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Current challenges and opportunities of public and private livestock insurance markets in Kenya

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Executive Summary

Livestock production by pastoralists is the dominant economic activity in the Arid and Semi-Arid Land (ASALs) of northern and eastern parts of Kenya. Approximately 80% of livestock, excluding poultry, is produced in these areas and employs about 90% of the ASAL workforce, with 95% of household income generated from the sector (AKI, 2016). In addition, livestock is the principal store of wealth for these pastoralists. However, increasingly frequent droughts have called attention to the need of building better resilience for these important Kenyan communities. Even though pastoral communities have developed a variety of strategies to manage and cope with the risk, these mechanisms are imperfect, inefficient, and have not fully mitigated persistent poverty via recurrent weather shocks to their livestock holdings. In response to enhancing risk management strategies in pastoralist areas, recently introduced Index Based Livestock Insurance (IBLI) suggest a potential for playing an important role for reducing weather related risk and building further resilience to the pastoralist communities of Kenya.

This review provides an overview of the livestock insurance program in Kenya in historical context (pre-2015) and focuses specifically on current events (2015 until today). This paper also assesses both the positive and negative effects of government interventions in private livestock insurance markets via their KLIP program. In addition, improved potential future government involvement is outlined recommending smart subsidies to achieve the same objectives, but at a lower sustainable cost, and would avoid some of the economic and institutional pitfalls currently being experienced.

The key lesson drawn from this review are:

- According to recent survey data, livestock loss due to weather shocks (drought/ flood) is the single biggest concern by pastoralists (over 80% list it as their top concern). Instead of relying on a stretched humanitarian response system, livestock insurance (especially index-based insurance) shows considerable promise to alleviate these problems in a sustainable way.

- Formal index insurance improves upon less economically efficient traditional risk strategies and can therefore enhance resilience for pastoralists (Figure 1). For example, a small periodic insurance payment, to prevent potential catastrophic livestock loss, frees the pastoralist to pursue more revenue enhancing activities over less efficient traditional risk mitigation strategies (e.g. preventative savings or decreasing herd size).

- Moving from livestock replacement to preventing loss is a recent insurance development that is superior from both a cost and cultural perspective (pastoralists trust the quality of their

own livestock over potential replacements and saving an animal is less expensive than replacing one).

- Fully subsidized livestock insurance products, provided by public support, should not *crowd out* private provision. Subsidies should instead support and catalyze the private sector (i.e. smart subsidies). Smart subsidies *crowd in* the private sector such that a sustainable private livestock insurance market can be created that does not become a permanent drain on public finances. Over time, the government purposefully withdraws subsidies and the private markets exclusively provide the service in the longer term.

- Facilitate improved input delivery (water, forage or vaccines) for herders so that pastoralist communities can effectively use any insurance cash payments that are distributed.

- Create demand sensitization and extension campaigns about the product using a variety of games, videos, cartoons and radio broadcasts. These can be effective tools to create awareness about the service provision.

- Integration of insurance with other social protection development interventions (e.g. safety-net programs). Create a sliding scale of payments for the premium either based on some minimum TLU (ie. the first few TLU are more heavily subsidized) or ability to pay by pastoralists.

- To ensure the subsidy is achieving its intended purpose, establish a good monitoring and evaluation (M&E) system, and undertake periodic evaluations for feedback into government programs.

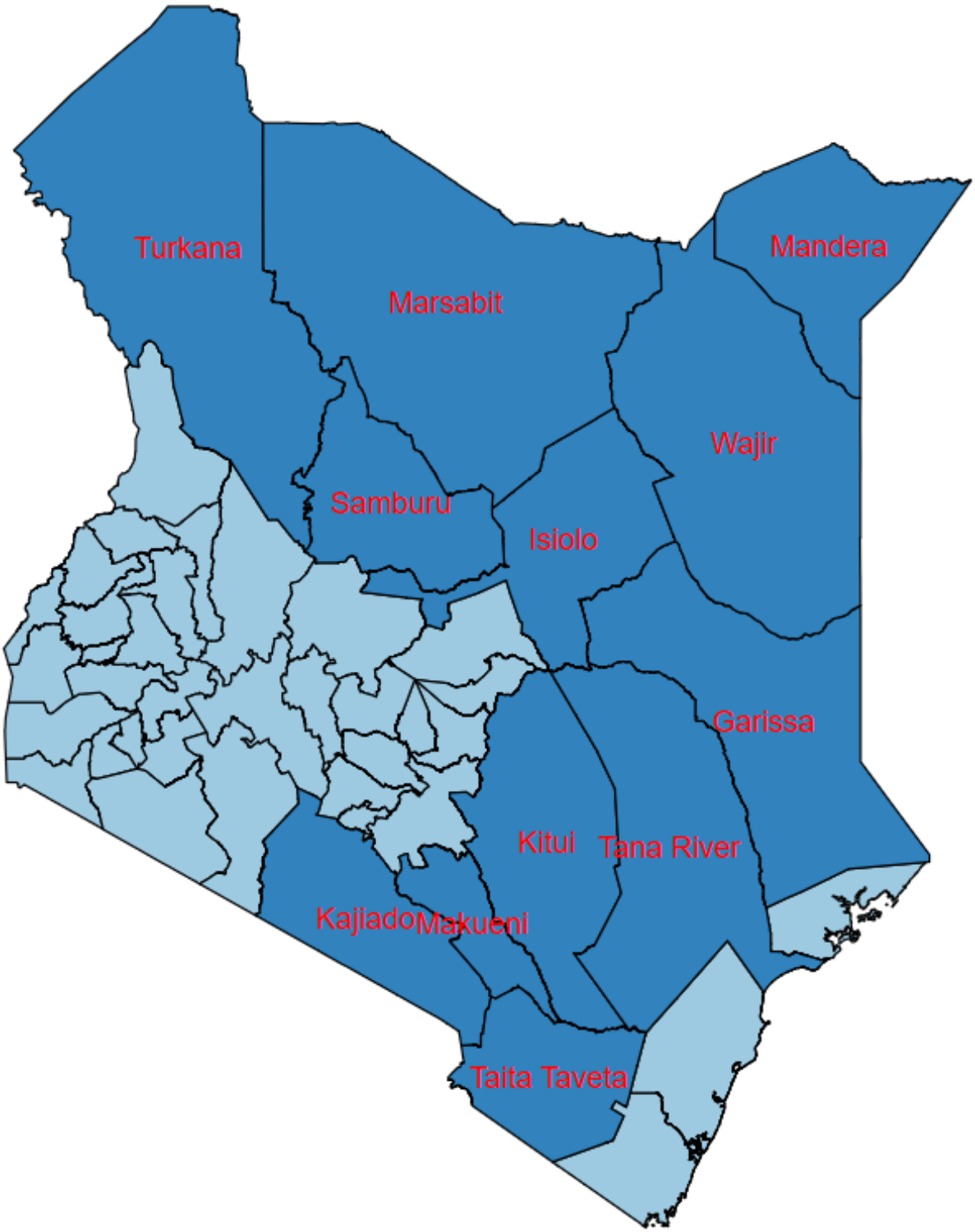
- Government policy needs to be clearly identified, at both the national and county level, regarding the specific objectives and support they will provide to index insurance over the medium to longer-term to provide private sector stability in the index insurance markets.

1. Introduction

The agricultural sector in Kenya, currently contributes 24 per cent of the GDP directly and another 27 per cent indirectly through value addition such as agro-processing (ACCI, 2013). The sector also accounts for 65 per cent of Kenya's total exports and provides more than 18 per cent of formal employment and more than 60 per cent of informal employment in rural areas (ASDS, 2010). Overall, 80 per cent of Kenya's population derives their livelihood from production, processing and marketing of crops, livestock, fisheries and other subsector related products (ACCI, 2013). The contribution of the livestock sub-sector in Kenya is approximately 17 per cent of agricultural GDP and 7 per cent of exports (ASDS, 2010). Specifically, livestock production is the dominant economic activity in Arid and Semi-Arid Land (ASAL) with approximately 80% of livestock, excluding poultry, in these areas (Diagram 1). Livestock also employs about 90% of the ASAL workforce, with 95% of the household income coming from the sector (AKI, 2016). Livestock is also the principal store of wealth for pastoralists. For pastoralists in ASAL areas, the likelihood of covariate risk[1] of livestock loss is increasing– particularly those related with frequent droughts and climate change (Jensen et al., 2015). In the past 100 years, 28 significant droughts have occurred in northeastern Kenya, four of which has been in the last 10 years (Hassan et al., 2017). Unexpected livestock mortality is the most serious economic risk these pastoralist households face.

[1] Covariate risks, as opposed to idiosyncratic risk (individual), affect many actors simultaneously which causes wide-spread community-level negative impacts (e.g. major droughts or floods, fluctuating market prices).

Diagram 1. Principal ASAL areas of Kenya



Land areas of > 85% ASAL land. Source: Adapted from Republic of Kenya (1992). 'Development Policy for Arid and Semi-Arid Lands'. Nairobi: Republic of Kenya.

Pastoral societies have developed a variety of risk coping strategies to manage risk. Informal social arrangements and diversification strategies that households employ to manage risk include income diversification and multi-cropping. However, in nearly all cases these mechanisms are highly imperfect and generally are less efficient in terms of economic productivity and result in lower incomes. The net result is that risk contributes significantly to the level and persistence of rural poverty (Chantarat et al., 2013).

Several projects have been implemented to manage risk in the ASALs but most have not resulted in transformative development. The Emergency Drought Recovery Project (EDRP) was implemented by the Government of Kenya with the support of World Bank from 1991–1996 in Mandera, Marsabit, Tana River, Turkana and Wajir districts. Later, other projects where implemented and include the Arid Lands Resource Management Project phase 1 and 11 (ALRMP 1996-2010) and as well as complementary projects such as a drought management initiative, Kenya Rural Development Project and Hunger Safety Net Project (Hassan et al., 2017). All of these projects have met with some success but have not alleviated poverty for most Kenyan pastoralists. In response to risk management strategies in pastoralist areas, a small, but growing number of micro-insurance and small-scale insurance products are provided to low-income pastoralists who are generally excluded from more traditional insurance products (Hassan et al., 2017).

Traditional agricultural insurance basically includes crop and livestock insurance and involves field agents who review potential losses on-site. It is an instrument of choice in many countries for helping farmers and pastoralist communities cope with risk. Some insurance is fully privatized with no private subsidies, but most agricultural insurance is provided on a subsidized basis as part of government efforts to either build effective insurance coverage and therefore further economic development or some political goal (Hazell et al.2017). These traditional insurance products required physical crop and livestock loss inspection, and this make the administrative cost prohibitively high for most potential recipients. Specifically, in an isolated region like ASAL, the high cost related to monitoring and validating claims makes the conventional insurance policies relatively cost prohibitive. Instead, a stretched humanitarian response system has been the primary "insurance" against reoccurring droughts (Jensen et al., 2015).

Only with the emergence of index-based weather insurance[2] in 2008 did more smallholder farmers begin to gain access to insurance. The insurance policy is structured to make payouts whenever rainfall exceed or fall short of certain levels, which are likely to cause crop yield

[2] Index-based weather insurance (index insurance for short) is a newer type of insurance contract for smallholder farmers or pastoralist affected by uninsured covariate weather risks. The index is based on satellite data on forage availability. More specifically, a Normalized Difference Vegetation Index (NDVI) measures the level of "greenness" and pays out when forage scarcity is predicted to cause livestock deaths in an area (Carter et al 2014). Appendix 4 provides a brief description of NDVI. For northern Kenya, where livestock rely on vegetation coverage for food, NDVI was a reasonable option.

losses. Recently introduced Index Based Livestock Insurance (IBLI) uses observable parameters, such as rainfall, temperature, and satellite-measured vegetation level to better address pastoralist risk needs (Hassan et al., 2017). IBLI was launched in Marsabit county in Kenya in January 2010. Since then, it has been expanded to include Isiolo (August 2013), Wajir (August 2013), Garissa (January 2015) and Mandera (January 2015) counties in Kenya. Starting from 2015, the Government of Kenya began exploring taking a variant of IBLI nationwide under the proposed Kenya Livestock Insurance Program (KLIP) (Jensen et al., 2015).

KLIP ("macro coverage") is essentially a scaling-up of the IBLI product and is made possible through ILRI's partnership with the World Bank Group and the Government of Kenya (GoK). It is important to note that IBLI (ILRI's micro/individual coverage) will still be sold on a commercial basis across Northern Kenya and it remains a separate product. The key difference between the two was that KLIP beneficiaries from the outset received free insurance for five TLU[3] while IBLI clients paid for coverage up to three TLU.

Despite the potential advantages of index insurance in Kenya, uptake has not met expectations (Federica, 2016). IBLI coverage would be available for purchase for pastoralists who were not covered or for those who wanted more than 5 TLUs of coverage, which is still far below the country averages of 17 and 12 TLU of livestock herded and owned (Federica, 2016).

This review provides an overview of the livestock insurance program in Kenya in historical context (pre-2015[4]) and focuses in greater detail on current events (2015 until today). More specifically, this paper assesses:

- both the positive and negative effects of government interventions (KLIP) on private insurance and the potential future of government involvement (smart subsidies[5]);
- the current state and future directions of private livestock insurance;

[3] The main livestock species in this region are cattle, camel, and shoats (e.g., goats and sheep). TLU is a standard measure that permits aggregation across species based on similar
average metabolic weight (1 TLU = 1 cow = 0.7 camel = 10 goats or sheep).

[4] 2015 is a watershed year for two important reasons. 1-IBLI Kenya started a new insurance model that evolved from an asset replacement contract to an asset protection product, so pastoralists could maintain their livestock in the face of severe forage scarcity. 2-The Government of Kenya began the national livestock Insurance program for pastoralists in northern Kenya. Due to these major events, there was a dramatic spike in sales of the products.

[5] "Smart subsidies", if designed properly, achieve several objectives. They are cost effective subsidies that crowd in (encourage further private sector engagement) private sector capital and expertise to manage the insurance risk, while not becoming a long-term financial burden on the government because strategies are in place to remove the subsidies over time.

- lessons from agricultural insurance case studies about how best to subsidize in order to effectively address the rationale at the core of the subsidy;

- and campaigning strategies to attract widespread interest on livestock insurance product as a means to enhance the resilience of pastoralist against drought risks.

The remaining parts of the paper are structured as follows: Section 2 provides a detailed discussion of the theory on livestock insurance in Kenya; Sections 3 and 4 focus on discussing livestock insurance programs in Kenya, starting from 2010 and onwards; Sections 5 and 6 describe the effects of government intervention on private insurance and smart subsidies for insurance products; and lessons for government and recommendations are provided in Section 7.

2. Livestock insurance theory as it relates to Kenya

2.1 Risk in Livestock sector

Economic activity is characterized by numerous and diverse sources of risk: some threatening all persons and some restricted to the owners of property while still others are typical for some individuals or for special occupations. Specifically, for Kenyan pastoralists, sustainable poverty reduction requires instruments to help rural households manage their livestock risk effectively. However, appropriate interventions are highly conditional on the nature of the risk involved (Barrett et.al 2011).

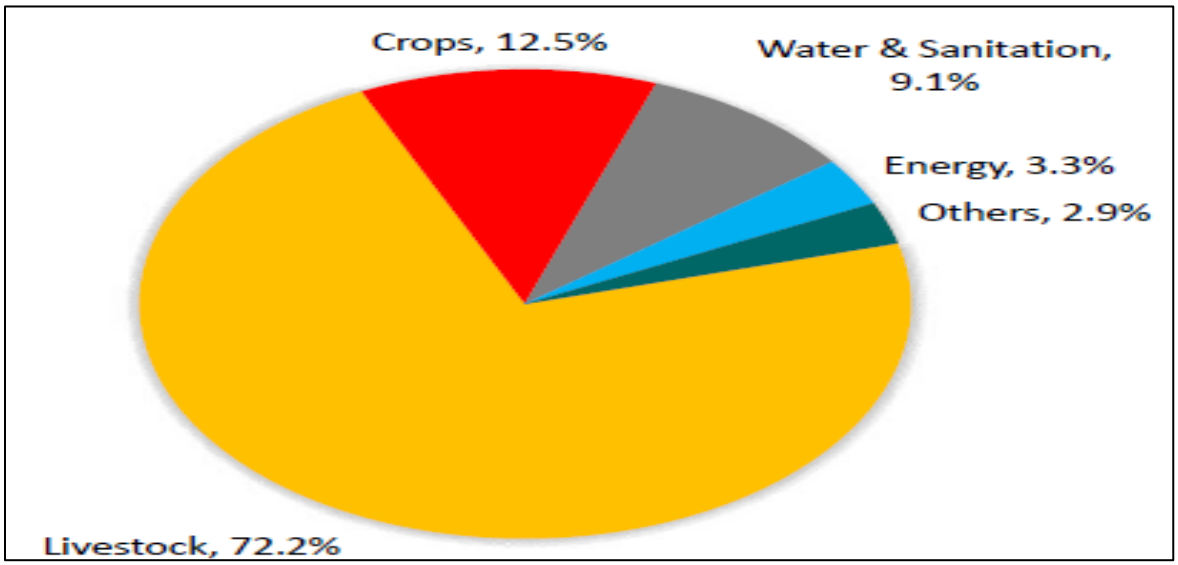
Livestock sector is exposed to a broad range of risks, from natural disasters, diseases and pests, to production and price risks. Herders face both idiosyncratic risks– meaning that one household's experience is unrelated to neighbors' (e.g., property loss due to fire, theft or health etc.), which affect them independently, and systemic risk or covariate risk (such as droughts, epidemic diseases, etc.) which affect many neighboring households at the same time (ACCI, 2013).

Because weather shocks tend to be covariate over large geographical areas, state and national governments, as well as development agencies, are also affected by weather shocks as they face sudden demands for relief, reconstruction, and recovery for which they may not have access to the necessary financial resources (Carter et al. 2014).

Drought has, for decades, been the single most disastrous natural systemic hazard in Kenya. The country has lost an estimated Sh1.2 trillion shillings between 2008 and 2011 due to drought (ACCI, 2013). According to an article in Kenya's Standard (28 April 2016), more than 13 million people in Kenya were affected in 2011 by a combination of drought, conflict and economic crisis. Kenyan agricultural sector risk assessment report (Diagram 2) by the World Bank group (2015), estimates that of the $ 12.1 billion (Sh1.2 trillion) losses suffered, nearly ¾

of all losses were in the livestock sector (Alessandro et al., 2015). In other words, 72% of economic losses of the drought were felt in the livestock sector.

Diagram 2. Impact of Drought on Key Sectors of the Economy



Source: Agricultural Sector Development Strategy 2010-2020

According to relevant literature, the main risk for northern pastoralists remains drought (Alessandro et al., 2015) and is getting more frequent. Livestock herders used to anticipate major droughts once every 10 years. However, the frequency of drought has increased to once in every three to four years, leaving less time for recovery and for rebuilding their herds (Alessandro et al., 2015). With a general lack of protection against drought, pastoralists have relied on self-insuring, and this is generally both costly to them and of limited effectiveness. Typical responses to drought shocks include both *ex-post* shock coping and *ex-ante* risk management (Carter et al., 2014). That is, pastoralists can either cope with losses after they suffer them (*ex-post*) or prepare better to avoid them (*ex-ante*). The next session goes into more detail regarding these strategies with examples.

2.2 Risk coping strategies

Farmers and pastoralists employ several strategies to manage the risks they are facing. Responses to risk (Table 1) includes either *ex-ante* risk management – before the shock event happens and/ or *ex-post* shock coping – after the event occurred. This section begins by discussing *ex post* coping strategies.

To cope with shocks, households typically sell productive assets (livestock, seeds, land) which usually undermines income-generating capacity and can push households into poverty traps from which it will be difficult to escape (Carter et al., 2014). Short-term shocks can push the household members to engage in temporary employment and in the long term can have

unexpected consequences like migration and child labor. Resilience coping strategies help mitigate the negative consequences of these shocks. Informal risk sharing arrangements with neighbors, friends, families (for example, if the household suffers an adverse shock, family members working in major towns may send more money). These types of support networks may be hampered with co-variate risk as those who might provide support also suffer from the same shock. Other *ex-post* shock-coping responses are supplied through social protection or donor support in the form of food relief, cash transfers and other types of support.

Table 1. Shock coping and risk management in response to drought shocks

Risk management strategies (*Ex-ante*)	**Shock coping strategies (*Ex-post*)**
Risk avoidance (e.g. Migrate livestock/Herd mobility)	Selling of productive assets (land, livestock, etc.)
Risk retention (e.g. precautionary saving)	Seeking temporary employment
Risk reduction (e.g. income diversification: farming)	Informal risk sharing, mutual assistance
Risk transfer (e.g. purchasing insurance)	Reliance on social safety nets (transfer, food aid)

Source: ACCI, 2013 and Carter et al., 2014

Ex-ante risk management includes potentially economically inefficient efforts. Since pastoralist households anticipate that uninsured shocks will strike, and their capacity to cope with such shocks is limited and unaffordable, they adjust their behavior to reduce exposure to shocks. Risk management responses consist of risk avoidance, risk retention, risk reduction, and risk transfer.

Risk avoidance includes the choice of activities with lower risk even if at the cost of lower expected returns (Carter et al 2014). Pastoralist usually migrate out of expected weather shock areas with their livestock when they anticipate a drought. This strategy has disadvantages of minimizing potential local innovations that could reduce risk by staying as well leading to over grazing in the migrated regions.

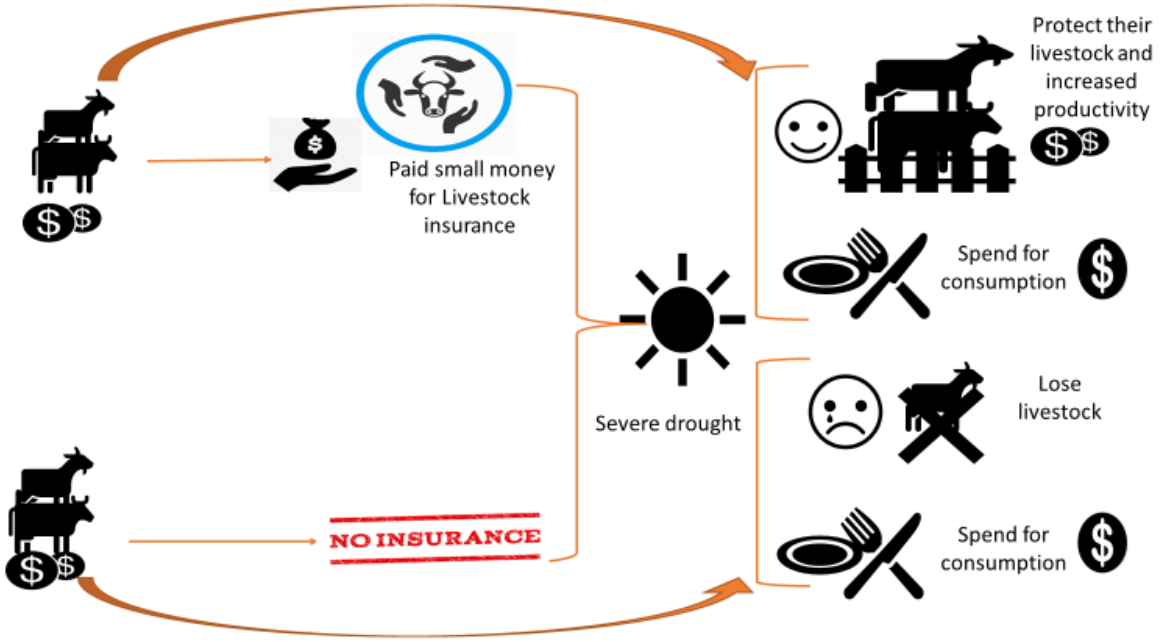
Risk retention includes precautionary savings and that also can include securing access to a credit line for a fixed fee and/or investing in patron-client relationships to be able to borrow from prominent individuals in the community when adversity strikes (Carter et al., 2014). Precautionary motives to delay consumption or investment reduces potential capital for productive investment and thus reduce overall economic gains.

Risk reduction includes investments to improve overall resilience. A specific example includes diversifying income sources away from just livestock. However, the ability to be successful may be dependent on the household's access to resources. For instance, poorer herders often are limited to smaller petty trade activities, charcoal production, and casual (unskilled) labor activities, while wealthier pastoralists are more likely to have the required labor and capital to diversify into more profitable activities and better protect against risk. Put another way,

diversifying income streams may not able to take advantage of economies of scale, especially for poorer farmers with limited capital.

Risk transfer typically includes contracting for loss adjustment-based insurance, or payment to replace what has been lost. With the current technology development in Kenya, using mobile phones and MPesa, can be characterized as risk transfer to improve the living standards of the pastoralists. In other words, insurance can serve as collateral for credit. One possible *ex-ante* risk management strategy is the use of an insurance product (risk transfer), particularly when the shocks are relatively infrequent but severe. Combined this product with other measures like farmer education and good and timely market information and the long-term development setbacks evidenced in the sector can be greatly reduced, while the shorter-term benefits are minimizing economic losses (AKI, 2016). Put simply, well developed insurance products can enhance resilience and increase economic outcomes. Overall, a small periodic payment for potential catastrophic loss frees the pastoralist to pursue more revenue enhancing goals over inefficient risk mitigation strategies. Figure 1, illustrates how livestock insurance lowers risk and encourage pastoralist to invest in increased productivity.

Figure 1. Use of livestock insurance for pastoralist households

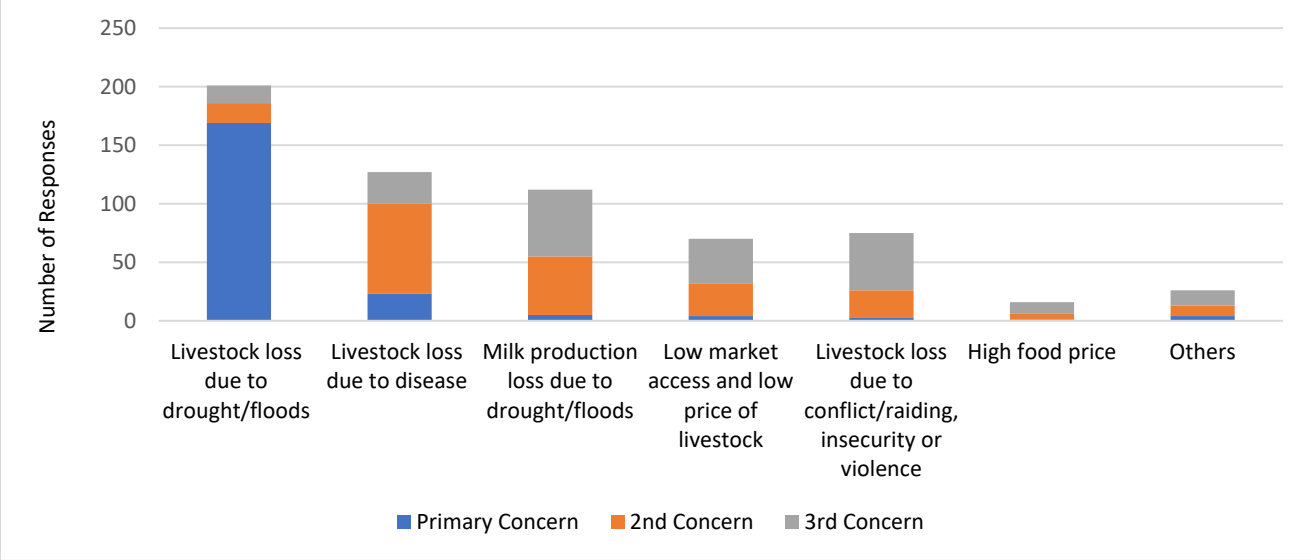


Source: Illustrated by the authors

The survey results from a 2009 baseline survey (Chantarat et al., 2009), from five arid and semi-arid pastoral locations in Marsabit district, indicate that the covariate livestock loss of inadequate rain impacting forage was the most significant risk reported by pastoralist households (Figure 1).

Pastoralists indicated that livestock loss due to either droughts/floods (81%) or disease (11%) were the top concern in regard to their economic livelihoods. In terms of their second highest concern, the responses are distributed among several answers. Disease, milk production loss, low selling price, and conflicts are the top five second most important responses and constitute about 85% of the total responses. (see Appendix1 for more detail). Overall, the results indicate that pastoralists are most concerned about loss of livestock for weather related reasons. Insurance, as well as other supporting strategies, could go a long way to address this issue.

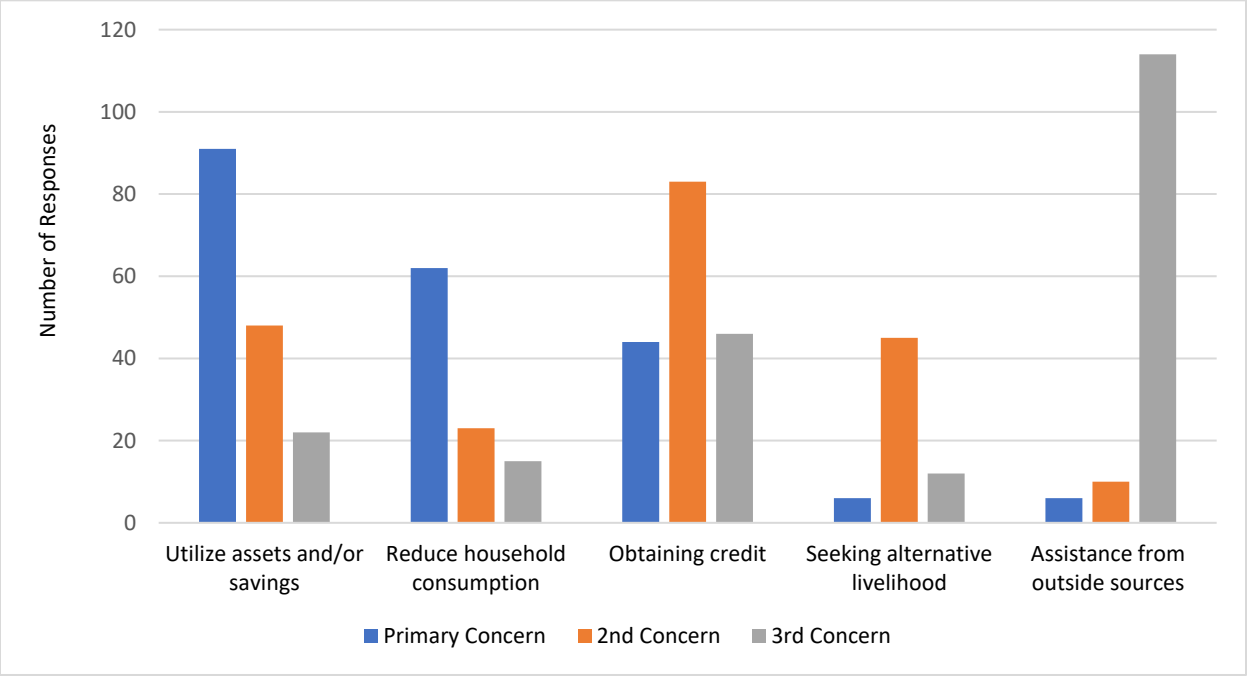
Figure 2. The three biggest problems pastoralists face



Source: IBLI Marsabit baseline sample surveys (Chantarat et al. 2009)

Understanding pastoralist coping strategies can better help plan effective policy that directly complements ASAL coping mechanisms. In other words, understanding what pastoralists currently do to reduce risk mitigation can better shape insurance policy. From the various coping strategies mentioned in Table 1, the traditional risk management strategies exercised in Marsabit district were ranked from utilization of assets and saving, obtaining credit, reduction of consumption and assistance from outside sources (Figure 3).

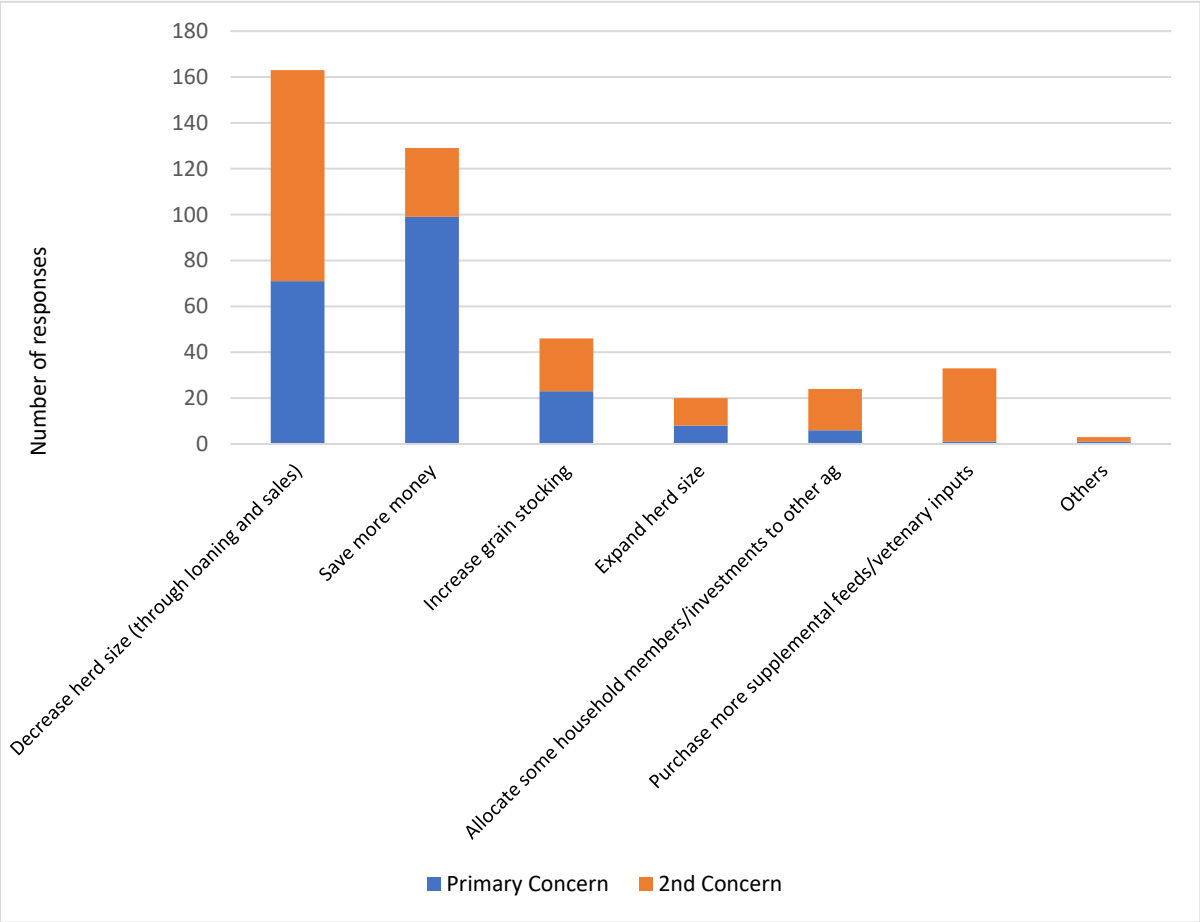
Figure 3. The three most important strategies household use to cope with livestock loss



Source: IBLI Marsabit baseline sample surveys (Chantarat et al. 2009)

As shown on Figure 4, apart from migration, decreasing herd size through livestock loaning and sales was the main precautionary action undertook in expectation of catastrophic herd loss. Appendix1 presents in greater detail summary statistics of pastoralist risk perceptions and existing coping strategies.

Figure 4. The two most important risk management strategies used by pastoralists



Source: IBLI Marsabit baseline sample surveys (Chantarat et al. 2009)

2.3 Livestock Insurance in Kenya

Although the market for agricultural insurance remains underdeveloped and only a few products are offered to farmers to protect their livelihoods against loss of harvest, Kenya has a long history in applying risk management mechanisms in agriculture. For example, during the economic depression of the 1930s, the colonial government introduced reforms to compensate for the slowdown in agricultural lending and the worsening food security situation due to droughts and locusts (ACCI, 2013). This scheme was ultimately discontinued in 1978. However, almost 30 years later (2005), several insurance companies started to look at the market potential of agricultural insurance (ACCI, 2013). More specifically, the commercialization of dairy farming led to an increased demand for livestock insurance. As these products require physical loss inspection, the administrative costs were too high to offer these products to smallholder farmers or pastoralists. As the result, formal insurance contracts are rarely available for pastoral

households who populate the small payment, perceived high risk, environments (Chantarat et al., 2013).

Most Kenyan insurance companies are also built around the urban business of insuring cars, houses and businesses but not agriculture (Tara et al, 2018). There were no private-sector existing product lines or delivery systems, and no perceived ability to develop these types of products for rural customers (Tara et al, 2018). However, in 2008, two national banks announced that they planned to open branches in Marsabit county and insurance companies began looking more seriously beyond the urban customer to new markets.

All insurance companies in Kenya are registered companies with the Insurance Regulatory Authority (IRA) under the Insurance Act (1984) (ACCI 2013). There were 50 licensed insurance companies in Kenya and currently 10 insurance companies (Figure-5) are underwriting livestock insurance (AKI 2016).

Figure 5. List of agricultural insurance companies in Kenya

Source: Association of Kenya Insurers, 2016

While the private sector was hesitant to insure rural smallholder pastoralists, a hybrid public/private partnership was piloted to assist smallholders in a relatively cost-effective manner. After the emergence of index-based weather insurance products in Kenya in 2008, more smallholder farmers started to gain access to agricultural insurance. In particularly, International livestock Research Institute (ILRI), with support from DFID and in partnership with UAP and Equity Bank, set out the first index-based weather insurance to mitigate against livestock mortality for the Marsabit District in 2009. The product aimed at insuring pastoralists in the event an animal died as a result of lack of pasture grazing due to drought. UAP acted as the risk carrier, and Swiss Reinsurance Company provided re-insurance[6] cover (ACCI, 2013).

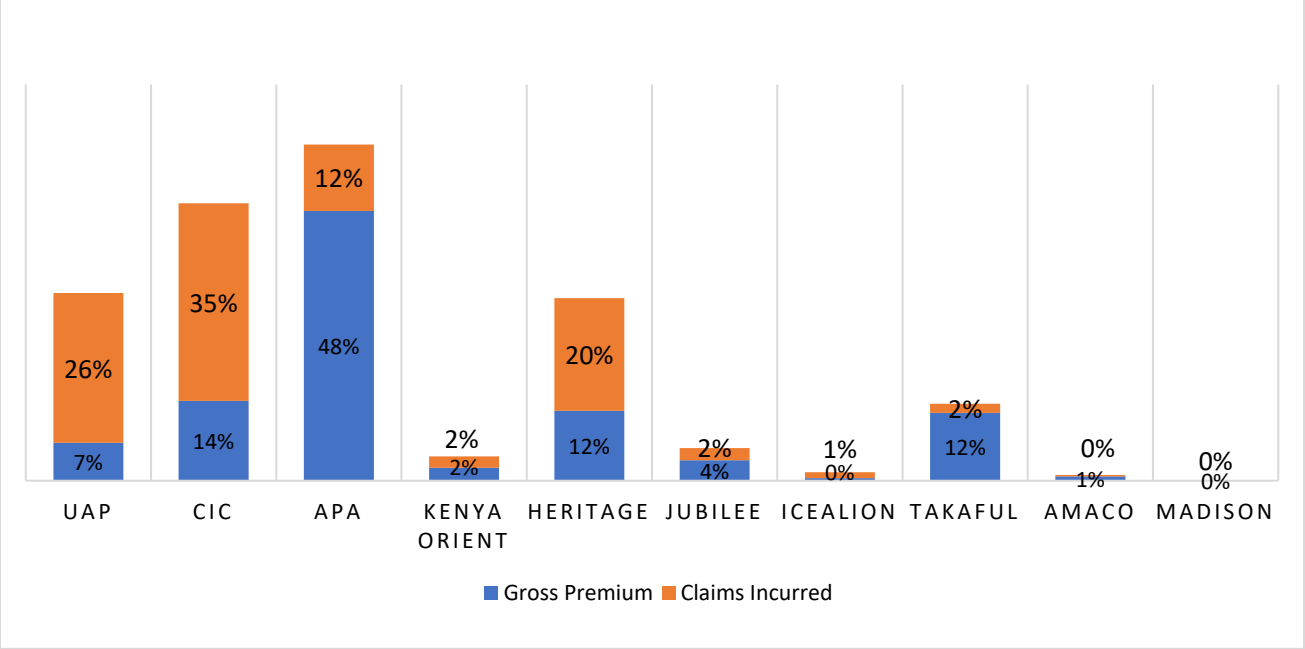
As shown on Figure-6, the total gross premium[7]for livestock insurance in 2015 was ksh.148.18 Million (1.4 Million USD). APA insurance company accounted for about 48% of the total gross

[6] Reinsurance, also known as insurance for insurers. It allows insurers to remain solvent by recovering some or all of amounts paid to claimants.

[7] Gross premium: is the total premium paid by the policy owner, and generally consists of the net premium plus the expense of operation minus interest.

premium followed by CIC (14%). On the other hand, ksh.56.17 Million (549.1 Thousand USD) claims incurred[8] and CIC accounts for 35% from the total livestock incurred in 2015.

Figure 6. Percentage of Livestock Insurance gross premium and claims incurred in 2015



Percentages are of total market premiums or claims. Source: Association of Kenya Insurers, Insurance Industry Annual Report 2015

IBLI originally worked with Equity Bank and UAP, but after 2011, in part because of massive losses by UAP, IBLI substituted APA for UAP. Since 2012, International livestock Research institute (ILRI) has been working with APA and Takaful Insurance company to sell IBLI's product.

3. Livestock insurance program in Kenya before 2015

3.1 Index-based livestock insurance

Index insurance policies make indemnity[9] payments according to the value of an "index", which is assumed to be a proxy and highly correlated for actual losses (Jensen et al., 2015). Index-based insurance differs from traditional insurance in that it is used to protect against shared rather than

[8] Incurred claims: An estimate of the amount of outstanding liabilities for a policy over a given valuation period. It includes all paid claims during the period plus a reasonable estimate of unpaid liabilities.

[9] Indemnity is a contractual obligation of the Insurer (indemnitor) to compensate the loss occurred to the insured pastoralist (indemnitee).

individual risk. Traditional insurance makes payouts based on case-by-case assessments of individual clients' loss and verify the truth of their claims (Matsaert et al., 2011). These verification activities are inefficient for smaller cases of insurance and so insurance is rarely made available in rural and low value settings. With index-based insurance products, all insurers have to do is to monitor the index, thereby sharply reducing operating costs. For clients in poor infrastructure environments like the northern Kenyan ASALs region, the costs of traditional insurance products are often prohibitive because of high administration costs (Mude et al., 2011).

There are also several reasons why index insurance might be selected over its traditional indemnity counterpart. Index insurance is more resistant to many problems that plague traditional insurance programs. For example, index-based participants are generally not subject to the problems of adverse selection. Adverse selection suggests that more risk prone participants are likely to purchase insurance which creates higher premiums for those that do not engage in more risky behavior. Index insurance does not rely on individual behavior and thus reduces this type of risk. Another problem of insurance is moral hazard, suggesting insured individuals have an incentive to take on added risk and drive up costs of insurers. Index based insurance products are relatively simple and have a transparent structure which does not incentivize greater risk behavior (Mude et al., 2011). However, there are still many limitations of index livestock insurance. For example, pastoralists may receive a payout even when their livestock survive, or they may experience losses when a payout is not triggered. This phenomenon is called "basis risk" and has been cited frequently as a key barrier in index insurance uptake (Ruth et al., 2014).

The Index-Based Livestock Insurance (IBLI) project took on the challenge of making insurance commercially viable amongst pastoralists who occupy vast remote areas in Kenya and Ethiopia with almost non-existent communication and transport options (Greatrex et al., 2015). The program was launched in Marsabit county of Kenya in January 2010. Since then, it has been expanded to include Isiolo (August 2013), Wajir (August 2013), Garissa (January 2015) and Mandera counties (January 2015) in Kenya (Jensen et al., 2015). As discussed later, there have been several challenges to this type of insurance but one of the fundamental issues was how to better augment less efficient traditional insurance strategies with index-based insurance.

3.2 Index-based insurance and informal risk-sharing

Most households in Sub-Saharan Africa deal with economic hardships through informal insurance, arrangements arising between individuals and communities on a personalized basis, rather than through markets or states. Examples include drawing down savings, engaging in reciprocal gift exchange, selling physical assets, and diversifying income-generating activities (Morduch,1999).

Many communities in Kenya have these kinds of informal safety nets. For example, these informal safety nets often take the form of loans or gifts of livestock for someone who has been struck by a loss. However, these "gifts" often come with conditions. For example, with a gift of a cow, new calves or milking rights, might have to go back to the original owner. Strategic giving can occur, whereby the help sometimes goes to someone who could potentially recover easier and reciprocate potential support in the future rather than households in the direst need. Beyond the complications of informal risk sharing is the issue of community acceptance of these new types of insurance. Making sure that interventions are culturally acceptable is critical for widespread adoption. The following example provides a successful method of encouraging insurance adoption.

IBLI faced a problem during 2013 when they began a new partnership to provide index-based product with Takaful Insurance Company, an Islamic financial institution that served the largely Muslim Wajir county (Tara et. al 2018). For many Muslims, insurance is considered forbidden, or against the tenets of Islam, as some believe it contains forbidden characteristics of usury, gambling and excessive uncertainty. Hassan Bashir, the CEO of Takaful, was a pastoralist and was looking for a way to solve problems for pastoralist communities. Takaful is rooted in the Arabic words for "helping one another" or "mutual guarantee" and branded its IBLI product "Index Based Livestock Takaful," and was the first sharia-compliant IBLI product. As per the principles of Takaful-type insurance, the company would return a portion of unused "contributions" from "shareholder clients" regardless of whether they receive claims or not (Tara et. al 2018). This example serves as a successful strategy for carefully integrating a "modern" insurance product that is more compliant with local religious practices. In this way, it can serve the community more effectively and build resilience.

Index insurance contracts are aimed at mitigating covariate shocks, such as livestock loss due to drought, that tend to simultaneously affect all pastoralist households in a village. By removing the covariate risk that informal risk sharing arrangements are unable to address, index insurance would appear to unambiguously increase pastoralist's risk bearing capacity and lead to greater investment and welfare (Boucher and Delpierre, 2013). Indeed, by providing protection from covariate risk, index insurance may complement and strengthen idiosyncratic risk sharing in informal risk sharing arrangements. In other words, pastoralists have come to think about index insurance as a complement to this informal sharing rather than as a replacement (Tara et. al 2018). This is a positive development as this suggests a more likely uptake by pastoralists.

3.3 IBLI development in the northern Kenya (2010-2014)

Pastoralism in the arid and semi-arid areas of northern Kenya is nomadic in nature, where herders commonly adapt to the variability in forage and water availability through herd migration. In the recent past, livestock insurance has gained a lot of interest in Kenya as a viable

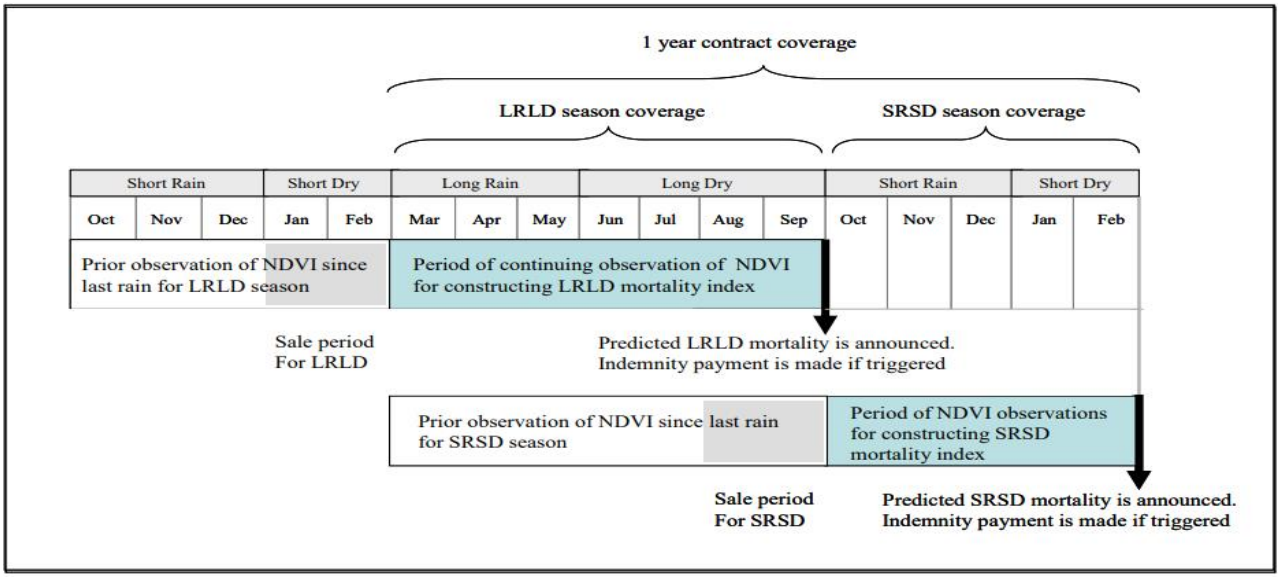
solution to addressing covariate risks like those associated with drought. International Livestock Research Institute (ILRI) has piloted index-based livestock insurance (IBLI) in arid and semi-arid land regions of Kenya, to cover livestock mortality related to forage scarcity due to drought.

One essential reason why Marsabit District was chosen in 2010, was the availability of data (both weather data and livestock mortality data) that could be used for designing the insurance product. Based on this data, ILRI researchers established that there was a strong correlation between livestock mortality rate and weather data captured using an index called the Normalized Difference Vegetation Index (NDVI). The NDVI was developed using satellite data on vegetation cover of the district for the last 40 years. The model accurately predicted the actual mortality in years that were affected by drought (ACCI 2013). The basis risk, was below 10% which was deemed reliable enough to proceed with the commercialization of the product (Mude et al. 2011). Box 1. in Appendix 4, demonstrates how droughts are determined based on NDVI.

The IBLI product is marketed and sold during two periods occurring directly before the two rainy seasons (August-September and January-February). The insurance product covers the short rains short dry season (SRSD) or the long rains long dry season (LRLD). The contract is specific at the location level, based on the predicted mortality rate as a function of the vegetation index specific to the grazing range of that location (Chantarat, 2009). The IBLI contracts are sold just before the start of rainy season and are assessed at the end dry period to determine whether indemnity payments are to be made (Figure 7).

The pastoralists deductible is 15% of the herd loss and any losses above 15% are compensated by the insurance company (Federica, 2016). The index threshold above which payouts must be made is called the strike level. In other words, the strike level for IBLI is 15% and indemnity payouts are triggered if the predicted livestock mortality index exceeds a threshold of 15%. In another way, if the forage conditions for the current contract season is ranked 20 and below, the contract will pay out. Therefore, the strike level is set at the 20th percentile. IBLI will compensate if the forage condition will fall below the worst 20 percentile of seasonal pasture levels in the contract area. Coverage is depending on how many total tropical livestock units (TLU) households wanted to cover with insurance and risk associated with the geographical region. As can be seen from Table 2, the time line development of IBLI in the northern Kenya from 2009-2014 as it expanded into three counties (Marsabit, Wajir, and Isiolo).

Figure 7. The temporal structure of an IBLI contract



Adapted from (Chantarat, 2009).

Table-2 IBLI Timeline of development in Kenya (2009 - 2014)

Year	Major activities/ Events	Area of implementation (Counties)	Involved insurance companies	Product sale/No of contract sold	Indemnity payment/No clients	Innovation activity	Remarks/Challenges
2009	IBLI product in Kenya launched as a pilot.	Marsabit and Wajir	UAP /Equity Bank		None		
2010	The IBLI product was launched in January.	Marsabit	UAP /Equity Bank	**January-February**: 1,979 **August-September**: 599	None		-Reasons for sharp decline of sales: low market development, no payout in the first indemnity, lack of awareness about the product and loss of trust.
2011	First payment of indemnities. Due to the severe drought in 2011.	Marsabit	UAP /Equity Bank	**January-February:** 647 **August-September**: 518	595 in all 5 districts	A color legend to improve communication was developed along with a phone app sales platform.	-Getting payouts out was a challenge. -Three and a half months after the payouts were triggered were payments finally completed.
2012	➢ Successful and widespread awareness creation. ➢ Redesigned the insurance contracts with 20 percent cash back if holders went two years with no payout. ➢ UAP had left after the first Payout.	Marsabit	APA	**August-September**: 216	Second payment on March for two districts	Mobile-based application for sales transactions created	-UAP and Equity failed to mount a marketing campaign for Jan-Feb period. -UAP had left after the first payout created serious trust issues.
2013	➢ IBLI team extended its partnerships with NGOs and government agencies. ➢ IBLI expansion beyond Marsabit.	Marsabit, Wajir and Isiolo	APA and Takaful	**January-February**: 209 (Marsabit) **August-September**: 117 (Marsabit);101(Wajir); 68 (Isiolo)	69 for one district in Marsabit	Improve marketing and capacity development.	The cost of premiums high for APA contracts. Takaful launched its first sales in Wajir but did not have time to sufficient mobilize and sensitize the community.
2014	➢ IBLI team start shifting to asset protection. ➢ Government of Kenya began to establish the National Livestock Insurance Program.	Marsabit, Wajir and Isiolo	APA and Takaful	**January-February**:113 (Marsabit); 240(Wajir); & 46 (Isiolo) **August-September**:288 (Marsabit);150 (Wajir); & 104 (Isiolo)	For all 3 counties: 101 in Wajir; 73 in the 2 districts of Marabit and 4 districts in Isiolo	Community dialogue sessions in order to regain the community's trust on IBLI	Sales in Marsabit and Isiolo were still suffering from the effects of reduced trust in 2010.

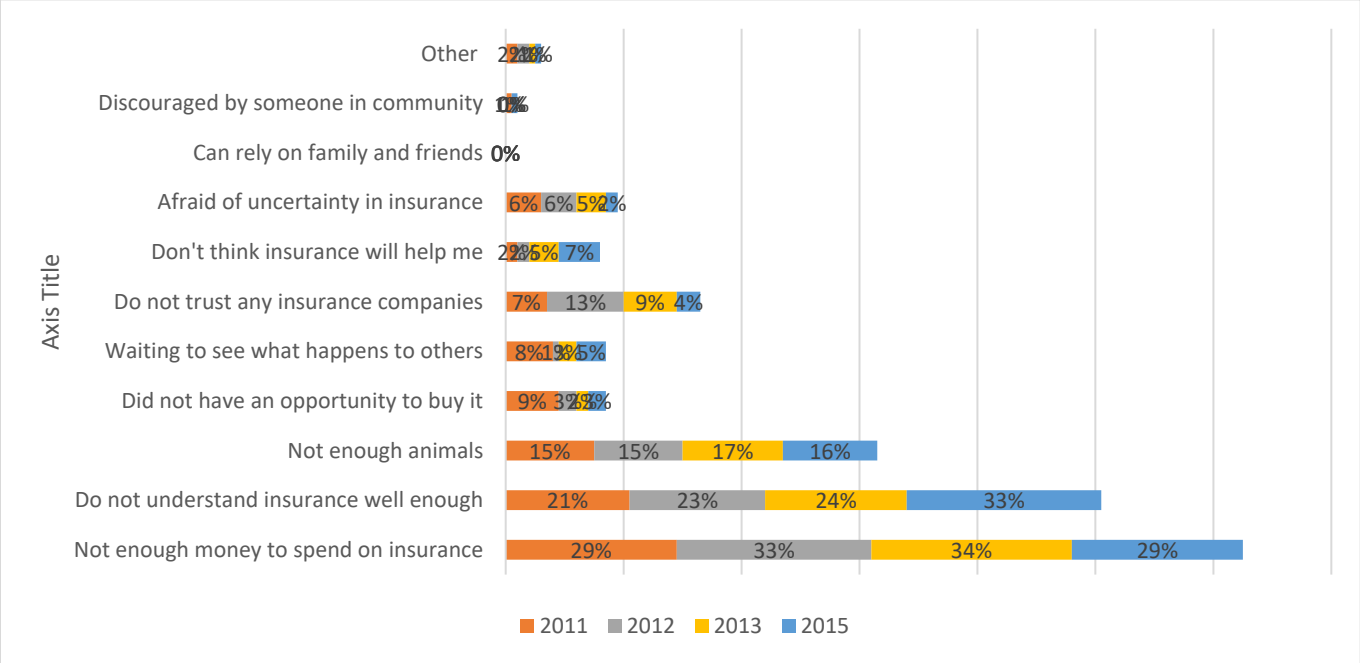
Source: (Tara et al., 2018; Munde, 2012; and Dror et.al., 2015)

UAP replaced by APA Insurance.

Despite the continued expansion, sales figures have still not reached significant numbers of pastoralists; at the end of 2014, sales were still at lower levels than the 2010-2013 period. The major reasons for the decline were: demand was found to be sensitive to discount coupons; marketing development was a major barrier; a lack of awareness about the products; low mobile usage (about 20%) and M-Pesa coverage at the time, and serious trust issues among the external agent that included cultural acceptance (Chantarat et al., 2009).

Moreover, as shown in Figure 8, the top three reasons for not purchasing insurance include, a lack of purchasing ability, not understanding the role of insurance, and insufficient need (not enough animals) These three reasons comprise nearly ¾ of all annual responses over the five-year survey period. The survey indicates that subsidies and awareness creation are critical bottlenecks to insurance adoption. A detailed summary of these statistics is provided in Appendex 2.

Figure 8. Top reasons why pastoralist households do not purchase livestock insurance



Percent of respondents per year. Source: Computed from IBLI Marsabit Sample Surveys Panel Data (2010-2015)

As pastoralists are a typically understudied community, exact figures concerning district populations of pastoralists are not readily available. However, based on Kratli and Swift estimations, less than 1% of pastoralists were covered by index insurance in 2014. Pastoralist households covered by IBLI products in the three counties are identified in Figure 3 in 2014 (Federica, 2016). Clearly, the first five years of IBLI (2010-2014) had not created a sustainable market for the insurance product.

A lack of uptake caused researchers to reconsider how to reduce costs to increase efficiency for improved insurance coverage. In 2014, an IBLI research team start to shift from an asset replacement contract to asset protection (Tara et al 2018). The reason for this shifting focus was based upon IBLI qualitative and quantitative survey research in the pastoralist areas. This research indicated costs of insurance could be reduced greatly if livestock was prevented from dying (providing emergency fodder, etc.) rather than actual livestock replacement after death. Put simply, protecting vulnerable livestock is less expensive than replacing it (Tare et al. 2018).

Traditional asset-replacement insurance contracts basically offer cash or in-kind replacement to make up for the value lost. For livestock, this is either paying cash for the fair market value of a dead cow or providing one of equal value. However, both forms of replacement created challenges for pastoralists. In pastoral areas, where input markets are generally not very well developed (Tare et al. 2018), herders have a hard time replacing lost livestock even with cash payouts. Herders were also very particular about their livestock and did not believe the market could deliver the exact livestock that was lost (Tare et al. 2018). This indicated that IBLI could serve as precautionary savings through preventing livestock death. Pastoralist can also increase spending on livestock health services including veterinary services and vaccination asset protection contracts.

Beyond IBLI insurance, there was a political momentum for the Government of Kenya to push hard to fulfill the promise of livestock insurance for the people of northern Kenya. The World Bank's Agricultural Insurance Development Program partnered with the Government of Kenya through the State Department of Livestock (SDL) as a first step to establish the Kenyan Livestock Insurance Program (KLIP) for 2015. The scheme was supported by the World Bank, ILRI and the Swiss Reinsurance Company and was developed with concurrently developed policy documents. The next section reviews current policy regarding index-based insurance.

3.4 Policy environment for livestock insurance in Kenya

Policymakers recognize the importance of agriculture and have been actively promoting the creation of an innovative and modern agriculture. However, little focus has been on risk and insurance.

Regarding agriculture insurance, while a number of policy documents touch on the issue of risk in agriculture and risk management issues in general, none of the policies propose concrete and result-oriented strategies on how to improve the agricultural insurance sector (Tara et al. 2018). For instance, the national Agribusiness Strategy 2012 sets the objective to strengthen the range and robustness of insurance schemes for small businesses, and to create awareness and scale up agricultural insurance products by improving data, information infrastructure and improving insurance awareness (ACCI, 2013). However, no specific targets are provided.

The Kenyan insurance market is governed by the Insurance Act (1984) administered by the Insurance Regulatory Authority (IRA). Under this Act, all assets, liabilities and lives within Kenya must be insured with an Insurance Company registered in Kenya under the Insurance Act. But some sections of the Insurance Act were amended in 2007 and it converts the department of Insurance into an autonomous Insurance Regulatory Authority. Under the current Insurance Act agricultural insurance is not mentioned as a separate type of insurance but is simply subsumed under "miscellaneous". Therefore, no statistics on agricultural insurance are kept within the IRA (ACCI, 2013).

The IRA has been very supportive in recent years concerning the introduction of index-based insurance products. Even though this type of products is currently not explicitly mentioned in the Insurance Act and other relevant documents, the IRA has allowed piloting of products for the benefit of low income farmers and pastoralists as well as closely supervising the progress of the various initiatives currently carried out in Kenya (ACCI, 2013).

The Government of Kenya created an enabling environment by formulating a task force for creating a national agricultural sector insurance program. The task force sought to address the wide range of risks that pose challenges to food security and lays out the potential costs and benefits of developing large-scale agricultural insurance involving both the public and private spheres (World Bank, 2015). This task force was headed by the Ministry of Agriculture, Livestock and Fisheries and the German Agency for International Cooperation (GIZ). The team set out a document and the accompanying technical analysis, lays out the costs and benefits of developing large-scale livestock insurance that involves both the public and private spheres.

The government also considered supporting the development of a voluntary livestock insurance market beyond fully subsidized coverage for the very poor. The government would foster this market by making sure that insurance providers underwriting the government's coverage, would receive financial assistance? for program recipients who may need additional coverage (World Bank, 2015). These additional programs, which would cover the slightly less vulnerable, would be subsidized by the government. In the next section, the review will highlight how this large-scale insurance program was implemented by the government and its side-effects of intervention on the private insurance market.

All in all, several index insurance interventions are currently taking place in Kenya, but there is still no broad regulation policy that can ensure even basic safe minimum standards for index insurance contracts. Index insurance is a completely new kind of product and very few regulators in developing economies completely understand them (Tara et al 2018). This lack of understanding has created some unintentional consequences when government does intervene in Kenya's index insurance markets.

4. New IBLI initiative starting in 2015

4.1 IBLI in 2015

IBLI incorporated an asset protection methodology in 2015 to intervene before losses actually occurred. During the January-February 2015, ILRI Kenya sold this new insurance model that would trigger payments for pastoralists to maintain their livestock in the face of severe forage scarcity. This revision to the IBLI contract and recent payouts were largely responsible for a dramatic increase in sales upon its introduction of the January-February 2015 sales period. In that period, IBLI sold 2,616 contracts, which was almost ten-fold increase in sales of the previous August-September 2014 period.

Later in 2015, IBLI further expanded and started to sale new products in Garissa and Mandera, over 548 policies sold. From IBLI's inception in 2010 to March 2015, a total of 7,454 contracts had been sold, covering 16,814 TLUs and with the total insured value exceeding KSH 266 million (USD $2.95 million) (Tara et al., 2018).

In 2016, IBLI covered 2,510 (2.8%) households in Wajir with 12,550 livestock units and 2,502 (4.2%) households in Turkana with 12,510 TLUs covered. During the short rains season (October through December), 62 livestock units out of 70 across six counties triggered (Tara et al 2018). IBLI program has plans to expand to 14 counties10 in the ASAL regions (Alessandro et al., 2015). Pastoralist can protect themselves against the impact of droughts and thus improve their resilience, as these droughts occur with increased frequency and severity (Federica, 2016).

4.2 Launching the Kenya Livestock Insurance Program (KLIP)

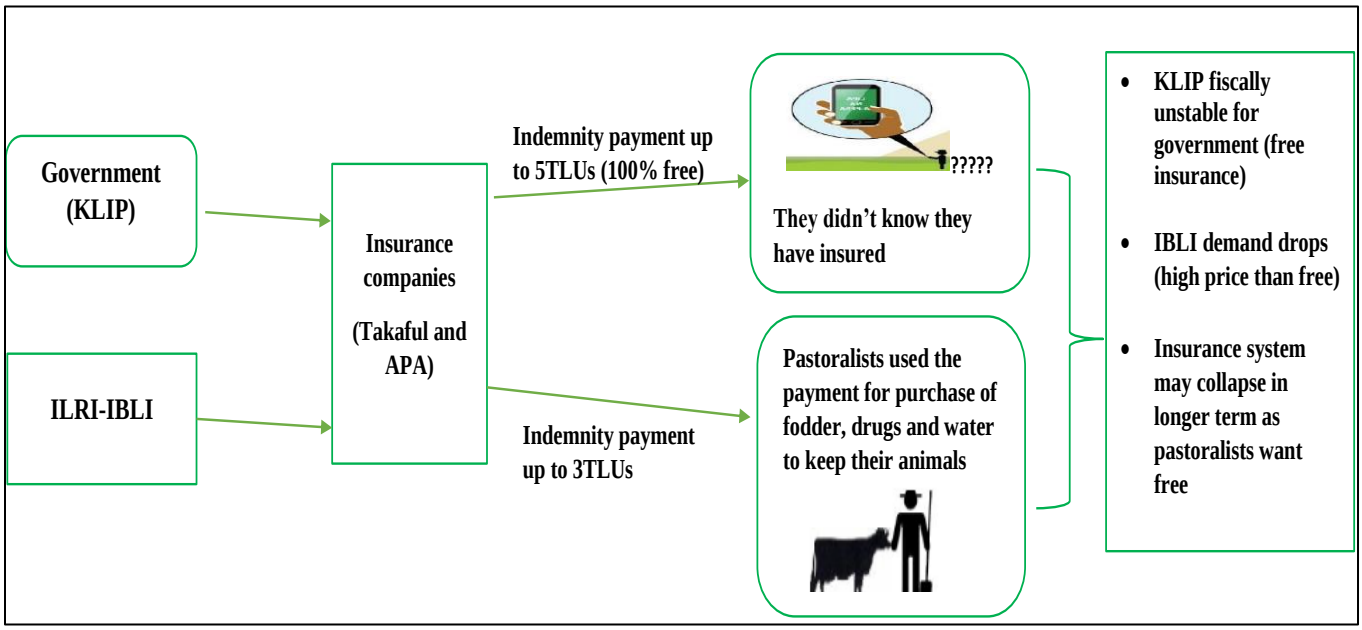
In contrast to IBLI, which remains a micro-insurance scheme to be sold on a commercial basis across northern Kenya, the first government livestock insurance scheme – KLIP was launched in October 2015 to cover larger numbers of pastoralists in Northern Kenya. KLIP was designed to insure the vulnerable pastoral households in the north of Kenya, covering the two counties of Wajir and Turkana, and initially providing insurance for 5,000 households.

The model used by KLIP was largely the same as the IBLI asset protection insurance contract that had just been offered by APA and Takaful. The key difference between the two was that KLIP beneficiaries received free insurance, or a 100% subsidy of the product, while IBLI clients paid for coverage (Figure 9). Moreover, KLIP is a macro coverage product – large numbers of

[10] Lamu, Isiolo, Laikipia, Mandera, Marsabit, West Pokot, Turkana, Tana River, Garissa, Baringo, Samburu, Narok, Kajiado, and Wajir Counties (Federica, 2016).

vulnerable pastoralists (beneficiaries) and essentially a scaling-up of the IBLI product whereas IBLI is micro or individual coverage and it remains a household product. There are several fundamental problems associated with the rollout of the KLIP program. In the first place, it was not well promoted and many of the recipients did not even know they were covered! In addition, with no financial commitment from the pastoralists the ultimate effects were to *crowd out* the private sector insurance products. As is frequently the case, when governments provide something for free, the private sector, who provides this good or service at a cost, collapses. In addition, the scalability of this free program is not possible, casting serious doubt on the sustainability of this type of program.

Figure 9. IBLI and KLIP Models



Source: Illustrated by the authors

Major Payouts through KLIP after Expansion

In October 2016, 14,000 vulnerable households from six counties (Turkana, Wajir, Tana River, Marsabit, Isiolo, and Mandera) were selected to benefit from the KLIP livestock insurance program (Mahul & Maher 2017). Recipients were selected based on their vulnerability to drought, but many were not actually informed of the insurance coverage. KLIP has benefited from the Hunger Safety Net Program (HSNP) systems, including its electronic registry and delivery channel (bank accounts for every household) to make timely payouts to beneficiary households in HSNP counties (Cerruti et al. 2015). Details as to who was specifically covered is

not available but estimates here suggest that about 4.7%[11] of pastoralists in these districts are estimated to have been covered under KLIP in 2016.

In February 2017, severe drought conditions triggered KSH 215 million, about a US$2.1 million payout by livestock insurance companies to 88 percent of insured households, directly benefiting 12,000 people of the 14,000 KLIP beneficiaries in the Kenya Livestock Insurance Program (KLIP) (Tara et al.,2018). This created major impacts on the households, as well as the insurance markets and other markets affected by the large increase in cash transfers. The next section briefly explains how the government intervention through KILP affect the private insurance market in Kenya.

5. The effect of government intervention (KLIP) on Private insurance (IBLI)

5.1 Positive effect of KLIP intervention on IBLI market

KLIP intervention in the market, initially helped to boost awareness of IBLI. While the product offered by KLIP was completely subsidy-based (100%), the model was the same as the IBLI asset protection insurance contract that had just been offered by similar insurance companies. Coinciding with the increase in KLIP awareness, IBLI expanded faster and started to sale a new product in four more counties at the same time KLIP was introduced (Garissa, Mandera, Turkana and Tana River).

Pastoralists who had been buying IBLI coverage most often chose coverage for three tropical livestock units (TLUs), the KLIP program would cover it beneficiaries for five TLUs. However, both are far below the country averages of 17 and 12 TLU of livestock herded and owned (Federica,2016). IBLI is still in the market as a separate product and creates a favorable environment for pastoralists who want to buy more than five TLUs of coverages.

5.2 Unintended effects of the KLIP intervention on IBLI

The way KLIP was subsidizing the product 100% in order to increase understanding and thus uptake of the product was not optimal for the sustainability of index insurance (Federica, 2016). The private insurance companies cannot compete with full subsidies and this suppresses sales of commercial insurance products in the longer term. Private insurance companies who are trying to provide this service in a manner consistent with a profit motive as well as longer term viability,

[11] Weighting the 6 districts by percent pastoralists by estimated 2016 number of households. The numerator is the total recipients and the denominator is the estimated number of pastoralists for each district summed or about 14,000 of 300,000 possible pastoralist families.

were *crowded out* of an already fragile insurance market. However, a Government partial insurance payment (strategic subsidy) for the coverage could help to *crowd in* sales and this would help to build a critical mass of buyers needed to generate sustainable informed demand. Therefore, even charging clients a small proportion of the total cost would be an improvement and could help defray initial start-up intervention costs (Tara et al., 2018) and cause farmers to "opt in" with a financial commitment to the coverage. Receiving the product for free is neither sustainable from a fiscal perspective, nor a clear strategy for developing an insurance market. Beyond free coverage, the lack of awareness also created confusion as to why pastoralists were receiving the funds. In 2017, APA insurance, on behalf of the insurance consortium, disbursed most payments directly to pastoralists' bank accounts or via mobile phones. When payouts were issued some insured individuals, unaware they had insurance, though it is a windfall or a mistake rather than something designed to better enable them to cope with drought. As a result, they hurriedly spend the unexpected windfall before the "mistake" was discovered (Tara et al., 2018). On the other hand, IBLI was designed to allow pastoralist to have the confidence to develop their productive assets prior to a shock occurring, and enhance resilience form their own asset allocation decision-making. KLIP did not allow for any change in risk decision-making because households were not even informed they were covered. Moreover, a good monitoring and evaluation system, designed before the implementation of a new insurance program that tracks the performance of subsidies, is paramount for the success of any subsidized insurance scheme (Federica, 2016).

Currently, the IBLI team are attempting to dissuade the government to stop providing 100 percent insurance coverage (Tara et al., 2018) and the team hoped, a better designed KLIP, could be used to *crowd-in*, rather than displace private insurance companies. They believed it would be possible to do this by giving careful attention to KLIP implementation and ensuring that IBLI coverage would be available for purchase for pastoralists who were not covered for those who wanted more than 5 TLUs of coverage.

In discussions with an ILRI insurance advisor, one of the biggest challenges IBLI is facing is concerning service delivery is the general supporting market environment (Tara et al., 2018). For example, a lack of accessible input markets makes indemnity cash payments ineffective for herders to buy water, forage or vaccines for their livestock. Put another way, asset protection insurance payments, in a drought stressed environment, may mean that pastoralists cannot buy forage and other necessary requirements. This suggests either rapidly increasing prices for the existing services or the inability to spend on needed items and livestock deaths. In the same way, huge cash transfers by KLIP, create increased demand to purchase inputs that cannot be immediately satisfied and create dramatic short-run price increases without additional inputs. Overall, little potential benefit is achieved with most of the additional income simply transferred to the providers of inputs. and exacerbate the existed problems that pastoralist faced.

Given the relatively low coverage provided by the "macro coverage" of KLIP and the commitment from the Government of Kenya to create a sustainable livestock insurance program,

Kenya plans to implement a second phase whereby beneficiaries will be required to contribute ("*opt in*") to the commercial cost of insurance. The government will provide a 50 percent livestock insurance subsidy for up to 10 TLUs per household. For this insurance to be commercially viable, it needs to be taken up by at least 65,000 pastoralist households by 2020 (Mahul & Maher, 2017).

Although a 50 percent insurance coverage can lead to an increased level of uptake, it could have an anchoring effect[12] (Federica, 2016). The recent examples of anchoring are the rapid growth in public spending on subsidized insurance in China, India, and the US which demonstrates that once subsidies are implemented, it is very difficult to remove them (Ruth et al., 2014 and Hazell et al.,2017). Therefore, smart subsidies, that take these factors into account, ensure that they do not become a permanent drain on public assets. Implementors should carefully design the program and indicate how they plan to exit the market Before the plan is implemented. Clear rules should be determined and adhered to, with full awareness to recipients undertaken as an essential component of the project.

5.3 Public and private livestock insurance

Livestock insurance products are already being offered in Kenya by private commercial insurers. Largely in the absence of government support so far, local insurers currently underwrite two kinds of livestock insurance programs in Kenya: The first one is traditional indemnity-based livestock insurance products, under which insurance companies reimburse policyholders for their losses, up to the limiting amount of the policy. These are marketed to medium-size and large commercial dairy farmers. The second one is index insurance offered to pastoralists.
Despite these products already on offer, less than 1 percent of Kenyan pastoralists have livestock insurance cover (World Bank, 2015). Moreover, these producers are mainly located in the ASALs of Kenya and are particularly vulnerable to losing their livelihoods during the severe droughts that affect Kenya every three to five years. The private insurance companies face major challenges in how to reach more potential policyholders, make a profit, and achieve long-term sustainability.

Therefore, a strong partnership between the public sector and the private sector could provide the foundation for a scaled-up and sustainable livestock insurance program in Kenya. Government contributions through a Public and Private Partnership in livestock insurance could solve market inefficiencies (See Box 2 in Appendix 5).

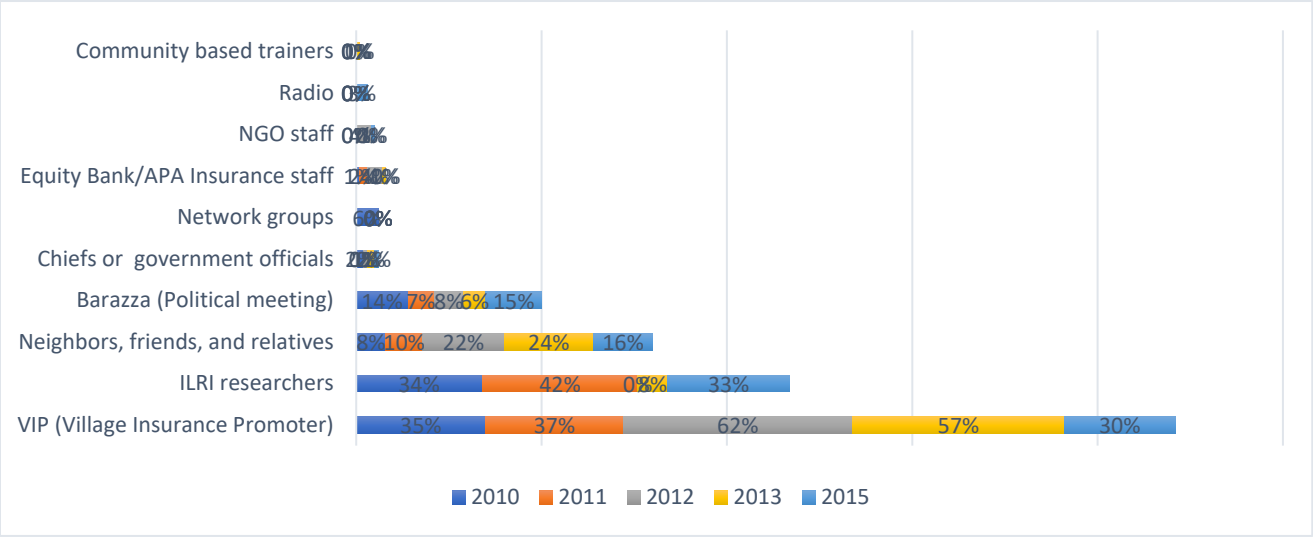
For instance, government could consider supporting:

[12] An anchoring effect suggests that recipients rely too heavily on the first piece of information offered to make subsequent judgments going forward.

- Fully subsidized livestock insurance products, , should not crowd out private provision instead support should catalyze the private sector (i.e. smart subsidies). Specifics are explained in the next section of the review.
- Collection and management of reliable agricultural insurance data, such as weather data, remote-sensing data, and livestock ownership and mortality data. These data are currently not collected, audited, and made available to insurance companies in a systematic manner.
- Offering technical expertise to insurers, such as how to design products and market development.
- Establishment and implementation of an enabling legal and regulatory environment, for example by ensuring that consumers are protected against potential abuse by insurers.
- Promoting effective linkages with complementary public services in target areas.
- Launching public awareness campaigns through extension services.

Data from IBLI Marsabit Sample Surveys Panel Data (2010-2015) from five arid and semi-arid pastoral locations in Marsabit in Figure10 shows that, livestock insurance promotion has been quite traditional and not aggressive in their marketing strategies. The most significant marketing strategy adopted by the agricultural insurance companies has been through village insurance promoters (44%) and through research institutes (24%) (see Appendix3). Awareness about the market through radio stations and community-based trainings is very low (less than 2%). Therefore, awareness campaigns through mass media (e.g. regional radio stations) and community-based training are recommended to expand the product among the pastoralist community.

Figure 10. Main source of information about livestock insurance products



Percent of respondents per year. Source: Computed from IBLI Marsabit Sample Surveys Panel Data (2010-2015)

Meanwhile, private sector insurers provide the necessary expertise to implement large-scale agricultural insurance successfully, since providing insurance is, of course, their core business. International experience shows that agricultural insurance is most effective when private insurers contribute to certain tasks, including:

- Collecting, auditing, and managing data.
- Marketing and distributing insurance products
- Managing claims and handling loss adjustment
- Making decisions concerning risk retention and reinsurance strategies

6. Subsidies for livestock Insurance

High premium prices have been identified as the main constraint faced by livestock farmers when purchasing insurance. That is why product expansion has mainly been driven by subsidies and the support of donors (Federica, 2016). According to Sina (2012), "the cost for index-based insurance is often considered high by low-income farmers as incomes of the vast majority in developing countries are absorbed by basic necessities such as food and housing". Therefore, it is generally recognized that subsidy programs are necessary to get these types of insurance going. There is no doubt that the economic benefits of reducing risk is economically viable and the importance to resilience is critical. Structuring subsidies and actual payments from pastoralists is critical for longer term viability. Price sensitivity is a major component to the effective implementation of IBLI.

Sensitivity to price increases has been explored by several researchers. Cole et al. (2013), show how a 10% decline in the price of insurance increases the probability of purchase by 10.4%. Findings from McIntosh et al. (2013) in Ethiopia shows that demand for the rainfall index insurance offered was very price elastic and highly correlated with the number of discount coupons distributed. Similarly, in Kenya, the reduced price of the insurance, through the provision of discount coupons, significantly increases the uptake of IBLI (Federica, 2016).

The aggregated demand for IBLI is considered to be very price elastic, which is contrary to other findings, with a 55% reduction in demand when the fair premium rate is increased? by 20%, and a further 26% reduction with an additional 20% premium loading (Chantarat et al., 2009), we see that the increase in uptake associated with discount coupons is mostly marginal, in the range of 3-7% (but the amount of the discount coupon was not mentioned).

6.1 Rationale for subsidies

When considering subsidies to support policy objectives, policy-makers or donors should be clear about the specific objective they are trying to reach. There are two broad categories of reasons for providing subsidies to insurance.

- First, subsidies can be used to improve equity of coverage by extending insurance access to previously excluded groups, such as low-income individuals.

- Second, subsidies can be used to correct market failures that may have hindered the development of the insurance sector. Market inefficiencies or high fixed costs may cause underinvestment by insurance companies, and lack of information and awareness among clients may lead to information asymmetries and prevent households from making important purchase decisions (Ruth et al 2014).

In theory, subsidies for insurance can simultaneously address both market inefficiencies and inequitable coverage. For example, subsidies that remove inefficiencies due to externalities[13] that prevent poor people from accessing schemes can increase equity of coverage (Ruth et al., 2014).

6.2 Smart subsidies

"Smart subsidies" are designed and implemented in ways that provide sustainable social benefits while minimizing distortions by crowded in private sector capital and expertise to manage the insurance risk (Ruth et al., 2014). A subsidy should be designed with a clearly stated and well-documented purpose. It should address a market failure or equity concern and should successfully target those in need with minimum inefficiency.

A related concern refers to the willingness of donors (the main suppliers of funds) and governments to continue to financially support subsidies. Should this support end, due to lack of resources or unwillingness to continue, the market would probably collapse. Smart subsidies require a clear knowledge of why subsidies are being provided and their projected effectiveness (Federica, 2016). This helps guide the appropriate design and targeting of subsidies and gives an idea of how long they are needed in order to determine a clear exit strategy.

6.3 Powerful tools for smart subsidy

Know your vulnerable households: One promising method is to link the insurance with existing social protection systems, such as safety net and cash transfer programs, as these already have an infrastructure in place for identifying the poor and vulnerable and delivering assistance. For instance, the HARITA /R4 Risk Resilience initiative in northern Ethiopia has used the Ethiopian Government's safety net program to identify poor households (Hazell et al., 2017). IBLI can use these mechanisms to expand and reach to all counties in ASAL using the information that linked to Hunger Safety Net Program (HSNP) systems.

[13] Externalities are a loss or gain in the welfare of one party resulting from an activity of another party, without there being any compensation for the losing party (Ruth et al 2014).

Know your elasticities (price responsiveness): This is about dealing with sensitivity to premium price and it needs to know how individuals respond to the premium price. The basic tools to hand this will be market assessments and Willingness to Pay (WTP) studies. WTP surveys help to assess, prior to the product being taken to market, how much different parts of the market would be willing to pay for the presented product. Therefore, in order to make the product sustainable on the market, KLIP officials should conduct a survey to know the minimum willingness to pay by pastoralists communities so that it is possibly make the product sustainable on the market.

Crowd in **and encourage competition amongst insurance providers:** Wherever possible, and especially for subsidized insurance provided through government, the subsidy should be used in ways that *crowd in* private insurers and encourage competition among them. It would be possible by giving insurance coverage based on the market price given by the private sector rather than providing free insurance.

Establish an M&E framework: To ensure that the subsidy is achieving its intended purpose, there should be a monitoring and evaluation (M&E) system in place and periodic evaluations to determine whether the program is achieving its designed purposes (Hazell et al., 2017).

Conduct a cost-benefit analysis: It should be shown that either the subsidy leads to a net social gain through a cost-benefit analysis or when the subsidy is being used to achieve broader social and political gains (Hazell et al., 2017).

6.4 Case studies

Table-3 gives a snapshot of the three case studies that helps to exemplify the lessons learned and includes two agricultural and one heath schemes. More specifically, these schemes include HARITA/R4 in Ethiopia, Index-Based Livestock Insurance (IBLI) in Mongolia, and the National Health Insurance Scheme (NHIS) in Ghana.

Table 3. Summary of case studies

Name of scheme and country and source	Description of the program	Type of subsidies used	Targeted at whom
Horn of Africa Risk Transfer for Adaptation (HARITA)/ R4, Ethiopia. (Ruth et al., 2014)	Farmers in the program are able to take out weather-indexed insurance and pay their premiums in cash or through labor in irrigation and forestry projects. Over time, as the poorest farmers become more prosperous, they can "graduate" from the need to pay through labor, and begin paying in cash, helping to ensure the project's commercial viability and long-term success.	Premium subsidies, investment in product development, infrastructure and technology, and training regarding insurance literacy.	Safety-net beneficiaries
Index-Based Livestock Insurance (IBLI), Mongolia. (Ruth et al.2014 and Hazell et al., 2017)	IBLI is based on an index of livestock mortality rates by species, compiled and maintained by the Mongolian National Statistics Office. Herders bear the cost of small losses (less than 6%), while losses of between 6 and 30 per cent are covered through a reserve fund reinsured by the Government, the Livestock Insurance Indemnity Pool (LIIP). Losses exceeding 30 per cent are covered by the Government, which has access to a contingent credit line from the World Bank.	Investment in product development, insurance data, reinsurance	Reinsurance
National Health Insurance Scheme (NHIS), Ghana. (Ruth et al.,2014)	Contributors to the NHIF are grouped according to their level of income. Based on the group a contributor falls in there is a specific premium to be paid that ranges from GHS 7.2 (2.25USD)for the "very poor" to GHS 48 (14.9USD) for the "very rich". Children and old persons are exempt from payment. Hence this selective premium helps the poorest and most vulnerable to have access to health services.	Premium subsidies	Low-income population and at-risk persons

Key lessons on implementation premium subsidies:

The evidence from the three-subsidized agricultural and health insurance schemes provides insights on how best to subsidize to effectively address the rationale at the core of the subsidy.

One of the challenges in targeting subsidies is to widen access to insurance coverage by identifying those who should be targeted for the subsidy and putting in place a good targeting mechanism. An effective strategy, R4 -Ethiopia case and NHIS, identifies and targets low-income groups with clear exit strategies before being implemented. If it is well targeted, subsidized insurance can include the poor and result in behavior change and have a longer-term positive impact.

Another challenge of using index-based insurance is the imperfect correlation between an insured's actual loss (basis risk) experience and the behavior of the underlying index on which the insurance product payout is based. Individuals can suffer losses specific to them but fail to receive a payout because the index does not trigger. On the other hand, lucky individuals may receive indemnity payments that exceed the value of their losses. This problem can be solved by carefully designed the IBLI contracts, like IBLI-Mongolia, for some exceptional case indemnity payments that are based on mortality rates so that it is possible to maximize its value to the insured households.

As in the case of the Ghana National Health Insurance Scheme (NHIS), premiums must be based on targeted population to reduce costs. Otherwise, benefits can go to individuals that do not actually need them or that are not the priority, Furthermore, having actuarially priced premium help better monitor the risk exposure and administrative cost of the schemes.

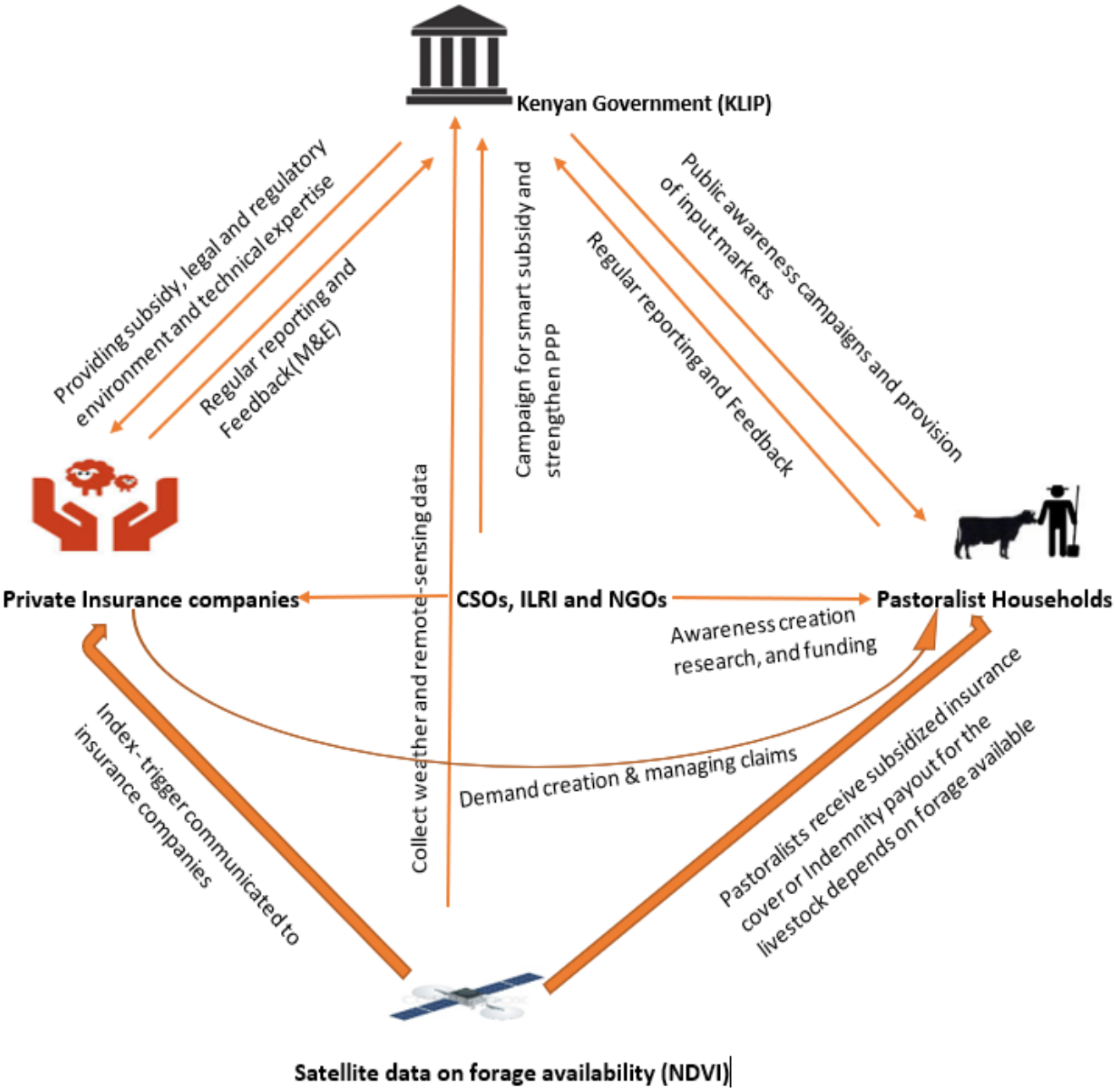
7. Recommendations

The fully subsidized livestock insurance product offered by government, through KLIP, helped to expand its coverage in order to enhance the resilience of pastoralists against climate risk. However, while considering this subsidy, it is important to assure that public support does not *crowd out* private livestock insurance provision. Subsidies should instead be supportive and catalyze the private sector for longer term sustainability. To achieve these objectives, the subsidy needs to be "smart", meaning that it needs to have a clearly stated goal, be well-documented, well targeted, have a clear exit strategy (R4 -Ethiopia case and NHIS) as well as a longer-term financing strategy and a good monitoring and evaluation system. Poorly designed subsidies can undermine efficiency, encourage overspending by seriously drain public expenditures and promote inefficient risk-taking behavior.

On the other hand, private insurance companies through IBLI project has made progress in supporting vulnerable pastoralists. Many of the lessons learned can apply to other settings and other vulnerable counties. Moreover, in order to reduce the low uptake and to provide the product to all vulnerable pastoralist communities in ASAL counties, the privates' insurance providers, government, NGOs and other Civil Society Organizations (CSO) (Figure-11) should involve through:

- **IT usage**: Use of the current technological advancement opportunity in Kenya. For instance, cellular phone ownership across cellular phone ownership Kenya has increased from 20 to 90 percent, and the coverage of the network has improved (Tata et al. 2018). This has made it possible to develop tools for agents, e-learning, in the field and for pastoralists who can learn about insurance in general, coverage triggers and receive payments.
- **Demand Creation**: Creating a need for livestock insurance through sensitization and extension campaigns about the product using a variety of games, videos, cartoons and radio broadcasts, by focusing on pastoralists' vulnerabilities and risk exposure. Publicizing about the product in certain places, a good way to increase awareness and knowledge about the product is by informing the area chief or, where available, the local Livestock Marketing Associations (LMAs).
- **Complementary Services**: Offering insurance as part of a wider package of services, possibly by combining agriculture insurance with agricultural extension services.
- **Available Inputs**: Provision of input markets with sufficient supplies makes cash insurance payments effective for herders to buy water, forage or vaccines for their livestock during drought periods.
- **Expand Insurance Providers**: In addition to individual agents selling to individual pastoralists, stablishing and campaigning sales of the product through aggregators. Aggregators include pastoral cooperatives and other organizations with which large groups of pastoral households are associated.
- **Monitoring and Evaluation**: Advocate for robust M&E programs to assist with the smart subsidy and other policy issues. These programs should be designed and implemented before these programs are begun.

Figure 11. Potential interventions of Civil Society Organizations (CSOs)



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Appendix 1: Risk Perception and Existing Coping Strategies

T*he three problems pastoralists are most concerned with given their household's resources, skills and networks.*

Problem	Primary Concern	2nd Concern	3rd Concern
Livestock loss due to drought/floods	81% (169)	8% (17)	7% (15)
Livestock loss due to disease	11% (23)	37% (77)	13% (27)
Milk production loss due to drought/floods	2% (5)	24% (50)	27% (57)
Low market access and low price of livestock	2% (4)	13% (28)	18% (38)
Livestock loss due to conflict/raiding, insecurity or violence	2% (3)	11% (23)	23% (49)
High food price	0% (1)	2% (5)	5% (10)
Others	2% (4)	4% (9)	6% (13)

N=209 Respondents, Source: Research results from IBLI Marsabit baseline sample surveys (Chantarat et al. 2009)

When faced with major livestock losses, rank the three most important strategies that your household used to cope with these losses?

Coping strategies	**Primary Concern**	**2nd Concern**	**3rd Concern**
Utilize assets and/or savings	44% (91)	23% (48)	11% (22)
Reduce household consumption	30% (62)	11% (23)	7% (15)
Obtaining credit	21% (44)	40% (83)	22% (46)
Seeking alternative livelihood	3% (6)	22% (45)	6% (12)
Assistance from outside sources	3% (6)	5% (10)	55% (114)

N=209 Respondents, Source: Research results from IBLI Marsabit baseline sample surveys (Chantarat et .al 2009)

Please provide the two most important actions you take to prepare your household with the expectation of catastrophic herd loss.

Rik management strategies	**Primary Concern**	**2nd Concern**
Save more money	47% (99)	14% (30)
Increase grain stocking	11% (23)	11% (23)
Expand herd size	4% (8)	6% (12)
Decrease herd size (through loaning and sales)	34% (71)	44% (92)
Purchase more supplemental feeds/veterinary inputs	0% (1)	15% (32)

Allocate some household members/investments to other ag	3% (6)	9% (18)
Others	0% (1)	1% (2)

N=209 Respondents, Source: Research results from IBLI Marsabit baseline sample surveys (Chantarat et .al 2009)

Appendix 2: Reasons why no household member purchased livestock insurance

What is the most important reason why no household member purchased livestock insurance?

Reason (Yes=1 or 0 otherwise) (% of Respondents)	2010	2011	2012	2013	2015	Average Total (In all years)
Not enough money to spend on insurance	31%	29%	33%	34%	29%	31%
Do not understand insurance well enough	25%	21%	23%	24%	33%	25%
Not enough animals	24%	15%	15%	17%	16%	17%
Did not have an opportunity to buy it	10%	9%	3%	2%	3%	5%
Waiting to see what happens to other people	4%	8%	1%	3%	5%	4%
Do not trust any insurance companies	2%	7%	13%	9%	4%	7%
Don't think insurance will help me	1%	2%	2%	5%	7%	3%
Afraid of uncertainty in insurance	0%	6%	6%	5%	2%	4%
Can rely on family and friends	1%	0%	0%	0%	0%	0%
Discouraged by someone in the community	0%	1%	0%	0%	1%	1%
Other	1%	2%	2%	1%	1%	1%

Source: Calculated from IBLI Marsabit Sample Surveys (2010-2015)

Appendix 3: Source of information about livestock insurance products

From what source(s) did you hear about the livestock insurance product?

Source of information (Yes=1 or 0 otherwise) (% of Respondents)	2010	2011	2012	2013	2015	Total (In all years)
From VIP (Village Insurance Promoter)	35%	37%	62%	57%	30%	44%
ILRI researchers	34%	42%	0%	8%	33%	24%
From neighbors, friends, and relatives	8%	10%	22%	24%	16%	16%
Barazza (Political meeting)	14%	7%	8%	6%	15%	10%
From chiefs or other government officials	2%	0%	1%	2%	1%	1%
From network groups	6%	0%	0%	0%	0%	1%
From Equity Bank / APA Insurance staff	1%	2%	4%	1%	0%	1%
From an NGO staff	0%	0%	4%	0%	1%	1%
On the radio	0%	0%	0%	0%	3%	1%
Community based trainers	0%	0%	0%	1%	0%	0%

Source: Calculated from IBLI Marsabit Sample Surveys Panel Data (2010-2015)

Appendix 4: Normalized Difference Vegetation Index (NDVI)

The Normalized Difference Vegetation Index (NDVI) gives a measure of the vegetative cover on the land surface over wide areas. Dense vegetation shows up very strongly in the imagery, and areas with little or no vegetation are also clearly identified. Vegetation differs from other land surfaces because it tends to absorb strongly the red wavelengths of sunlight and reflect the near-infrared wavelengths. Satellites measure the intensity of the reflection from the Earth's surface in both these wavelength ranges. The Normalized Difference Vegetation Index (NDVI) is a measure of the difference in reflectance between these wavelength ranges. NDVI takes values between -1 and 1, with values above 0.5 indicating dense vegetation and values <0 indicating no vegetation. The following Moderate Resolution Imaging Spectroradiometer (MODIS) composite image shows how, for example, drought conditions are determined. By comparing current NDVI values with the long-term average for the region at a particular time of year, scientists can determine the condition of vegetation in a region.

Source: ACCI, 2013

Appendix 5: How Government Supports Livestock Insurance in Mongolia

Box 2— How Government Supports Livestock Insurance in Mongolia

Since 2005, the World Bank has supported the Government of Mongolia in setting up a public-private partnership with domestic insurance companies to offer affordable and cost-effective insurance coverage to herders. Today, 16 percent of the approximately 1 million herders in the country are insured under the Index-Based Livestock Insurance Program (IBLIP).
While the Government of Mongolia significantly subsidizes the national program, the subsidization does not take the form of direct premium subsidies. Instead:

1. The Government pays for the collection of all data used in the livestock insurance scheme and provides audited data to accredited insurance companies in a timely manner.

2. The Government also provides a "social layer" of reinsurance to all farmers at no additional cost. While farmers purchase insurance priced commercially against relatively frequent shocks, the social layer protects against infrequent catastrophic losses when the insurance is exhausted. In other words, the Government guarantees payouts in extreme natural disaster situations, allowing insurance companies to offer affordable premiums to policyholders. Additionally, thanks to this publicly funded extra layer of insurance, policyholders possess additional coverage beyond that of the insurance they purchase.

3. Finally, government extension workers provide education to herders about livestock insurance and its potential use as part of a holistic approach to herd risk management.