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The Impact of Index Based Livestock Insurance on the Livelihoods of Pastoralists: The Case of Borana, Moyale Woreda

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Addis Ababa, Ethiopia

DECLARATION

I, Melkachew Temesgen Gutema hereby declare that the research thesis entitled "The Impact of Index Based Livestock Insurance on the Livelihoods of Pastoralists: The Case of Borana, Moyale woreda is my creditable and original work that has not been submitted earlier for award of any degree, diploma or fellowship to any other universities to the best of my knowledge and belief. All the sources of materials used for this thesis have been dully acknowledged.

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Abbreviations and Acronyms

ADB Asian Development Bank

CIFA: Community Initiation and Facilitation

FAO: Food and Agricultural Organization

FGD: Focus Group Discussion

GDB: Gross Domestic Product

IBLI: Index Based Livestock Insurance

IFAD: International Fund for Agricultural Development

ILRI: International Livestock Research Institute

KLIP: Kenyan Livestock Insurance Programme

OIC: Oromia Insurance Company S.C

NDVI: Normalized Differential Vegetation Index

Abstract

The aim of the research was to assess the impact of Index Based Livestock Insurance on the livelihoods of the pastoralists. The study was conducted in Moyale woreda, Borana zone, Oromia regional state. The required data set forth for the study was obtained from primally, the survey questioners from 95 respondents randomly selected households, from both non-insured and insured. A cross sectional mixed research was adopted as it involves qualitative and quantitative research methods. The data were collected though both open-ended and closed ended structured interview, focus group discussion and key informant interview methods. Secondary data were collected from reports and other documents. To analyze the qualitative data, descriptive, inferential statistical tools and econometric models were used.

Though it is not statistically significant, the insured household's income was found to be higher as compared to their non-insured counter parts, it had positive impact as a drought risk management practice, as traditional coping strategies were no longer dependable and the insured pastoralists were able to buy feeds, water and were able to get treatment for their sick herds. Most importantly, none of the insured households were looking for aid as a traditional coping strategy and migration was found to be the last option. However, the premium rate of the product was found to be on the higher side and government has to provide a subsidy. To upscale the product the, quality of the product and agricultural insurance policy found to have a profound effect. It is highly recommended that ILRI and OIC should work on the product quality improvement and at the same time government should work on to put in place the agricultural insurance policy and should work on awareness creation and com unity mobilization activities at the same time.

Key Words: Index Based Livestock Insurance, Livelihoods

CHAPTER ONE

1. Introduction

1.1. Background of the Study

The livelihoods of pastoralist, mainly depends on livestock farming, which is predominate stay of the population living in the arid and semi-arid regions of the world. The arid and semi-arid lands (ASAL) of east Africa are among the poorest regions, with severe (less than $1/day, poverty rates routinely in excess of 75%. The livestock sector generates a large portion of national economies in African dry lands and is the principal source of livelihood for pastoralists living there. Pastoralism is the main livelihood for an estimated 268 million people and represents 10 to 44 percent of the gross domestic product (GDP) of African countries, FAO 2018. However, pastoralists are often among the poorest, for example, 41 percent of pastoralists across the Horn of Africa are estimated to live in extreme poverty, which is well above the national averages of the region.

Pastoralists make up about 14 percent of Ethiopia's population approximately 110 million people and inhabit about 60% of the country's landmass. The pastoral production system in Ethiopia is characterized by extensive livestock grazing and seasonal migration. Pastoralists raise a significant proportion of the national herd, and most of Ethiopia's live animal and meat exports are also sourced from pastoral areas. Livestock represent a large share of the household assets of pastoralists and are therefore key for sustaining rural livelihoods and human welfare. For many years, drought has been one of the major threats to the economy of pastoral households. While pastoralists in Ethiopia have developed various traditional coping mechanisms to overcome their livelihood challenges, including the problems they face during drought, these mechanisms are undermined by environmental changes and political and socioeconomic marginalization, pushing pastoralists to increasingly rely on humanitarian assistance, Yihenew Z. et al July 2020.

Given meager rainfall and infrastructure, the pastoralist populations who inhabit these areas rely heavily on extensive livestock grazing for their livelihood. On the other hand, the customary counsel from Borana pastoralists also advocated that drought cycles have shortened from 5-10 years to 3-5 years (Oxfam, 2011). Frequent and severe drought is a tremendous risk for pastoral communities;

drought-related livestock losses can push households into a poverty trap and chronic destitution, Jensen et al. (2015) and Lybbert et al., (2004).

Recent economic research, building on extensive prior ethnographic work, finds that east African pastoralists operate in an environment characterized by multiple herd size equilibria characteristic of poverty traps, Lybbert et al., (2004), Barrett et al., (2006). The prominent role that covariate climate risk plays in driving pastoral poverty traps (Santos and Barrett 2007) and growing concern that droughts are driving growing numbers of pastoralists into destitution (Sandford 2006, Little et al. 2008), naturally motivated the recent development of index based livestock insurance (IBLI) against catastrophic herd loss in the northern Kenyan ASAL, Chantarat et al., (2009a).

The Index Based Livestock Insurance (IBLI) products has been first implemented in Kenya in 2010 and brought to southern Ethiopia, Borena in 2012 which is bordering Kenya as the communities living in the two countries are sharing common socio-economic features and bringing the experiences is easier, to help pastoralists manage drought related risk.

Like any typical insurance, Index Based Livestock Insurance (IBLI) compensates for livestock loss-initially it was designed as asset replacement product which compensate pastoralists at the end of the contract period. However, the information obtained from the commercial underwriter of the insurance, Oromia Insurance Company S.C shows that the asset replacement contract was modified and asset protection was put in place in 2015 based on the requests of the pastoralists. This is because compensating the pastoralists might not help after the livestock died, rather, providing the compensation before the animals die would help as the pastoralists would buy forage and supplementary feeds to keep the animals alive during critical forage conditions.

Unlike traditional insurance which compensates individual loses on case by case basis, IBLI only compensates for covariate herd losses that are predicted by the historical relationship with remotely sensed Normalized Differential Vegetation Index (NDVI) measures; an indicator of vegetative cover widely used in drought monitoring programs in Africa. These data are publicly available in near-real time and objectively verifiable, Chantarat et al. (2009a), explain the details of the IBLI contract design and show that it performs extremely well out-of-sample in insuring against catastrophic covariate shocks in this region.

The information obtained from the Oromia Insurance Company S.C further revealed that it had paid claims for the insured pastoralists in the target area several times and the pastoralists were being benefited from the payout. This, however, never been documented and the researcher aimed at researching and documenting the impact of the IBLI on the livelihoods of pastoralist and forwarding possible policy recommendations based on the outcomes of the findings as well.

To conduct the research on the impact of the IBLI on the livelihoods of pastoralists living in the Borena Zone of Southern, Oromia, Ethiopia, the researcher had conducted focus group discussion, interviewed the respondents, collected data based on structured pre designed questionnaire and secondary data had also been gathered from literatures (published and unpublished) and reports of the implementing institution as well and impacts of IBLI on the socio-economy of the pastoral communities of the target area has been assessed.

1.2. Statement of the problem

As aforementioned, some researches, Yihenew Z. et al (2020), Oxfam (2011), Jensen et al. (2015) and Lybert et al. (2014), indicated that drought is a covariant risk affecting the likelihoods of pastoralists and its cycles are being shorted from time to time. The prominent role that covariate climate risk plays in driving pastoral poverty traps, Santos and Barrett (2007), and growing concern that droughts are driving growing numbers of pastoralists into destitution, Sandford (2006), Little et al., (2008). Further, it was indicated by scholars that, frequent and severe drought is a tremendous risk for pastoral communities; drought-related livestock losses can push households into a poverty trap and chronic destitution, Jensen et al. (2015); Lybbert et al. (2004). These, naturally motivated the recent development of index based livestock insurance (IBLI) against catastrophic herd loss in the northern Kenyan ASAL, Chantarat et al. (2009a).

Similarly, the information obtained from the Oromia Pastoral Area Development Coordination Commission, the Oromia regional government spent more than ETB 200 million for destocking and restocking alone in a response to 2017 drought. However, had a portion of this money been invested on IBLI many pastoralists would have been benefited from the scheme as the IBLI is ex-ante risk management mechanism and that of restocking and destocking is an ex-post coping mechanism. Barnett, Barrett, and Skees (2008), Dercon et al., (2008) and Cole et al., (2012) provide summaries of the literature. The literature highlights two primary avenues through which insurance might bring about

positive impacts. These avenues reflect the fact that households make both ex-ante risk management decisions and ex post risk coping decisions.

From the aforementioned literatures, we can generalize that drought is the most risk, yet frequently affecting the livelihoods of pastoralists, and IBLI is contributing towards the livelihood developments of pastoralists by helping them transfer drought related risks through formal insurance mechanisms in response to such adverse effects.

On the other hand, according to a study conducted by Masresha and et al., (2019) in this area, pastoralists were aware of the benefits of IBLI on their livelihoods. A study was conducted on livestock insurance payouts and coping strategies of pastoralists during drought both in Kenya and Ethiopia. In Ethiopia, policyholders reported that the announcement of 2017 payouts changed their drought management decisions; 93% of households reported changing behaviors because they knew there was a payment coming. A large portion of the households reported increasing purchases of livestock inputs in response to the indemnity announcement, as well as migrating with their livestock and investing in non-livestock activities Masresha and et al., June (2019).

Despite the positive impacts of the IBLI on the livelihoods as ex-ante risk management mechanisms, however, majority of the pastoralists are not benefiting out of it or in other words, the insurance penetration is quite low, the information obtained from OIC revealed. Furthermore, the government federal and regional and/or local government's contribution is almost null in promoting the insurance product.

On the other hand, according to the summary of the Executive Seminar for Members of the Kenyan Parliament on Index Based Livestock Insurance, unlike that of Ethiopia, the government of Kenya established a national programme called Kenyan Livestock Insurance Programme (KILP). Under this programme, the government provides IBLI for free for vulnerable pastoralists for up to 5 tropical livestock unit and the beneficiaries will cover the premiums themselves for additional covers. The KLIP also works on client registration, awareness creation and data management activities. As such the take up rate is much higher than IBLI Borana programme. In contrary, in Ethiopian side neither regional nor federal government gave due attention into this innovative idea and there is long way to go in this regard. The researcher believes that to bring a robust change in this regard there has to be agricultural insurance policy in general and that of IBLI in particular.

Hence, to improve the uptake and realize the benefits of the pastoral community out of this product and bring a policy change, the impact of IBLI on the livelihoods of pastoralists, the roles government can play in promoting the product, role of the IBLI as drought risk management mechanism and factors contributing to IBLI up scaling needed to be studied and documented.

To the best of the researcher knowledge, there is no empirical research conducted on the impacts of the IBLI on the livelihoods of pastoralists by focusing on Borana cases. Most studies of insurance commonly focus on take-up (Cole et al. 2014) and focus on insurance as a drought coping strategy. Nevertheless, the researcher had believed that conducting empirical research would find out the impact of the IBLI on the livelihoods of pastoralists, would help to facilitate the involvement of the government at all levels and other stakeholders committing themselves for the pastoral development as well through documentation on the IBLI intervention over the past more than 10 years.

Therefore, based on the aforementioned realities and facts the research was designed to find out the impacts of the IBLI on the livelihoods of pastoralists by focusing on the cases of Moyale district, Borana Zone, Oromia, Ethiopia.

1.3. Objective of the Study

1.3.1. General objectives

The general objective of the research was to find out the impact of IBLI on the livelihoods of pastoralists.

1.3.2. Specific objectives

The following were specific objective of the research. These were:

- ✓ To find out the impact of IBLI on the household's income;
- ✓ To identify the role of the IBLI as drought risk management mechanism;
- ✓ To investigate factors contributing to IBLI up scaling;
- ✓ To assess the roles and responsibilities of government to promote IBLI

1.4. Research question

1. What are the correlation/interdependence between the Index Based Livestock Insurance and Pastoralists livelihoods? To what extent the pastoralists are benefiting from the insurance product?

2. What are the significances of IBLI that plays in the pastoral households' income, protecting the livestock from death due to drought?

3. What are the roles can government play in the IBLI?

4. What are the major factors that contribute to IBLI up scaling?

1.5. Significance of the Study

The significance of this study was seen from two sides, namely: with regards to knowledge, and other in relation to practical contributions. This study could add on the limited research findings on IBLI as it is one of the tools of adoption to drought risk management mechanisms. This study was meant to provide useful empirical information to policy makers, researchers, academicians, development practitioners and others regarding IBLI. As far as the practical contribution is concerned, the authorities at different levels should no more blame drought as an excuse for their failure to protect the pastoral communities. The findings from this study were intended to also complement and act as a reference point for other similar studies to be conducted by other researchers in other parts of the country or the world. This study was meant to also provide empirical data to support the perceived statement of problems and responses to it, serves as a contribution of promotion of IBLI, at least from the perspective of the participants in this study. Of course, it is also hoped that this study will add on the limited research findings on IBLI and livelihood development of pastoralists.

In addition, the findings of the research were expected to help all the stakeholders involving in the pastoral development to see the impacts of the IBLI on the livelihoods of the pastoralists, include IBLI in their agenda, create awareness of the pastoralists so that they would purchase the product and build their future.

Furthermore, the findings of this study were also expected to serve as an input for various governmental and nongovernmental development organizations to assert their effort on IBLI as a modern drought risk management to reverse the spreading of poverty problems in the pastoral community so as to keep their future bright by scaling up it to other pastoral community areas.

1.6. Scope and Limitation of the Study

In view of the fact that, the research is unmanageable if broad in topic and it could not have a clear-cut point of direction, the scope of the research was limited. Thus, the scope of this study was restricted to a specific issue of concern; focusing on Index Based Livestock Insurance on the livelihood developments of pastoralists. Furthermore, the impact of IBLI was evaluated considering income perspective from multiple livelihoods dimensions, which is also other limitations of the research.

Similarly, this study was limited in scope and the research was conducted only in Borana Zone covering one district, Moyale. Furthermore, time and resources were very limited to cover the wider geographical areas of the Borana zone and other parts of the country where IBLI is being implemented.

Therefore, it was suggested that it would be good if further research is undertaken on the rest issues and other parts of the country where IBLI is being implemented so that the general picture of the product could be assessed and documented for future works.

1.7. Organization of the Thesis

The rest of the chapter is organized as follows: The second chapter encompassed the theoretical, conceptual and empirical review of related literature that was believed to be helpful in dealing with data analyzing, interpretation and presentation. The third chapter dealt with methodological approaches comprising a description of the study area, research design and data collection techniques and analysis. On the fourth chapter, Results and discussion of the findings were presented, based on the analysis and interpretation of the data outcome obtained from the study. Finally, under chapter five conclusions and recommendations of the study was dealt.

CHAPTER TWO

2. Review of Literature

The study was borrowed from the Program theory which attempted to give insights on the intervention of Index based Livestock insurance expected to have its intended impact on the livelihood of pastoralists who purchased the product. The successful theory-based impact evaluation shall encompass to map out the Program theory, understand context, anticipate heterogeneity, rigorously evaluate impact using a credible counterfactual, use rigorous factual analysis, and use mixed methods *(White, H., 2010).*

2.1. Theoretical Literature Review

A Program theory explains how an intervention (a project, a Program, a policy, a strategy) is understood to contribute to a chain of results that produce the intended or actual impacts. It can include positive impacts (which are beneficial) and negative impacts (which are detrimental). It can also show the other factors which contribute to producing impacts, such as context and other projects and Programs. Different types of diagrams can be used to represent a Program theory. These are often referred to as logic models, as they show the overall logic of how the intervention is understood to work. Program theory can be used to provide a conceptual framework for monitoring, for evaluation, or for an integrated monitoring and evaluation framework. A Program theory can be a very useful way of bringing together existing evidence about a Program, and clarifying where there is agreement and disagreement about how the Program is understood to work, and where there are gaps in the evidence. It can be used for a single evaluation, for planning cluster evaluations of different projects funded under a single program, or to bring together evidence from multiple evaluations and research. The diagrams used to represent a Program theory (usually referred to as logic models) can be drawn in different ways. Sometimes they are shown as a series of boxes (inputs->processes->outputs->outcomes->impacts), sometimes they are shown in a table, sometimes they are shown as a series of results, with activities occurring alongside them rather than just at the start, Rogers**,** P., (2014).

2.1.1. Concepts and definitions

Impact evaluation is an assessment of how the intervention being evaluated affects outcomes, whether these effects are intended or unintended. The proper analysis of impact requires a counterfactual of what those outcomes would have been in the absence of the intervention. There is an important distinction between monitoring outcomes, which is a description of the factual, and utilizing the

counterfactual to attribute observed outcomes to the intervention. The IFAD impact evaluation guidelines accordingly define impact as the "the attainment of development goals of the project or program, or rather the contributions to their attainment." The ADB guidelines state the same point as follows: "project impact evaluation establishes whether the intervention had a welfare effect on individuals, households, and communities, and whether this effect can be attributed to the concerned intervention".

Attribution: The problem of attribution is the problem of assigning observed changes in outputs and outcomes to the intervention. This is done by constructing a counterfactual.

Counterfactual: outputs and outcomes in the absence of the intervention. The counterfactual is necessary for comparing actual outputs and outcomes to what they would have been in the absence of the intervention, i.e. with versus without. With versus without: 'with 'refers to the outputs and outcomes with the intervention (the factual), which are compared with the outputs and outcomes 'without' the intervention (the counterfactual) to determine the impact of the intervention, though single or double difference estimates.

Comparison group: For project-level interventions, the counterfactual is often established by taking a comparison group (typically a geographic area) which is identical to the ***treatment group***, except that it is not subject to the intervention. (The expression '***control group'*** is also commonly used, but strictly speaking only applies to experimental settings in which the conditions of the control group can be controlled).

Experimental design: In order to ensure comparability, an experimental design randomly assigns eligible households to the project and comparison groups. This approach can avoid selection bias, but the extent to which it can be applied to the types of intervention.

Selection bias: The beneficiaries of an intervention may be selected by some criteria (or select themselves) which is correlated with the observed outcome. For example, entrepreneurs being selected for microcredit or for a business development scheme may have done better than those who did not bother to apply, even in the absence of the support. Hence comparing outcomes of beneficiaries and non-beneficiaries can give misleading results. Where these criteria or not observed (i.e. there are no data on them), then there is a bias in the impact evaluation findings (this point is discussed further

below). But where the determinants of participation are observed, then the bias can be removed using quasi-experimental methods.

Quasi-experimental design: evaluation designs which address selection bias using statistical methods, such as propensity score matching, rather than randomization. These methods model the selection process and so control for these variables in the analysis of outcomes.

Contagion or contamination: The comparison group is contaminated if it is subject to a similar intervention, either by spill-over effects from the intervention or another donor starting a similar project.

Single difference: the difference in the output or outcome either (1) before versus after the intervention, or (2) between project and comparison groups. Before versus after is not a good impact measure as it fails to control for other factors. The single difference project versus comparison groups fails to allow for differences between the two groups which may have existed prior to the intervention. The double difference takes care of these two problems.

Double difference: The Difference -in- Difference method combines insights from cross-sectional treatment-control comparisons and before-after studies for a more robust identification. First consider an evaluation that seeks to estimate the effect of a (non-randomly implemented) policy ("treatment") by comparing outcomes in the treatment group to a control group, with data from after the policy implementation

2.1.2. Basic Theory on Livestock Insurance and Related concepts

The frequency of droughts and other climate-related risks has increased in the recent past, leading to the loss of large numbers of livestock and livelihoods, and particularly affecting pastoralist communities.

Pastoralists have traditionally used various risk-management mechanisms; these include splitting herds, pasture management by creating dry- and wet-season grazing areas, and movement of herds to access water and pasture in other areas. Recently, livestock insurance has been tested in a few countries as one of the modern risk-management tools. The insurance systems are designed to cushion households against unpredictable losses. Some countries that have piloted livestock insurance include Mongolia, India, Senegal, Kenya and Ethiopia *(Kunow, 2016)*

The Livestock Insurances so far practiced are broadly categorized as traditional systems (including both conventional systems and traditional social insurance schemes) and emerging livestock insurance schemes such as loan-based schemes and Index-Based Livestock Insurance (IBLI) *(Yacob Aklilu,2020).*

2.1.2.1. Traditional Livestock Insurance Systems

(a). Conventional Livestock Insurance Systems

Commercial livestock farms (dairy, beef, poultry, etc.) that require substantial capital investments and operational expenses are insurance policy holders in many cases. The types of insurance coverage provided to commercial livestock farms vary by company policies. Farm owners have to choose from a bundle of available policy options with the premium rising as more options are included in the bundle. The range of insurable animals may include cattle, sheep and goats, pigs, poultry and buffaloes, depending on the case. For example, UAP Old Mutual's website in Kenya claims to provide coverage for accidental death due to lightning; internal/external injury on location or during transit, fire, windstorm, snake bites, diseases of terminal nature, emergency slaughter on vet's advice, calving complications, theft of livestock and epidemics. 'What is not covered' by UAP's policy (for which the insured does not receive indemnity) includes the following: for the first 10% of livestock loss for each and every loss, for the first 20% of the loss for theft, for famine (drought), malnutrition and poisoning, impotence and infertility, prior disease and deformities, and, any death due to neglect and husbandry practices. The website also states that 'in the event of theft, the insurance requires a period of six weeks for recovery before settlement of losses (UAP OLD Mutual web.).

(b). Indigenous Social Insurance Schemes

Mobile herders of East Africa have been practicing an elaborate system of risk management strategies for centuries through social insurance schemes. These strategies are triggered from the time drought becomes imminent, through the drought cycle, and in the post-drought phases.

For example, the post-drought social insurance practiced by the Gari community in North-East Kenya, are the following

Robdoon - Over the course of a period of days, elders will discuss what collective action should be taken. Such action may be the transfer or lending of livestock to assist 'poor' clan members or to

arrange with other clans/ people for the use of pasture outside of the drought-affected area and migration.

Zakad - While not a drought relief strategy per se, zakad requires people to give 2.5% of their wealth to the poor. In the case of livestock ownership, this follows an established schedule. For example, the owner of 40 shoats would be required to give one shoat. Likewise, the owner of 5 camels would be required to give one shoat. If 30 cattle are owned, a bull of three years might be given. The number of livestock given increases in direct proportion to the number of animals owned.

Orge - This literally means 'unborn calf'. In practice, it is the loan of a bull for slaughter to those without. This loan will be repaid sometime in the future when a bull is born to the recipient. It benefits both parties, as a bull given during drought is likely to die. Other loan animals - Other loan animals given in difficult times are likely to be camels or donkeys if they can be spared. These are vital to surviving drought as they may be employed as beasts of burden, either ferrying water or shifting to areas less impacted by drought.

Irb (restocking) - Irb may be a response to disease, drought or livestock raids and is usually in the form of shoats as these provide the fastest milk production. For the longer term, camels and cattle may also be given. This assistance is only given to family men who have lost livestock through misfortune in the recent past, to help them begin again. It is not given to those who have lost their animals through mismanagement or to young men to help them get started. It may even be extended to members of the larger clan who migrate into the area because of conflict, disease or drought elsewhere. The number of animals that are given varies, depending upon the resources of the supporting community and perceived need of the individual. Traditional restocking targets specific individuals who are most capable of managing livestock resources, increasing herd size and thus providing social and food security for themselves and other members of the community in the future. In this respect, it is not a purely philanthropic undertaking, instead concentrating on ensuring the future wellbeing and security of the community. Restocking may also occur over time as families who have lost their livestock continue to work for patrons and are given livestock each year as payment, with additional livestock provided through the practice of zakad. Livestock may also be given to elders, as a sign of respect (Chris Pratt (2002).

Buusa Gonofaa (BG)- Across the border in Ethiopia, the Borana pastoral community has been practicing a similar social insurance scheme for centuries known as Buuasaa Gonofa (BG). BG is

supported by the Borana's elaborate traditional administrative Gada system which oversees impartial application to needy families. The system even goes to the extent of prioritizing recipient families according to their needs. In writing about the resilience of this system, even during the 1890's Great Rinderpest Outbreak, Waktole and Oba (2009) state that 'despite the extermination of cattle, the collapse of the pastoral economy and human population, the practice of pawning children … the wiping-out of entire families and, most critically, the crisis of social identity, societal responses enabled the revival of those social institutions that coordinated recovery and the redistribution of resources…., the social and ritual re-organization of the Gada, and the revival of social institutions that re-created social harmony and promoted pastoral economic recovery.

Catley and Aklilu (2013) also confirm that BG presently provides only one fifth of the household support needed compared to the past and now it takes years before a household can receive this support due to a long list of intended beneficiaries.

2.1.2.2. Emerging Livestock Insurance Schemes

Emerging livestock insurance schemes focusing on small herders, sedentary livestock farmers and cooperatives consist of, at least, the following variants.

(a). Loan-tied and/or Government subsidized Livestock Insurance Schemes

India - According to the Department of Animal Husbandry and Dairying website, as of 2008/9, livestock insurance has been implemented in 100 new districts under a 'scheme policy' through the Integrated Rural Development Program or other subsidized schemes. The 'scheme' is restricted to cross-bred cows and buffaloes yielding 1,500 liters of milk or more per lactation period and does not extend to animals covered under other insurance schemes. Premium rates are tagged at a maximum of 4.5% for annual policies or 12% for three years plus additional premiums of 0.85% for permanent total disablement and 1% for transit beyond 80 km. Under such a 'scheme', the Government subsidizes 50% of the insurance premium for two animals per household for high yielding dairy cattle (from 2 years at first calving up to 10 years), buffaloes (from 3 years at first calving up to 12 years) and for indigenous/first crossbred female calves from four months to 32 months or first calving whichever is closer. The 'scheme' policy covers livestock death due to surgical operations, famine or diseases contracted prior to commencement of risk on a pre-agreed value basis, and for permanent disablement at 75% of the sum insured.

Bangladesh – The Insurance Development and Regulatory Authority of Bangladesh (IDRA) operates under the Ministry of Finance, which oversees and regulates both life and non-life policies for the State-owned General Insurance Company and 43 other non-life insurance companies. In 1990, the Government set up a 'not for profit organization' under the title of Palli Karma-Sahayak Foundation (PKSF), which acts as a second-tier organization providing financial and non-financial services to its 203 active NGO MFIs operating as Partner Organizations (POs). In 2013, 14 POs started a pilot livestock insurance for a beef fattening Program in which 124,669 cattle belonging to 112,821 borrowers of micro-finance loans were insured. The loan cycle was set to between 6-10 months with a premium structure of 0.7% of the value of the cattle plus a 20 Taka (monetary unit of Bangladesh) veterinary service fee paid at the start of the loan and a further 0.3% fee in the event of a borrower's death. Achievements of the pilot scheme included a reduction in cattle mortality from a national average of 5.43% to 0.33% (due to enhanced veterinary services). The total premium collected under this pilot scheme was US$233,609 with a pay-out of US$98,561 for 408 claims. Given that the POs were operating without reinsurance, setting up a Co-variant Risk Fund (CRF) was recommended to the Government as an alternative to reinsurance to cover this drawback (source: Karim, A. 2013).

(b). Index Based Livestock Insurance (IBLI)

Like any insurance product, index-based insurance aims to compensate clients in the event of a loss. On the other hand, different scholars defined IBLI as a financial tool that has the potential to be used in managing the risk of asset loss (Chantarat et al. 2009a, Barrett et al. 2008, Mude et al. 2008, Barnett and Mahul 2007. Unlike traditional insurance, which makes payouts based on case-by-case assessments of individual clients' loss realizations, index-based insurance pays policy holders based on an external indicator that triggers payment to all insured clients within a geographically-defined space. For index insurance to work there must be a suitable indicator variable (the index) that is highly correlated with the insured event. Using a data source that is promptly, reliably, and inexpensively available (and not manipulatable by either the insurer or the insured), an index insurance contract makes the agreed indemnity payment to insured beneficiaries whenever the data source indicates that the index reaches the "strike point," or insurance activation level.

IBLI was designed by the International Livestock Research Institute (ILRI) in Marsabit county of Kenya in January 2010 and in Borana zone of Oromia region of Ethiopia July 2012. In both Kenya and

Ethiopia, the index is based on Normalized Difference Vegetation Index (NDVI) satellite imagery that gives an indication of the level of forage or level of 'greenness' (Kunow 2016).

The index on which the insurance contract is written is the predicted area average mortality rate, defined as a function of the NDVI. Because NDVI data are available in real time, the predicted mortality index can be updated continuously over the course of the contract period. We express the index in terms of percentage predicted mortality instead of NDVI in order to expressly link the index to the insurable interest of contract holders. The index emanates from a longitudinal research outcome, which established that pastoral households in Northern Kenya (and Southern Ethiopia) tend to tip into destitution or, at least face very severe and long-term consequences, if their herd size dips below the critical threshold – i.e. between 8 and 16 Tropical Livestock Units (TLUs). This threshold represents a marginal line, above which herders may survive and/or thrive in the system, and below which herders may risk 'irreversible asset losses. IBLI's main objective is in protecting 'vulnerable but presently non-poor households' from such 'irreversible asset losses. IBLI differs from traditional insurance systems in three fundamental ways. Unlike traditional insurance, which makes pay-outs based on case-by-case assessments of individual clients' loss realizations, index-based insurance pays policyholders based on an external indicator that triggers payment to all insured clients within a geographically defined space. Secondly, the external index is reliable and inexpensively available, and cannot be manipulated by the insured or the insurer, as the data source determines when the index has reached the 'strike contract; Thirdly, the gains from index-based insurance come at the cost of 'basis risk' (Chantarat et al 2013).

According to the information obtained from OIC the operational area grew to 16 districts as of today – 13, 2 and 1 districts in Borana, West Guji and East Hararghe zones respectively. It was designed by International Livestock Research Institute (ILRI) and the commercial underwriter in Ethiopia is Oromia Insurance Company S.C. After years of implementing an index that estimated average livestock mortality, which made payouts at the end of the dry season for 'asset replacement' (Chantarat et al. 2013), the product was redesigned with a focus on 'asset protection'; payouts are provided at the onset of the drought during the rainy season to facilitate pastoralists implementing early coping and mitigation strategies (such as purchasing fodder/water/veterinary services, destocking before emergencies, and migration planning) to protect their livestock against more severe impacts (Fava and Vrieling 2021).

In Borana, IBLI uptake was slow in the first two years – 627 households in 2012 and 509 households in 2013 and then sharply increased as of 2014. In 2017/18, the number of insured households grew to 2,962 and the number of insured animals rose to 14,017. This growth is attributed to demonstrated evidence of pay-outs beginning 2014 and a 35% premium subsidy provided by a local NGO (CIFA) for cash-strapped groups (Yacob Aklilu,2020)

In October 2017, the World Food Program (WFP) also launched a similar weather-index insurance scheme in the Somali Region of Ethiopia for pastoralists covering the gu (long rain/long dry) and deyr (short rain/short dry) seasons. The WFP project enrolls Productive Safety Net Program (PSNP) beneficiaries only. WFP's IBLI builds on and is closely linked to the PSNP through which beneficiaries receive livestock insurance premiums for contributing their labor for 'creation and rehabilitation of community disaster risk reduction assets' – such as, ponds, access roads, bush clearing, small scale irrigation, etc. Individuals benefitting from pay-outs in the project period (5 years) are 'expected' to purchase their own policies in the post-project period. Though the project targets households with 5-11 TLUs, WFP pays premiums for only 5 TLUs at a premium rate of $80 with the value of insured livestock at $400 per household. So far, premiums have been paid for 15,500 households and WFP plans to cover 70,000 households by around 2022. WFP engages a consortium of four insurance companies, which are reinsured by SCOR of France. The first payout was triggered in late 2019 amounting to $435,324 for 4,673 beneficiaries (WFP 2019). Like IBLI Ethiopia (Borana) and Kenya, pay-out is done before animals die.

IBLI in Ethiopia (Borana) and Kenya it was first designed as asset replacement contract which compensate pastoralists at the end of contract period- even after the livestock would die of drought. Based on the request of the pastoralists of the target area and reality on the ground in 2014 it was changed to asset replacement which compensates pastoralists in between the contract period after the evaluating the forage condition during the critical seasons.

2.2. Livestock Development in Ethiopia

Ethiopia has the largest livestock population in Africa, with 65 million cattle, 40 million sheep, 51 million goats, 8 million camels and 49 million chickens in 2020 (Central Statistics Agency, CSA, 2020a). Between 2000 and 2016, the average stock of livestock, measured in tropical livestock units (TLU) per 100 people, stood at 51 TLU, which is more than double the continental median of 23 TLU.

The gross production value average growth rate during the same period was 4.5% — also twice the continental median of 2.2% (FAO, 2019). The national herd supports, at least in part, the livelihoods of more than 11.3 million rural households, including 27– 35% of the highland livestock keepers, and a large proportion of the lowland herders, who live below the Government of Ethiopia established poverty line (Shapiro et al., 2017). Livestock is a major source of animal protein, power for crop cultivation, means of transportation, export commodities, manure for farmland and household energy, security in times of crop failure, and means of wealth accumulation. The sector contributed up to 40% of agricultural Gross Domestic Product (GDP), nearly 20% of total GDP, and 20% of national foreign exchange earnings in 2017 (World Bank, 2017). Table 1 shows the main livestock species by Region.

Table 1. Estimated Numbers of Livestock in Ethiopia by Region

Region	**Cattle**	**Sheep**	**Goats**	**Poultry**
Tigray	4,908,964	2,097,619	4,838,969	6,317,518
Afar	1,952,394	4,040,176	8,531,082	92,941
Amhara	16,318,446	10,386,223	6,883,316	16,827,119
Oromia	25,031,068	9,260,493	7,526,644	16,668,657
Somale	3,646,940	9,188,394	17,001,672	354,264
Benshangul-Gumuz	626,537	72,284	404,015	884,660
SNNP	12,404,963	4,735,604	4,819,573	7,347,205
Gambela region	327,801	43,903	134,206	229,151
Harari	69,615	4,236	103,567	104,585
Dire Dawa Astedader	67,364	65,462	258,629	129,575
	65,354,092	39,894,394	50,243,044	48,955,675

Source: CSA (2020a)

The Ethiopian livestock population is almost entirely composed of indigenous animals. Recent estimates showed that 97.8%, 1.9%, and 0.3% of cattle are indigenous, hybrid, and exotic breeds, respectively. The estimates for sheep are 99.6% and 0.3% for local breeds and hybrids, respectively; for poultry 81.7%, 10.9%, and 7.4% are indigenous, hybrids and exotic, respectively. Nearly all goats (99.9%) are indigenous breeds (CSA, 2020a)

Management Practices

The livestock production system is predominantly extensive, with indigenous breeds and low-input/low output husbandry practices. The productivity of this sector is constrained by several factors, including poor genetics, low reproductive performance, poor quality and varying seasonal availability of feed, high disease incidence and parasite challenges, and low accessibility to services and inputs. Milk production averages only 1.35 liters per day per cow and 5.16 liters per day per camel. The use of animals depends on the production system and the ethnic group(s); for instance, sheep are kept primarily for cash income in the mixed farming system, such as in North Shoa of Amhara region, but milk production is rationale for keeping sheep in the Afar region (Getachew, 2010). Small ruminants are a major source of cash income for rural women (Biffa et al., 2006). Extensive scavenging poultry production is often the domain of poor women because it requires little initial investment and does not usually conflict with women's other household duties.

There are three predominant management systems in the country: intensive management, mixed crop-livestock, and pastoral/agro-pastoral (extensive).

Intensive Management

The intensive management system is practiced on market-oriented dairy and poultry farms in urban and peri urban areas, where exotic breeds or crossbred animals are mainly kept for their high performance (Tegegne etal., 2013). In this system, milk production is market oriented and is predominantly from high yielding improved exotic breeds or crossbreeds with local cows. Intensive management involves relatively high inputs and technology.

Mixed-Crop Livestock

The mixed crop-livestock farming system is the dominant livestock production system in the Ethiopian highlands. In this system, crops and livestock play interdependent roles, with livestock providing draught power and manure for crop agriculture while crop residues provide feed for the livestock (Yisehak, 2008). In the mixed farming system, livestock follow crops as the means of livelihood (Tegegne et al., 2013). Due to the emphasis on crop cultivation, the number of livestock kept per household in mixed farming areas is low (Balehey et al., 2018; Mulugeta and Amsalu 2014).

Pastoral

Pastoral and agro-pastoral livestock production are the second most dominant systems in Ethiopia and they are mainly in southern and eastern parts of the country in Afar, Somali, Southern Oromia (Borana), Karayu in East Showa and South Omo in SNNPR. There is no crop production in the pastoral system, but agropastoral is characterized by dominance of livestock husbandry and limited crop production (Tegegne etal., 2013). Transhumant systems that involve the seasonal movement of animals from mixed crop livestock systems to highland and lowland rangelands, such as in western Tigray and Amhara regions, are also categorized under agro-pastoral system (Nyssen et al., 2009; Tegegne et al., 2009)

Livestock Products: The estimate of total cow milk production for the rural sedentary areas of the country in 2019/2020 was about 3.89 billion liters (CSA, 2020a). The estimate of camel milk for pastoral areas of the country was about 1.82 billion liters. The estimate for total number of eggs produced was 317 million. According to CSA (2020b), of the total annual milk production, 50% was used for household consumption, 10% was sold, 0.56% was used for wages in kind, and the rest (39%) was used for other purposes (e.g., to produce butter, cheese, yogurt, etc.). With respect to the utilization of butter, 55% of the produce was used for household consumption although a considerable portion (39%) was sold. Most of the total cheese produced was used for household consumption (77%), 17% was sold, and the rest (6%) was used for wages in kind and other purposes (Table 2).

Table 2**.** National livestock product utilization in 2019/2020

Type of Product	**Household Consumption**	**Sale**	**Wages in Kind**	**Other**
Milk	50.1%	10.0%	0.6%	39.4%
Butter	54.9%	38.6%	0.5%	6.0%
Cheese	77.2%	17.2%	0.5%	5.1%
Beef	56.9%	29.4%	1.9%	11.8%
Mutton/Goat Meat	88.9%	3.9%	0.4%	6.8%
Eggs	31.4%	46.8%	0.3%	21.5%
Skim milk	60.9%	2.8%	0.7%	35.5%
Camel Meat	46.5%	16.3%	1.9%	35.4%

Source: CSA (2020b)

The national level production and consumption of meat is indicated in Table 3. Livestock is a key source of industrial raw materials (milk, meat, hides and skin) and high value protein to potential consumers in Ethiopia (FAO, 2015; USAID, 2010). Due to low productivity, the average live weight of cattle is estimated at 250 kg; with 14% offtake rates and 110 kg carcass weight at 44% dressing (MOA, 2012; USAID, 2010). The offtake rates for sheep were 40% with 10kg of average carcass weight per sheep, whereas the offtake rate for goats was 27% with average carcass weight of 8kg/goat. (MOA, 2012; ESGPIP, 2011). The per capita consumption of meat in the country is very low (8.5kg) and is lower than the average per capita consumption in Africa.

2.2.1. Impact of Drought on Livestock Production in Borena

Many researches have been conducted on the impacts of drought on the livestock production as a country in general and in Borana zone in particular. The findings of some of these researches have been presented as follows. Ethiopia is repetitively exemplified as the potential country in livestock resource (Shapiro et al., 2015). This resource forms an integral part in the agricultural system and basis of livelihood for larger rural and semi-urban population. On the other hand, a study conducted by Coppock with the title "The Borana Plateau of Southern Ethiopia: Synthesis of pastoral research, development and change". The findings show that in pastoral areas, beyond the economic advantage livestock matters a cultural prestige and social status of the society (Coppock, 1994). Livestock, especially cattle, plays a leading role in determining the social position of the pastoral households in the society besides its crucial role in cultural heritages and economic welfares. However, the anecdotal evidence indicated that the per capita livestock in the pastoral area is radically decreasing than ever. The intellectual evidence also indicated that the livestock per capita of pastoralists are diminishing from 4.1 to 2.3 TLU1 and more recently found 1.9 TLU (Bekele, 2013). However, in sight of self-reliance study indicated that the standard livestock per capita for self-sufficiency was accepted to be 3-4.1TLU and 7TLU per person for agro-pastoral and pure pastoral community respectively (Lybbert et al., 2004). However, the decline in livestock per capita and resultant shifts in households' wealth ranks over a period of years reflect the erosion of pastoral economy (Little et al., 2006). On the other hand, the customary counsel from Borana pastoralists also advocated that drought cycles have shortened from 5-10 years to 3-5 years (Oxfam, 2011). As a result, the density and reproductive performance of livestock have been reduced to the lower level despite the fact that livestock mortality was increasing (Herrero et al., 2010).

2.3. Empirical Literature

Many researchers have been conducted on the livelihoods of pastoralists of Borana Zone. Similarly, there are a number of researches conducted IBLI across the globe, specifically by focusing in Kenya and Ethiopia. Under this section the findings of previous similar researches has been summarized and presented as follows:

2.3.1. Impact of IBLI on the livelihoods of pastoralists (Economic and Social Returns to IBLI)

It has been found by many scholars that drought is the most natural phenomenon challenging the livelihoods of pastoralists in Borana. These scholars further highlighted that its frequency is becoming shortening from time to time and causing immense losses on the livestock which is the main income sources of the community. In such an environment, the economic and social returns to an effective program that insures pastoral and agro-pastoral populations against drought-induced livestock losses can be substantial. Some studies conducted in this regard shows that to the extent that the likelihood of severe herd mortality reduces incentives to build herds, insuring livestock against catastrophic loss would address the high risk of investment in such environments. A research conducted by Barret et al, 2008 on "Altering Poverty Dynamics with Index Insurance in Northern Kenya" shows that stabilizing asset accumulation, insurance improve incentives for households to build their asset base and climb out of poverty, thereby enhancing economic growth.

IBIs are also evidenced to have impacts on ex-post shock coping. Recent works provide compelling evidences in this regard. Janzen and Carter (2013) explained that access to an Index-Based Livestock Insurance (IBLI) in northern Kenya helped pastoral households to smooth their asset and consumption that constitute the two key dimensions of self-insurance. The study revealed that after the intervention, poor pastoral households are less likely to destabilize their consumption in response to drought, while those who are better off are less likely to have to compromise their accumulated assets. Insured households are observed to be less dependent on food aid and other forms of assistance, which indicates their better ability to cope with shocks. The impact of the IBLI intervention was also selective based on wealth position of the pastoral households.

Empirical researches conducted in this regard in Kenya put as because it provides compensation ahead of time, before the animals died, to keep the core breads of the livestock alive, livestock insurance

could help stem the collapse of vulnerable-but-presently-non-poor households into the ranks of the poor following a drought (or related crisis) due to irreversible losses from which they do not recover. Poverty traps manifest in the form of a dynamic herd size threshold above which herds accumulate to a high-level equilibrium and below which herds sizes naturally diminish to a low-level equilibrium below the poverty line. For those with herd sizes slightly above this threshold, protecting them against losses that will naturally lead them toward chronic poverty is an important priority that IBLI could theoretically fill (Barrett et al. 2008; Chantarat et al., 2009b). From the above hypothesis we can conclude that IBLI has economic benefit to pastoralists whose livelihoods mainly rely on livestock. Barnett et al. (2008) explains that the economic returns to adoption of IBI are potentially broad and substantial. The researchers further elaborate the economic returns as "it can be in terms of inducing households to make more prudential investments, providing better management for consumption risk, crowding-in finance for ancillary investment and enhancing local adaptation to climate change".

On the other hand, a study conducted by Coppock with the title "The Borana Plateau of Southern Ethiopia: Synthesis of pastoral research, development and change". The findings show that in pastoral areas, beyond the economic advantage livestock matters a cultural prestige and social status of the society (Coppock, 1994). The findings further revealed that livestock, especially cattle, plays a leading role in determining the social position of the pastoral households in the society besides its crucial role in cultural heritages and economic welfares.

Thus, from the different empirical researches conducted and presented above on the impacts of IBLI on the livelihoods of pastoralists we can draw the conclusion that IBLI plays a crucial role in maintaining the social status of the pastoralists among the community by protecting the livestock related mortality that may happen due to drought.

2.4. Conceptual frame work

A conceptual framework is how the researcher conceptualizes the current problem and clarifies goals and expectations of a research. It enables the researcher to critically consider multiple facets of the research problem, identify key factors, and depict their logical interrelationships in a scheme. The following conceptual framework was developed to serve as a vital compass to assist focusing a study towards the central research problem. The diagrammatic form of the conceptual framework that displays interrelationships among key factors and their likely outcomes depicted in Figures 1 below.

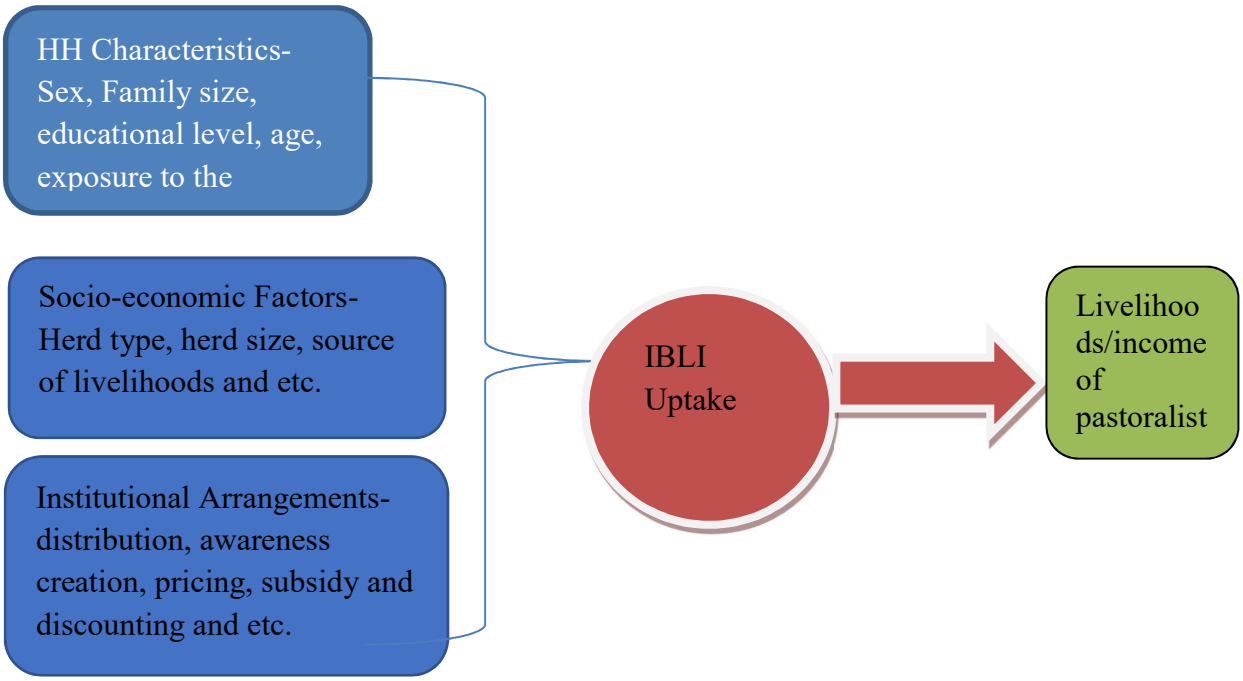


Figure 1. Conceptual framework
Source: Developed by the researcher

From the literatures, households' characteristics- Sex, Family size, educational level, age and exposure to the product, socio-economic factors- herd type, herd size, source of livelihoods and etc. and institutional arrangements- distribution, awareness creation, pricing, subsidy and discounting and etc. play a crucial role in boosting the uptake of the product.

Empirical research conducted in this regard in Kenya put as because it provides compensation ahead of time, before the animals died, to keep the core breads of the livestock alive, livestock insurance could help stem the collapse of vulnerable-but-presently-non-poor households into the ranks of the poor following a drought (or related crisis) due to irreversible losses from which they do not recover. Poverty traps manifest in the form of a dynamic herd size threshold above which herds accumulate to a high-level equilibrium and below which herds sizes naturally diminish to a low-level equilibrium below the poverty line. For those with herd sizes slightly above this threshold, protecting them against losses that will naturally lead them toward chronic poverty is an important priority that IBLI could theoretically fill (Barrett et al., 2008; Chantarat et al., 2009b).

Similarly, the Ethiopian Microinsurance Diagnostic Report (Anja Smith and et al., 2010) show that the structure of the Ethiopian insurance market, as well as the way that distribution currently takes place,

does not bode well for the development of a microinsurance market. The report further highlights, even if insurers decide to pursue new and lower-income markets, there are a number of challenges that they will face; - these are: high transaction costs, limited distribution opportunities, limited technical capacity, and absence of electronic management information system (MIS).

A handful of studies on the dynamics of insurance demand have revealed that one's own experiences with insurance payouts as well as those of one's network members positively affect the subsequent uptake (Cole et al., 2014; Karlan et al., 2014). This in turn have a great impact on the livelihoods of the pastoralists.

On the other hand, studies conducted social and economic returns shows that to the extent that the likelihood of severe herd mortality reduces incentives to build herds, insuring livestock against catastrophic loss would address the high risk of investment in such environments. Research conducted by Barret et al., 2008 on "Altering Poverty Dynamics with Index Insurance in Northern Kenya" shows that stabilizing asset accumulation, insurance improve incentives for households to build their asset base and climb out of poverty, thereby enhancing economic growth. Thus, the study built the conceptual frame wok to illustrate the wide variety of factors that determined the uptake of the IBLI that contributes to improve the livelihoods of insured pastoralists than the non-insured ones.

CHAPTER THREE

3. Research Methodology

3.1. Study Area

3.1.1. Location

The study took place in the Moyale woreda of Borana zone, Oromia region in southern Ethiopia. Moyale is one of the 15 woredas found in the Borana zone. The town is also called Moyale, which is located at a distance of 771 Km from of Addis Ababa. It is named after the administrative center of the Woreda, Moyale. It is located in the southeast corner of the Borena Zone. Moyale is bordered on the south by Kenya, on the west by Dire woreda, on the northwest by Arero woreda, on the north by the Dawa River which separates it from Liben woreda, and on the east by Dawa Zone Somali Region (Moyale woreda Agriculture and Natural Resource Office). The capital town of the district is Moyale which serves for both Moyale Borana and Moyale Somale districts. It has been organized into three town kebeles and 26 rural kebele administrations.

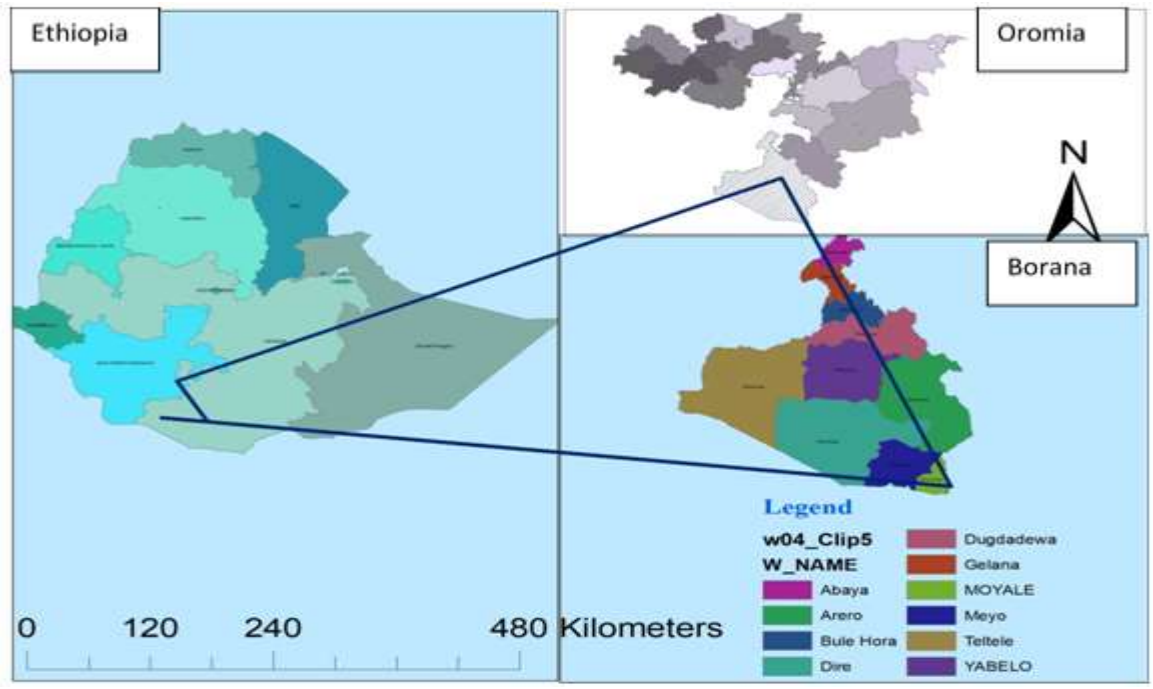


Figure 2. Location Map of Moyale District

Source: adopted from Ethiopian Mapping Agency

3.1.2. Agro-ecological Condition

The study area has one agro ecological condition which is low land (kola). The altitude of this district ranges from 1150 to 1350 meters above sea level. Moyale is an arid to semi-arid ecological zone characterized by a bimodal rainfall pattern broken into four seasons: a long rainy season (March to May), a long dry season (June to September), a short rainy season (October to November), and a short dry season (December to February). The area receives an average annual rainfall 500 mm and the annual mean temperature ranges from 25^0C-37^0C.

3.1.3. Socio-economic Condition

Based on figures published by the Central Statics Agency, this woreda has an estimated total population of 128,016, of whom 60,529 were males and 67,487 were females; 25,038 or 19.56% of its population are urban dwellers, which is greater than the Zone average of 11.6% (CSA 2005). With an estimated area of 15,575.47 square kilometers, Moyale has an estimated population density of 8.2 people per square kilometer, which is less than the Zone average of 21.1. The majority of the inhabitants belong to the Oromo although there is an organized community of the Garri clan of the Somali people around the town of Moyale. The economic condition of the community relays on livestock raring which is the main income source of the population. According to the land use information obtained from the woreda Agriculture and Natural Resource Office 9% is arable, 60% pasture, 21% forest, and the remaining 10% if is considered swampy, degraded or otherwise unusable. This shows the area is suitable for livestock raring as majority of the land is used for pasture.

3.2. Sampling Procedures

Different sampling design technique were employed for qualitative and quantitative data sets. For the qualitative data set, a non-probability sampling approach was used in order to identify the sample units (participants) for the study. These include stratified purposive sampling, and criterion-based sampling. Whereas for the quantitative data set, the sample survey utilized a multi stage sample design technique to select the kebeles and households moving from the general level of areas to the precise level (household).

The study woreda was selected purposively because of the following reasons. First the district is one of the pioneers in adopting the IBLI from the rest of the districts the product has been implemented in. Second, the highest sales have been registered from time to time at this woreda. According to the

information obtained from the commercial underwriter of the insurance product, OIC from the total sales figures and the pastoralists being enrolled in the insurance contract, this district accounts more than half. However, empirical study has never been conducted with regard to the impact of IBLI in this district.

Thirdly, three kebeles have been selected again purposively based on their participation into the scheme. Pastoralists of the three selected kebeles again were grouped in to two; - treatment (insured) and control (non-insured). Accordingly, individual who have purchased and who have never purchased the product from these highest sales achieving kebeles were selected randomly and the researcher was aimed to seeing the impact of the IBLI on the livelihoods of the pastoralists by comparing the insured against the non-insured.

Sample size determination for the study made following Kothari (2004) references of the study population. The approach to determine sample size is valid only if simple random or systematic random sampling methods are applied. Sampling frame has been the households living in selected *kebeles* and respondents was selected using systematic random sampling technique proportionate to the size of households for both the control and treatment. Hence, systematic random sampling technique was employed because, it is one of the probability sampling methods and easy to manipulate the selection of the sample households. The total households living in the three *kebeles* were taken as a sampling frame, and then respondents were selected using a systematic random sampling technique- households were listed by each strata (non-insured and insured) then the simple random sampling technique was used to select sample households from each strata using a random number balanced to the size of households of each *kebele*. Accordingly, the number of households currently living in these three Kebeles was assumed to be 2,100. The sample size is calculated and resulted in a total of 116 (39 respondents each from Buledi and Showa Bere Kebeles and 38 respondents from arable kebele) participants out of which 50% (58) from the insured) and the remaining 50% (58 from the non-insured). In sample size determination, a 95% confidence level and a *p*-value of 0.05 for maximum variability will be assumed. This study used a simplified formula to determine the required sample size at 95% confidence level, 0.05 degree of variability and 9% (0.09) level of precision.

$$n = \frac{N}{1 + N(e)^2}$$

Where **(n)** Stands for the sample size,

(N) Signifies the total number of households in all the *kebeles*,

(1) Stands for the probability of the event occurring,

(*e*) Designates level of precision 9% (0.09).

Accordingly

$n = 2,100/1+ 2,100(0.09)^2$

$n = 2,100/18$

$n = 116$

However, only 95 (32 each from Buledi and Shewa Bere kebeles and 31 respondents from Arbale) respondents were reached out and interviewed as getting the pastoralists were quite difficult owing to the recurrent drought and they were travelled far in search of forage and water.

3.2.1. Data Source and Data Collection Methods

Generally, this particular research utilized integrated method of research design. The quantitative data was generated from household survey and secondary sources (was generated from reports, facts and figures from the institutions participating in the IBLI implementation processes). For household survey instruments like structured questionnaire and semi structured questionnaire were employed. The qualitative data largely have been obtained through focus group discussion (FGD) and key informant interview (KII).

Household Survey

Relevant data that is pertaining to the objectives of study was generated from households using structured survey questionnaire. Using primary data, personal related information, socioeconomic, institutional variables, the impact of IBLI on livelihoods of pastoralists and other relevant data were collected, among others. To generate information at household level, household level survey has been undertaken using semi-structured interview with closed ended and open-ended questionnaires. Prior to conducting the interview, pre-test of the interview schedule and consistency with the objectives of the study have been evaluated and accordingly, certain revision to the schedule had been made as deemed necessary.

Enumerators were recruited based on their proficiency in communicating using local language and prior exposure to similar works. Training was given to enumerators on the content of the schedule and

procedures follow while conducting interview. The researcher had made a close and intensive supervision of the interview process to minimize possible errors that might occur during data collection.

Focus Group Discussion:

As the researcher used a mixed research method, focus group discussion has also been used to triangulate the information to be obtained using different tools from different sources. The researcher conducted two formal focus groups discussions at kebele level (one from the IBLI beneficiary households and the other from non-beneficiary households) consisting 6-8 households per groups. Mix of age, gender and educational level has also been taken care of with the objective of getting concert evidence about the subject under study. Note taker was employed to capture the information of the FGD.

Key Informant Interviews (KII): Furthermore, to find out the real impact of the IBLI on the livelihoods of pastoralists KII has also been conducted involving different parties those have been taking part, mainly OIC and ILRI, in the IBLI intervention from the start. Furthermore, other institutions like zonal/regional pastoral area development offices and other local NGOs who have stake in the implementation of the product has also been interviewed. These individuals have been selected as they have been engaging in the IBLI activities representing their respective institutions. The details of the interview and their institutions have been presented in table as herein below:

S. No	Name of Institutions	Number of persons interviewed	Remarks
1	OIC	2	
2	ILRI	1	
3	CIFA	2	
4	Zonal and woreda agricultural Office	4	

3.2.2. Method of Data Analysis

This study employed both quantitative and qualitative data analysis techniques. The quantitative data has been analyzed using descriptive and inferential statistical tools, whereas, the qualitative data has been analyzed thematically and the information from the data used to triangulate and prove the quantitative data. The qualitative data set has also been used to capture commonality and divergence across the study area in terms of the variables of interest. The descriptive statistic methods have been used to disclose the social, economic and demographic characteristics of study households.

The data obtained with regards to the first objective, which is to find out the impact of IBLI on the household's income, the researcher utilized propensity matching model. Furthermore, descriptive tools have also been applied to compare the study area in terms of the variables of interest that include: to investigate factors contributing to IBLI upscaling, the role of IBLI as drought management mechanisms and challenges to the implementation of the responses. For detail analysis, the survey data has been edited, coded and entered into a computer, and then has been analyzed using STATA software.

Generally, it should be noted that the detailed analytical techniques that was employed for each of the study objectives has been provided in chapter four. The analyzed quantitative data has been presented in tables, figures, and graphs based on the nature of data generated, and the qualitative data generated presented using narratives.

Propensity Score Matching (PSM) Procedure

In determining the impact of an intervention, an impact assessment must estimate the counterfactual; that is, what would have happened had the intervention or program never taken place or what otherwise would have been. To determine the counterfactual, it is essential to net out the effect of the intervention from other factors. This is accomplished through the use of control groups which are compared with the treatment group. The choice of a good counterfactual is therefore crucial in impact assessment. The PSM is a probability, and it ranges in values from 0 to 1. PSM values are dependent on a vector of observed covariates that are associated with the receipt of treatment. In this study, PSM was used to evaluate the impact of impact of index based livestock insurance on the livelihoods of pastoralists. Propensity Score, Matching construct a statistical comparison group then based on a model of the probability of participating in the treatment using observation characteristics. The degree of similarities between different units is measured on the basis of the probability of being exposed to the intervention given a set of observable characteristics which are not affected by the program. Once the two groups are matched based on observation, the average treatment effect of the intervention is calculated. The mean effect of treatment can then be calculated as the average difference in outcomes between the treated and non-treated units after matching across treated and control groups.

This propensity value is estimated based on a statistical model, e.g., logit or probit model, and thereby estimate the average treatment effect of the outcome difference between the two groups using nearest-neighbor, caliper, stratification and kernel matching. It is more robust compared to others. However,

it requires a large sample size and good quality data. It may not able to control all preexisting difference between the two groups.

To understand, the procedures for implementing PSM in impact evaluation, consider that Y_1 denotes the potential outcome conditional on participation and Y_0 denotes the potential outcome conditional on non-participation; the impact of the program is given by;

$$\Delta = Y_1 - Y_0 \qquad (1)$$

Based on eq. (1), propensity scores can be estimated. However, it is important to detail the assumptions and practices of in application of the use of PSM to evaluate the impact of IBLI on household level outcome.

ASSUMPTIONS

Propensity score matching is based two assumptions, namely the conditional independence (CI) and the common support (CS) assumptions

Conditional independence (CI) assumption

This assumption states that given a set of independent observable X that are not affected by the intervention (treatment) potential outcomes Y are independent of treatment assignment T. That means if y_i^T represent outcome for participants (IBLI adopters) and y_i^C represent outcome for non-participants (i.e., pastoralist who did not buy IBLI), conditional independence implies that

$$y_i^T y_i^C \perp T_i / \ X_i \qquad (2)$$

Where $\perp$ indicate Independency, X is a set of observational characteristics. This assumption is also called un confoundedness, Rosenbaum and Rubin (1983). In this study, it implies that uptake of the IBLI is based entirely on observed characteristics. To estimate the treatment on the treated (TOT) as opposed to the average treatment effect (ATE), a weaker assumption is needed:

$$y_i^C \perp T_i / \ X_i \qquad (3)$$

Common support (CS) assumption

This assumption requires that there need to be a region of common area where households with the same characteristics have a probability of being both participants and non-participants. Treatment units therefore have to be similar to non-treatment units in terms of observed characteristics unaffected by participation; thus, the common support assumption implies that the probability of receiving treatment for each possible value of the vector X is strictly within the unit interval that fall outside the region of common support area would be dropped. Mathematically, it is represented as follows:

$$0 < P\ (Ti = 1/Xi) < 1 \qquad (4)$$

This assumption improves the quality of matches as it excludes the tails of the distribution of (X). If there is a sizable overlap in propensity scores (PS) between participants and nonparticipants, PSM estimates TOT as the average Mean difference in the possible outcome (Y) within the common support region. It weights the comparison unit by the PS distribution of participation. The cross section estimated as follows.

$$TOT_{PSM} = E_{p(x)|T=1}\ \{E\ [Y^T|\ T = 1, P\ (x)] - E\ [\ Y^c\ |\ T = 0, P\ (X)]\} \qquad (5)$$

More clearly, the treatment effect with cross section data and within the common support can be written as follows.

$$TOT_{PSM} = \frac{1}{N_T}\ [\sum_{i\in T} Y_i^T - \sum_{j\in c}(\omega)(i,j)\ Y_j^c \qquad] \qquad (6)$$

Where N_T is the number of participants i and (ω) (i, j) is the weight used for aggregated outcome for the matched non participantsj^2.

ESTIMATING THE PROPENSITY SCORE (PS)

The PS is defined as the conditional probability of receiving a treatment given pre-treatment characteristics (Rosenbaum and Rubin, 1983). The PSs will be computed using binary logit regression models given as

$$P(X) = P_r(D = 1 \mid X) = E(D \mid X) \qquad (7)$$

Where D = (0,1) is the indicator of exposure to treatment characteristics (dependent variable). That is D = 1 if exposed to treatment and D = 0 if not exposed to treatment; X is the multidimensional vector

of observed characteristics (explanatory variables). To calculate eq. (7), one must first calculate the propensity score P(X) on the basis of all observed covariates X that jointly affects participation and the outcome of interest. To undertake this, the following steps are required.

Step 1: Estimating a model of household participation in the program

In order to calculate the program treatment effect on samples of participants (i.e., the effect of IBLI on the outcome of adopters), the propensity score is estimated on all the observed covariates X in the data that are likely to determine purchase decisions of the households. The procedure compares the outcomes for those participating (T=1) with those not participating (T=0). The estimate can be constructed from a Probit or Logit model of program participation. The value of propensity score ranges from 0 to 1. When estimating the propensity score, two choices have to be made. The first one concerns the model to be used for the estimation, and the second one the variables to be included in this model. With regard to the model, since this study has binary treatment variable (i.e., IBLI purchase) as a dependent variable to estimate the propensity scores, Probit model is chosen for the application. Regarding the choice of variables which was included in the model, only variables that influence simultaneously the insurance purchase decision and the outcome variable were included.

Step 2: Identifying the common support (CS) region and balancing tests

The distribution of the probability of participating in the intervention may differ for treated and control groups; therefore, it is important to look where distribution of propensity score overlaps drop non-treated that fall outside of the region of common support. Hence, an important step is to check if there is at least one treated unit and one non-treated unit for each value of the propensity score. Several methods are suggested in the literature, but for this study a visual analysis of the density distribution of the propensity score in the two groups (treated and non-treated group) is used to check overlap and common support before matching samples. Balancing tests can also be conducted to check whether the distributions of the treated group and control groups are similar or balanced. This implies that the propensity scores of the groups from SFP beneficiary samples and non-beneficiary students need to be similar since propensity scores are based on similar observed X.

Step 3: Matching Participants to Nonparticipants

Based on the propensity score different matching criteria can be used to assign participants to non-participants. Doing so entails calculating a weight for each matched participant-nonparticipant set. The

choice of a particular matching technique may therefore affect the resulting program estimate through the weights assigned:

A) Nearest-neighbor matching: one of the most frequently used matching techniques is NN matching, where each treated unit is matched to the unit in the comparison group that presents the closest estimated propensity score. One can also choose n nearest neighbors and do matching (usually n=5 is used). Matching can be done with or without replacement. Matching with replacement (an untreated unit can be used more than once as a match) and matching without replacement (an untreated unit can be used only once as a match). Once each treated unit is matched with a control unit the difference between the outcomes of the treated units and the outcome of the matched control units is computed, however, it is obvious that some of these matches are fairly poor because for some treated units the nearest neighbors may have a very different propensity score.

B) Caliper or radius matching: One problem with NN matching is that the difference in propensity scores for a participant and its closest nonparticipant neighbor may still be very high. This situation results in poor matches and can be avoided by imposing a threshold or "tolerance" on the maximum propensity score distance (caliper). This procedure therefore involves matching with replacement, only among propensity scores within a certain range. A higher number of dropped nonparticipants are likely, however, potentially increasing the chance of sampling bias Khandker et al. 2010).

C) Stratification or interval matching: This procedure partitions the common support into different strata (or intervals) and calculates the program's impact within each interval. Specifically, within each interval, the program effect is the Mean difference in outcomes between treated and control observations. A weighted average of these interval impacts estimates yields the overall program impact taking the share of participants in each interval as the weights (Khandker et al., 2010).

D) Kernel matching: The matching methods discussed above have in common, that only some observations from the comparison group are used to construct the counter factual outcome of a treated unit. Kernel matching uses weighted averages of all individuals in the control group to construct the counter factual outcome. Weights depend on the distance between each individual from the control group and the unit exposed to the treatment for which the counter factual is estimated. The kernel function assigns higher weight to observations close in terms of propensity score to a treated individual and lower weight to more distant observations. The choice between different matching techniques implies a trade-off between bias and variance reduction. For instance, nearest-neighbor matching only

uses the participant and its closest neighbor. Therefore, it minimizes the bias, but might also involve an efficiency loss, since a large number of close neighbors are disregarded. Kernel-based matching on the other hand, uses more (all) non-participants for each participant, thereby reducing the variance but possibly increasing the bias. Finally, using the same non-treated unit more than once (nearest neighbor matching with replacement) can possibly improve the matching quality (Ahmed Jemal et al. ,2011).

Matching quality

The quality of the matching procedure is evaluated on the basis of its capability in balancing the control and the treatment groups with respect to the covariates used for the propensity score estimation. There are several procedures for this the basic idea of all approaches is to compare the distribution of these covariates in the two groups before and after matching on the propensity score. If there are significant differences after matching, then matching on the propensity score was not successful in making the groups comparable and remedial measures have to be taken. A good matching procedure should reduce the standardized bias for each of the covariates used in the estimation of the propensity scores. Thus, this approach requires comparing the standardized bias for each covariate X before and after matching. A similar approach uses a two-sample t-test to check if there are significant differences in covariant means for both groups. After matching the covariates should be balanced in both the treatment and the non-treatment group therefore no significant difference should be found. After matching there should be no systematic differences in the distribution of the covariates between both groups. The pseudo-R^2 after matching should be fairly low. The same can be done inspecting the F-statistics before and after matching. In fact, these statistics indicate the joint significance of all regresses used for the estimation of the propensity score.

Calculating the Average Treatment Impact

If conditional independence and a sizable overlap in propensity scores between participants and matched nonparticipants can be assumed, the PSM average treatment effect is equal to the mean difference in outcomes over the common support, weighting the comparison units by the propensity score distribution of participants. To understand the potential observed mechanisms driving the estimated program effect, one can examine the treatment impact across different observable characteristics, such as position in the sample distribution of income, age, and so on. The results are indicated in Section 4.8.

3.3. Ethical Considerations

"Most ethical issues in research fall into one of four categories: protection from harm, informed consent, right to privacy, and honesty with professional colleagues." (Leedy and Ormrod, 2010: 101). As much as possible the researcher tried to comply with all the ethical issues mentioned herein. The consent of respondents has been sought before conducting the interviews. The respondents have been randomly selected. Only those individuals who were voluntary to participate in the research have been contacted for the survey, and focus group discussions. They were also assured that their names will not be revealed in the study. In other words, participants' rights and privacy has been respected. Confidentiality has also been maintained and steps have been considered not to violate any ethical issues. All the reference materials used for the study have been acknowledged as much as possible.

The findings of the research have been presented without any deviation from reality.

CHAPTER FOUR

Result and Discussion

4. Description of Household Characteristics

In this section, the house holds socio-demographic characteristics and socio-economic characteristics were discussed using descriptive statistics such as mean and percentage.

4.1. Socio-Demographic Characteristics of the Respondents

4.1.1. Sex and Household Head of the Respondents

The Sex of the respondents can have effect on the uptake of IBLI. The Survey result revealed that 30.43% and 51.02%, and 69.57% and 48.98% were females and males from the non-insured and insured respectively from the study area. This shows that the proportion of females in the insured were higher than that of the non-insured counter parts. This is may be, due to the burden to feed the family goes to the female during the critical drought conditions and they opted to get insured their herds as a means of protection. The survey statistical result presented in table 1 below further revealed that the proportion of male household headed were higher than that of the female household head, for both non-insured and insured households with a percentage being 65.22/34.78 and 75.51/24.49 respectively. This shows that most of the household head were males and the headship was dominated by males. The study depicted that majority of the female household headed were found in the non-insured pastoralists and this might be due less resources /income to pay for the insurance premium and also might be due to lack of information than their male counterparts.

4.1.2. Age of the Respondents

The Age of the respondents is the important variable in the uptake of Insurance in generally and in the uptake of Index Based Livestock Insurance specifically. According to field level survey result, the average age of the respondents was 43.61 and 43.31 for non-insured and insured respectively, table 1. Age of the respondents affect the insurance uptake as usually older age adoption to new technology will be less than the younger ages as the younger age has better education level and information. The demand for ILBI is different among different age category of population and the younger tend to have more information and demand for ILBI compared to the older respondents and this result is consistent

with Bageant, (2014) that have revealed the younger the community the better the awareness of IBLI as a new form of insurance.

4.1.3. Education of the Household

The level of education is important variable to show the literacy and information level of the respondents. According to Katz et al., (2005), the level of respondents Education influences the understanding of IBLI as a new and emerging option in insurance and risk management strategies for the risks that happens to their livestock. The survey result presented in the table 1, majority of the non-insured respondents have no education (60.87%), 28.26%, 4.35 and 2.17% had junior elementary grade education, high school and some college TVET level education respectively. The remaining 4.35% were literate with a degree level education. Similarly, 46.94% of the insured households were not educated, 46.93%, 4.08% and 2.04% were educated with a junior & elementary, high school and degree level education respectively.

The insured households' literacy level was found to be better as compared to the non-insured households. The survey result depicted 60.87% of the non-insured households were not educated, in contrary the percentage of the illiterate households of the insured households was found to be less, 46.94%. This shows that the literacy of the households has a positive relationship with insurance uptake. The better the literacy level, the better the adoption of IBLI as a tool for a risk management practice.

4.1.4. House hold size of the respondents

Similarly, the average household size of the respondents was found to be 6.54 for non-insured and 6.96 for the insured respectively, table 1. In both cases the average family size was depicted to be higher than the regional average of 6, (CSA 2020).

Table 1. Socio-Demographic Characteristic of Respondent

	Non-insured		Insured	
	Freq.	Perc.	Freq.	Perc.
Gender				
Female	14	30.43	25	51.02

Male	32	69.57	24	48.98
Age and Family Size				
Family size (Mean)	6.543478		6.959184	
Age (Mean)	43.6087		43.30612	
Household Head				
Female-headed Household	16	34.48	12	24.49
Male-headed Household	30	65.22	37	75.51
Educational Background				
No education	28	60.87	23	46.94
10	2	4.35	2	4.08
10+3	1	2.17	0	0
2	3	6.52	2	4.08
3	3	6.52	7	14.29
4	3	6.52	1	2.04
5	2	4.35	4	8.16
6	0	0	3	6.12
7	0	0	1	2.04
8	2	4.35	5	10.2
Degree	2	4.35	1	

Source: Survey result, 2022

4.2. Socio-economic characteristics of sampled households

The second discussed variable was socio-economic characteristics of the Respondents. There is no crop production in the pastoral system, but agropastoral is characterized by dominance of livestock husbandry and limited crop production (Tegegne et al., 2013). As indicated in the table 2, the survey result confirmed this and it revealed that crop production was quite low which is being practiced as a mixed farming by 6.52% and 4.08% of the non-insured and insured respondent households respectively in the study area. In another word, it was depicted that the major livelihood source of the pastoralists of the study area was found to be livestock coupled with different livelihood diversification, the survey result presented on table 2 revealed. Livestock and diversified with petty trade were found to be the major sources of income for both the non-insured (43.48%) and insured households (65.31) being

followed by livestock and support from other including government, the percentage being 23.91 and 16.33 for the non-insured and insured households respectively. Livestock and daily labor were the third income sources for both groups.

However, livestock alone was found to be the income source for few households for both the non-insured (8.70%) and the insured (8.16) target area with almost the same percentage for both groups. This show in response to the drought risks the pastoralists of the study area are practicing income diversification activities on top of the livestock rearing.

As presented on table 2, the average livestock holding of the respondents were found to be dominated by cattle (14.06522), goat/sheep (12.26087), camel (2.478261 and donkey (2.434783) and cattle (10.77551) goat/sheep (12) camel (2.244898) and donkey (2.326531) for the non-insured and insured respectively.

Table 2. Socio-economic characteristics of sampled households

	Non-insured		Insured	
	Freq.	Perc.	Freq.	Perc.
Income Sources				
Livestock and sup. from others - Go	11	23.91	8	16.33
Livestock and Petty Trade	20	43.48	32	65.31
Livestock	4	8.7	4	8.16
Livestock and Daily labor	8	17.39	3	6.12
Livestock and Farming	3	6.52	2	4.08
Stats (Mean)				
Cattle	14.06522		10.77551	
Goat/Sheep	12.26087		12	
Camel	2.478261		2.244898	
Donkey	2.434783		2.32651	

Source: Survey result, 2022

4.3. Major Risks, Season of Occurrence, Number of Livestock Sick and Died as a Result, Traditional Coping Strategies (TCS) and Dependability of the TCS.

The researcher sought to identify the major risks that the pastoralists are facing, traditional drought coping strategies being practiced among the pastoral communities, and at the same time to find out whether these strategies are dependable or not. The details of the findings were presented as separately as here in below.

4.3.1. Major Risks and Season of Occurrence

The researcher sought to identify the major risks that the pastoralists are facing and the season of its occurrence. The survey result showed that drought coupled with disease (32.61%) and drought & livestock market price drop (65.22%) for non-insured and drought &livestock market price drop (95.92%) for the insured were the major risks of the respondents, table 3. The result further depicted that, for both non-insured and insured respondents, drought coupled with either disease or livestock market price were the major risks, table 3. The finding was in line with previous findings of different researches, Santos and Barrett 2007 and Sandford 2006, Little et al. 2008.This majorly may be due to during the critical drought conditions, the livestock cannot get enough feed/forage and water. As a result, they become week and could be susceptible to disease. In the meantime, because of the body condition and all most all the pastoralists are forced to sell their livestock, in fact, at distressed prices and reduce the herds and at the same time to feed their family. As a result, the price significantly drops.

Similarly, the researcher aimed at exploring out the season of the occurrence of the risks during the year 2021. All the respondents (both non-insured and insured) replied that the drought had occurred in both seasons (long rain-long dry and shirt rain-short dry), table 3. The report obtained from the Borana Pastoral Development office confirmed the same and further highlighted that the rain failed for 4 seasons starting from 2020, which is of course continued during the 2022 year too.

4.3.2. Number of Livestock Sick and Died as a result and Money Spent on Treatment

The number of livestock sick and died as a result and the monetary spent on treatment was another variable the researcher was interested to sought. The data obtained from the respondents revealed that the average livestock sick was found to be 14.46667 and 13.91837 with standard error of 1.888723 and 1.245685 for the non-insured and insured households respectively, which is below the acceptable standard error of ±1.96, table 3. The survey results further revealed that the average livestock sick for

the non-insured households was found to be higher as compared to their insured counter parts. The reason would be the insured households could get compensation and could buy and provide supplementary feeds and water so that their livestock couldn't be susceptible to disease.

Similarly, the data obtained from the survey showed that birr 19,816.78 and birr 26,008.78 were spent on treatment of the livestock for the non-insured and insured households respectively. This shows that the insured households had better opportunity to get treated their livestock than their non-insured households. The survey further revealed that 4.521739 and 4.469388 average heads of livestock had died as a result of the drought for the non-insured and insured HHs respectively. The average heads of livestock died was found to be higher for the non-insured households which could be due to the insured households were able to keep their livestock alive with the compensation they obtained from the insurance.

4.3.3. Traditional Coping Strategies (TCS) and dependability of the TCS

The researcher aimed at finding out the traditional drought coping strategies being practiced among the pastoral communities, and at the same time to find out whether these strategies are dependable or not. The survey result revealed that the major traditional coping strategies were Buusaa Gonofaa and migration for both non-insured (30.43%) and insured (51.02%) followed by Migration, Buusaa Gonofaa and looking for aid (26.09%) for non-insured and migration, destocking, Buusaa Gonofaa for insured (24.49%) HHs, table 3. On the other hand, migration alone was found to be the third coping strategy for the non-insured the percentage of respondents being 19.57. Likewise, for the insured (16.33% HHs, the third strategy was found to be migration, Buusaa Gonofaa and looking for aid either from government or NGOs, the survey result revealed.

The most important thing we can see from the table 3 is that none of the insured HHs were looking for aid as traditional coping strategy. Similarly, the number of insured HHs relaying on migration as coping strategy was found to be less, which was 4.08% as compared to the non-insured (19.57%) HHs. This could be due to the insured HHs have insurance payouts expectations and this could be why they didn't look for aid as an option and very few of them looked migrations as an option. This confirms the previous study conducted by Diriba, 2016, where the finding clearly articulated out that migration is a last option practiced the pastoral communities only when their environment is bare to live on otherwise it is a perilous game. Similarly, study conducted on livestock insurance payouts and coping strategies of pastoralists during drought both in Kenya and Ethiopia by Masresha and et al, (2019) confirmed this

and the finding was put as "in Ethiopia, policyholders reported that the announcement of 2017 payouts changed their drought management decisions; 93% of households reported changing behaviors because they knew there was a payment coming- a large portion of the households reported increasing purchases of livestock inputs in response to the indemnity announcement, as well as migrating with their livestock and investing in non-livestock activities".

On the other hand, the dependability of the traditional coping strategies was also analyzed based on the survey outcomes. The result obtained depicted that majority of the respondents believes that the traditional strategies are not dependable- 84.78% and 79.59% of the respondents of the non-insured and the insured HHs respectively. This is in line with previous finding" increased frequency of drought threatens to overwhelm the traditional coping mechanisms and resilience of the pastoralists", Stark and Ejigu, (2011) and Catley and Aklilu (2013) where the BG provided only one fifth of the and they had to wait for long to receive it. On contrary, only, 15.22% and 20.41% of the non-insured and insured HHs respectively replied the traditional strategies are dependable. The reason being cost effective and takes less time 4.35% and 2.04%, safest 4.35% and 4.08%, take less time 4.35% and 14.29% for the non-insured and insured HHs respectively. The survey result revealed that 14.29% of the insured respondents replied the traditional strategies takes less time which is higher than that of the non-insured respondents. This could be due to there might be some delay in paying claims from the insurance company. The results of the FGD also confirms that the traditional coping strategies are no more dependable due to the frequency of the drought and the community is no more self-reliant let alone contributing and helping others which confirms the findings of the quantitative data.

Table 3. Major risks of the livestock, Season, Livestock died, Money spent on Treatment, TCS and dependability of the TCS

	Non-insured		Insured	
	Freq.	Percent	Freq.	Percent
Major Risk Types				
Drought and Disease	15	32.61	1	2.04
Drought, Low Livestock Market Price	30	65.22	47	95.92
Drought, Disease, Conflict	1	2.17	1	2.04
Season of Occurrence of the risk				
Both Season	46	100	49	100
Number of Livestock Sick, Money Spent on Treatment and Number of Livestock Died as a result				

	Mean	Stand. Error	Mean	Stand. Error
Number of Livestock Sick as a Result	14.46667	1.888723	1391837	1.245685
Money Spent on Treatment	19,816.24	3,221.16	26,008.78	3,203.78
Livestock Died as a result	4.521739	0.5549419	4.469388	0.6288839
Key Traditional Coping Strategies				
Buusaa Gonofaa	3	6.52	1	2.04
Looking for aid	1	2.17	0	0
Migration	9	19.57	2	4.08
Migration and Buusaa Gonofa	14	30.43	25	51.02
Migration and Looking for aid	2	4.35	1	2.04
Migration, Destocking, Buusaa Gonofaa	5	10.87	12	24.49
Are traditional Coping Strategies Dependable?				
No	39	84.78	39	79.59
Yes	7	15.22	10	20.41
Why Traditional Coping Strategies are Dependable?				
Not dependable	39	84.78	39	79.59
Cost effective, Takes less time	2	4.35	1	2.04
Safest	2	4.35	2	4.08
Takes less time	2	4.35	7	14.29
Cost effective, Safest, Takes less time	1	2.17	0	0

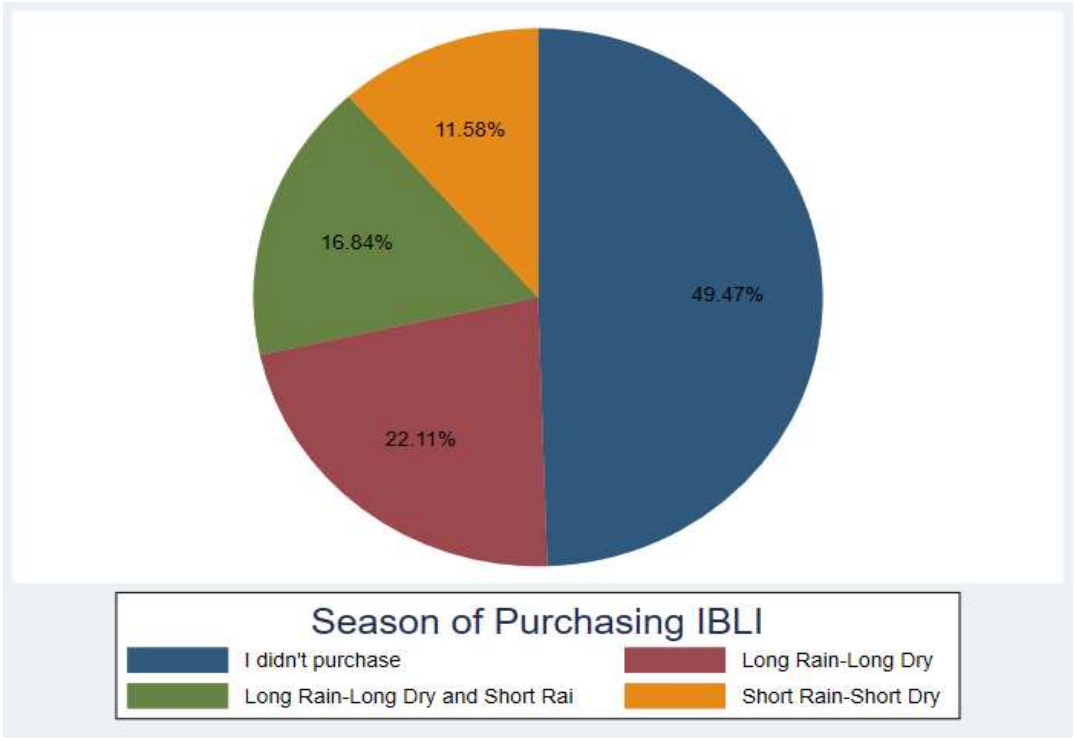
Source: Survey result, 2022

4.4. IBLI Related Results

4.4.1. Seasonality of IBLI purchase

The Index Based Livestock Insurance (IBLI) Borana Programme have two sales windows which matches with seasonality of the area. These are, the long rain-long dry which covers a period from march to September and short rain-short dry, October to February. Accordingly, the researcher decided to evaluate the seasons the HHs purchased IBLI. The survey result depicted that majority of the respondents (22.11%) purchased for the long rain-long dry season, while 16.84% of the respondents purchased for both seasons. The remaining 11.58% purchased only short rain-short dry season.

Figure 1: Season of Purchasing IBLI

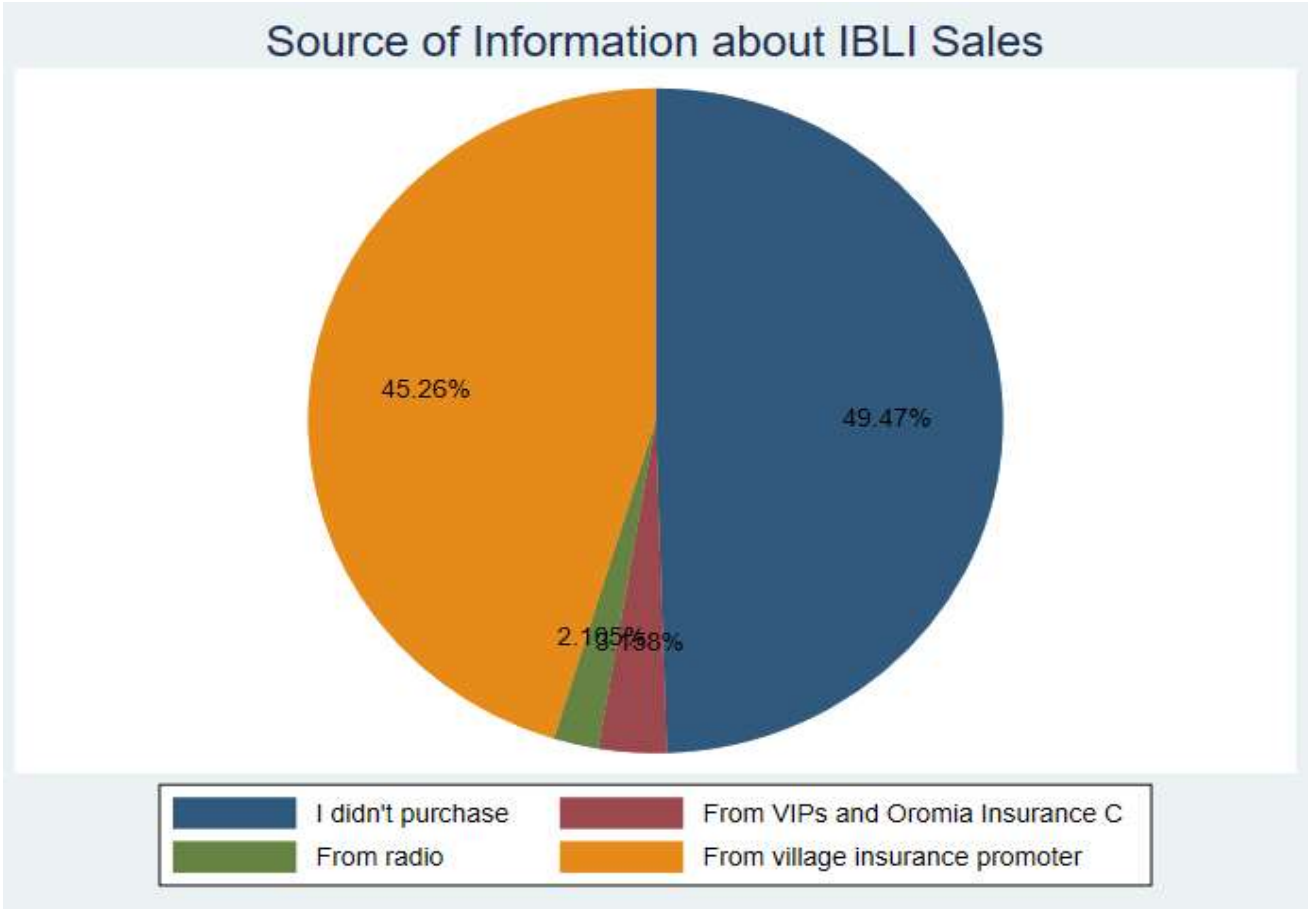


Source: Survey result, 2022

4.4.2. Sources of Information

It is believed that information is a power full tool in any adoption of new interventions. Accordingly, the Oromia Insurance Company S.C have been using different awareness creation campaigns using different promotional materials and through other important platforms, like Village Insurance promoters (VIPs), so that the pastoralist could make informed decision either to purchase or not. In views of these, the researcher was keen to evaluate the sources of information of the insured pastoralists. The survey result depicted that for 45.26% of the respondents' VIPs were sources of information. For the remaining 2.10% and 3.17% the sources of information were radio and VIPs & Oromia Insurance Company's employees.

Figure 2: Sources of Information



Source: survey result, 2022

4.4.3. Number of payouts Received

IBLI has two contract seasons with two sales windows within a year with a possibility getting indemnity twice a year. With this intention, the respondents were asked whether they have received a payout twice or once during the 2021/22 fiscal year. The survey results reveled that majority of the respondents (32.635) of the research area responded that they have received once a year with a mean payout of 4,551.51, figure 3 & and table 4. On the other hand, 17.89% of the respondents received their payout twice and the mean payout being 12,494.87, figure 3 & table 4. This implies that getting twice a payout could have a positive impact on the HHs capacity to manage drought related risks as the research area receive bimodal rain and as such there is a probability of being exposed to drought twice a year too.

Figure 3: Number of times IBLI payout received

Source: Survey Result, 2022

Table 4: Number of time payout received

Number of times Payout Received	Mean
Once	4,551.51
Twice	12,494.87
Total	**7,364.78**

4.4.4. Adequacy of the Payout and Payout Investment

The IBLI compensation was aimed at feeding the livestock and keep them alive during the critical drought conditions. As a result, the sum insured was determined based on the amount of money required to feed the livestock during the critical forage conditions. Based on this assumption, the researcher decided to identify as to how the payout were sufficient or not. The survey result depicted that the

payouts were not enough- 97.96% insured respondents said that the payout were not sufficient. This is due the price of the feeds (sum insured) was set in 2015 when the product design changed to asset protection from asset replacement and has not been updated since then, due to the current inflation in the country, and as the feeds of livestock are transported from the central highlands. Only the remaining 2.04% responded the payout was sufficient. In order to triangulate the result FGD has been conducted on the adequacy of the payout. The result obtained revealed that the payouts were not enough which may be due to the similar reasons mentioned above.

The respondents were also asked where they invest the payout money they receive. Large portion of the respondents (44.90%) spent their payout on animal feed and food purchase for their family, 40.82% of the respondents replied they spent to purchase feed only for their livestock. The remaining 14.28% spent their payout on animal feed purchase, reinvest on livestock and household expenditure like for medicine, table 5. The survey result depicted that significant percentage of the payouts were spent on livestock feed and related expenditure. On the other hand, there were also in some cases spending for households' consumption and medical expenses, the survey result revealed. The finding is in line with a previous finding by Masresha and et al, (2019), where more than 80% of the respondents spent their indemnity payments on livestock inputs, like fodder, water, or veterinary services.

Table 5. Adequacy of the payout and Payout Investment

Was the payout enough?	Freq.	Percent
no	49	100

Investment of the payouts	Freq.	Percent
Animal feed purchase	20	40.82
Animal feed purchase, food purchase	22	44.90
Animal feed purchase, re-invest on livestock	1	2.04
Animal feed, household expense (medication)	4	8.16
Food purchase and other household expense	2	4.08

Source: Survey result, 2022

4.5. Survey Result for Non-insured Households

4.5.1. Reasons for Not Purchasing The IBLI

The researcher sought to identify the possible reasons for not purchasing the IBLI. Accordingly, the questionnaire was designed and the no-inured pastoralists were asked as to why they didn't purchase the insurance product. The survey result revealed that majority of the non-insured pastoralists (45.65%) believe that the premium was too expensive, followed by 30.43% of them have no information about the product, 8.70% replied lack of awareness and no insurance company/agent around. The remaining 6.52% of the pastoralists were responded they have shortage of money to pay the premium out of pocket.

Table 6. Reasons for not purchasing IBLI

Reasons for not purchasing the IBLI	Freq.	Percent
I didn't have information	14	30.43
Lack of awareness	4	8.70
No insurance company/agent around	4	8.70
Shortage of money	3	6.52
The premium was too expensive	21	45.65

Source: Survey result, 2022

4.5.2. Feed Family During the Critical Forage Conditions?

Feeding the family could be difficult for the family whose livelihood mostly rely on livestock. Information was gathered on how the pastoralists feed their family during the critical forage conditions. The survey result depicted that most of the non-insured households replied that they will work as a daily laborer (58.70%) followed by looking for relative help (26.09%). 8.70% of the respondents were engaged in small business to feed the family. The remaining 2.17% responded as they will earn government salary, sell livestock at distressed prices and will look for aid either from government or NGO.

Table 7. Feeding family during critical forage conditions

Feeding family during critical forage conditions	Freq.	Percent
Engaged in small business	4	8.70
Government Salary	1	2.17
I will work as a daily laborer	27	58.70

Look for relatives help	12	26.09
sell my livestock to purchase food for	1	2.17
support from Gov't & NGO	1	2.17

Source: Survey Result, 2022

4.5.3. Keeping Livestock Alive During the Critical Forage Conditions

Keeping livestock, which is the only source of livelihood in pastoral area is task during severe drought. Most of the time, during such circumstances, government and other NGOs are busy transporting animal feed and water to such an area and /or government works on destocking the population of the herd. The researcher, aimed to identify as to how the pastoralists of the study area could keep their herds alive during such conditions. The survey result revealed that, majority of the respondents (52.17%) responded they will migrate to somewhere else in search of feeds and water with livestock followed by selling of the livestock at distressed process (26.09). The remaining 21.74% replied they will look for aid (animal feed).

Table 8. Ways of keeping livestock alive during the critical forage conditions

To keep livestock alive during critical forage conditions	Freq.	Percent
I will look for aid (animal feed)	10	21.74
I will migrate with my livestock	24	52.17
I will sell my livestock/distress sale	12	26.09

Source: Survey result, 2022

4.6. IBLI Benefits: as drought risk management mechanism, psychological and Socio-economic among the pastoral communities.

4.6.1. Benefits of IBLI as a Drought Risk Management Mechanism

Poverty traps manifest in the form of a dynamic herd size threshold above which herds accumulate to a high-level equilibrium and below which herds sizes naturally diminish to a low-level equilibrium below the poverty line. For those with herd sizes slightly above this threshold, protecting them against losses that will naturally lead them toward chronic poverty is an important priority that IBLI could theoretically fill (Barrett et al. 2008; Chantarat et al. 2009b). Barnett et al. (2008) explains that the economic returns to adoption of IBI are potentially broad and substantial. Having this in mind, the

researcher sought to evaluate the perception of insured pastoralists on the IBLI as a drought risk management mechanism. Accordingly, perception questions were designed and the pastoralist were asked mainly focusing on perception of IBLI as a drought risk management mechanism, whether payouts were made timely or not and if the payouts were enough to keep the livestock alive during the critical forage conditions through the purchase of feeds and water. The survey result depicted that majority of the pastoralists responded 63.27% strongly agree followed by 30.61% agree that IBLI can serve as a drought risk management mechanism and 4.08 were replied as neutral and the remining 2.04 replied disagree, table 9. This confirmed the previous study by, Barrett et al., (2008); Chantarat et al., (2009b) and Chantarat (2009a).

Similarly, the pastoralists were asked whether the payouts were made timely and as a result pastoralist were able to reduce death of the livestock. The survey result revealed that, majority of the pastoralists replied disagree (57.14%) followed by agree (28.57%) and 10.2% replied strongly disagree, 2.04 % were neutral and 2.04% strongly agree, table 9. This shows that there was some delay in delivering the payouts to the pastoralists from the insurance company side. Though it requires to conduct further research as to how the payouts were not delivered timely, the information obtained from OIC however, revealed that the Company had been processing and distributing payouts manually and there were also some delays in receiving the index report from the technical partner, ILRI.

Furthermore, information was also sought to see whether the payouts were enough to keep the livestock alive or not. The survey result depicted more than half of the respondents replied they disagree (63.2%), followed by strongly disagree (24.49%). The remaining 6.12% replied agree and neutral. This is confirms the finding presented under 4.4.4 (Adequacy of the payouts and Payouts Investment) above and the payouts were not enough owing to the price of the feeds (sum insured) was set in 2015 when the product design changed to asset protection from asset replacement and has not been updated since then, due to the current inflation in the country, and as the feeds of livestock are transported from the central highlands, according to the information obtained from OIC.

Regardless of its adequacy, on the other hand, the majority of the pastoralists replied they were able to buy feeds and water, agree (71.43%) followed by they were not be able to buy feeds and water, disagree (14.29%), table 9. The remaining 8.16%, 4.08 and 2.04% replied neutral, strongly agree and strongly disagree respectively. Previous research conducted by Barret et al, 2008 also depicted the same. The result of the FGD confirms the above findings (the pastoralists were able to keep their livestock alive

during the critical drought conditions with the payout money received). The respondents further noted that the payouts were not adequate which may be due to the current inflation in the country and the sum insured has not been revised for long period of time.

Table 9. Perception of IBLI as drought risk management mechanisms

Perception on IBLI as drought Management mechanism	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	N	%	N	%	N	%	N	%	N	%
IBLI helped as a drought risk management mech.	31	63.3	15	30.6	2	4.1	1	2	0	0
Payouts were timely and reduced livestock death	1	2.04	14	28.6	1	2	28	57	5	10
Payouts were enough to keep them alive	0	0	3	6.12	3	6.1	31	63	12	24
Able to purchase feeds and water	2	4.08	35	71.4	4	8.2	7	14	1	2

Source: Survey result, 2022

4.6.2. Psychological benefits of among the pastoral communities

IBLI was believed to have a psychological benefit among pastoral communities by protecting the livestock from drought induced death as the livestock is the only source of livelihood and the death of livestock in turn have a psychological impact. The survey result depicted that IBLI has a psychological benefit, 75.51% replied disagree to the question IBLI has no any psychological benefit as there is BG, and 12.24% replied they strongly disagree. Similar percentage of the respondents (6.12%) replied they were neutral and agree, table 10. On contrary, majority of the respondents of the study area replied disagree (63.27%) to the question pastoralists become free from anxiety insuring their livestock followed by 16.33% neutral. 10.20%of the pastoralists replied agree and strongly disagree, table 10. This s may be due to they did not insure all the herds they own due to either lack of awareness and/or affordability issue.

On the other hand, majority of the respondents were replied IBLI boost confidence of the pastoralists and can supplements Buusaa Gonofaa, 67.35% and 65.31% respectively agree to these ideas.

Similarly, significant number of respondents replied IBLI is more helpful than BG as drought is highly covariant (46.94%) strongly agree and 18.37 agree, which means during such occurrence of covariant risk no one could be there to help others as they are equally exposed to the risk- the remaining significant percentage of respondents replied disagree (26.53%). The remaining 8.16 were neutral, table 10. The FGD result confirms that IBLI has a psychological benefits and boosts confidence among the pastoral communities as the livestock is the major source of livelihoods and IBLI helps pastoralists to keep their herds alive during the critical drought conditions.

Table 10. Psychological benefits of IBLI among the pastoral communities

Psychological Benefits	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	N	%	N	%	N	%	N	%	N	%
Pastoralists become free from anxiety insuring	0	0	5	10.2	8	16.33	31	63.27	5	10.2
IBLI has no any psycho benefits as there is BG	0	0	3	6.12	3	6.12	37	75.51	6	12.2
IBLI boosted confidence of the pastoralists	3	6.12	33	67.35	5	10.2	8	16.33	0	0
IBLI can supplement the BG	4	8.16	32	65.31	10	20.41	3	6.12	0	0
IBLI is more helpful than BG as drought is highly covariant	23	46.94	9	18.37	4	8.16	13	26.53	0	0

Source: Survey Result, 2022

4.6.3. Socio-economic benefits of IBLI

IBLI is believed to have a positive impact on the socio-economy of the pastoral households. Previous researches conducted on this in Northern Kenya evidenced it has compelling benefit in terms of smoothening their asset and consumption that constitute the two key dimensions of self-insurance. The study revealed that after the intervention of IBLI, poor pastoral households are less likely to destabilize their consumption in response to drought, while those who are better off are less likely to have to

compromise their accumulated assets, Barret et al.(, 2008) and Janson and Carter (2013). The researcher was decided to identify whether the case is true in Ethiopian side or not.

The survey data revealed that IBLI helps pastoralist to maintain their social status in the community, 46.94% and 34.69% of the respondents replied they strongly agree and agree respectively. The remaining 10.20% and 8.16% replied neutral and disagree respectively, table 11. This shows that IBLI helps the pastoralists to maintain their social status in the community which confirms similar previous studies finding in Northern Kenya.

On the other hand, the respondents were also as asked whether the payouts were able to keep their livestock alive during severe drought conditions. Majority of the respondents replied disagree (28.57%) and 20.41% replied they strongly disagree. Likewise, significant number of the respondents replied strongly agree (26.52%) and 20.40% replied they agree with the idea. The remaining 4.08% of the respondents were neutral, table 11. This shows the payout is not enough for the reason mentioned on the adequacy of the payout above and confirms the finding at the same time.

For the question (due to IBLI, the gov't can shift the budget being utilized destocking /restocking during the critical forage conditions to other development activities) the majority of the respondents replied they strongly disagree (38.78%) followed significant and equal percentage of the respondents strongly agreeing the idea and neutral (26.53%). This shows that majority of the respondents were against the idea which may be due to dependency syndrome created in the pastoral area or the respondents may have a doubt of the government may opt IBLI and shift the its budget to other development intervention compromising aid, it may require further study, though.

Similarly, the respondents were also asked whether the premiums were high or not and at the same time which way they opt (insuring their livestock regardless of the expensive premium or not to insuring). The survey result depicted that they respondents disregarded the idea (premium is too high and not ensuring the better than insuring), large percentage of the respondents replied disagree (48.98%) followed by strongly disagree (26.53%). The remaining 14.29% and 10.21% were replied strongly agree and disagree respectively. On the other hand, significant number of respondents responded strongly agree (42.86%) and agree (44.90%) to the question though the premium is too high insuring is better than not insuring. This shows that insuring the livestock regardless of the non-reasonable premium is better than not insuring, where majority of the respondents replied disagree

(57.14%) to the idea (premium is reasonable as compared to the livestock losses due to drought), table 11. As part of the triangulation works, the FGD participants were asked whether the insurance product has been able to keep their livestock alive and the pastoralists were able to maintain their social status among the community. The finding revealed that the pastoralists were able to keep their livestock alive and were able to maintain their social status in the community as well. This confirms the result of the survey.

Table 11. Socio-economic Benefits of IBLI.

Socio-economic Benefits of IBLI	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	N	%	N	%	N	%	N	%	N	%
IBLI helps maintain social status	23	46.94	17	34.69	4	8.16	5	10.2	0	0
Payouts were able to keep livestock alive	13	26.53	10	20.4	2	4.08	14	28.57	10	20.41
Due to IBLI, the gov't can shift the budget of de/restocking to other dev't activities	13	26.53	0	0	13	26.53	4	8.16	19	38.78
Premium is reasonable as compared to the livestock losses due to drought	4	8.16	8	16.33	9	18.37	28	57.14	0	0
Premium is too high and not ensuring the better than insuring	7	14.29	5	10.2	0	0	24	48.98	13	26.53
Though the premium is too high insuring is better than not insuring	21	42.86	22	44.9	4	8.16	1	2.04	1	2.04

Source: Survey result, 2022

4.7. Factors contributing to up scaling, Limitations/Challenges and Roles and responsibilities of government in promoting IBLI

4.7.1. Factors Contributing to Up Scaling IBLI

The innovative livestock insurance, IBLI, has been first implemented in Kenya in 2010 and brought to southern Ethiopia, Borena in 2012 which is bordering Kenya as the communities living in the two countries are sharing common socio-economic features and bringing the experiences is easier, to help pastoralists manage drought related risk. However, the product didn't scale out as expected to other parts of the country where there are similar socio-economic conditions. The information obtained from OIC and ILRI shows that IBLI only operational in two regions, namely: Oromia (three zones) and Somali region (two zones). Even, within the study area (Moyale woreda) only few pastoralists are enjoying the benefit of IBLI. Due to these and other appealing facts the researcher decided to asses factors contributing to up scaling of the IBLI designing open-ended questioners. The data was collected from ILRI, a technical partner, OIC commercial owner(underwriter) of the product, CIFA Ethiopia, a local NGO providing financial assistance through premium financing and awareness creation and zonal woreda agricultural offices. Based on the interview with the KII the details of the factors contributing to the up scaling has been presented as herein below, among others. These are: -

Product Quality: The product quality has to be improved- the day to day operation of the product has to be evaluated and has to be improved accordingly. The respondents believe that the product has to be reviewed as to how it is client centric and viable to the insurance company at the same time, unless it won't be scalable.

Government should own the product: The respondents (mainly from OIC and ILRI) boldly mentioned that there has to be government involvement as it has structure across the administration hierarchies (at higher-federal to local-kebele level) that the private and non-governmental organizations doesn't have. The respondents further emphasized that if government doesn't own the product, non-governmental organizations and private company alone cannot upscale the product to new area, as it requires a lot of resources which non-governmental and private organizations couldn't bear it alone.

Premium Subsidy: Premium subsidy plays crucial role in bringing down the premium pastoralists are required to pay out of pocket. The respondents had mentioned that there has to be a premium subsidy to upscale the product to new area and even, to increase the uptake in the current intervention areas.

4.7.2. Limitations/Challenges

As the product is new to the pastoral community and the exposure of this community is very limited to insurance there are lots of limitation/challenges, especially during the early years. The respondents mentioned a number of limitations and challenges based on their experiences and exposure to the product operations and some of them have been presented as follows. These are:

Lack of Agricultural Insurance Policy in the country: To guide the growth and development of agricultural insurance in the country, it is believed that, there must be a national agricultural insurance policy. The policy forms the conceptual framework and provides guideline in addressing the challenges in agricultural insurance sector and exploring the opportunities to bring greater competitiveness and economic growth in the country in general through hedging the agricultural risks through formal risk transferring mechanism. However, contrary to this, the respondents from OIC and ILRI had mentioned that there is no agricultural insurance policy in the country and this has been a bottle neck for the upscaling the product.

Less support and attention from government side: Both federal local regional governments have to support the prograame, otherwise, it could be difficult to upscale the product. So far, the support from government is very minimal and the attention given is less at the same time.

High transaction cost: The operations of the product is being undertaken manually and as such the operation cost is appeared to be on the higher side.

High basis risk: Basis risk is a mis-match between the potential payout and the actual payout. The key informant interviewee had reported that the product found to have higher basis risk which need to addressed through research and development.

Poor infrastructure in remote areas: As the pastoralists are living in a remote and scattered area there is poor infrastructure which make the product in accessible.

Lack of premium subsidy: Absence of premium subsidy resulted in high premium which in turn had compromised affordability issue.

Lack of coordination among partners and Public-Private Partnership (PPP): There is no coordination among partners every organization plan by its own and commit resources depending on

the resource they have- as such the public-private-partnerships is missing, among others, that resulted in low uptake and compromised upscaling.

Less Apatite from insurance companies: Only few insurance companies are engaged into this business out of 19 insurers operating in the country.

High loss ration by insurer. Payout is much bigger than premium collected and this resulted in high loss ration

Literacy gap among pastoralists on insurance: There is a gap in understanding the product which resulted in high expectations of payout for every season.

Commercial sustainability issue: As climate is getting worse from a season to season pastoralists experience losses year-on-year and this may result in less appetite for insurance companies to invest in the product. This left the sustainability issue felt under question.

4.7.3. Roles and responsibility of the government in the area of IBLI

Responding to the roles and responsibilities of the government in the area of the key informant interviewee had suggested a number of roles and responsibilities the government can shoulder. These are:

Government should facilitate a very good ground for this product to run smoothly: For example, there is a need for agricultural insurance policy in the country, hence government has a responsibility to come up with a favorable policy.

Subsidize the product -there is no experience of successfully running index insurance market in the world without subsidy. Thus, government should regularly subsidize (smart subsidy) depending on the needs and assessment on the ability to purchase the product.

Extension and advocacy: Insurance education should be mainstreamed in large government structure; insurance company should not incur any extra cost for insurance education, awareness creation and onboarding clients.

Regulation: Government regulating and overseeing all works related to IBLI in the country. As such it should provide incentives for the insurers as the product not yet at breakeven.

Calculating agent: At the moment, ILRI is willingly serving as a calculating agent in addition to the technical backstopping. This should be changed and public institutions like National Metrology Agency, which is a government institution, should shoulder this responsibility.

4.8. Propensity Matching Score Results

Although the difference is not statistically significant, before matching the insured group had an average higher income/monetary value of the herds by close to 33,000ETB. The data presented show us that insured groups had increased their income after they insured their livestock compared to their counter party. Overall average treatment effect was found to be ETB 36,386.3. Similarly, the average value from the sale of livestock was found to be ETB 12,052.907 for the insured households with overall income difference of ETB 16,747.336. This indicate insurance had positively affected the household income as they insured this livestock against risk and shocks though statistically insignificant.

This finding is in line with previous Chantarat, (2009a) where the findings clearly figured out that IBLI had a positive impact on the welfare improvement as it protects households from being driven to poverty trap thereby by helping households accumulate resources. Similarly, in confirmation to this finding a previous study conducted by Barret et al., (2008) on "Altering Poverty Dynamics with Index Insurance in Northern Kenya" shows that stabilizing asset accumulation, insurance improve incentives for households to build their asset base and climb out of poverty, thereby enhancing economic growth.

From the table 12 it evident that, Male headed household were less likely to get the coverage compared to their counterparts and the difference was also significant (p-value = 0.002). Female headed households are more likely accessed insurance coverage for their livestock compared to Male. This might be Male household over look risk or they have less understanding for livestock insurance coverage for their livestock. This implies that households that benefit from insurance has more resilience capacity to shocks and drought than households that doesn't benefit insurance.

Independent variable like Education level, Family size and Age are positive and significant determinant of household's uptake to insurance at 5% significance level. This indicate family size; primary education level and age affect positively at 5% percent significant level the uptake of insurance. This study is in line with another study conducted by Bageant, (2014) which revealed that the younger the age the higher the adoption of the IBLI as the youngers have more information access. Similarly, a

study conducted by Katz et al., (2005), the level of respondents Education influences the understanding of IBLI as a new and emerging option in insurance and risk management strategies for the risks that happens to their livestock which attests the finding above.

Table 12: Propensity Matching Score Results

Two-sample t test with unequal variances

	obs1	obs2	Mean1	Mean2	dif	St Err	t value	p value
Monetary Value	44	44	110840.9	143897.7	-33056.8	23988.9	-1.4	.173

Probit regression

IBLI Status	**Coefficient**	**Std. err.**	**Z**	**P>z**	**[95% conf. interval]**	
Age	0.006	0.014	0.430	0.668	-0.021	0.033
Gender (Female)						
Male	-1.155	0.367	-3.140	0.002	-1.875	-0.435
Education (No Educ)						
Primary	1.281	0.381	3.360	0.001	0.535	2.028
Secondary and above	1.078	0.616	1.750	0.080	-0.129	2.285
Family Size	0.134	0.071	1.890	0.059	-0.005	0.272
_cons	-1.057	0.733	-1.440	0.149	-2.494	0.380

Treatment-effects estimation

Monetary Value	**Coef.**	**St. Err.**	**t-value**	**p-value**	**[95% Conf**	**Interval]**
(Insured vs Uninsured)	30704.545	29569.804	1.04	.299	-27251.205	88660.296
Mean dependent var		127369.318	SD dependent var		113097.748	

**** p<.01, ** p<.05, * p<.1*

Variable	**Sample**	**Treated**	**Controls**	**Difference**	**S.E.**	**T-stat**
Monetary Value	Unmatched	1.44E+05	1.11E+05	33056.82	23988.91	1.38
	ATT	1.52E+05	1.18E+05	33742.88	30899.51	1.09
	ATU	1.11E+05	1.49E+05	38489.02	.	.
	ATE			36386.3		

Two-sample t test with unequal variances

	obs1	obs2	Mean1	Mean2	dif	St Err	t value	p value
Monetary Value	43	44	31972.093	44025	-	9573.423	-1.25	.212

Sell 12052.907

IBLI Status	Coefficient	Std. err	Z	P>z	[95% conf. interval]	
Age	0.004	0.015	0.270	0.790	-0.025	0.032
Gender						
Male	-0.976	0.357	-2.730	0.006	-1.675	-0.276
educ						
Primary	1.031	0.380	2.710	0.007	0.286	1.776
Secondary and above	0.032	0.730	0.040	0.966	-1.399	1.462
Family Size	0.108	0.070	1.540	0.123	-0.029	0.246
_cons	-0.703	0.768	-0.910	0.361	-2.209	0.804

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
Monetary Value sell	Unmatched	44025	31972.093	12052.907	9643.491	1.250
	ATT	47655.263	35063.061	12592.202	11442.709	1.100
	ATU	30947.619	51454.361	20506.742	.	.
	ATE			16747.336	.	.

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
Monetary Value sell	Unmatched	44025	31972.093	12052.907	9643.491	1.250
	ATT	47655.263	35063.061	12592.202	11442.709	1.100
	ATU	30947.619	51454.361	20506.742	.	.
	ATE			16747.336	.	.

CHAPTER FIVE

5. Conclusion and Recommendation

The study was conducted in Moyale woreda, Boarana Zone, Oromia regional state with the objective of finding out the impact of Index Based Livestock Insurance on the livelihoods of pastoralists.

5.1. Conclusion

Index Based livestock Insurance is being widely considered as a drought risk management practices among the pastoral communities. It used as an ex-post drought risk management to hedge against socio-economic shocks so that the pastoralists improve their resilience. The study assessed the impact of IBLI on the household's income, the role of the IBLI as drought risk management mechanism, factors contributing to IBLI up scaling, and roles and responsibilities of government to promote IBLI. Based on the survey and KII outcomes the following conclusions have been drawn.

It was reported that IBLI have a positive impact on the income of the households of the respondents. The insured households found to get more income as compared to the non-insured households. However, the income difference between the two groups were not statistically significant. Similarly, the impact of IBLI on the socio-economic aspects was found to positive- the pastoralists were able to keep their livestock alive (which is the major sources of livelihoods) and were able to maintain their social status among the community.

The assessment result revealed that premium rates were appeared to be on the higher side and the respondents opted to insure their livestock regardless of the higher premium as the traditional drought coping mechanisms becoming unreliable.

Similarly, IBLI served as a drought risk management mechanism among the pastoral communities. The outcome of the research depicted that the pastoralists were able to buy supplementary feeds and water by the compensations they got and were able to keep their livestock alive during the critical drought conditions. However, the payouts were not adequate to buy the supplementary feeds as the cost of feeds escalate from time to time. Furthermore, it was reported that the payouts were not delivered timely which may have a negative impact on uptake of the product.

On the other hand, the factors contributing up scaling of IBLI has also been assessed. The assessment result indicated that product quality, government involvement and owning the product and premium subsidy were the key elements in upscaling the product within the operational areas and to new areas as well-otherwise, it would be impossible.

There are also different roles and responsibilities that government can play in the area of promoting IBLI. From the research findings we can concluded that government should facilitate a very good ground for this product to run smoothly, can provide premium subsidy, and work on awareness creation advocacy of the product. Furthermore, the government can effectively work on a regulatory issue that ranges from putting in place agricultural insurance policy and acting as a calculating agent on the product.

Thus, from the above research findings and regardless of all the limitations, we can conclude that IBLI have a positive impact on the livelihoods of the pastoralists.

5.2. Recommendation

The assessment result clearly showed that IBLI found to have a commendable impact on the livelihoods of the respondents. To upscale the product into new areas and maximize the benefits of the pastoralists that are already enjoying the benefits of the product, the following recommendations have been forwarded by the researcher. These are:

- ✓ To improve the timely delivery of the payouts, use of digital financial technologies are strongly advised as it avoids the manual transaction and speeds us the delivery of the payouts too. Furthermore, to improve the adequacy of the payouts the sum insured has to be revised in consideration of the current feed costs. Therefore, technical partner, ILRI and OIC should put in place digital financial technologies and shall revise the sum insured in a such a way that it accommodated the current feeds and water price as soon as possible.
- ✓ The assessment result revealed that premium rates were appeared to be on the higher side and the respondents opted to insure their livestock regardless of the premium as the traditional drought coping mechanisms becoming unreliable and at least they were able keep alive their livestock during the critical drought conditions. On the other hand, there is no any insurance programme in the world running sustainability without subsidy. Therefore, it is strongly

recommended that the government should subsidize the premium so that the product could be affordable.

- ✓ To minimize the basis risk, the product quality has to be improved though research and development as it is the key element for the up scaling- ILRI and OIC should work to improve the quality of the product as of immediately.
- ✓ So far, there is no national agricultural insurance policy as a country. To upscale the product agricultural insurance policy has to be enacted as of immediately and the government should deliver the roles and responsibility required of it at the same time. Thus, the government (federal) should put in place national agricultural insurance policy very soon.

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Appendix: Research Questionnaire

Addis Ababa University College of Development Studies

Center for Regional and Local Development Studies

Questionnaires to be completed by enumerators interviewing the pastoral communities of the research target area (insured and non-insured.

Dear respondents,

This study is conducted for the partial fulfillment of the requirements for Addis Ababa University graduate program for Master's in Local and Regional Studies. The objective of the study is to find out the 'impact of Index Based Livestock Insurance on the livelihoods of pastoralists and forward policy recommendation thereon'.

In this regard your patience in answering all the questions, your genuine and well thought response will greatly contribute to achieve the objectives of the study. Any information provided will only be used for academic purpose and it will be kept confidential with utmost anonymity. Please also remember there is no right or wrong answer and only your honest opinions are important.

Instructions

- Do not write your/their name.
- Please provide your answer for the questions by either circling the letters of the answers, putting a (√) mark within the box or writing your answers on the space provided.

Thank you in advance for giving me your valuable idea and time through responding the questionnaire.

Melkachew Temesgen Tel: +251-913-73 4287

I. General Information

1. What is your age?
2. Sex
3. What is your educational background?
4. What is your family size?
5. What you're your sources of livelihood income (please write in their orders of importance)?

S.No	Sources of HHs livelihood income
1	
2	
3	
4	
5	

6. Household head
   A. Female house hold headed
   B. Male house hold headed

II. Households' income source, risks associated with the sources of livelihoods and Copping strategies (for both insured and non-insured)

1. What is your herd size?

S/N	Live stocks type	No. of herds	Estimated Monetary value, currently, ETB	Monetary value obtained from the sales of the livestock (2021) ETB
	Cattle			
	Goats			
	Camel			
	Donkey/Mule			
	Any other			

2. List the three major risks associated to your livestock/herds in your area from the given alternatives in the table.

Risks types A. Drought B. livestock price drop C. Disease outbreak D. Conflict	**Season of the occurrence ofthe year 2021**	**How many of the livestock were sick asa result?**	**How much money spent for treatment/feed and water as result?**	**How many died as a result of the risk?**

3. What are the traditional coping strategies used during these risks (multiple answers possible)?

   A. Migration
   B. Destocking
   C. Buusaa Gonofaa
   D. Looking for aid
   E. Accept

4. Do you think the traditional coping mechanisms are dependable?

   A. Yes
   B. No

5. If your answer is 'yes' to the question number 4 above why? If your answer is 'no', then skip question number 5 below

   A. Cost effective
   B. Safest
   C. Saves livestock life
   D. Takes less time
   E. Have immediate impact

III. IBLI related questions

1. Have you ever purchased IBLI in 2021?
2. If your answer is **yes** to the question number one above, then answer the following questions, if your answer is **no**, then, skip questions **1 to 8.**
3. For which season you purchased?
   A. Long rain long dry (bona adoolessa)
   B. Short rain short dry (bona hagayya)
4. From where did you heard about the insurance product?
   A. From radio C. From insurance company employees
   B. From Village insurance promoters D. From different promotional materials posted at kebele office
5. How many times did you received insurance payouts?
   A. Never received so far B. Twice
   C. Once D. More than three times
7. Can you tell us the amount and the seasons in year 2021you received payout?
   Season_____Amount _____
   Season_____Amount _____
8. What did you do with the money you receive as a payout; multiple answer is possible?
   A. Bought animal feeds C. Covered my children's school expense
   B. Bought some foods for my family D. Spent on medical treatment
   E.Any other than specified above
9. Was the payout enough to keep the animals alive during the critical forage conditions?
   A. Yes B. No

IV. For non-insured

1. Why were you not interested to buy IBLI for your Livestock?
   A. No potential risks that happens to my livestock
   B. The premium was too expensive
   C. No Insurance company in the area to insure our livestock
   D. Have no information about IBLI
   E. other, please mention it_____

2. What do you do to feed your family during the critical forage conditions?
   A. I Will force my children to drop from school C. Look for relatives help
   B. I will migrate to somewhere else D. I will work as a daily laborer
   E. Any other than specified above

3. What do you do to keep your livestock alive during the critical forage conditions?
   A. I will migrate with my livestock to somewhere else
   B. Will look for aid (animal feed to be distributed by either government or NGOs)
   C. I will sell my livestock as distressed prices
   D. I will restock my livestock with the help of government

V. IBLI Benefits on: drought risk management, psychological benefits of among the pastoral communities, Socio-economic benefits, Factorscontribute to up scaling, Limitations/Challenges and Roles and responsibilities of government in promoting IBLI.

Please indicate your agreement level by putting a (√) mark within the box whether **IBLI has impact on: IBLI served as drought risk management mechanism,** psychological and Socio- economic benefits of IBLI among the pastoral communities.

1 = Strongly Disagree. 2 = Disagree. 3 = Neutral. 4 = Agree. 5 = Strongly Agree.

	1	2	3	4	5
A. Perception on IBLI as drought risk management mechanism					
➢ I believe that the IBLI helped the pastoral community as a drought risk management mechanism.					
➢ The IBLI compensations are being delivered timely and thus reduced livestock mortality due to drought.					
➢ The IBLI compensations were quite enough to keep the livestock alive during bad forage conditions.					
➢ I believe the pastoralists were able to purchase livestock feeds and water to keep their livestock alive during critical seasons using the compensation obtained from IBLI.					

B. **Psychological benefits of IBLI among the pastoral communities**					
I believe the pastoralists become free from anxiety that comes to them as a result of drought after insuring theirlivestock					
IBLI has no any psychological benefits as there is Buusaa Gonofaa in the community.					
➢ I believe the IBLI boosted confidence among the pastoralists.					
➢ I believe the IBLI can supplement the Buusaa Gonofaa (a cultural way of collecting and compensating the one wholost livestock from the community).					
➢ I believe the IBLI is more helpful than Buusaa Gonofaa as drought is highly covariant.					
C. **Socio-economic benefits**					
I believe the IBLI helps the pastoralists to maintain their social status in the community.					
➢ I believe the compensations of the IBLI were able to keep the livestock alive during the critical periods.					
➢ I believe, due to IBLI, the government can shift the budget being utilized in destocking and restocking during drought to other development activities					
➢ I believe that paying premium is reasonable as compared tothe livestock losses drought could bring to the pastoralists.					
➢ I believe the premium is too high and not ensuring the livestock is better than insuring.					
➢ I believe that although the premium is too high insuring is better than not insuring.					

Checklists for focus group discussion

1. Do you think traditional drought coping strategies are reliable?
2. Do you think IBLI would be helpful than TCS?
3. Do you think that IBLI could help the pastoralist;

A. as a drought risk management mechanism?

B. Maintain their social status among the community?

4. Are the payouts adequate to keep the livestock alive during the drought conditions?

KPI Questionnaire

This questionnaire is designed to collect data from Oromia Insurance Company S.C (implementing partner) and International Livestock Research Institute (technical partner) on factors contribute to IBLI up scaling, major limitations/challenges of the IBLI, and roles and responsibilities of government to promote IBLI.

1. Could you tell us factors contribute to up scaling IBLI?
2. What are the major limitations/challenges of the IBLI?
3. What are the roles and responsibilities of government to promote IBLI?