

# Participatory Research on the effectiveness of Index Based Livestock Insurance as a Pro-poor Climate Risk Management Strategy in Borena zone: the case of Moyale and Miyo Districts



March 2018

**Address:**

CAFOD / SCIAF / Trócaire  
P O Box 1875, Addis Ababa,  
Gulele Subcity, Swaziland Street, Enqulal  
Fabrika,  
Ethiopian Catholic Bishops Conference Centre  
Tel: +251-(0)11-278-8843/44/45  
Fax: +251-(0)11-278-8846  
Email: [reception@cst-together.org](mailto:reception@cst-together.org)  
Website: [www.trocaire.org](http://www.trocaire.org) /  
[www.cafod.org.uk](http://www.cafod.org.uk) / [www.sciaf.org.uk](http://www.sciaf.org.uk)

**Research Team:**

- Mr. Temesgen Keno (Team leader, Assistant Professor):[temesgen.belissa@wur.nl](mailto:temesgen.belissa@wur.nl)
- Dr. Dawit Diriba (Team member, Assistant Professor):[davediriba@yahoo.com](mailto:davediriba@yahoo.com)
- Mr. Tadese Lemesa (Team member, Senior Lecturer):[make3708@yahoo.com](mailto:make3708@yahoo.com)

**Photo and Layout:** Samson Haileyesus

**Cover Picture:** Shepherd in Borena tending to his flock

**Acknowledgements**

We would like to acknowledge the friendly cooperation we get from the staff of CAFOD, SCAIF, Trócaire Ethiopia, joint office throughout the study period, especially Mrs. Teamrat Belai, Mr. Yoseph Kassahun, Mrs. Kassech Abegaz, and Mr. Takele Berihun (driver). Furthermore, we like to express our appreciation from Community Initiative Facilitation and Assistance (CIFA) field experts, Oromia Insurance Company (OIC) staff, and International Livestock Research Institute (ILRI) representatives for the support they rendered to us during data collection. We would also like to acknowledge all respondents.

**Participatory Research on the effectiveness of Index Based Livestock Insurance as a Pro-poor Climate Risk Management Strategy in Borena zone: the case of Moyale and Miyo Districts**

# List of Acronyms and Abbreviations

IBLI: Index-Based Livestock Insurance

CST: CAFOD, SCIAF and Trócaire

CIFA: Community Initiative Facilitation and Assistance

OIC: Oromia Insurance Company

ILRI: International Livestock Research Institute

VIP: Village Insurance Promoter

IBRTP: Index Based Risk Transfer Products

IPCC: International Panel on Climate Change

GIS: Global Information System

GDP: Gross Domestic Product

WFP: World Food Program

WTP: Willingness To Pay

CGIAR: Consortium for Group International Agricultural Research

PAC: Primary Agricultural Cooperative

# Contents

EXECUTIVE SUMMARY .....	i
CHAPTER ONE: INTRODUCTION .....	1
Background and Purpose of the research .....	1
Audience for and use of the research .....	8
Objectives of the study .....	8
Limitations of the study .....	8
CHAPTER TWO: METHODOLOGY OF THE STUDY .....	9
Data sources .....	10
Secondary data sources .....	10
Primary data sources .....	10
Method of data analysis .....	10
CHAPTER THREE: RESEARCH FINDINGS .....	12
Introduction .....	12
General characteristics of household survey respondents .....	16
Trend in uptake of IBLI by the pastoralists and factors affecting uptake of IBLI .....	16
Community perception on IBLI .....	20
Perception towards contribution of IBLI in protecting the livelihoods of households against climate risk.....	21
Impact of IBLI on policyholders .....	23
IBLI adoption on usage of high-risk high-return production inputs .....	24
Impact of IBLI adoption on household consumption .....	25
Source of initial information on IBLI scheme .....	26
Perception towards the advantages and disadvantages of IBLI .....	26
Role of Gada system on pastoralists' uptake of and trust on IBLI .....	26
Pastoralists' perception on the benefits of IBLI intervention .....	27
Perception on basis risks .....	27
Partners' implementation strength and gaps .....	27
Stakeholders strength and gaps .....	32
Government policy support environment .....	33
CHAPTER FOUR: SUMMARY, CONCLUSION, AND RECOMMENDATION .....	35
Summary and Conclusion .....	35
Policy Recommendations .....	40
References .....	44

# Executive summary

Pastoralists' livelihoods depend heavily on livestock and livestock products. Over the last two decades, there is an increasing climatic variability that has a profound impact on African agriculture. The increase in water scarcity and shortage of forage reduces livestock productivity and, in severe cases, leads to irreversible herd die-offs and widespread livestock losses. The intensity of extreme climate and weather events are expected to be severely worsening the risk of life and livelihood among vulnerable smallholder pastoralists in arid and semi-arid of Sub-Saharan Africa over the coming periods (Stern, 2007). To mitigate the adverse effect of climate related risks on the livelihoods of vulnerable pastoralist community index based insurance has been increasingly championed in rural Africa. IBLI which was Initiated and advanced in Kenya was adopted among Borana pastoralists in including Ethiopia as a way by which the benefits of insurance can be offered to the relatively poor and remote population (World Bank 2007). The Index Based Livestock Insurance (IBLI) has become the most innovative device applied to insure the risk of livestock mortality. Accordingly, over the past 4 years, CAFOD/SCIAF/Trócaire /CST, in collaboration with its partners Community Initiative Facilitation and Assistance (CIFA), Oromia Insurance Company (OIC) and International Livestock Research Institute (ILRI), has been piloting index-based insurance scheme to protect livestock keepers, - particularly in the drought prone areas of Borana zone (Miyo and Moyaleworedas) – from drought -related asset losses. This participatory research was designed to assess

the effectiveness of IBLI as a pro-poor climate risk management strategy in Moyale and Miyo woredas of Borena Zone. The overall aim of this is (1) examine the determinants of uptake of IBLI, (2) analyze impact of IBLI on policyholders, (3) assessing the perception of pastoralist towards the climate change impacts and contribution of IBLI as a strategy of mitigating it, (4) to identifying the strengths and gaps of partners working with IBLI scheme, (5) exploring the strengths and weakness of stakeholders of IBLI scheme, and (6) examining the government policy in supporting the IBLI project implementation, (7) analyze the trend IBLI uptake. For this purpose, the researchers designed and applied qualitative and quantitative research approaches to collect primary data. First, quantitative data was collected from 189 beneficiary pastoralist households and 312 non-beneficiary households of the IBLI. From these, 177 households were female and the remaining 324 were male-headed. Second, focused Group Discussion was conducted with male and female representatives of beneficiary households, non-beneficiary households, Geda leaders and community elders, and VIPs. Third, in-depth key-informant-interview was undertaken with representatives of CIFA Ethiopia (Zonal and field experts), IRLI Zonal representatives, and Micro-insurance insurance department of OIC. Furthermore, secondary data on the trend of IBLI uptake were also collected from OIC, project document from CST and project report from CIFA Ethiopia and other sources. The finding of the study evidenced that there was significant increase in uptake of the IBLI over time

both in terms of number of household and livestock insured. The main driving factors for the tremendous increase in the actual uptake of IBLI as per the qualitative and quantitative findings of this study were the 35% price-subsidy offered by CIFA, peer influence among pastoralists to adopt IBLI which can be the result of social learning from awareness creation or training programs arranged by CIFA. The size of livestock owned by the household measured in standard tropical livestock units (TLU), understanding, trust and liquidity concerns (mental accounting) were also observed to determine the demand for IBLI. IBLI has become an amenable solution on the instant when pastoralists have experienced adverse effect of climate change in the form of recurrent drought that has resulted in rampant livestock mortality. A large number of the respondent households have perceived the pattern of climate change in terms of sharp decline in moisture, long-period dry season without rain, irregularity in rainy season, decrease in rainfall intensity, untimely rain and/flooding, dry wind, severe drought and lack of precipitation. Such patterns were revealed to cause adverse consequences on the livelihoods of the households causing, among many others, scarcity of water, degradation in pasture land and forage unavailability. The majority of the respondent households have perceived weakened carrying capacity of the land biomass to feed livestock, physical deterioration of livestock and overall asset depletion ultimately led to death of livestock, severe poverty and food insecurity. This consequently resulted in pastoralists' migration to other areas, children school leaving, loss of family and dissolution of social capital and emergency of conflict on range resources. Pastoralists have become acquitted with the benefits

of IBLI as mitigating device to reduce the climate related risks. The pastoralists underlined the important contribution of IBLI in protecting their livelihoods against climate risks. Some of the benefits that they identified include: (1) pastoralists receive payouts as indemnification for their losses of livestock which helped them to cope up with the adverse impact of drought, and to substitute their lost livestock, (2) in the new IBLI, asset protection approach, the pastoralists purchase fodder for their livestock to cope up with anticipated drought, (3) the pastoralists indicated that they pay less premium but receive huge compensation or pay-outs as indemnification. Our finding indicates that the asset protection approach minimized death of livestock and pastoralists prefer it. However, the pastoralists identified major limitations of the IBLI: (1) lack of awareness about concept of IBLI, (2) they felt that the premium is too high, especially for the poor groups, (3) pastoralists are discouraged by termination of subsidy provision by CIFA without any prior notification, (4) many pastoralists do not purchase insurance because they do not receive pay-outs as indemnification if there is a good rain.

Descriptive and econometrics model were used to analyze determinants of uptake of IBLI and impact of IBLI uptake on policyholders. The finding indicates that there was significant difference in family size, number of livestock owned, peer influence, mental accounting, per capita food consumption, expenditure on improved feed, expenditure on veterinary medicine, trust on OIC, and drought frequency between insured and uninsured pastoralist households. The econometric model shows positive and significant effect of peer influence, family size, and mental accounting on

pastoralists' uptake of IBLI. On contrary, increase in number of livestock owned by pastoralists results in decrease in uptake of IBLI. The result shows that uptake of IBLI significantly improves pastoralists investment on livestock productivity and enhances their welfare.

The major strength of OIC and CIFA Ethiopia were identified: 1) CIFA Ethiopia undertakes awareness creation and community mobilization activities which reduced burden from OIC, (2) using its own financial resources, CIFA produces and distributes promotional materials, (3) CIFA has also been covering training costs for Village Insurance Promoters and Sales Agents, (4) CIFA was providing 35% premium subsidy for pastoralists who were trapped in liquidity constraints to pay the premium upfront. As a result OIC was able to increase its sales (both number of customers and volume of premium). Major gap that were identified include: (1) low premium (15% of payout), (2) lack of technical support, (3) lack of capital to invest on promotion of IBLI, (4) lack of training for CIFA's field expertise or human capital development, and so on.

In general as insurance is a new concept is new to pastoralist communities there are a need for more education, awareness creation and trainings. Subsidy is very critical to motivate pastoralists and attract more customers and to make the scheme pro-poor strategy. Therefore, the pastoralists suggested that it need to be scaled-up to reach more people. But CIFA's capacity is limited and demand is increasing exponentially. In addition to subsidy, they highlighted the experience of other regions such as Somalia to employ the poor pastoralists on natural resource conservation (terracing) to cover their premium.

However, according to them, they are concerned that the government has not taken the IBLI seriously. They recommended that IBLI has to be given recognition as government's program. This, according to the pastoralists, will improve sustainability, build trust on IBLI, and offer them confidence or give them guarantee.

To put it a nutshell, IBLI is a major institutional innovation that could revolutionize access to formal insurance for millions of pastoralists. The main strengths of IBLI are overcoming moral hazard, adverse selection and transaction costs. In pastoral financial market (credit and insurance) development these factors were the main obstacles for long. To use these strengths, significant efforts have been made in research and practical implementation of IBLI, mainly in countries like Kenya, Ethiopia and Mongolia. This study is meant to assess the effectiveness of IBLI on achieving impacts on pastoral shock coping and risk management, and to contribute to improvements in design and implementation. While impacts have typically been positive where IBLI uptake has occurred, actual uptake is low. There is a need for improvements in product design, complementary interventions to boost uptake, and strategies for sustainable scaling up of uptake. Specific recommendations for a practical IBLI intervention include: (1) The first-order importance of reducing basis risk, pursuing for this multiple technological, contractual, and institutional innovations as this study detailed the issue in chapter 4: Summary and conclusion section. (2) The need to use risk-layering, combining the use of IBLI with credit, savings, and risk-reducing investments to optimally address different categories of risk. For this, these various financial products should be offered in



a coordinated fashion. (3) Calling on a role for state intervention on two fronts. One is “smart” subsidies for learning, data accumulation, initial re-insurance, and catastrophic risks, and the other if possible is the implementation of public certification standards for maximum basis risk of insurance contracts. (4) Using twin-track institutional-level IBLI contracts combined with intra-institution distribution of payouts to reduce basis risk and improve the quality. For this, credible intra-institutional rules for idiosyncratic transfers must be carefully designed. Finally (5), the need for further research on the determinants of behaviour toward risk and insurance, the design of customized IBLI product for a given intervention or institution(s) like CST is highly important.

# CHAPTER ONE: INTRODUCTION

## Background and Purpose of the research

Over the last two decades, increasing climatic variability has shown to have a profound impact on African agriculture. It causes a downside production risk which is a considerable constraint for development and transformation of the rain-fed agricultural sector in the region. Climate extremities are the greatest sources of smallholders' production risk with droughts and floods resulting in total or partial crop failure and livestock collapse (Michael, 2011). Drought often results in water scarcity and forage unavailability that in turn reduces livestock productivity and, in severe cases, leads to irreversible herd die-offs and widespread livestock losses (Thornton et al., 2008; Hellmuth et al., 2007; IPCC, 2007).

The trend of global climate change has remained devastating overtime. It has aggravated the recurrence of natural disasters to rise sharply worldwide with the largest increase in low-income countries where disaster incidence rose at twice the global rate (Tebaldi et al., 2006; IFRCRSC, 2004). In this pattern, low income countries were evidenced to be disproportionately affected, incurring 20 percent higher costs of natural disasters as a proportion of their GDP compared to higher income countries, mainly, due to their low financial, technical and institutional capacity for adaptation (Kanbur and Lastig, 2001; Rahmman et al., 2007).

Future climatic scenarios are also predicted to be pessimistic. By the coming year 2050, the costs of

climatic extreme weather events are predicted to be 1 percent of the global annual GDP (Stern, 2007). Due to Africa's heavy dependence on agriculture, its high proportion of low inputs, rain-fed farming and existing stresses such as land degradation and population pressure, the impact of climate change and its fatal consequences such as drought is argued to remain high in the region. Thus, the intensity of extreme climate and weather events are expected to be severely worsen the risk of life and livelihood among vulnerable smallholder farmers (including What for pastoralists and agro pastoralists) in Sub-Saharan Africa over the coming periods. Hence, managing agricultural production risk becomes increasingly important in the region.

For instance, Ethiopian pastoralists face recurrent drought almost three times in a decade. The so-called the 'East African Drought', is characterized as the worst climatic catastrophe of its nature in the history of the last sixty years. Its most horrible impacts are perceived among pastoralists in arid and semi-arid lands of Eastern Africa, where it caused 70-90%, 70-80% and 75% of the total livestock losses in Maasi district in Kenya, Borana zone in Ethiopia and Niger, respectively (Huhuet al., 2011).

Empirical evidences reveal that the root cause of the drought is climate change which led to the disappearance of precipitation and rainfall. In Ethiopia, average rainfall intensity, which ranges from

2000 mm in south-west to 200 mm in north-east low lands of Afar during 1961-1990, has decreased from average precipitation of 2.04 mm per day to 1.97 mm per day. The decrease in rainfall amount is exacerbated by higher evaporation rate which is associated with the increasing temperatures (Cline, 2007). In the future, average annual temperature is predicted to increase from 23.08<sup>o</sup>c to 26.92<sup>o</sup>c for the next two decades with an average estimated rise in temperature between 0.5<sup>o</sup>c and 3.6<sup>o</sup>c. During the last two decades, drought manifested by acute shortage of rainfall has adversely affected crop and vegetation growth of the pastoralists' landmass, making it difficult for livestock feed and forage production and this shock is predicted to continue in future with its severe consequences.

Changes in climate and weather patterns are inevitable, and in spite of rapid advances in using geographical information systems (GIS) and simulation models, there is no clear picture of how climates will change. Instead, there is now a wide consensus that these changes have significant impact on the economies of agrarian communities. Due to Africa's heavy dependence on agriculture, its high proportion of low input, rain-fed farming (95%) and existing stresses such as land degradation and population pressure, the impact of climate change and its fatal consequences such as drought will remain very high in Africa. Hence, research-oriented innovative interventions are recommended as mandatory to cope up with the ever changing climate and to mitigate impact of its adverse consequences on the livelihoods of the poor.

In Ethiopia, there are more than fifteen million pastoralists who reside in 61% of the nation's

landmass. Livestock production is an integral part of the Ethiopian agricultural system. In addition to the recent drought that caused about 80% of total livestock losses, the pastoral areas of Ethiopia have lost significant number of livestock population due to droughts that occurred in the years 1918-19, 1928-29, 1933-34, 1943-45, 1975-76, 1983-86, 1990-91, 1999-2000, and 2002-2003 (Sandford and Habtu, 2000).

FAO (2004) estimated about 1,378,165 livestock losses due to the 2002-2003 drought mainly in Oromia, Afar and Somali regions while Sandford and Habtu (2000) revealed that the total livestock loss in these regions from 1972-1997 were a 72% decrease in the number of cattle herds from the then existing stock. The occurrence of the drought at different periods that has decreased the per capita livestock population in different pastoral areas of Ethiopia has made the poverty situation in these areas complex and worse than it is in the other regions. Besides the decrease in livestock population, the provision of social services such as health, education and water supply is at the lowest level in pastoral areas contributing to the deterioration of life condition. For instance, the gross enrolment ratio in primary schools for the country is 62% in 2002 while it is 12.6% and 13.1% for Afar and Somali regions, respectively. It is not only that there are fewer schools and fewer teachers in the pastoral areas but also less pupils come to attend in the already existing schools (FDRE, 2002).

The Borana plateau of southern Ethiopia is a vast pastoralist territory occupying nearly 10% of Ethiopia. The region is comprised of arid and semi-arid ecological zone with bimodal rainfall. Pastoralist

is a key livelihood, dominated by large cattle herds and increasing numbers of goats and camel. Livestock can range widely in search of forage and water during dry periods, but households in general are increasingly settled for most of the year. The sustainability of these pastoral communities has been significantly undermined due to recurrent drought, violent conflict, and loss of spatial refugia to bush encroachment, privatization of key rangelands and gazzeting of parks and protected areas.

Livestock comprise the overwhelming majority of households' non-human capital and account for more than two-third of their average income. Livestock, however, are subject to frequent, severe shocks, which often bring about catastrophic losses that strike many households at once. Among these drought is by far the greatest cause of livestock mortality in the areas explaining the key covariate losses in the region. There exist a range of social insurance arrangements that provide informal inter-household transfers. But these schemes cover less than ten percent of household losses, on average, do not include everyone, and are generally perceived as in decline. Food aid is used to (highly imperfectly) insure households against covariate risk of livestock loss among pastoral households in this region.

As the cost and frequency of emergency response in the region has grown, however, mounting dissatisfaction with food aid-based risk transfer has prompted exploration for more comprehensive and effective policies. These shocks have resulted in long-term, community-wide deprivation with a lasting effect of deterioration in the indigenous capacity to cushion those who slide into permanent destitution. The importance of developing effective livestock mortality

risk management is amplified by the apparent presence of poverty traps in these semi-arid pastoral areas of southern Ethiopia. Previous research identifies multiple herd size equilibria such that losses beyond a critical threshold amount appear to be irreversible, or to at least have very severe, long-term consequences (Santos and Barrett (2008)). Put differently, livestock losses that push households below this threshold amount appear to be irreversible, or to at least have very severe, long-term consequences. Thus, uninsured drought risk appears as the primary driver of such poverty traps among the Borana and Guji pastoralists. Livestock rearing is the major economic activity in the area. People keep cattle, goat, sheep, camel and equines which are usually under risk of mortality due to drought caused by climatic change. In addition, opportunistic farming is practiced in few pocket areas. Thus based on the household income, it can be said that people in the district are pastoralists. Livestock is basic for the economic life of Borana and Guji people and they have strong affluence for cattle. People are considered as out of culture if they do not keep cattle as one source of income. Even those who reside in urban and semi urban areas have cattle that are kept by themselves or with their relatives in rural areas. The region is also known for its good breed of livestock, the Borana breed.

The Borana land is one of the known rangelands in east Africa and the people are known for their strong traditional institutions and mutual social protection or insurance mechanisms, which enabled them to survive in such fragile environment. These include iddir and iquib as social financial insurance, and the Gada system as a community based indigenous democratic governance system. As Legesse (1973) put

it, the Borana Gada system is a complex traditional democratic system of self-rule that governs the social, economic, political and spiritual life of the whole Oromo society.

Pastoralists in the study rear the four major livestock species found in the Horn of Africa – sheep, goats, cattle and camels. Cattle and sheep are the most dominant species since pastoralist areas are mostly flat and the long dry season that covers from October to February is usually cold, which is a problem for goats and camels. Camels and goats are dominant and are common in the mountainous ranges where the bushy plants (used by browsers) are common. Pastoral area rangelands experience low rainfall with long spell of dry seasons and frequently recurring drought. The influence of drought on the quantity and quality of forage production has largely affected pastoralists' livelihoods. That is, the productivity of the rangelands is determined mostly by variation in the rainfall patterns. The amount of average rainfall in the study areas ranges from 500 to 700 mm per year. Still worse, the distribution and intensity of the rainfall is erratic and irregular. The existing rangelands are mainly woodlands without any grass and they appear to be infested badly with some undesirable plant species. Additionally, rangelands are also subject to the problem of soil compaction. Several factors cause degradation of rangelands though their impacts vary across time and space. In the study areas, the main reasons for rangeland degradation are climate change, repeated and prolonged drought, over grazing (over population of livestock and low mobility), soil erosion (gully formation) and deforestation. The frequent drought, which the households experienced for the

past two decades, reduced the quality (grass and tree composition) and coverage of rangelands.

Over grazing, especially in the grazing areas, reduced the rangelands species composition and sometimes made them rocky. Although soil erosion is not considered as a cause it is found important for the formation of gullies that dissect rangelands and make them inaccessible. Deforestation is mainly practiced during drought period when sales of fuel wood and charcoal serve as a mechanism to cope with food shortfalls. In pastoralist areas, ownership pattern of the grazing land is mainly communal type and they are using the grazing and pasture lands available for large number of animals and all stock graze in the same place. The livestock productivity is mainly affected by availability of feed. But for different species of livestock the availability of feed varies across seasons. In dry season feed is available more for camel and small ruminants and is scarce for cattle. The basic grazing management practices of Ethiopia pastoralists in the rangelands are moving animals each season and moving to distant places when the situation turns against them. They also move animals in dry season though it is preferred to keep them in settlement area in wet season. In some situations herds are divided into moving and village groups. Burning grazing land is practiced in order to initiate fresh grass growth and avoid incidences of some parasitic insects.

All these factors added together increased the number of vulnerable pastoral population. The proportion of pastoralists in need of food aid generally varied from 10% to 22% between 1991 and 1999 and peaked at 40% in 2007 and 2009 (Amsalu, 2010).

In this condition, Ethiopian pastoralists face the world's gravest hunger and impoverishment which is gradually getting worse. Pastoralists' poverty status in the country has always been studied in a world of certainty. However, if the aim of studying poverty is not only improving the well-being of pastoralists who are currently poor, but also preventing the others from becoming poor in the future, vulnerability assessment as a new forward-looking, ex-ante risk management approach must be adopted. Vulnerability within the framework of poverty eradication is defined as the ex-ante risk that a household will, if currently non-poor, fall below poverty line, or if currently poor will remain in poverty. Vulnerability, therefore, is a forward-looking concept and is not directly observable. The observed poverty status of a pastoralist household can be seen as the ex-post realization of potential poverty states whose probabilities are predicted ex-ante as the household's level of vulnerability. Hence, vulnerability assessment is a pro-poor risk management strategy.

Developing reliable and easily applied measures of pastoralists' vulnerability to drought or food insecurity is a necessary but not sufficient condition for household well-being. Social protection which is inextricably interconnected with agriculture in low income nations like Ethiopia is required. Added to this, in Sub-Saharan Africa in general and in Ethiopia in particular, pastoralists' capacity to manage the risks of climate change and drought is especially low due to multiple stressors coupled with a poor asset base. Poor pastoralists are frequently confronted by severe uninsured idiosyncratic risks in addition to the covariate livestock mortality risk, which cause high variability in their income and asset endowments that

in turn, makes them particularly vulnerable to poverty and food insecurity.

Pastoral economies in Ethiopia are evidenced with a poverty trap characterized by a herd threshold that leads to bifurcation in herd growth prospect (Lybbertet al. 2004; McPeak, 2004, Barrett et al., 2006 and Santos and Barrett 2006). As a result, the presence of catastrophic risk of livestock loss can place long-term impacts on households' welfare dynamics, especially if shocks knock their herd beneath the threshold onto the de cumulating growth trajectory toward an irreversible poverty trap. Studies reveal that all factors that seem to impede the capacity of poor households to surmount the critical threshold (poverty line) revolve around some combination of market imperfections and institutional failures that generate exclusionary mechanisms, like credit and insurance rationing, resulting in the separation of sub-populations into distinct groups with different prospects.

In Ethiopia, like in many developing countries, given the importance of the livestock sector and poorly developed pastoralist areas, on the one hand, and the reluctance of the traditional formal credit and insurance institutions to penetrate into the rural pastoralist areas, on the other, practical and timely steps were not taken to provide policies and legal framework services to the rural poor pastoralists who faces acute shortage of access to credit and insurance services. Studies in developing countries reveal that while formal insurance markets routinely fail to provide adequate insurance for covariate risk in poor and infrastructure-deficit pastoral areas, informal

mutual insurance networks are structurally ill-suited to insure against covariate risks, calling for the need to develop effective covariate risk management strategy for reducing persistent poverty among pastoralists. However, despite its innovative nature and considerable commercial and development appeal for replication to Africa and Asian regions with similar poverty and livestock population profile, the IBLI designed for pastoralists in northern Kenya has a number of caveats that can limit the commercial viability, long-term sustainability and replicability of the product.

Overall, we came to learn that most studies focus on study of poverty in a state of certainty than predicting the probability of shocks in the future, in a state of uncertainty. It is also evidenced that only few attempt are made to study, design and implement crop and livestock insurance in Africa. While livestock insurance is being designed and attempted in northern Kenya, and tried to be adapted in Ethiopia, a number of caveats are remained untouched to contextualize the model taking into account the socio-economic characteristics of the pastoralists in Ethiopia.

On agenda of the International Panel on Climate Change (IPCC), the increasing recognition of climate-change induced considerable risks faced by the smallholder agricultural sector and the non-trivial impact of these risks on agricultural growth and rural welfare have currently placed a spotlight on risk and lifted the management of risk to place of top priority in channelling interventions aimed catalysing agricultural production and revitalizing the role of agriculture in food security and poverty reduction in Africa (World Bank, 2005; Barret et al., 2007).

Consequently, global efforts to mitigate the adverse impacts of climate change have increased to the development of innovative risk handling tools in agricultural technologies and services. In particular, the development of innovative instruments for managing weather-related agricultural risks to reduce the impact of climate change on livelihood and food security of farm households has significantly increased.

In this attempt, weather derivative index-based crop and peril insurances have been introduced to countries as diverse as India, Malawi, Mongolia and Thailand to help smallholders hedge against production risks such as floods or drought. These technologies are also shared among stakeholders in African agricultural sector to use weather derivatives as adaptive instruments to mitigate the impact of climate change on the production capacity of the smallholder. Of these, the class of Index-Based Risk Transfer Products (IBRTPs) were designed and developed as weather derivative insurance markets. Thus, the creation of insurance markets for events whose likelihood of occurrence can be precisely calculated and associated to a well-defined index increasingly being championed in rural Africa including Ethiopia as a way by which the benefits of insurance can be offered to the relatively poor and remote population (World Bank 2007; Barrett et al., 2007b; Skees and Collier 2008; Skees et al., 2006, Hellmuth et al., 2009). One of such innovations is the index-based livestock insurance.

Index-Based Livestock Insurance (IBLI) product represents a promising and exciting innovation for managing the climate related risks that vulnerable

households face. Initially, IBLI was designed to manage the risks of livestock mortality among pastoralist in Marsabit district of northern Kenya. It represents a promising and exciting market-based pro-poor risk management option for climate-induced risks that vulnerable households in the region are exposed to (Mude et al., 2011). In arid and semi-arid lands of northern Kenya, IBLI was designed for the first time to manage livestock asset risk by compensating for location average livestock mortality estimated using remotely sensed measures of vegetative cover on range lands. The concept was based on the promissory findings of empirical works of previous scholars (Chantararat, 2007). It was argued that factors that seem to impede the capacity of poor households to surmount a critical threshold (poverty line) revolve around some combination of market imperfections and institutional failures that generate exclusionary mechanisms, like credit and insurance rationing, resulting in the separation of sub-populations into distinct groups with different prospects. The International Livestock Research Institute (ILRI) and the Innovative Insurance Initiatives (3I) based in Cornell University has taken the lead to design the pilot experiment in Kenya and as of January 2010, about 2,000 IBLI contracts were sold in Marsabit district (Carter et al., 2011). This technology has become the most innovative device to insure the risks of livestock mortality. As a result, recently is attracting the attention of many scholars. As a result, today this satellite-based insurance scheme is providing a safety net to farmers, and assured that they will be reimbursed if their animals die, pastoralists are facing fewer risks, and accessing credit easier as a result. In assessing the performance of this venture in late 2011,

results went beyond expectations that provided the promise and potential to reinvigorate the commercial partners to scale-up the pilot to African and south Asian regions with significant level of poverty and populous livestock mortality.

Based on the pilot venture in Marsabit, IBLI was customized for pastoral households in southern Ethiopia. In the area, drought is the most pervasive hazard for more than 12 million pastoralist households who regularly hit by increasingly severe droughts. In the past 10 years, Southern Ethiopia recorded 4 major droughts. For livelihoods that rely solely or partly on livestock, the resulting high livestock mortality rate has devastating effects, rendering these pastoralists amongst the most vulnerable populations in Ethiopia. As the consequences of climate change unfold, the link between drought risk, vulnerability and poverty becomes significantly stronger in the area. Considering the geographical proximity and similarity in socio-economic setup and risk characteristics of pastoralists in southern Ethiopia with those in northern Kenya, on the one hand, and the considerable appeal of IBLI for both commercial and development purposes, on the other, the Kenyan IBLI venture was adopted to the Ethiopian context and implemented in Borana pastoralist zone of southern Ethiopia. In particular, over the past 4 years, CST, in collaboration with its partners Community Initiative Facilitation and Assistance (CIFA) Ethiopia, Oromia Insurance Company (OIC) and International Livestock Research Institute (ILRI), has been piloting index-based insurance scheme to protect livestock keepers particularly in the drought prone areas of Borana zone (Miyoy and Moyale woreda) since 2012– from



drought related asset losses.

Therefore, this participatory research was conducted as part of the UKMA5 project under the Index Based Livestock Insurance (IBLI) component in Moyale and Miyo woredas of Borana Zone of Ethiopia. The purpose of the study is to better understand and assess the success of IBLI as well as the various encouragement techniques and interventions implemented alongside the IBLI roll-out. Moreover, the study was motivated by the need for continuous impact evaluation and assessment of trend and uptake of IBLI by pastoralists and its impact on their well-being. Finally, the study assessed the strengths and weaknesses of the key stakeholders (OIC, IRLI, CST and CIFA) of this project to recommend major collaboration areas in the future.

### **Audience for and use of the research**

The result of this study will be used by pertinent organizations working on IBLI in the Borena Zone such as CST, CIFA, OIC and ILRI. The lessons learnt from the study will be used as an input by these actors to develop strategies to address identified challenges by the study. Furthermore, its output will also be used by development practices of local, national and international level actors such as SCIAF, DFID, local administration and sector bureaus, research institutes and targeted and non-targeted community group by the project, and national and regional level stakeholders.

### **Objectives of the study**

The general objective of this study was to assess the effectiveness and contribution of IBLI as climate risk in protecting the livelihood of the pastoralist households against climate risk and identify factors affecting demand for IBLI to draw key lessons learnt from the pilot IBLI project to develop strategic recommendations and for designing sustainable IBLI project initiatives.

The specific objectives of the study are to:

- 1. analyze the trend IBLI uptake**
- 2. examine the determinants of uptake of IBLI,**
- 3. analyze impact of IBLI on policyholders,**
- 4. assessing the perception of pastoralist towards the climate change impacts and contribution of IBLI as a strategy of mitigating it,**
- 5. to identifying the strengths and gaps of partners working with IBLI scheme,**
- 6. exploring the strengths and weakness of stakeholders of IBLI scheme, and,**
- 7. examining the government policy in supporting the IBLI project implementation,**

### **Limitations of the study**

The study was conducted during a period of time when there was high political instability in study area. The researchers undertook the primary survey under frightening condition due to presence of military and clashes between local communities. As the result, the team could not exhaustively contact all the stakeholders.



# CHAPTER TWO: METHODOLOGY OF THE STUDY

## Data sources

### Secondary data sources

The study used secondary data sources gathered from different stakeholder organizations. These are performance reports of CIFA Ethiopia, IBLI sales data from OIC, previous research findings from IRLI, project documents and other information from CST Ethiopia. Moreover, the researchers reviewed related literatures from different books, websites, and reports.

### Primary data sources

The primary data were collected using formal data collection procedures. Primary data were collected from 501 (324 male-headed and 177 female-headed) pastoralist households, who are actively involved in livestock production and whose livelihoods were adversely affected due to livestock deaths caused by severe drought, using structured questionnaire.

The survey questionnaire was pre-tested before data collection and modified accordingly. First, household survey was collected from 312 non-beneficiaries and 189 beneficiaries. Second, the Key Informant Interview (KII) was used to collect relevant information from expertise working on IBLI project implementations. These experts were from CIFA Ethiopia at zonal level and field representatives, micro-insurance department of OIC, IRLI Zonal representative. Third, focused Group Discussions (FGD), data were collected from pastoralist community Geda system leaders, elders,

beneficiaries and non-beneficiary pastoralists, male and female representatives from each group in Miyo and Moyale districts of the Borana zone of southern Ethiopia, Oromia National Regional State. Lastly, the researchers personally observed the pastoralists' community conditions.

We conducted FGDs at community level with a group of male and female participants from beneficiary and non-beneficiary pastoralists, Geda elders. The FGDs was conducted in five kebeles (3 of Moyale and 2 of Miyo woreda) at offices of kebele. A total of 9-13 participants joined the discussion.

### Method of data analysis

Household data was analyzed using descriptive statistics and econometric models. We applied inferential statistics (t-test) of the differences in the demographic characteristics and socio-economic variable between beneficiary and non-beneficiary pastoralists. The econometric model is based on two step approach. First, we estimated the determinants of uptake of IBLI using the linear probability model. Second, we estimated the impact of IBLI intervention on policyholder using Ordinary Least Square regression. For this purpose, predicted uptake of IBLI from step one was used as covariate in step two to examine impact on policyholder. The model

controlled for demographic factors, drought frequency, socio-economic variables and insurance policy related variables such as peer-influence.

Furthermore, the researchers collected an in-depth qualitative data through FGD and KII. The data were transcribed, interpreted and analyzed by the researchers. Additionally, these data were supported by secondary data collected from different organizations. The secondary data were displayed in bar graphs and line graphs.

# CHAPTER THREE: RESEARCH FINDINGS

## Introduction

We have undertaken this study in Borana Pastoralist zone of Ethiopia taking two districts Miyo and Moyale as a case of the study. The Borana Plateau is located in southern part of Oromia region at about 687 Km from Addis Ababa. The Borana plateau of southern Ethiopia is a vast pastoralist territory occupying nearly 10% of Ethiopian land mass. The area is comprised of arid and semi-arid ecological zones with bimodal rainfall distribution. Pastoralism is a key livelihood, dominated by large cattle herds and increasing numbers of goats and camel. Livestock can range widely in search of forage and water during dry periods, but households in general are increasingly settled for most of the year. The livelihood of these pastoral communities has been significantly undermined due to recurrent drought, violent conflict, and loss of spatial refugia to bush encroachment, privatization of key rangelands and gazzeting of parks and protected areas.

Livestock comprise the overwhelming majority of households' non-human capital and account for more than two-third of their average income. Livestock, however, are subject to frequent, severe shocks, which often bring about catastrophic losses that strike many households at once. Among these drought is by far the greatest cause of livestock mortality in the areas explaining the key covariate losses in the region. There exist a range of social insurance arrangements that provide informal inter-household transfers. But these schemes cover less than ten percent of household losses, on average, do not include everyone,

and are generally perceived as in decline. Food aid is used to (highly imperfectly) insure households against covariate risk of livestock loss among pastoral households in this region.

Livestock rearing is the major economic activity in the area. People keep cattle, goat, sheep, camel and equines which are usually under risk of mortality due to drought caused by climatic change. In addition, opportunistic farming is practiced in few pocket areas. Thus based on the household income, it can be said that people in the district are pastoralists. Livestock is basic for the economic life of Borana and Guji people and they have strong affluence for cattle. People are considered as out of culture if they do not keep cattle as one source of income. Even those who reside in urban and semi urban areas have cattle that are kept by themselves or with their relatives in rural areas. The region is also known for its good breed of livestock, the Borana breed.

The Borana land is one of the known rangelands in east Africa and the people are known for their strong traditional institutions and mutual social protection or insurance mechanisms, which enabled them to survive in such fragile environment. These include busa-gonofa and the Gada system as a community based indigenous democratic governance system.

As Legesse (1973) put it, the Borana Gada system

is a complex traditional democratic system of self-rule that governs the social, economic, political and spiritual life of the whole Oromo society.

Pastoralists in the study rear the four major livestock species found in the Horn of Africa – sheep, goats, cattle and camels. Cattle and sheep are the most dominant species since pastoralist areas are mostly flat and the long dry season that covers from October to February is usually cold, which is a problem for goats and camels. Camels and goats are dominant and are common in the mountainous ranges where the bushy plants (used by browsers) are common.

Pastoral area rangelands experience low rainfall with long spell of dry seasons and frequently recurring drought. The influence of drought on the quantity and quality of forage production has largely affected pastoralists' livelihoods. That is, the productivity of the rangelands is determined mostly by variation in the rainfall patterns. The amount of average rainfall in the study areas ranges from 500 to 700 mm per year. Still worse, the distribution and intensity of the rainfall is erratic and irregular. The existing rangelands are mainly woodlands without any grass and they appear to be infested badly with some undesirable plant species. Additionally, rangelands are also subject to the problem of soil compaction. Several factors cause degradation of rangelands though their impacts vary across time and space. In the study areas, the main reasons for rangeland degradation are climate change, repeated and prolonged drought, over grazing (over population of livestock and low mobility), soil erosion (gully formation) and deforestation. The frequent drought, which the households experienced for the

past two decades, reduced the quality (grass and tree composition) and coverage of rangelands.

Over grazing, especially in the grazing areas, reduced the rangelands species composition and sometimes made them rocky. Although soil erosion is not considered as a cause it is found important for the formation of gullies that dissect rangelands and make them inaccessible. Deforestation is mainly practiced during drought period when sales of fuel wood and charcoal serve as a mechanism to cope with food shortfalls. In pastoralist areas, ownership pattern of the grazing land is mainly communal type and they are using the grazing and pasture lands available for large number of animals and all stock graze in the same place. Livestock feed one of the key variables that affect the livestock productivity in addition to water and veterinary medicine. But for different species of livestock the availability of feed varies across seasons. In dry season feed is available more for camel and small ruminants and is scarce for cattle. The basic grazing management practices of Ethiopia pastoralists in the rangelands are moving animals each season and moving to distant places when the situation turns against them. They also move animals in dry season though it is preferred to keep them in settlement area in wet season. In some situations herds are divided into moving and village groups. Burning grazing land is practiced in order to initiate fresh grass growth and avoid incidences of some parasitic insects.

## General characteristics of household survey respondents

Table 1 shows the general characteristics of respondent pastoralist households in the survey.

Variable	Description of variables	Mean	Std. Dev.	Min	Max
IBLI uptake	=1 if insured, 0 otherwise	0.38	0.49	0.00	1.00
hrhrfeed	Expenditure on improved feed (Birr)	1456.62	2605.98	22.00	27000.00
hrhrvetmed~e	Expenditure on veterinary medicine (Birr)	460.37	1034.33	8.00	14352.00
Wfcp	Per capita weekly food consumption (Birr)	48.96	61.50	16.00	929.00
Topc	Per capita annual consumption (Birr)	528.39	604.75	13.00	6667.00
Livestocki~e	Livestock income (Birr)	9677.11	15944.95	100.00	150000.00
Age	Age of head (Years)	45.70	45.38	1.00	999.00
Gender	Sex of head (=1 if male 0 otherwise)	0.65	0.48	0.00	1.00
eduyears	Education level of head (years)	1.35	3.31	0.00	13.00
familysize	Number of family member	6.30	2.82	1.00	32.00
droughtf~qcy	Drought frequency	2.61	0.66	1.00	4.00
TLU	Number of livestock in TLU	15.44	13.45	0.00	136.00
nonfarmemp~t	Participation in non-farm employment (1= if participated, 0 otherwise)	0.32	0.47	0.00	1.00
nettransfe~n	Net income transfer from IBLI (Birr)	1199.56	6748.90	-30288.00	27997.00
mentalacco~g	Mental accounting (1= if yes 0 otherwise)	0.21	0.41	0.00	1.00
peerinflue~e	Peer influence (1= if yes, 0 otherwise)	0.40	0.49	0.00	1.00
distr1moyale	Dummy woreda (1= if moyale, 0 otherwise)	0.74	0.44	0.00	1.00

About 74% of the respondents were from Moyale district. About 65% of the pastoralist households in the survey were headed by male and about 38% of the respondents are beneficiary of IBLI. On the other hand about 32% of the respondents participated in nonfarm employment activities. Only 21% of the respondents plan different account for different purposes and about 40% reported that their decision uptake the IBLI was influenced by peers.

*Table 2, shows the mean difference test of variables used in the model between beneficiary and non-beneficiary pastoral households.*

<b>Variable</b>	<b>Beneficiaries of IBLI</b>	<b>Non-beneficiaries of IBLI</b>	<b>Diff. in Mean</b>
Age of the HH head (year)	48.07 (5.14)	44.26 (0.95)	-3.81 (4.18)
Sex of the HH head (male=1)	0.67 (0.03)	0.63 (0.03)	-0.04 (0.04)
Family Size (number)	6.77 (0.15)	6.02 (0.22)	-0.75*** (0.26)
Education level (number of year)	1.38 (0.24)	1.33 (0.19)	-0.05 (0.31)
Number of livestock in TLU	14.81 (1.00)	15.82 (0.75)	1.01 (1.24)
Livestock income (birr)	15785.40 (1638.35)	5976.90 (458.78)	-9808.50 (1404.14)
Drought frequency (times)	2.66 (0.04)	2.57 (0.04)	-0.09 (0.06)
Mental Accounting	0.45 (0.04)	0.06 (0.01)	-0.39*** (0.03)
Trust of OIC	1 (0)	0.45 (0.03)	-0.55*** (0.04)
Peer influence	0.96 (0.01)	0.06 (0.01)	-0.90*** (-0.02)



Table 2 shows that there is statistically significant difference in family size between insured and uninsured pastoralist households at 1percent level of significance. However, there is no empirical evidence about the significant variation between insured and uninsured households in terms of gender of head, age, and education level.

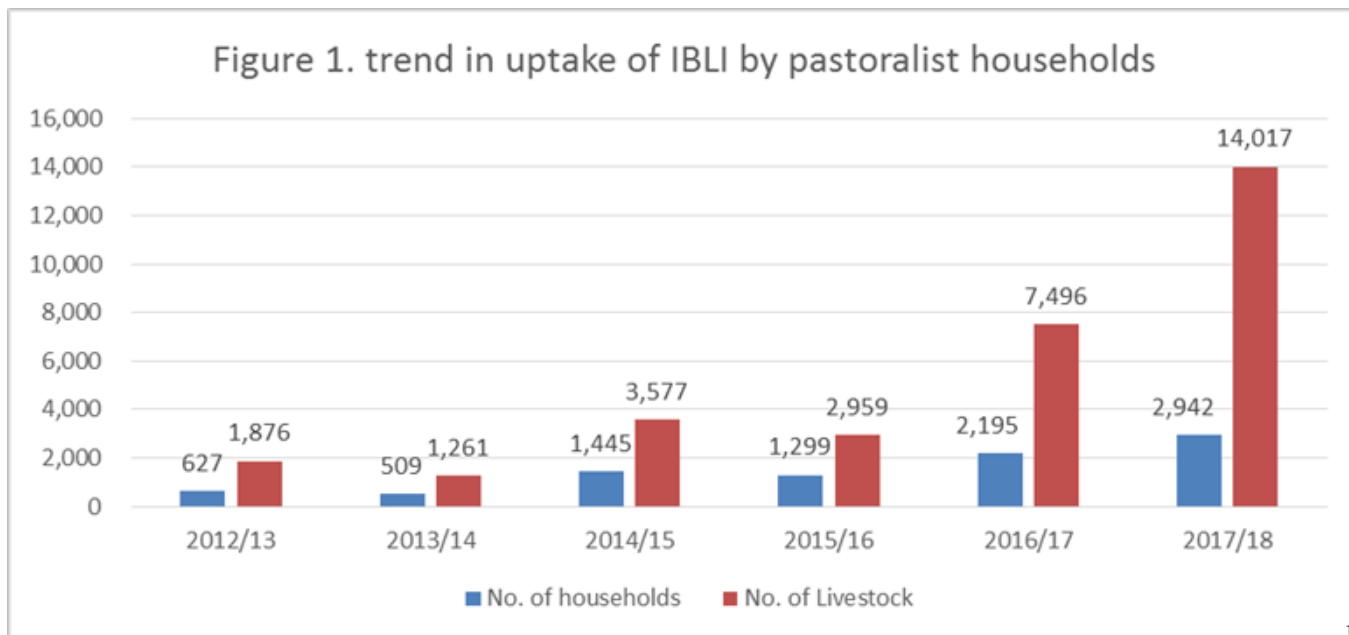
The result shows that there was significant difference in number of livestock owned in tropical livestock Unit (TLU) between insured and uninsured pastoralists at 1 percent level of significance. The mental accounting has significant variation between insured and uninsured pastoralist at 1percent level of significance. This means that household head with good mental accounting, people having different plans for different purposes, are more likely to buy the policy compared to households without mental accounting.

Trust of household head towards Oromia Insurance Corporation varied significantly between insured and uninsured households at 1percent level of significance. Similarly, peer influence varied significant between buyers and non-buyers at 1percent level of significance.

### Trend in uptake of IBLI by the pastoralists and factors affecting uptake of IBLI

#### Trend in uptake of IBLI

Figure 1 below in the annex shows the trend in uptake of IBLI by pastoralists in terms of number of households purchased IBLI and livestock insured. The figure shows that there has been a significant rise in both the number of households who purchased the insurance and livestock insured. The number of pastoralist households purchased insurance significantly rose from 627 to 2,942 or 364% gross

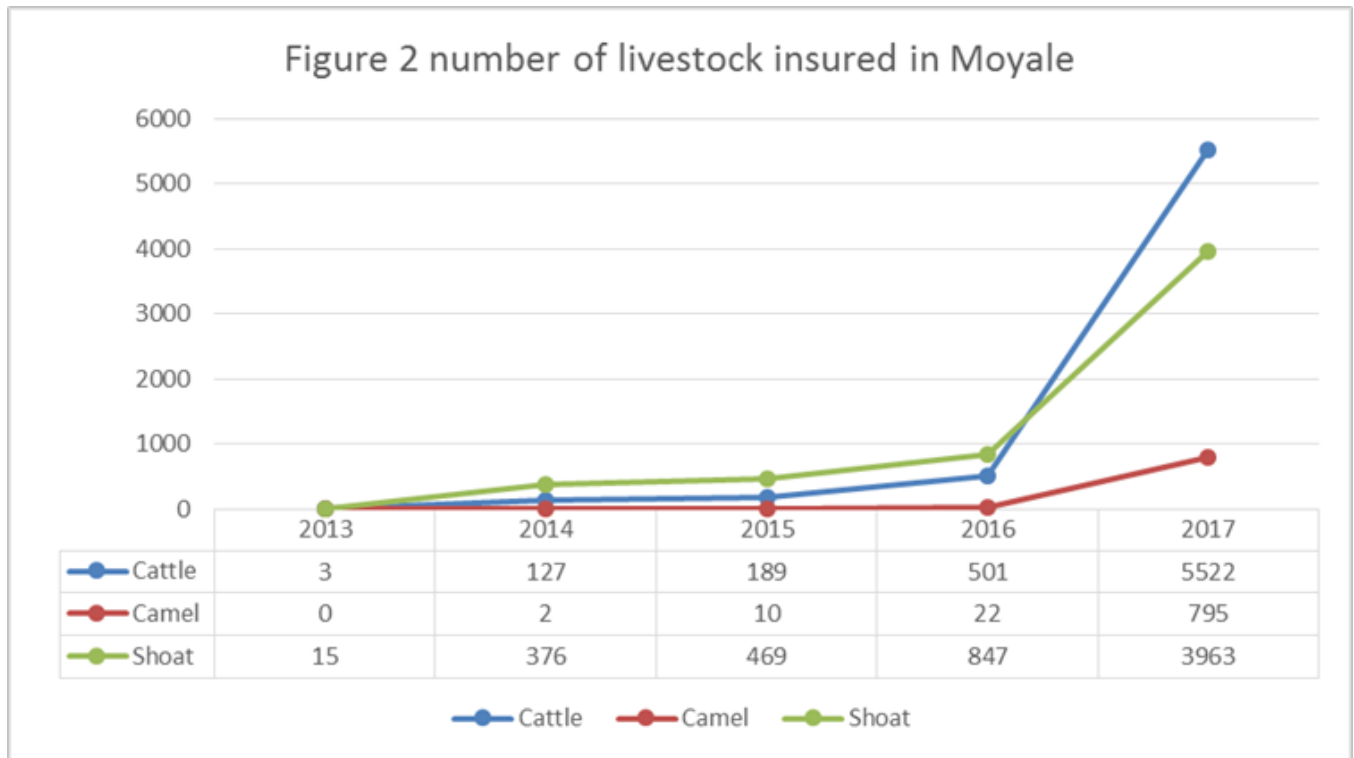


growth rate during 2012/13 to 2017/18 FY (Fiscal Year).

Annual growth rate average was about 52% for the period. This shows that overtime the pastoralists had become more acquainted with the importance of the IBLI and hence demanded more insurance product. Moreover, the number of insured livestock increased exponentially from 1,876 to 14,017 during the period. In percentage this is about 647% compared to the base year. The annual growth rate of number of livestock insured was about 75%. Therefore, uptake of IBLI has shown an exponential growth. This conforms to the information acquired during FGD with selected

pastoralists. They explained that even after the subsidy is terminated demand for the insurance is rising significantly. Our FGD participants predicted that IBLI demand continues to rise in the coming years.

*Figure 2 and Figure 3 in the annex show number of livestock insured by type of livestock by the two woredas Moyale and Miyo respectively. Note the data show the aggregate sum of insurance policies sold in the two sales windows (January and August). The three livestock types insured by pastoralists were cattle, camel and shoats.*



The figure shows that in both woredas the total number livestock insured rose significantly in the last two fiscal years (2016&2017. The data shows also that more number of cattle was insured followed by camel and shoats respectively.

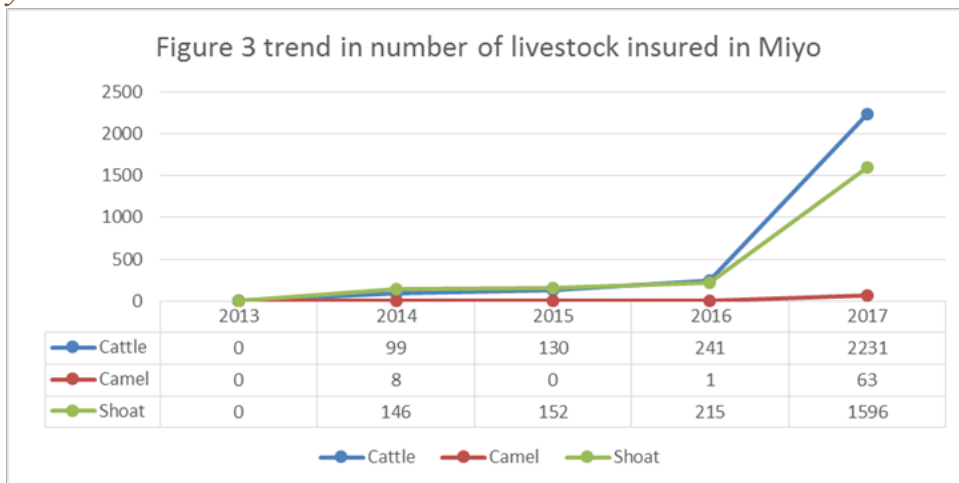
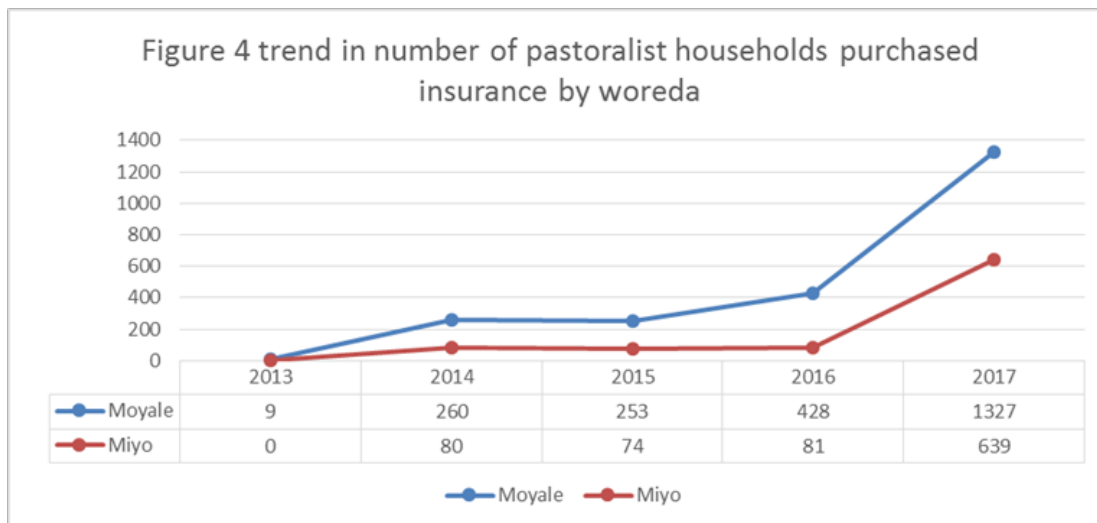


Figure 4 in the annex depicts trend in the total number of pastoralists households purchased IBLI in the two sales windows. The figure shows that uptake of IBLI increased overtime in both woredas. The major percentages of insured pastoralists were situated in Moyale woreda. For the time period (2013–2017) high proportion of insurance purchasers were from Moyale which accounted for annual average of 81% compared to only 19% were from Miyo woreda.



## Factors affecting uptake of IBLI

Table 3 reports the result of linear probability model, the selection equation estimated using the Ordinary Least Square (OLS) or simple regression model.

Table.3 Stage one: Linear probability model of determinants of uptake of IBLI

Linear regression		Number of obs	=	500		
		F(12, 15)	=	5494.53		
		Prob > F	=	0.0000		
		R-squared	=	0.8104		
		Root MSE	=	.21395		
(Std. Err. adjusted for 16 clusters in kebeleid)						
ibliuptake	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
Livestockincome	1.54e-06	1.01e-06	1.53	0.147	-6.08e-07	3.69e-06
age	-.0000416	.0000751	-0.55	0.588	-.0002017	.0001186
Gender	-.0156956	.0259613	-0.60	0.554	-.0710307	.0396396
eduyears	.0013526	.0037789	0.36	0.725	-.0067019	.009407
familysize	.0058461	.0029703	1.97	0.068	-.0004849	.0121772
droughtfreqcy	-.0212517	.0184782	-1.15	0.268	-.0606371	.0181337
TLU	-.001046	.0005595	-1.87	0.081	-.0022385	.0001466
nonfarmemplyt	-.0165922	.0241677	-0.69	0.503	-.0681045	.0349201
nettransferin	1.05e-06	1.92e-06	0.55	0.593	-3.04e-06	5.14e-06
mentalaccounting	.1406162	.0480033	2.93	0.010	.0382995	.2429329
peerinfluence	.8208729	.0363692	22.57	0.000	.7433537	.8983921
distrlmoyale	.0061497	.017071	0.36	0.724	-.0302364	.0425357
_cons	.0512436	.0463535	1.11	0.286	-.0475566	.1500437

(Dependent variable ibliuptake is dummy, takes value 1 if pastoralist purchased IBLI and zero otherwise)

It shows the estimated effect of determinant factors affecting pastoralists' uptake or demand for IBLI. The model controlled for number of demographic variables. Nevertheless, none of the demographic variables were statistically significant except household (family) size. This is consistent to previous studies concluded that demographic characteristics have no or little effect on the uptake of IBLI. Our finding indicates that uptake of IBLI is positive correlated with family size. This is likely related to the fact that when family size increases uptake of IBLI increases as the fear of exposure to risk of livestock loss leave them more vulnerable food insecurity. On the other hand, the finding shows that there is no empirical evidence supporting that there is gender differential in pastoralist uptake of IBLI since the gender effect was statistically insignificant. In deed in our FGD with pastoralists the participants indicated that both male and female pastoralists purchase IBLI.

The results of the models show that two variables mental accounting, peer influence had positive and significant effect on IBLI uptake and thus serve as suitable instruments. IBLI uptake is negatively correlated with mental accounting. This is perhaps because pastoralist households who plan different accounts for different purposes have better capacity to save money to buy insurance compared to others. Similarly, as expected uptake of IBLI is positively correlated with peer influence. This is consistent with relevant theory as most peasant pastoralists are presumed to be risk averter and they make gradual learning from experience of their peers.

Our finding also shows that total number of livestock owned by pastoralist household was associated negatively with uptake of IBLI and significant at 10 percent level of significance. This is perhaps because pastoralists with large number of livestock are rich class and have more capacity to better manage the exposure to drought and lower the risk of loss of livestock. For instance, they may sell some of their livestock and buy improved feed for their livestock instead of adopting IBLI. This finding confirms to our FGD result; pastoralists stated that households with large number of livestock are more reluctant in uptake of IBLI.

### **Community perception on IBLI**

Pastoral communities in Ethiopia often pool various development interventions. Most such interventions provide aid and humanitarian services. So, for a community that have been subjects of aid, perception of aid dependence syndrome can prevail. In addition, we expect that as compared with the common micro-finance model, IBLI as a micro-insurance model entails the perception of reversal of cash flow in the mind of the pastoralist. This is because micro-finance offers credit in which pastoralists borrow today and repay tomorrow. On the contrary, IBLI requires the pastoralist out-of-pocket payment today, the returns of which are contingent on future occurrence or risks. So, this reversal cash flow can make pastoralists to perceive that IBLI is risky, particularly as compared with the traditional rural credit offers. In this study, we assessed the perception of the community in the Borana zone about the IBLI concept and suggest possible recommendation for effective implementations that

take these perceptions into account in the future.

### **Perception towards climate change risks on their livelihood**

The pastoralists explained that climate change risks such as drought, increased temperature, change in pattern of rain and its seasonality are some of the challenges affecting their livelihoods adversely. Since the area is a semi-arid, rain is a sole source of water for producing fodder/feed for their livestock. They described that drought is the most severe climatic problem that they face year in and year out. Overtime they observed an erratic change in rainfall both in terms of its intensity and seasonality. For instance, one participant described that in early period they used to get rain for three months in each of the two rainy seasons but now days it rains only for three days in each of the rainy season. Livelihoods of pastoralists heavily depend on livestock, and extended drought/loss of rain/shortage of drinking water and fodder adversely affect their livelihoods (income, food security). This is because of shortage of fodder and feeding for their livestock. In qualitative interview we made them, the pastoralists also indicated that their land has become degraded and infertile.

This has resulted in decline in productivity in terms of feed/fodder yield for their livestock. Another climate related risk they identified is the change in tree species grown in the area. Some pastoralists stated that trees have become more toxic for livestock to graze as compared to earlier period. They also stated that the types of grasses being grown now days are changing. The grass species grown now days are fast grown

and dries quickly. Therefore, the immediate negative impact of climate change or drought is reflected in loss of livestock, forced selling of livestock and hence this directly affect their food security and welfare.

### **Perception towards contribution of IBLI in protecting the livelihoods of households against climate risks**

In our discussions and interviews, participant pastoralists underlined the important contribution of IBLI in protecting their livelihoods against climate risks. First, the participants indicated that in the old IBLI approach pastoralists receive payouts as indemnification for their losses of livestock. This helped them to cope with the adverse impact of drought, and to substitute their lost livestock but complain that they can't substitute the breed they had after death. Second, in the new IBLI approach, they stated that the insurance company payouts prior to the occurrence of drought risk (death of livestock) so that they purchase fodder for their livestock to cope with anticipated drought. This has minimized death of their livestock. More than 90% of the pastoral households indicated that they prefer this new approach as it is more effective in enabling them to mitigate negative impact of drought in a proactive manner.

### **Impact of IBLI on policyholders**

The impact of IBLI on policyholder was analysed by investigating the effect of predicted IBLI (iblihatt) from the step one above (Table 3).

Two types of impacts were considered. First, impact on investment on high risk –high-return production inputs was investigated using expenditure

on improved feed and on veterinary medicine as dependent variables. Second, the impact of IBLI uptake on pastoralist welfare was examined by taking per capita weekly food consumption and per capita annual consumption as dependent variable in step two. In all cases the OLS or simple linear regression was applied to estimate the coefficient of iblihatt and other explanatory variables. The coefficient on predicted IBLI measures the causal effect of adoption of IBLI on policyholder.

Table 4 reports the impact of pastoralist's adoption of IBLI on expenditure on improved seed. Since the variables mentalaccounting and peerinfluence were used as instrument for the potential uptake of IBLI in step one, the coefficient on predicted IBLI 'iblihatt' has a strong causal effect on pastoralist expenditure on improved livestock feed, indicating that the pastoralists use insurance coverage to increase their expenditure on improved feed for their livestock; enabling them to cope with drought risks. The estimated coefficient on iblihatt indicates that uptake of

## IBLI adoption on usage of high-risk high-return production inputs

### Impact on expenditure on improved feed

*Table 4: Stage 2-OLS regression (expenditure on improved feed) estimate*

<b>Linear regression</b>	<b>Number of obs</b>	=	<b>500</b>		
	<b>F(11, 15)</b>	=	<b>244.87</b>		
	<b>Prob &gt; F</b>	=	<b>0.0000</b>		
	<b>R-squared</b>	=	<b>0.5040</b>		
	<b>Root MSE</b>	=	<b>1857.7</b>		
(Std. Err. adjusted for 16 clusters in kebeleid)					
hrhrfeed	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]
iblihatt	1947.043	244.0765	7.98	0.000	1426.806 2467.28
livestockincome	.0452934	.0148439	3.05	0.008	.0136543 .0769325
age	-.0637021	.9436776	-0.07	0.947	-2.075103 1.947699
Gender	113.6436	144.5778	0.79	0.444	-194.5167 421.804
eduyears	48.56949	26.35316	1.84	0.085	-7.600942 104.7399
familysize	136.3046	39.76509	3.43	0.004	51.54727 221.0619
droughtfreqcy	-51.26204	97.12654	-0.53	0.605	-258.2824 155.7583
TLU	64.24403	12.77057	5.03	0.000	37.0242 91.46386
nettransferin	-.0053661	.0152725	-0.35	0.730	-.0379186 .0271864
nonfarmemplyt	-274.4281	178.0518	-1.54	0.144	-653.9365 105.0803
distrlmoyale	-20.62918	123.4168	-0.17	0.869	-283.6859 242.4275
_cons	-1460.026	492.1599	-2.97	0.010	-2509.04 -411.0123

IBLI resulted in increase in pastoralist expenditure on improved feed by about 1943 birr, citrus paribus.

In addition to estimating the causal effect of IBLI uptake on pastoralist expenditure on improved livestock feed, we controlled for other covariates. The result shows a theoretically consistent effect of livestock income and number of livestock owned by pastoralists on their expenditure on improved feed, citrus paribus. Similarly, the finding indicates that increase in the education of household head is associated positively with an increase in expenditure

on improved feed.

### Impact on expenditure on veterinary medicine

Table 5 reports the estimated impact of IBLI on pastoralist expenditure on veterinary medicine. The coefficient on the predicted IBLI uptake or the variable *iblihatt* is positive and statistically significant at 1 percent level of significance. The point estimate suggests that insuring the livestock increases expenditure on veterinary medicine by 928 Birr, citrus paribus.

*Table 5: Stage 2-OLS regression (expenditure on veterinary medicine) estimate*

Linear regression		Number of obs	=	500		
		F(11, 15)	=	202.71		
		Prob > F	=	0.0000		
		R-squared	=	0.4671		
		Root MSE	=	764.13		
(Std. Err. adjusted for 16 clusters in kebeleid)						
hrhrvetmedicine	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
<i>iblihatt</i>	934.5034	63.28584	14.77	0.000	799.6128	1069.394
<i>livestockincome</i>	-.0184162	.0066571	2.77	0.014	-.0042269	-.0326055
<i>age</i>	-.0256219	.6567782	0.04	0.969	-1.374268	1.425511
<i>Gender</i>	-7.849206	50.03457	-0.16	0.877	-114.4954	98.79695
<i>eduyears</i>	8.017582	9.611371	0.83	0.417	-12.46857	28.50373
<i>familysize</i>	35.00863	24.55813	1.43	0.174	-17.33578	87.35304
<i>droughtfreqcy</i>	-9.020179	32.75544	-0.28	0.787	-78.83674	60.79639
<i>TLU</i>	18.08408	4.214826	4.29	0.001	9.100389	27.06777
<i>nettransferin</i>	-.0086917	.0056536	-1.54	0.145	-.0207419	-.0033586
<i>nonfarmempty</i>	-104.324	61.93071	-1.68	0.113	-236.3262	27.67819
<i>distrlmoyale</i>	14.77716	38.27033	0.39	0.705	-66.79412	96.34845
<i>_cons</i>	-520.5763	156.835	-3.32	0.005	-854.8623	-186.2904



This is perhaps because IBLI improves pastoralists' capacity to spend on veterinary medicine to reduce risk of livestock loss. Similarly, expenditure on veterinary medicine was positively associated with an increase in the households head's education level, increase in livestock income and number of livestock owned by pastoralists.

## Impact of IBLI adoption on household consumption

### Impact on per capita weekly food consumption

Table 6 reports the estimated impact of IBLI on per capita weekly food consumption of pastoralist. The estimated result shows a strong positive effect of IBLI on per capita weekly food consumption at 1 percent level of significance.

*Table 6: Stage 2-OLS regression (per capita weekly consumption) estimate*

<b>F (11, 15)</b>	=	<b>27.01</b>
<b>Prob &gt; F</b>	=	<b>0.0000</b>
<b>R-squared</b>	=	<b>0.2174</b>
<b>Root MSE</b>	=	<b>55.062</b>

(Std. Err. adjusted for 16 clusters in kebeleid)

<b>wfcpc</b>	<b>Coef.</b>	<b>Robust Std. Err.</b>	<b>t</b>	<b>P&gt; t </b>	<b>[95% Conf. Interval]</b>	
<b>iblihatt</b>	<b>46.54461</b>	<b>7.019806</b>	<b>6.63</b>	<b>0.000</b>	<b>31.58224</b>	<b>61.50697</b>
<b>astockincome</b>	<b>.0007236</b>	<b>.0002443</b>	<b>2.96</b>	<b>0.010</b>	<b>.000203</b>	<b>.0012443</b>
<b>age</b>	<b>-.0110955</b>	<b>.0145433</b>	<b>-0.76</b>	<b>0.457</b>	<b>-.0420938</b>	<b>.0199028</b>
<b>Gender</b>	<b>5.015067</b>	<b>3.746128</b>	<b>1.34</b>	<b>0.201</b>	<b>-2.969615</b>	<b>12.99975</b>
<b>eduyears</b>	<b>2.929247</b>	<b>1.309705</b>	<b>2.24</b>	<b>0.041</b>	<b>.137677</b>	<b>5.720817</b>
<b>familysize</b>	<b>-3.318488</b>	<b>1.03747</b>	<b>-3.20</b>	<b>0.006</b>	<b>-5.529804</b>	<b>-1.107172</b>
<b>oughtfreqcy</b>	<b>-4.783915</b>	<b>3.157432</b>	<b>-1.52</b>	<b>0.151</b>	<b>-11.51382</b>	<b>1.945993</b>
<b>TLU</b>	<b>-.0094195</b>	<b>.1607618</b>	<b>-0.06</b>	<b>0.954</b>	<b>-.3520751</b>	<b>.3332362</b>
<b>sttransferin</b>	<b>-.000382</b>	<b>.0003091</b>	<b>-1.24</b>	<b>0.236</b>	<b>-.0010408</b>	<b>.0002768</b>
<b>nfarmemptyt</b>	<b>2.261054</b>	<b>6.853253</b>	<b>0.33</b>	<b>0.746</b>	<b>-12.34631</b>	<b>16.86842</b>
<b>listrlmoyale</b>	<b>-3.335544</b>	<b>2.587472</b>	<b>-1.29</b>	<b>0.217</b>	<b>-8.85061</b>	<b>2.179522</b>
<b>_cons</b>	<b>53.49035</b>	<b>11.6763</b>	<b>4.58</b>	<b>0.000</b>	<b>28.6029</b>	<b>78.37779</b>

The estimated coefficient of the predicted IBLI uptake indicates that IBLI causes per capita household weekly food consumption to increase by about 46 birr, other factors remaining constant.

### Impact on per capita total annual consumption

*Table 7: Stage 2-OLS regression (per capita annual consumption) estimate*

**F(11, 15)** = 21.75  
**Prob > F** = 0.0000  
**R-squared** = 0.2130  
**Root MSE** = 543.01

(Std. Err. adjusted for 16 clusters in kebeleid)

<b>tcpc</b>	<b>Coef.</b>	<b>Robust Std. Err.</b>	<b>t</b>	<b>P&gt; t </b>	<b>[95% Conf. Interval]</b>	
<b>iblibatt</b>	225.7282	72.66707	3.11	0.007	70.842	380.6144
<b>Livestockincome</b>	.0092793	.0019359	4.79	0.000	.0051531	.0134056
<b>age</b>	-.0451588	.2335505	-0.19	0.849	-.5429599	.4526423
<b>Gender</b>	-7.80152	62.79695	-0.12	0.903	-141.65	126.047
<b>eduyears</b>	53.82151	23.28105	2.31	0.035	4.199114	103.4439
<b>familysize</b>	-40.5645	11.39539	-3.56	0.003	-64.8532	-16.2758
<b>droughtfreqcy</b>	-50.9244	45.44189	-1.12	0.280	-147.7815	45.9327
<b>TLU</b>	-4.790505	2.475037	-1.94	0.072	-10.06592	.4849127
<b>nettransferin</b>	.0045675	.0023534	1.94	0.071	-.0004486	.0095837
<b>nonfarmemptyt</b>	-16.76101	53.65164	-0.31	0.759	-131.1168	97.59475
<b>distr1moyale</b>	-6.627003	62.37738	-0.11	0.917	-139.5812	126.3272
<b>_cons</b>	755.8592	150.1367	5.03	0.000	435.8504	1075.868

Table 7 shows the impact of IBLI on the per capita household annual consumption. The result shows that IBLI has strong positive causal effect on the per capita annual household consumption. The finding indicates that uptake of IBLI increases the per capita annual household consumption by 229 Birr.

### **Source of initial information on IBLI scheme**

Pastoralists explained that on their periodic schedules village insurance promoters (VIP) make meetings with them time to inform, orient and train about (1) nature and seasonality based weather variations, and the emerging climate change induced drought that they face (ii) the need for insurance to mitigate the adverse effects of these risks and (iii) the IBLI insurance working philosophy. Participant pastoralist witnessed that from the awareness creation and training offered to them through their VIPs, they have acquired very good knowledge about insurance, particularly the weather index-based livestock insurance. Furthermore, the information that pastoralists obtain from their fellow peers and social organizations are crucial in increasing their awareness about IBLI. This was shown in the quantitative analysis above.

### **Perception towards the advantages and disadvantages of IBLI**

The participant pastoralists in our FGD identified several benefits of IBLI. First, the payouts as indemnification for lost animals in the old approach and to purchase fodder in the new approach gave pastoralists a means of coping with drought. Second, the pastoralists indicated that they pay less premium but receive huge compensation or

payouts as indemnification. Third, it created general awareness about climatic changes and the way outs. The pastoralists also identified limitations of the IBLI. First, they indicated that at first there was lack of awareness about IBLI in the pastoralists communities. This is because the concept of insurance is new to pastoralist communities. Accordingly, there is a need for more education, awareness creation and trainings. Second, few of the respondents felt that the premium is too high, especially for the poor groups. Third, the participants in our FGD stated that they are discouraged by termination of subsidy provision by CIFA without any prior notification. They stated that subsidy is very crucial to motivate them and attract more customers. In this regard, the participants indicated that subsidy is important to attract poor pastoralists, and hence it need to be scaled-up to reach more people. But CIFA's capacity is limited and demand is increasing exponentially. Lastly, the participants indicated that pastoralists do not purchase insurance because they do not receive payouts as indemnification if there is a good rain.

### **Role of Gada system on pastoralists' uptake of and trust on IBLI**

The pastoralists in our FGD described that there are two ways to increase public trust on the IBLI services: First, through government structure, Second, through the Gada elders or well-known people in the communities. They described that promotion of IBLI through the Gada elders can increase pastoralists' acceptance and trust on service because they have inherent trust on Gada elders. According to them, the Abba Gada in Borena tradition has a loud voice,

respect, and acceptance. They also underlined that instead of leaving to the insurance company alone the government and other NGOs need to work together on the IBLI promotion and assure its sustainability. They stated that the government (at different stages) has key role to train/educate the pastoralists and provide sustainable subsidy. In addition to subsidy, they highlighted the experience of other regions such as Somalia to employ the poor pastoralists on natural resource conservation (terracing) to cover their premium. However, according to them, they are concerned that the government has not taken the IBLI seriously. They recommended that IBLI has to be given recognition as government's program. This, according to the pastoralists, will improve sustainability, build trust on IBLI, and offer them confidence or give them guarantee.

### **Pastoralists' perception on the benefits of IBLI intervention**

Beneficiary participant pastoralists in our FGD listed number of benefits of IBLI. First, most pastoralists received payouts as indemnification for their loss. Once they purchase insurance their livestock is insured against any drought induced death of livestock. Second, the new approach of prior payouts as indemnification for anticipated drought or supplies of fodder enabled pastoralists to tackle loss of their livestock. The participants have shown their preference for the new approach as a proactive strategy to mitigate loss of livestock.

### **Perception on basis risks**

During our FGD, the pastoralists indicated that the IBLI met their expectations. Regarding the basis risk that the satellite helps to distinguish drought impact, in most cases, pastoralists found pattern of payouts and amount paid as fair but we observed some irregularities and complains. For instance, the FGD participants in Hidhbaboke kebele in Miyo Woreda explained the mismatch between the period of satellite mapping and occurrence of drought in 2015. According to them, Satellite mapping took place during December to February but livestock died in March in that year. Hence, payouts were not triggered for lost livestock, which in turn resulted in complaint. The intensity of risks is variable between highland and lowlands as the risk is more severe in the lowland.

### **Partners' implementation strength and gaps**

The researchers have undertaken an in-depth-interview with partner organizations such as OIC higher officials including the Manager of the Department of Micro-insurance, CIFA zonal Ethiopia zonal and field representatives and IRLI zonal representative to identify their strengths and gaps in implementing the project.

### **Oromia Insurance Company S.C**

According to the interview conducted with micro insurance department of OIC, it is an innovative insurance company transacting all class of business under one roof, Life and Micro insurance. It was established and commenced operation in January 2009. Due to the fact that 1.5 million farmers and pastoralists are the founding shareholders of OIC, it started rendering micro insurance activities

immediately after one year commencing in to operation, with the intention of providing protection to its shareholders and extending corporate social responsibility, and looking first mover's advantage as well. As such, so far, OIC has been operating and rendering micro insurance services in Oromia and Benishangul Gumuz Regional states.

The insurance company mentioned that in collaboration with World Food Programme (WFP) and three insurance companies it is planning to launch Index Based Livestock Insurance in Somali Regional state. Micro insurance in general, even in developed countries is subsidized by government and/or donors. As a company, OIC is working to develop Public-Private –Partnerships so that the government will provide some sort of subsidy and participate on community mobilization activities that would in turn have a positive impact to extend our outreach to the excluded part of the population, low income people. Therefore, for OIC, micro insurance in general is strategic area and passion and is planning to expand to other parts of the country that are vulnerable to climate risks. Within the coming three years, OIC planned to expand IBLI to Bale, Somali and Afar pastoralists.

CIFA Ethiopia has been collaborating with OIC on Index Based Livestock Insurance (IBLI) in Moyale and Miyo districts since January 2014 in the following areas. First, OIC officials explained that CIFA was undertaking awareness creation and community mobilization activities which reduced burden from OIC. This promotion aspect is very important in

increasing uptake of the technology which then increases the economic benefits of the intervention at household as well as community levels. Second, using its own financial resources CIFA have been helping OIC for the adoption IBLI by producing and distributing producing promotional materials. Thirdly, CIFA has also been covering training costs for Village Insurance Promoters and Sales Agents that reduces the administration costs for OIC. Fourthly, CIFA was providing 35% premium subsidy for pastoralists who were trapped in liquidity constraints to pay the premium upfront. As a result of premium subsidy that has been provided by the CIFA to pastoralists of Miyo and Moyale districts, OIC was able to increase its sales (both number of customers and volume of premium). However, out of the total sales achievement, almost more than 65% of the premium collected comes from these two districts that shows really the project been helping pastoralists to purchase the IBLI.

The manager raises to be worked on was that our research should influence the insurance policy of the National Bank of Ethiopia. The micro insurance service is a special service for smallholders. Those pastoralists with whom they work were indicated to have a liquidity constraint, and may not have excess cash to buy insurance by paying the premium upfront. OIC is a young insurance company looking to explore any opportunity that would help to increase its outreach to the low income people. Therefore, working with research institutions will be helpful to OIC in supporting our works with researches and to explore any opportunity that might come in this regard. Starting from the beginning, for technical

merits, OIC works with various partner organizations including the ILRI and Kifia Financial Technology. OIC is gradually expanding its area of operation based on its own plan. With new innovative findings from various partners, the company has a full interest to move to new areas with the new products.

As a constraint what OIC official raised is the fact that the company currently works with low income people which requires intensive initial capital investment. The company currently charges a pure premium which is only 15 percent of the payout. This revenue is not adequate to cover all administration costs. However, charging the pastoralist beyond this further discourages the uptake which is even quite low by its own reason. In addition, the microinsurance activity of OIC, for instance selling the conventional insurance product, is undertaken through agents, namely, cooperatives and cooperative unions that often ask about 5% of the total premium collected for covering their administration costs. At the start of the OIC agricultural insurance operation, during 2013-2014, financing all project administration and logistic costs were initiated by the International Livestock Research Institute (ILRI) which funds all capacity building costs of OIC to promote microinsurance for livestock. However, in the future such offer may not be in place. Hence, covering these costs from its own source will become a major operational impediment for OIC. Except this, OIC officials explained that they are very much enthusiastic and has a full willingness and ability to implement innovative research-oriented livestock insurance products for a full scale impact evaluation. Lack of technical capacities in product

development, index design and pricing and lack of enabling regulatory framework are also the other constraints of OIC.

Insurance in general is low of large number and this holds for microinsurance as well. Currently, the OIC's outreach with regard to IBLI is limited to 10 districts with quite low level of penetration. Thus, it is working on how to go at large scale so that the product will be viable and that in turn insures its sustainability. Another important thing we need to consider while thinking the improvement of commercial sustainability of IBLI is regulatory issue.

There has to be conducive/supportive and enabling regulatory environment that promote microinsurance in general. Similarly, Government needs to consider microinsurance as one of the development strategies and should extend any support required of it. On top of this, currently OIC, in collaboration with donors and research institutions like ILRI are investing on insurance education so that pastoralists could make informed decisions in purchasing IBLI. The premium has to be affordable to pastoralists. Lastly, there has to be fast and reliable claim settlement whenever there is a claim, so that the pastoralists will be able to understand that insurance is really working and benefiting them. So far, OIC has been undertaking marketing activities through market day education, using pictorial teaching aids, using marketing materials (T-shirts and Capes) and etc. This has been challenging OIC as it requires huge capital. Therefore, OIC in collaboration with partners is working on how to digitalize, developing learning tools, Clickers

and the like so that it can reach the pastoralists easily, collect premiums and pay claims digitally.

### **CIFA Ethiopia**

There are many organizations working to help pastoralists cope up with climate risks in Borena Zone in general and particularly in Moyale and Miyo Woredas. Some of the organizations are working on creating awareness on how to use the farm products during such climatic conditions; others help pastoralists in providing subsidy for insurance premiums, others try to provide fodders for animals of the pastoralists, while others try to provide water for them.

The organizations in the zone are working independently. Sometimes, even, they are engaged in similar tasks using contradicting approaches. This is, partly because, there are no collaborations among the organizations working in the area. If these organizations collaborate and work together, they can share resources like information and logistics so that duplication of effort will be minimized. These discussants are the middle level facilitators of the IBLI insurance intervention. Development agents (DAs), extension officers and supervisors have participated on the various training activities on the IBLI insurance. Their role in the community is to advertise, promote and sell the insurance product. They have also collected feed-back and comments of the households. In addition, they were also engaged in collecting the baseline, midline and end-line data of OIC intervention.

These participants believe that given the severe

drought Borana zone of Ethiopia and the observed losses of welfare at the grassroots level, insurance serves as a means of earning livelihood for the smallholders. They also addressed that since micro-insurance serves the poor and vulnerable households, this makes it a special service to reach the mass of smallholders. According to these agents, experts and officers the IBLI insurance intervention has solved the migration problems of the households in the area. Households, who used to migrate to far areas due to drought risks, have made settle and become resilient when they were paid the payouts. These households have also learnt to invest more in feed and veterinary medicine without fear since their livestock were insured, and as they obtained a better understanding about the function of agricultural insurance.

CIFA staffs and governmental agricultural officers and development agents who participated in the project activities explained that through the insurance training they obtained better understanding and knowledge on insurance in particular and on climate risk management in general. This has a great relevance for their official duties and the return to the knowledge gain is multifaceted. Agents also believe that the modality of the IBLI insurance intervention, that means approaching pastoralist through their networks, has made the extension agents to be efficient in monitoring and training the households. Hence, these experts recommend the insurance activity to be much more institutionalized, coordinated and aligned with their official duties on agricultural technology adoption.

Participants also rose that they need further formal or

informal training focused on climate risk management, insurance and innovations in insurance businesses in order to qualify to be insurance professionals. They raised the possibilities of motivating and training some field workers of the IBLI insurance in Ethiopia or abroad so that such personnel can fill the acute shortage of insurance professional in the country. So, these agents need such a tailor-made training and human capacity building activity from the next generation of insurance projects in order to gain more experience, knowledge and understanding, and professionally serve the smallholders who are in need of insurance to mitigate the risks of climate change induced drought on their livelihoods.

The experts, officers and development agents believe that insurance is a social security service, so it should be integrated with other financial services like micro-credit and saving to support other smallholder businesses like petty shops, micro- and small-scale enterprises as well as farm intensification pursuits of the households.

### **International Livestock Research Institute**

ILRI is a leading research institute in Ethiopia in striving to improve the livelihoods of smallholders through its applied research activities. In line with the current global focus on innovative strategies to mitigate the adverse effects of climate change on the welfare of smallholders, IBLI has partnered with the World Bank, various CGIAR members, government sector offices, commercial companies like Oromia Insurance Company (OIC), and global universities. With these partners, IRLI is committed to primarily

promote agricultural insurance in the nation's climate smart agricultural practice.

Pastoralists can be benefited from the project in acquiring a better understanding on agricultural insurance and in terms of financial benefits from the payout distributions. The IBLI research intervention is considered as a major societal developmental agenda committed to help pastoralists adopt insurance technology as a pro-poor risk management strategy. The intervention was also followed by a series of awareness creation and training activities with beneficiary households, Gada leaders as pastoralists' representatives, development agents and agricultural officers. This has provided our researchers and the implementing agency, OIC, with an opportunity to learn from the grass roots level stakeholders about the nature of the demand for the microinsurance product, basis risk and other important features of the innovation. From the perspective of the firm, OIC officials often address that due to the research intervention, their company enjoyed a great improvement in its portfolio composition. The numbers of new clients have also increased overtime. Furthermore, OIC staff has also got opportunities to participate on different workshops which helped them to interact with many international personnel who works on the same area. Learning, experience sharing and interaction of the OIC staff with various people on these workshop occasions have increased the skill and knowledge of the OIC staff to tackle implementation problems through multidimensional actions.



## **Stakeholders strength and gaps**

### ***Gada System***

There is one Abba Geda in Borena as a whole. The Geda groups at community scale are elders. From the perspectives of social insurance inherently embedded in the Borana community, pastoral households explained that orders of reciprocity like the bosa-gonofa livestock transfer scheme within the Gada system are indigenous voluntary mutual help associations that found both in rural and urban settings. These are made up by a group of persons united by ties of family and communities friendship, by living in the same district, by jobs, or by belonging to the same ethnic group. The number of members, the composition, the functions, and the organization of the scheme can differ from one to another.

### ***Iddirs, Cooperatives and other social ties***

As we explained above Gada groups are formed within the indigenous Borana community through an age-based transfer of social, economic, political or leadership roles. In this way, the Gada System differs from iddirs, cooperatives and social ties. Iddirs, for instance, have been originally formed in Ethiopia to take care of the activities linked to the burial ceremonies and to support their members during the time of funeral. But through time, they have progressively expanded their spectrum of activities. Currently, iddirs serve as social insurance institution that cover different risks such as funeral ceremonies, death of major productive assets (such as draft oxen), medical expenses, food shortages, and so on. These institutions can serve in promoting IBLI. Specifically, this can be worked-out as follows. Just sell or market

IBLI through a feasible social group (ties) in the specific area like Gada groups, busa-gonofa or iddirs. This is known as a customary channel, much more amenable to the local pastoralists, than the state-owned statutory channel (cooperatives) in Ethiopia. Because nowadays, these social groups have increased their spectrum of activities, and have basically become insurance programs that provide mutual aid and financial assistance when members face shocks. Iddirs in Ethiopia function on principles of reciprocity and altruism, bearing important trustworthiness at the public.

All these associations are however based on a voluntary mutual agreement between community members in order to collaborate when one of them or one of their direct relatives faces a serious shock. They request therefore a high-level of participation from their members. Pastoralists described that cooperatives in their area are formed by government bodies. There is no regular meeting, and participation in cooperative activities is conditional on arrangements made through kebele administrative bodies. In principle, all households in a given kebele are assumed to be members of a given primary agricultural cooperative (PAC) in Ethiopia. All PACs are also members of a cooperative union. The most common types of cooperatives in rural Ethiopia are agricultural cooperatives mainly meant for distribution of agricultural inputs including fertilizer, seeds and other inputs. We learnt from the FGD that similar to other rural producer organizations in developing countries, cooperatives in Ethiopia are ineffective and inefficient for adoption of rural technologies due to their state

control and bureaucratic operation systems.

### **Government policy support environment**

IBLI is a financial product that requires the support of the government financial regulatory body. One issue that needs attention in this regard is how to influence the recent directives of the National Bank of Ethiopia. There is a directive of 'no premium no payout except for government institutions' for all firms in Ethiopian insurance industry. But the micro-insurance service is a special service that micro-insurance firms provide for smallholders. Those farmers with whom the micro-insurance projects are implemented and work were indicated to have various constraints. Government interventions in terms of physical and legal infrastructure as well as financial and technical services area scant. During insurance sells windows, pastoralists also face credit and liquidity constraints as they invest more in income, asset or consumption smoothing pursuits to shield from the adverse influence of drought shocks induced by climate change. So such pastoralists may not have excess cash to buy IBLI by paying the premium upfront. But after dry seasons their liquidity constrains can be resolved. Thus, there should a policy window that provides for the postponement of the premium payment of smallholders towards periods in which their cash inflow is better. However, this can be in sharp contrast with the no premium no coverage policy of the NBE in the absence of government institutions as intermediary agents in pastoral areas. Hence, the government policy environment should be supportive in the sense that the conventional general motors insurance rules should have leave windows to

work for the large mass of smallholders that dominate the developing world. In addition, government agencies like financial institutions, banks and other parastatal institutions should operate in a guided policy environment to make the micro-insurance industry feasible and workable for smallholders.

Government policy support should also fulfill the usual complains of the actors in micro-insurance industry that lack of adequate rural financial extension agents and intermediaries is one of the main challenges that limit full operations of insurances meant for the poor like IBLI. Regional and national government bodies were also required to ensure the affordability of micro-insurance for pastoralists through arranging premium subsidies. Government policy support should also be in place to deal with how to manage administration costs. For instance, what OIC usually raises as a constraint is the fact that the company currently charges a pure premium which is only 15 percent of the payout. This revenue is not adequate to cover all administration costs. However, charging the pastoralists beyond this further discourages the uptake which is even quite low by its own reason. In addition, the micro-insurance activity of OIC (e.g., selling IBLI) is undertaken through agents, namely, cooperatives and cooperative unions that often ask about 5% of the total premium collected for covering their administration costs. Till now there is a fragmented donor support, the sustainability of which is not guaranteed. However, covering these costs from its own source has become a major operational impediment for OIC. In general, it is a rare case to see micro-insurance interventions like IBLI becoming successful without substantial

government policy support. A policy environment that create a close collaboration among various actors in terms of public-private-partnership (PPP), create a lobbying forum for micro-insurance firms to secure premium subsidy from the government and that put in place mechanisms that facilitate soliciting funds from donors is highly required. To get government policy support in these issues, the policy recommendations of this study should be disseminated to regulatory bodies and influence the policy environment to work in a way that larger number of smallholders can be benefited.

# CHAPTER FOUR: SUMMARY, CONCLUSION, AND RECOMMENDATION

## Summary and Conclusion

Reducing the adverse welfare effects of the risk of climate change induced drought that causes rampant livestock mortality requires innovative risk management strategies. This remains important to protect the economic loss of the smallholders whose adaptive capacity is very low. This study undertakes analysis of how climate change systematically affects the pastoral economy, the degree of households' understanding about climate change, their perceived consequences and impacts together with the households' indigenous coping strategies to climate risk in order to design and test the commercial feasibility and institutional effectiveness of index-based livestock insurance as a pro-poor risk management strategy.

The results of the study evidence that climate change largely causes recurrent drought and rampant livestock mortality in pastoralist areas. More than 90% the respondent households have perceived the pattern of climate change in terms of sharp decline in moisture, long-period dry season without rain, irregularity in rainy season, decrease in rainfall intensity, untimely rain and/flooding, dry wind, severe drought and lack of precipitation. Such patterns were revealed to cause adverse consequences on the livelihoods of the households causing, among many others, scarcity

of water, degradation in pasture land and forage unavailability. In areas with a relatively better rainfall and precipitation intensity, the adverse consequence of climate change was manifested in terms of the emergency of unpalatable grass species in the study area.

In addition, it was also evidenced that the changing climate was a long-term phenomenon leading to various socio-economic impacts as perceived by the respondent households. The majority of the respondent households have perceived weakened carrying capacity of the land biomass to feed livestock, physical deterioration of livestock and overall asset depletion while some of them additionally indicated decrease in breeding cycle of their livestock as an impact of the climate change on their economy. The adverse economic impacts were indicated to cause social impacts like pastoralists' migration to other areas, children school leaving, loss of family and dissolution of social capital and emergency of conflict on range resources.

The findings from household survey indicates that uptake of IBLI is positively correlated by peer influence, mental accounting and family size but negatively associated with number of livestock owned. Furthermore, result from impact of IBLI

on policyholders indicates that IBLI significantly increase expenditure on improved feed and veterinary medicine and enhance pastoralists welfare measured in terms of per capita food consumption.

Overall the study outcome have indicated that livestock is highly threatened by adverse weather conditions as a result of changing climate in the study area. Pastoral households have experienced livestock and livestock product losses due to rampant herd die-offs. The large number of livestock that the households often lost due to drought induced livestock mortality in the face of changing climate over decades were indicated. The current study constitutes a critical analysis that provides an important input for the redesign and effective implementation of insurance in the study area. From the perspective of livestock insurance as a risk management tool for pastoral households, it is important to focus on the degree at which drought as an adverse consequences of climate change contributes to the rampant herd mortality that pastoralists rank as the most important factor in threatening their livelihood. However, for the design, demand and commercial sustainability of the IBLI, was undertaken, the study exhaustively explained the indigenous climate risk adaptation techniques of the households. Accordingly, climate change has caused immediate consequences and long-term impacts on livelihood of the pastoralists. Livestock is the main sources of livelihood in terms of consumption, food security and income generation. But these assets were being threatened by the adverse consequences of the changing climate resulting in high mortality rates. However, before we discuss about technological

innovations for adaptations, it is logical to understand the pastoralists' indigenous adaptation techniques. Generally, the study identified two main categories of adaptation strategies that pastoralists have underwent. The first strategy is adaptation to climate change risks which include weather-related risk prediction and adaptation, adaptation to risks associated with livestock, mitigations related to range and water resources. Secondly, pastoralists have undertaken livelihood diversification as a strategy for risk mitigation under changing climate conditions. Households mainly use indigenous climate forecasting techniques like the gada cycle, probabilistic forecasts and awareness through access to external information to manage weather related risks. Similarly, households use herd mobility which is maintained to ensure that herds can find pasturelands not decimated by drought, rotational and selective grazing in which certain traditional communal grazing areas were restricted not to be utilized for a season to provide extra nourishment for sick, young and lactating animals in times of scarcity, preferential animal health treatments through which sick animals are isolated from healthy animals to prevent the spread of disease and animal injuries and diseases were treated using local knowledge.

In addition to these practices, as indicated above a strong social welfare system has developed to ensure that all pastoral households can continue to herd livestock. For example, pastoralists reported that households with more cattle can be called on to redistribute cattle to those who have sustained severe losses, as part of the social welfare system called Busagonafa. The primary means by which pastoralists, like communities

everywhere, will feel the impacts of climate change is in changes in land and water resources. Pastoralists have been living with scarce pastureland and water for generations. A number of rangeland-related risk-mitigation measures including traditional systems of wet/dry grazing areas and bush clearing programs have been undertaken by pastoralists communities, as well as initiated by the government and NGOs. Many of these measures have been in use for at least decades, and were developed in response to local climatic fluctuations without specifically being in response to recent climate change. However, these measures may still be relevant in conjunction with other, more “modern”, methods as responses to climate change, and are mentioned here.

The most innovative device to insure the risks of livestock mortality that recently attracted the attention of many stakeholders in livestock sector is the Index Based Livestock Insurance (IBLI). IBLI provides indemnity for managing livestock asset mortality risk by compensating for location averaged livestock mortality estimated using remotely sensed measures of vegetative cover on range lands. And our analysis has indicated that livestock are the most important assets in terms of income generation and consumption for pastoral households. Herd mortality due to climate change is also indicated to be significantly large. As it is logically important to identify the parameter and empirics of the most important causes for such mortality so that innovative ways of handling this mortality causes would keep in pace a sustainable morbidity of the livestock sector in the pastoralists' economy, starvation due to drought which is caused

by lack of pasture resources and water was found to be the largest cause of livestock mortality, followed by diseases and predation. On top of this, disease and predation as indicated by the respondents were aggravated during seasons of drought and immediately after drought which indicates these are also the most likely consequences of the climate change. Hence, the potential for IBLI development is large and adopting this technology is very important as it indemnifies herd losses due to climate change which is the main driver of the mortality.

As indicated in the above discussions, pastoral households have been using different adaptation mechanisms to protect their livelihood against hostile environmental conditions. However, none of these techniques provide a guarantee to safe the pastoral resources from drought induced risks. Therefore, innovative ways of insuring the pastoral households were designed in different parts of the world. For instance, the Index based livestock insurance is designed for the first time in northern Kenya and this technology is required to be replicated in southern Ethiopia. As the aim of this study was to test the applicability of insurance as a risk transfer approach, analysis of the understanding and perception of households was made. The summary of these responses were given below. The methodological approaches involved in this study include framing the analysis using theoretical models and undertaking the analysis using empirical models. The analytical framework combines conceptualization of herd mortality from herd mortality from differentials of the vegetation cover which constitutes livestock forage, estimation

of insurance indemnity and premium based on the expected estimated livestock losses. The framework conceptualizes the demand and willingness to pay for the insurance. The empirical models were fitted to the data based on the objectives of the study.

The overall study corroborates the fact that pastoralist of southern Ethiopia have perceived the impact of climate variability changing from long to short period rain, from regular and stable to irregular, pattern less, untimely raining and flooding, decreased intensity of rainfall, drought and minimized precipitation over periods in the past. Pastoralists argue that the overall asset depletion and economic value losses were large over the past years which were attributable to the changing climatic scenario. Hence, these households opt for insurance and any other innovative intervention which makes them overcome the problem of livestock and asset losses in their area. Even though the role that the livestock sector plays in pastoral system is obviously significant, it is important to determine the component of pastoralists' income by sources in order to understand the associated economic losses with livestock mortality. In other way, this helps us to value insuring the livestock based on the economic value of the livestock.

For this, IBLI is an innovative, amenable and promising hedging instrument that mitigate drought risks of pastoralists. These merits intrinsic to the nature of the innovation that payout is triggered when the index of a selective weather variable falls

below a given threshold that signals risk. Intensity of rainfall measured in rain gauge (which is feasible at a local level) or, vegetative range cover the earth surface measured by satellite remote sensing can be used to construct such an index. A reliable index closely correlates with the insured livestock asset, objectively quantifiable and publicly verifiable in order not to be manipulated by both the insurer and the insured.

Hence, IBLI has three strengths as compared with indemnity-based insurance. First, IBLI delinks loss assessment from individual behaviour to overcome moral hazard problems. Second, IBLI design is based on publicly verifiable data (e.g., data based on satellite measures), so it partially tackles the problem of adverse selection<sup>1</sup>. Third, the use of a single index to estimate losses of a group of farms minimizes transaction costs. Hence, IBLI tackles classic incentive problems like information asymmetry and transaction costs associated with claim verification and contract enforcement in pastoral financial market development. However, the main weakness of IBLI is which are also highly interrelated are the prevalence basis risk or residual risk, and the low demand that insurance firms face to break even. The former is the endogenous source of cause for the later. Basis risk is the imperfect correlation between computed indices and real losses. In IBLI design, scientifically, basis risk cannot be totally eliminated, and be zero.

This because by definition any deviation between the computed losses based on the index and the actual loss at the ground constitutes basis risk. However, construction or estimation of the 'index' encompasses the stochastic error term that cannot be reduced to

---

<sup>1</sup> But spatio-temporal adverse selection still remains as a limitation

zero. Hence, the main weakness of IBLI is reflected when the index is weakly correlated with individual farm level losses that it is supposed to insure. In developing countries where terrestrial weather stations are sparse, the discrepancy between losses indicated by the index and actual losses realized at farm level is high. Hence, due to basis risk, IBLI provides only partial (probabilistic) insurance coverage. Invalid index signal that constitutes basis risk can arise with two mutually exclusive probabilities in a given insurance period. First, an upward basis risk with false positive probability (FPP) can cause the index to trigger payout though the insured did not incur losses. Second, a downside basis risk with false negative probability (FNP) can cause the index to trigger no payout though the insured incurred significant loss. Thus, IBLI contracts with high levels of basis risk function like a lottery than an insurance.

Low demand is the direct impact of basis risk. When down-side basis risk prevails, since premiums are paid, losses are incurred and no payout is forthcoming, the insured remains better off than purchasing IBLI at all. Once such case happens, reservation for uptake of the next IBLI sell can be high due to economic as well as behavioural reasons. Cash outflow for premium and the yield loss due to covariate shocks penalizes the wealth of the insured twice. Poor farmers are particularly very sensitive to such double penalty that further ruins their minimum welfare level. The expected but not realized payout can also make the insured to consider the IBLI contract as non-trustworthy. Individual buyers worry that if they decide to buy IBLI, then drought may vanish their

livestock and the payout may not come forth. Mostly recommended scientific solutions of this generation are elucidated below.

**Reducing basis risk:** On the supply side, adoption of an index-based insurance hinges principally on ability to improve the quality of the product by reducing basis risk. The most feasible way is multiple technological, contractual, and institutional innovations like institutional-level and twin-track approach. While individual-level IBLI sells has met a low demand, there are good reasons why institutions may want to index-insure their portfolios at risk. This includes cooperatives with shared fixed costs, banks with outstanding loans, development agencies with a commitment to deliver expeditiously social protection at a time of crisis, and state governments with a legal obligation to provide relief to farmers. IBLI payouts can be distributed internally to the institution to compensate for locally observable idiosyncratic risks, thus reducing basis risk and improving the quality of the index insurance product. Policy questions should be directed at the way these institutions manage basis risk, distribute premium payments to their membership (for instance reducing interest rates on insured loans), and add a layer of verifiable loss-based transfers to index insurance (thus following a twin-track approach of local-traditional social insurance combined with regional/institutional index-based livestock insurance. Particularly, the use of risk-layering has various supportive merits to reduce basis-risk. Hence, addressing risk reduction, shock coping, and risk management in pastoral areas should go beyond and take a portfolio approach combining



different instruments on a demand-driven basis, if the main concern of an IBLI intervention is precision or perfection with regard to basis risk.

This will allow customization of the various instruments effective for this purpose, including insurance, savings, credit, technology, and infrastructure, where IBLI serves as a complement to other instruments eventually also indexed on observable indicators. This requires risk-layering where particular financial products and investments are used to cover particular sources of risk. IBLI in this case is used for larger covariate shocks (catastrophic and commercial risk layers), while credit is used for intermediate and less covariate shocks, and savings and technology for the more frequent and smaller shocks (risk retention layer). In that perspective, the delivery of IBLI should be coordinated with the provision of other financial services and resilience-building investments.

**Share a role with government in regulating and subsidizing strategically:** Private sector providers need large markets to cover fixed costs. Data need to be accumulated over long periods of time over small areas for re-insurance to be competitively accessible. Learning needs to be achieved by users, principally by witnessing payouts to oneself or to trusted others, hence giving a role to social networks for the circulation of information on payouts. This calls for state intervention. This starts with a regulatory role for the state in certifying standards with respect to maximum basis risk. Subsidies are also needed and can be delivered in the context of Public-Private Partnerships in a phase of demand creation. Subsidies

for learning and scale can be for a few years, but likely more than one due to the credence nature of IBLI, with the need to learn about the distribution of covariate events. If loadings for reinsurance include a cost for data uncertainty, public subsidies to reinsurance can be provided in the transition to data accumulation. If insurance reduces the cost of social protection as a right, permanent subsidies are also justified, especially for catastrophic risks. The practical policy implication is thus for a careful design of “smart” subsidies in support of IBLI which remains to be scientific and technical. Here it should be noted that short-term subsidies should be designed to cover risk in the absence of reinsurance, learning, and economies of scale in a big push approach. And with long-term subsidies to insurance premiums in the face of social externalities, particularly for catastrophic risks.

### **Policy Recommendations**

IBLI has high promise as an institutional innovation, but it faces the difficulty of low uptake. Successful uptakes have been confined to substantially subsidized sells windows, raising the issue of potential approaches to sustainable scaling up. This study analysed the effectiveness of IBLI, and explored ways of increasing uptake in a sustainable fashion. There is a need for improvements in product design, complementary interventions to boost uptake, and strategies for sustainable scaling up of uptake. As a matter of conclusion, this participatory research leads us to advance to the following recommendation toward successful scaling-up of the next generation of IBLI, with policy implications for governments and international development agencies.

1. The first-order importance should be given to reducing basis risk in IBLI design, through pursuing multiple technological, contractual, and institutional innovations as explained in the summary and conclusion section of this study.
2. Combining the use of IBLI with credit, savings, and risk-reducing investments to optimally address different categories of risk that pastoralists face. For this, these various financial products should be offered in a coordinated fashion.
3. Calling on the government to play roles shared with international development agencies or solely on two fronts. One is in providing “smart” subsidies for learning through training, data accumulation, initial re-insurance, and catastrophic risks, as a down-payment for premium. The aspect that needs the attention of government is implementation of public certification standards for maximum basis risk of IBLI contracts.
4. Using twin-track institutional-level IBLI contracts combined with intra-institution distribution of payouts to reduce basis risk and improve the quality of IBLI. For this, credible intra-institutional rules for idiosyncratic transfers, for instance through the Gada leaders, must be carefully designed for Borana pastoralists.
5. Interventions or institutions that undertake institutions should be guided by research-oriented customized IBLI product designs for a given intervention or institution(s) like CST.
6. Climate change induced drought is proved to be the main cause for rampant livestock mortality in areas of southern Ethiopia. Households have experienced both short-term consequences and long-term impacts of the problem reflected on their economic loss. Hence, policy makers in livestock sector should promote climate risk management strategies in pastoral areas to sustain the livestock sector. All stakeholders including government and non-government organizations (NGOs) working with pastoralists groups should value climate risk management and innovative adaptation techniques in planning their pro-poor interventions.
7. Indigenous techniques of predicting the fate and effect of climate change were evidenced to be prevalent for long among the pastoralist in the study area. Pastoralists’ value for the gada system in which factors aggravating the adverse impacts of the climate change like overgrazing and deforestation are banned as well as social insurance mechanisms like buusagonofaa were found to be the most local adaptation techniques to the climate change. Hence, policy makers should build on the traditional and adaptation techniques to the climate change in order to design innovative climate risk management strategies.
8. The feasibility of index-based livestock insurance (IBLI) to manage livestock asset risk by compensating for location average livestock mortality estimated using remotely sensed measures of vegetative cover on the pastoralists’ grazing land

is tested by the existing ample demand and willingness to pay (WTP). Hence, policy making in the area of developing sustainable livestock insurance should be based on the tested and verified demand for the product. IBLI should also be adopted as a pro-poor risk management strategy which is innovative and persuasive as it easily overcomes the twin problems of information asymmetry including adverse selection and moral hazard.

9. In developing the IBLI as a more amenable and dependable climate risk management option in pastoral areas, policy makers should take into account, the existence of alternative livelihood options, agricultural land availability, livestock size, education level of the household head and family size.

10. IBLI policy should be set to provide more information, make much more awareness and understanding among households. Training and financial literacy should be provided for pastoral households to enhance their indigenous knowledge about their climate risk perception and minimize their ambiguity and risk aversion behaviors, and encourage them to undertake calculated risks of future losses within a given domain of expectation.

11. Basically the pastoral development policy should be geared towards enhancing pastoral household enterprise and livestock cooperative enterprises to easily cope with both man-made like market price volatility and natural disasters like drought induced livestock mortality risks. Policy should promote diversification of herd composition

towards drought resistant stocks like shoats, camel and cattle variety in the household enterprise. Hence, in underwriting the IBLI contract, the composition or diversity of the livestock owned by the pastoralists should be taken into account (i.e diversification helps for risk mitigation).

12. Institutionalization and implementation of effective and sustainable insurance industry should be promoted based on the existing social institutions including Gada groups or buusaagonofa. Just sell or market IBLI through a feasible social group (ties) in the specific area like Gada groups, busa-gonofa or iddirs. This is known as a customary channel, much more amenable to the local pastoralists, than the state-owned statutory channel (cooperatives) in Ethiopia. This has two advantages (1) uptake can be increased since pastoralists trust Gada leaders than other agencies. (2) during distribution of payouts these Gada leaders can make actual audit of losses and fair distribution of payouts, that means such intervention creates endogenous risk management.

13. As farmland is scarce or non-existent in pastoral areas and undue reliance on a single livestock sector is risky in the face of increasing families, diversification towards alternative income generating activities should be promoted. Agencies working with pastoral communities should give due attention to the diversification of income by expanding non-farm activities such as petty shop and mini-farming etc. The expansions of non-farm activities with diversified business plan will hedge smallholders' against natural

calamities. Hence, IBLI payouts should target household income diversification aims through post-payout training and awareness creation.

14. Income from petty trade is paramount for the pastoralists in Moyale and Miyo since the sector contributes significant percentage of revenue for pastoralists besides being source of food for consumption. Hence, petty trade should be given due attention by development practitioners and policy makers by strengthening and establishing sustainable supply chain for inputs and value chain for agricultural products marketing. Hence, in the long-run IBLI payouts should target household livelihood diversification through post-payout training and awareness creation.

15. Finally, agencies working to improve the living standard of the pastoral community like CST and policy makers should give due attention to female borrowers, family planning and reduction of spending on social ceremonies and a need to determine an appropriate risk management strategy like insurance that just suffices the insurance cost or purpose of the hedging, focusing on the prevailing demand for insurance and reinsurance in which the insurance industry operates optimally both in the local, national and international reinsurers' market.

# References

- Amsalu, 2010. The Impact of Food Prices Inflation on Rural Household's Food Security in Moyale and Shashemene Districts of Oromia Regional State, Ethiopia. An M.Sc. Thesis presented to the School of Graduate Study of Haramaya University.
- Barrett, C.B., S. Chantarat, G. Gebru, J.G. McPeak, A.G. Mude, J. Vanderpuye-Orgle and A.T. Yirbecho. 2008. "Codebook for Data Collected under the Improving Pastoral Risk Management on East Africa Rangelands (PARIMA) Project." Unpublished, Cornell University.
- Bayarjargal, Y., A. Karnieli, M. Bayasgalan, S. Khudulmur, C. Gandush and C.J. Tucker. 2006. "A Comparative Study of NOAA-AVHRR-derived Drought Indices using Change Vector Analysis." *Remote Sensing of Environment* 105:9-22.
- Chantarat, S., A.G. Mude and C.B. Barrett. 2009c. "Willingness to Pay for Index Based Livestock Insurance: A Field Experiment from Northern Kenya." Working Paper, Cornell University.
- Chantarat, S., A.G. Mude, C.B. Barrett and C.G. Turvey. 2009b. "Dynamic Evaluation of Effectiveness and Demand for Index Based Livestock Insurance in Northern Kenya." Working Paper, Cornell University.
- Chantarat, S., C.B. Barrett, A.G. Mude, and C.G. Turvey. 2007. "Using Weather Index Insurance to Improve Drought Response for Famine Prevention." *American Journal of Agricultural Economics* 89 (5): 1262-1268.
- de Goncalves, L. G. G., W. J. Shuttleworth, B. Nijssen, E. J. Burke, J. A. Marengo, S. C.
- Chantarat, S., C.G. Turvey, A.G. Mude, and C.B. Barrett 2008. "Improving Humanitarian Response to Slow-Onset Disasters using Famine Indexed Weather Derivatives." *Agricultural Finance Review* 68(1).
- Cline, 2007. Agricultural productivity and climate change of Ethiopia
- Cynthia Rosenzweig and Daniel Hillel Potential, 2005. Impacts of Climate Change on Agriculture and Food Supply
- Dercon, S., ed. 2005. Insurance Against Poverty. Oxford: Oxford University Press.
- Elbers, C., J.W. Gunning and B. Kinsey. 2007. "Growth and Risk: Methodology and Micro Evidence." *World Bank Economic Review* 21(1): 1-20.
- Eswaran, M. and A. Kotwal. 1989. "Credit As Insurance in Agrarian Economies."
- FDRE (Federal Democratic Republic of Ethiopia), 2002.
- FAO (2004). Rationales and Guidelines for livelihood Based Emergency Intervention for the Pastoral Sector in Ethiopia. Prepared for Oxfam America. Feinstein International Famine Center. Tufts University.
- Gine X., Townsend R., and James Vickery. 2007. "Patterns of Rainfall Insurance Participation in Rural India." World Bank Policy Research Working Paper 4408
- Greene, W.H. 2000. *Econometric Analysis*. Macmillan Publishing Company. New York.
- Gujarati, D. 2003. *Basic Econometrics*. 4th edition. McGraw Hill Book Company. New York.
- Kogan, F. N. 1990. "Remote Sensing of Weather Impacts on Vegetation in Nonhomogeneous Areas." *International Journal of Remote Sensing* 11, 1405-1420.
- Kogan, F. N. 1995. "Droughts of the Late 1980s in the United States as Derived from
- Legesse, A. 1973. *Gada: Three Approaches to the Study of African Society*. The Free Press, New York.
- Lybbert, T.J, Barrett C.B., Desta S., and D. Layne Coppock. 2004. "Stochastic Wealth Dynamics and Risk Management Among A Poor Population," *Economic Journal* 114(498): 750-777.
- Lybbert, T.J., C.B. Barrett, S. Boucher, M.R. Carter, S. Chantarat, F. Galarza, J. G. McPeak and A.G. Mude. 2009. "Dynamic Field Experiments in Development Economics: Risk Valuation in Kenya, Morocco and Peru." Paper presented at NAREA Workshop on Experimental Methods. June 9-10. Burlington, Vermont.
- Maddala, G.S. *Limited Dependent and Qualitative Variables in Econometrics*. Cambridge University Press. New York.
- Mclaurin and Calum G. Turvey, 2011. *Applicability Of The Normalized Difference Vegetation Index In Index-Based Crop Insurance Design* Charles H. Dyson School Of Applied Economics And Management Cornell University March 3, 2011

- McPeak, J.G. and C.B. Barrett. 2001. "Differential Risk Exposure and Stochastic Poverty Traps among East African Pastoralists." *American Journal of Agricultural Economics* 83:674–679.
- Miguel A. Altieiri, J., 2009. *Agroecology, Small Farms, and Food Sovereignty*.
- Morduch, J. 1995. "Income Smoothing and Consumption Smoothing." *Journal of Economic Perspectives* 3:103–114.
- Rosenzweig, M., and H. Binswanger. 1993. "Wealth, Weather Risk and the Composition and Profitability of Agricultural Investments." *Economic Journal* 103(416):56–78.
- Sandford, S. & Habtu, Y. 2000. *Emergency Report Interventions in Pastoral Areas of Ethiopia*. DFID Report.
- Santos P. and C.B. Barrett. 2008. "Persistent Poverty and informal credit." Working Paper, Cornell University.
- Tucker, C. J., J. E. Pinzon, M. E. Brown, D. A. Slayback, E. W. Pak, R. Mahoney, E. F. Vermote, and N. E. Saleous, 2005. "An Extended AVHRR 8-km NDVI Data Set Compatible with MODIS and SPOT Vegetation NDVI Data." *International Journal of Remote Sensing* 26(14):4485-4498.
- UNFCCC, 2009. *Climate Change, Food Insecurity and Hunger*, November, 2009.





**Address:**

CAFOD / SCIAF / Trócaire  
P O Box 1875, Addis Ababa,  
Gulele Subcity, Swaziland Street, Enqulal  
Fabrika,  
Ethiopian Catholic Bishops Conference Centre  
Tel: +251-(0)11-278-8843/44/45  
Fax: +251-(0)11-278-8846  
Email: [reception@cst-together.org](mailto:reception@cst-together.org)  
Website: [www.trocaire.org](http://www.trocaire.org) /  
[www.cafod.org.uk](http://www.cafod.org.uk) / [www.sciaf.org.uk](http://www.sciaf.org.uk)