001	0.00537	0.402514	0.000001	0.494017	0.111526	0.00034
<b>Number of lags</b>	1	0	0	0	2	1	2	0
<b>Number of observations</b>	9	10	10	10	8	9	8	10
<b>Reject (signif. level 0.05)</b>	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE
<b>Critical value 1%</b>	-4.473135	-4.331573	-4.331573	-4.331573	-4.665186	-4.473135	-4.665186	-4.331573
<b>Critical value 5%</b>	-3.289881	-3.23295	-3.23295	-3.23295	-3.367187	-3.289881	-3.367187	-3.23295
<b>Critical value 10%</b>	-2.772382	-2.7487	-2.7487	-2.7487	-2.802961	-2.772382	-2.802961	-2.7487

**Source: Author's computation**

By applying the critical values as indicated, the results of the test are indicated on the table above. Based on the analysis, the null hypothesis is rejected in about half of the results while for the rest the null is not rejected implying that the data is stationary.

**Table 4.12: Durbin Watson test for autocorrelation:**

<b>Statistic</b>	<b>Value</b>
Durbin Watson Statistic	2.309166

**Source: Author computation**

I tested the autocorrelation of the variables using the Durbin Watson test, the resultant statistic was 2.309165, which is within the ideal threshold of the test for us to assume that the residuals autocorrelated negatively. Residual autocorrelation assumption is therefore met.

#### 4.9 Testing for Fixed effects

This test allows us to know whether the independent variables have a fixed relationship with the dependent variable. The Lagrange multiplier was used to perform this test, the Null hypothesis is that there are no effects. The resultant p-value is greater than the critical value 0.05 and we therefore do not reject the null hypothesis.

**Table 4.13: Lagrange multiplier Output**

Statistic	Value
Lagrange multiplier statistic',	8.480484294
p-value',	0.292135418
f-value',	1.442536461
f p-value',	0.415248097

Source: Author's computation

#### 4.10 Regression Analysis and Summary Output

**Table 4.13a: Regression analysis output**

<i>Regression Statistics</i>	
Multiple R	0.99985
R Square	0.9997
Adjusted R Square	0.999
Standard Error	0.000436
Observations	11

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	7	0.001906	0.000272	1428.592	2.82E-05
Residual	3	5.72E-07	1.91E-07		
Total	10	0.001907			

Source: Author's computation

The results indicate that the variables tested have a strong relationship with economic development (HDI) in Baringo County (R-squared = 0.9997). The resultant statistic implies that 99% of changes in Human Development Index in Baringo county can be explained by number of

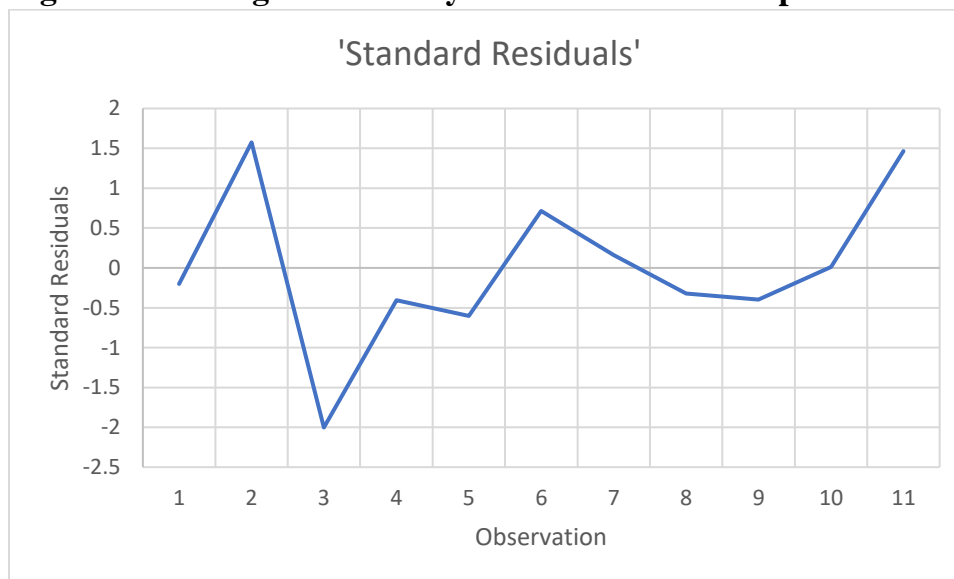
livestock owned per household, level of security, life expectancy, number of health facilities, mean and expected years of education and literacy levels (Adjusted R-squared = 0.999).

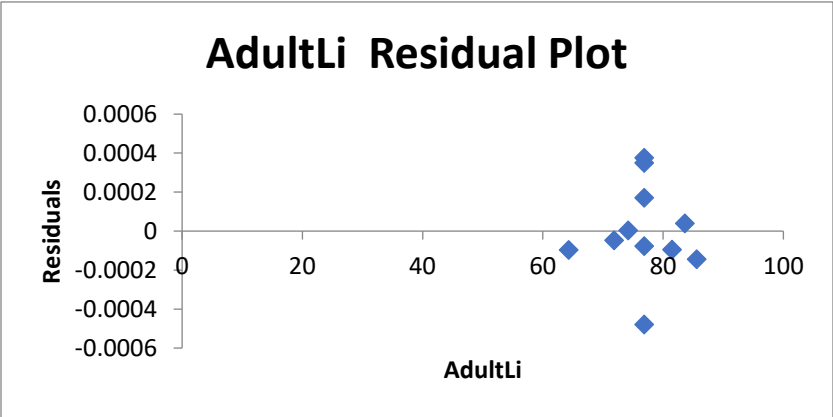
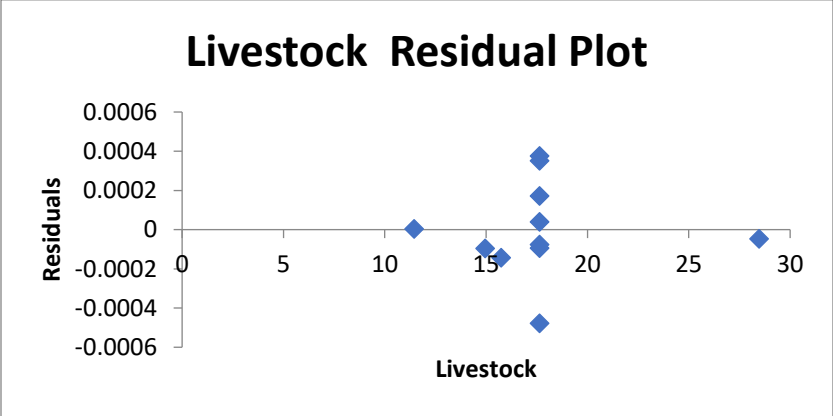
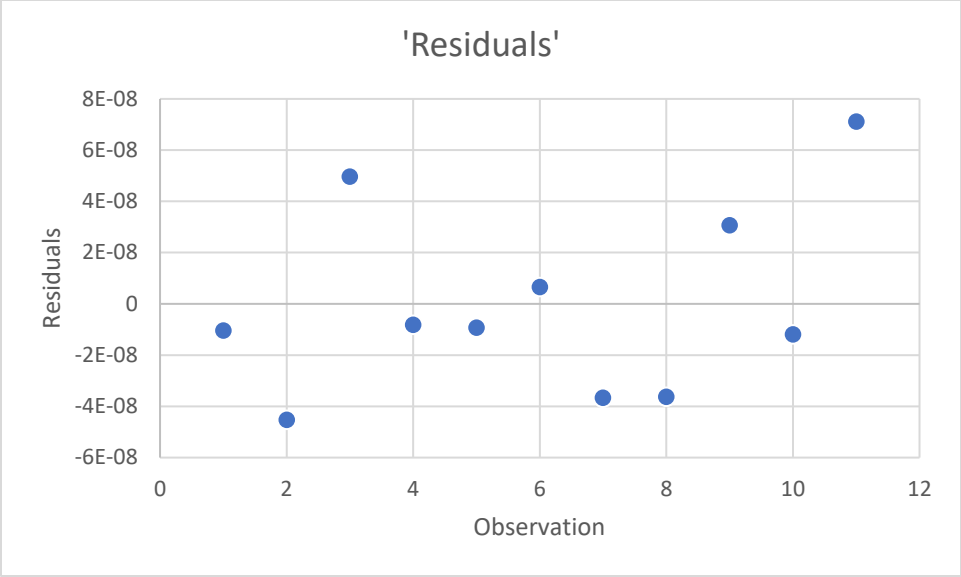
**Table 4.13b: Regression analysis output**

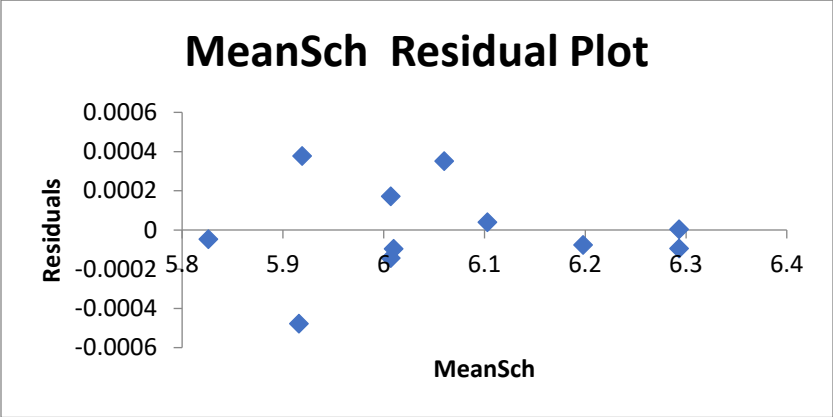
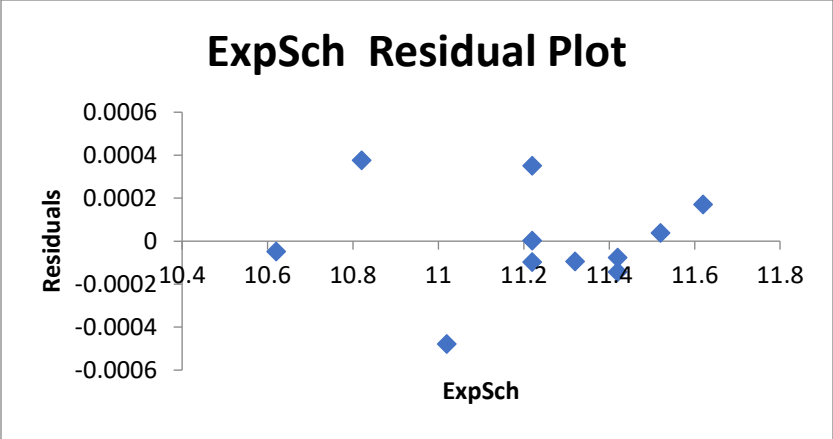
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>VIF</i>	<i>Jarque Bera</i>
<b>Intercept</b>	-0.02208	0.013226	-1.66973	0.193566		1.111348087
<b>Livestock Production per household</b>	-7.3E-05	6.56E-05	-1.10934	0.348215	5.283764	66.4193
<b>InSecurity</b>	1.65E-05	1.49E-05	1.106038	0.349436	3.497666	22.72421
<b>Life expectancy</b>	0.007123	0.000667	10.67595	0.001757	2048.459	1.542751
<b>No. Of Health Facilities</b>	2.67E-05	1.46E-05	1.82737	0.165102	6.52017	2.884505
<b>Mean Years in Sch</b>	0.009409	0.006143	1.531732	0.223104	82.16252	1.459246
<b>Expected Yrs in Sch</b>	0.005453	0.001533	3.557658	0.037883	57.8975	3.717978
<b>Adult Literacy Rate</b>	5.1E-05	3.35E-05	1.520349	0.225756	3.478573	5.143545

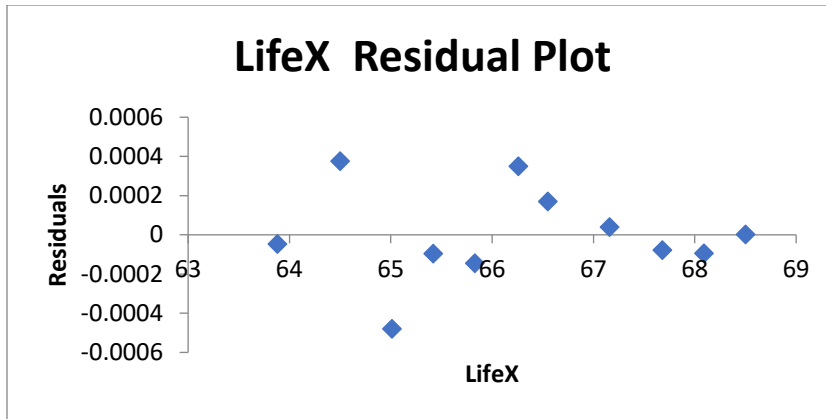
Source: Author's computation

**Figure 4.13c: Regression analysis standard residual plots**









**Source: Author's computation**

I analysed for linearity and homoscedasticity using above computation and residual plots which reveals that the data is randomly distributed across the range of dependent variable, the implication of this is that the aforementioned assumptions of multiple regression are met.

I used Jarque Bera to test for normality, where  $H_0$  is that errors are Not Normally distributed and based on p-values less than 0.05 we could reject the Null Hypothesis that errors are not normally distributed for Life Expectancy and Expected years of School, resultant figures for Livestock and insecurity are high.

Multicollinearity was tested using VIF, and the results show evidence of high multi-collinearity in life expectancy, mean years of school and Expected Years of school variables with other variables, and medium multi-collinearity in Health Facilities and Livestock with other variables.

## 4.12 Hypothesis Testing

H<sub>0</sub>: **Livestock production** has no significant impact on economic development (HDI) in Baringo

The findings indicate that ( $\beta_1 = -0.00007$ ,  $P > 0.05$ ) livestock production has a negative insignificant effect of human development index, the resultant  $P = 0.193566$  which is  $> 0.05$  (critical value  $P$ ), and the null hypothesis is therefore not rejected which means there is no sufficient evidence for the expected effect.

H<sub>0</sub>: **Insecurity** has no significant impact on economic development (HDI) in Baringo county

$\beta_2 = 0.000016$ ,  $P = 0.349$  ( $P > 0.05$ )

The  $P$  value for insecurity is  $> 0.05$ , and the null is therefore not rejected. Insecurity has a positive but insignificant effect on HDI.

H<sub>0</sub>: **Life Expectancy** has no significant impact of economic development (HDI) in Baringo county

$\beta_3 = 0.0071$ ,  $P = 0.0017$  ( $P < 0.05$ ), Since the  $p$ -value is less than the critical value  $0.05$ , we reject the null hypothesis. The coefficient is positive and significant, implying that life expectancy has a positive and significant impact on HDI.

H<sub>0</sub>: **Health Facilities** has no significant impact of economic development (HDI) in Baringo county

$\beta_4 = 0.000026$ ,  $P = 0.165$  ( $P > 0.05$ ), the results indicate that coefficient is positive but insignificant, the null hypothesis is not rejected since the resultant  $p$  value is greater than the critical value.

H<sub>0</sub>: **Mean Years of Schooling** has no significant impact on economic development (HDI) in Baringo county

$\beta_5 = 0.0094$ ,  $P = 0.223$  ( $P > 0.05$ ), the results indicate that coefficient is positive but insignificant, the null hypothesis is not rejected since the resultant p value is greater than the critical value.

$H_0$ : **Expected years of Schooling** has no impact on economic development (HDI) in Baringo county

$\beta_6 = 0.0094$ ,  $P = 0.037$  ( $P < 0.05$ )

Since the p-value is less than the critical value 0.05, we reject the null hypothesis. The coefficient is positive and statistically significant.

$H_0$ : **Adult Literacy** has no impact on economic development (HDI) in Baringo county

$\beta_7 = 0.00005$ ,  $P = 0.225$  ( $P > 0.05$ ), the results indicate that coefficient is positive but insignificant, the null hypothesis is not rejected since the resultant p value is greater than the critical value.

Based on these results and analysis, only expected years of schooling and life expectancy have a p-value  $< 0.05$  and consequently the only ones that are statistically significant in explaining economic development in Baringo. We can infer the final estimation equation since both P values are less than 0.05, as follows:

$$\text{HDI} = -0.02208 + 0.009409 \beta_5 + 0.005453 \beta_6 \dots \dots \dots \{ \text{Equation 4.1.0} \}$$



## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.0 Introduction**

This chapter presents a summary of the study, conclusion and recommendations drawn guided by the research objectives and also provides suggestions for further study.

#### **5.1 Summary of Findings**

##### **Effect of Livestock Capital on Economic Development**

The data indicates that over the period, number of livestock held per household has reduced significantly over the years, which impacts the household income output. The regression analysis reveals that number of livestock per household positively, but insignificantly affects human development index (HDI)

##### **Effect of Insecurity on Economic Development**

The data indicates that the incidence of cattle rustling has varied through the years. The analysis reveals that there is an insignificant relationship between insecurity and HDI.

##### **Effect of Health on Economic Development**

Health in Baringo county was analysed using data on life expectancy and the number of health centres available in the county. The available data indicates that life expectancy has tended to fluctuate around the mid sixty's while number of health centres has seen an increase in the period under study.

The data analysis reveals that life expectancy has a positive and significant impact on HDI while number of health centres has a positive but insignificant impact on HDI.

### **Effect of education on economic development**

Education status in the county was looked at using data on the literacy level, the mean years of schooling and expected years of schooling. Mean and expected years of schooling have generally increased over the years, and so has adult literacy.

The data analysis reveals that adult literacy and mean years of schooling have a positive but insignificant impact on HDI, however expected years of schooling has a significant impact on HDI levels for the county.

### **Human development Index (HDI)**

The data analysed indicated that there is a general year on year increase in the HDI levels in the period studied, implying that for the measurement of economic development using HDI, there has been year on year development. The data analysis further revealed correlation between the variables and HDI.

### **5.3 Conclusion**

The study concluded that there is a positive relationship between HDI and level of insecurity, life expectancy, health facilities, literacy, mean years of schooling and expected years of schooling and a negative relationship with livestock production. The granger causality test did not provide enough evidence to reject the hypothesis that HDI does not granger cause livestock ownership, level of insecurity, life expectancy, health facilities, literacy, mean years of schooling and expected years of schooling and vice versa.

### **5.4 Policy Implications and recommendations**

The study attempted to expand how we view individual, household, and community assets to encompass not just the physical and tangible aspects but social and political aspects among others by bringing intangible aspects that we seldom use in explaining economic development. With this view, it then attempted to analyse how cattle rustling impedes the development of the county in impeding these intangible assets, beyond physical and tangible outputs that it is often associated with, to how it affects the human condition. The economic development of the county was measured using HDI levels, HDI is a measure that encompasses literacy, health, and income per capita, and the study reveals a relationship between HDI and health, literacy, and security.

On the back of this it is important for government and policy makers to recognize and build on the combination of the intangible human and social capital and resources of residents as much as they build on the physical capital of the county. In dealing with cattle rustling, the approach needs to shift focus from just increasing security forces and peace building initiatives (which remain important and significant), and delve into rebuilding the human and social capital of the region, the asset based approach often drives a shift in focus from community scarcity to refocus on the available resources, in this case though there is a need to rebuild the human and social capital that has been lost and destroyed in the years that the community has been ravaged by insecurity by relooking at health and education as assets that are vital and can be built. There is also a need to refocus on other physical assets and resources within the community beyond just the livestock.

### **5.5 Suggested areas for further study**

Although this study covered Baringo county, there are huge discrepancies within the Baringo sub-counties in terms of data on indicators like literacy and life expectancy, however

due to unavailability of complete sub-county level data breakdown, this study focused on the county as a whole using available data, there is a room in the future to expand such a study and delve into a more granulated sub-county level, and possibly to the other counties in the North-rift region and the North Eastern part of the country.

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## APPENDIX A: DATA

Year	HDI	Livestock Production per household	InSecurity	Life expectancy	No. Of Health Facilities	Mean Years in Sch	Expected Yrs in Sch	Adult Literacy Rate
2010	0.553	28.46	3.69	63.88	214.6	5.826	10.62	71.85
2011	0.56	17.64	3.42	64.5	183	5.919	10.82	76.84
2012	0.564	17.64	3.42	65.01	189	5.916	11.02	76.84
2013	0.57	14.96	4.6	65.42	232	6.01	11.22	64.3
2014	0.575	15.74	6.8	65.83	232	6.007	11.42	85.6
2015	0.581	17.64	1.76	66.55	237	6.007	11.62	76.84
2016	0.586	17.64	43	67.16	214.6	6.103	11.52	83.6
2017	0.589	17.64	7.19	67.68	214.6	6.198	11.42	76.84
2018	0.593	17.64	38.1	68.09	214.6	6.293	11.32	81.5
2019	0.595	11.45	4.78	68.5	214.6	6.293	11.22	74.2
2020	0.577	17.64	11.8	66.26	214.6	6.06	11.22	76.84