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# Building financial resilience in pastoral communities in Africa

## LESSONS LEARNED FROM IMPLEMENTING THE KENYA LIVESTOCK INSURANCE PROGRAM (KLIP)

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# Contents

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# 1 Introduction

The livestock sector generates a large portion of national economies in African drylands 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.

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). This has, in turn, severe consequences on the efficacy of countries' and international donors' efforts to improve welfare and develop the economies in pastoral regions. In spite of these challenges, donors' and governments' response to crises often arrives very late, on average six months after the drought has set in (Clarke and Dercon 2016). The delayed response and access to support lead to loss of livelihoods and sometimes lives, weakening recovery from the crisis even after the conditions have improved. Furthermore, the governments' ex post response to shocks is costly because it results in budget reallocations that might affect basic government functions (Clarke and Dercon 2016). The increased impacts of natural disasters due to climate and environmental changes call for adoption of new and innovative ways of funding disasters. Crisis risk financing (CRF) instruments, defined as financing mechanisms that target a reduction of adverse socioeconomic or ecological impacts of potential crises (Poole et al. 2020), offer this opportunity. CRF programs can support a proactive and timely response to drought for clients and beneficiaries and help governments make drought response plannable and more cost-efficient.

Among the different CRF instruments, index-based risk transfer products, such as index insurance, have gained considerable traction over the last two decades for initiatives targeting the impacts of drought shocks on African smallholder farming and pastoral systems. Insurance is a financial protection tool that can be used to address relatively low frequency but high impact shocks. Unlike conventional insurance, which is based on a claim verification process of the losses, index insurance uses payout triggering mechanisms that rely on transparent and objectively measured indicators of drought (that is, the index). Payouts are made to all policyholders when predetermined index thresholds are met, which are normally derived from historic realizations of the index values. This mitigates some of the key issues that make conventional insurance unlikely to work in African rural settings, such as the lack of historic 'loss data' required for assessing risk and profiling clients; the high implementation costs in remote and sparsely populated areas (that is, for verification, data collection, monitoring); and problems related to asymmetric information (for example, adverse selection and moral hazard).

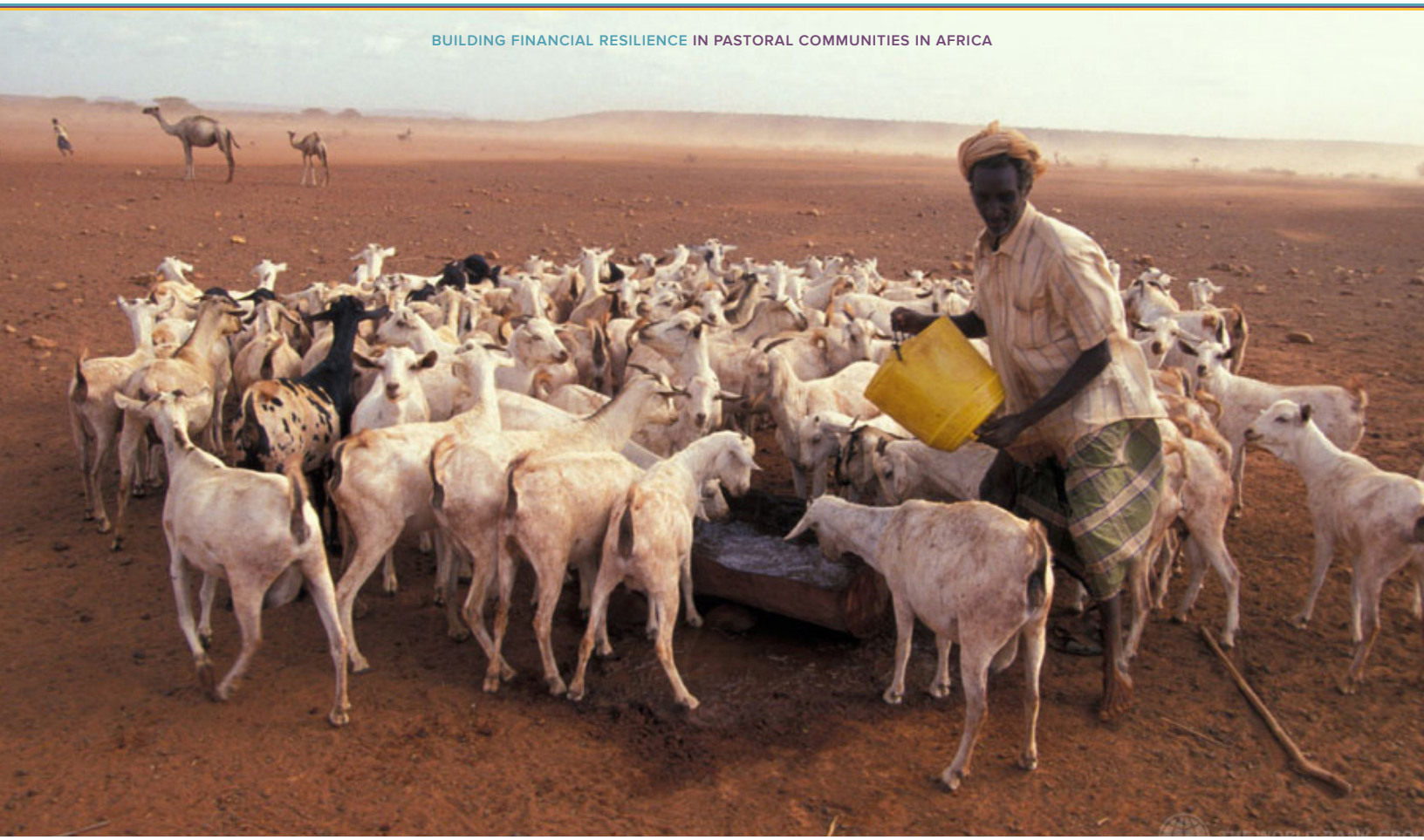
To address the challenge of extending formal insurance to extensive pastoral systems, several international organizations, local institutions, and private partners have, since 2008, implemented an ambitious research-for-development agenda that resulted in the design of a set of innovative drought index insurance solutions that could cushion pastoralists against the impacts of drought, named Index-Based Livestock Insurance (IBLI) program.

IBLI solutions are based on an index of the relative seasonal forage availability in a given area, which is derived from indicators of vegetation conditions collected by satellites (Vrieling et al. 2014). 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). Thus, the sum insured is based on the estimated cost of feeding and keeping the animals alive during the drought.

The early trigger/early action approach pioneered in the IBLI 'asset protection' product design is, in principle, particularly valuable for pastoralists (Jensen et al. 2019). More generally, this anticipatory approach is at the forefront of an emerging paradigm in disaster risk financing, highlighting the value of preemptive responses to anticipated shocks. A recent study in Kenya, for example, found that for every dollar invested in early response and resilience measures, US$2.8 are saved in later humanitarian response interventions (USAID 2018). While there is no question that the humanitarian responses will continue to play a major role in supporting ex post disaster relief, the complementary use of anticipatory financial instruments can make a relevant contribution to protecting the livelihoods of affected households during drought crises. For example, livestock deaths due to forage scarcity can be minimized, such that every dollar spent on purchasing insurance can protect US$25[1] worth of livestock assets.

IBLI provision started as a fully commercial initiative with private insurance companies retailing it as microinsurance product in northern Kenya and southern Ethiopia since 2010. However, the huge losses and damage that occurred during the 2008–2011 droughts, estimated at US$12 billion (70 percent from the livestock sector), acted as a trigger for the government of Kenya (GoK) to review its strategic planning on ending drought emergencies. As a result, in 2013 the GoK recognized agricultural insurance as an important tool for protecting

1 This is calculated by assuming a premium rate of 20 percent (approximately the rate applied in 2019-2020) and cost of one mature cow (TLU) expected at US$500.



farmers and herders against production crises during drought. The Ministry of Agriculture, Livestock and Fisheries (MALF) allocated funding under the Second Medium-Term Plan Two, 2013–2017, for (a) the implementation of a National Livestock Insurance Scheme (NLIS) and (b) increasing producers' access to credit and financial services including agricultural insurance. These efforts culminated in the design and launch of a public-private arrangement (PPA), called Kenyan Livestock Insurance Program (KLIP), offering subsidized IBLI coverage to selected beneficiaries.

KLIP started purchasing insurance coverage on behalf of 5,000 vulnerable households from two counties (Turkana and Wajir) in October 2015. Each household received fully subsidized coverage for five tropical livestock units (TLUs).[2] KLIP rapidly scaled up to eight counties in the arid and semi-arid lands (ASALs) and to about 18,000 pastoralists annually. In the first five years of KLIP implementation, over US$10 million was paid out to vulnerable pastoralists to protect their livestock and livelihoods from severe drought events.

Recognizing the benefits of the subsidized coverage, but also its limitation for long-term financial sustainability of the scheme, GoK has considered a voluntary component with partial subsidy. The partial subsidy is expected to be accessible by all pastoralists, but it is capped at 10 TLUs and 50 percent of the commercial premium. The GoK's proposition to offer universal access to partial subsidy rather than to select a subset of beneficiaries was informed by the high cost of targeting and a relatively low inclusion error of universal coverage because poverty rates in the region are high.

This paper aims at summarizing the main components of KLIP and at discussing the lessons learned during implementation. It targets policy makers, technical experts, practitioners, and researchers interested in designing and supporting the design and implementation of similar programs. Section 2 describes the KLIP product design, Section 3 presents the KLIP operational implementation, Section 4 reports observed impacts, while Section 5 summarizes and critically discusses the key lessons learned.

2 Five TLUs were considered the least viable herd threshold size that if lost from drought shock could lead to irreversible livelihood damage, hence the choice of the government to provide 100 percent subsidy for five TLUs to cushion vulnerable households. A TLU is a standardized measure for livestock, where 1 cattle = 1 TLU, 1 goats or sheep = 0.1 TLU, 1 camel = 1.4 TLU.

# 2 KLIP product design

Index insurance products offered under KLIP relies on a low-cost, accessible, and well-established satellite indicator of drought (that is, Normalized Difference Vegetation Index - NDVI) (Annex 1), which is a proxy for vegetation condition. High NDVI values indicate healthier vegetation and vice versa. NDVI values from coarse spatial resolution satellites (250 m and coarser) are generally used because (a) time series are available to describe long-term variability in forage conditions, (b) their daily acquisition frequency allows for more cloud-free observations to describe vegetation changes throughout the season, and (c) documented evidence exist for a strong relationship between rangeland biomass and NDVI for arid and semi-arid rangelands (for example, Dingaan and Tsubo 2019; Schucknecht et al. 2017).

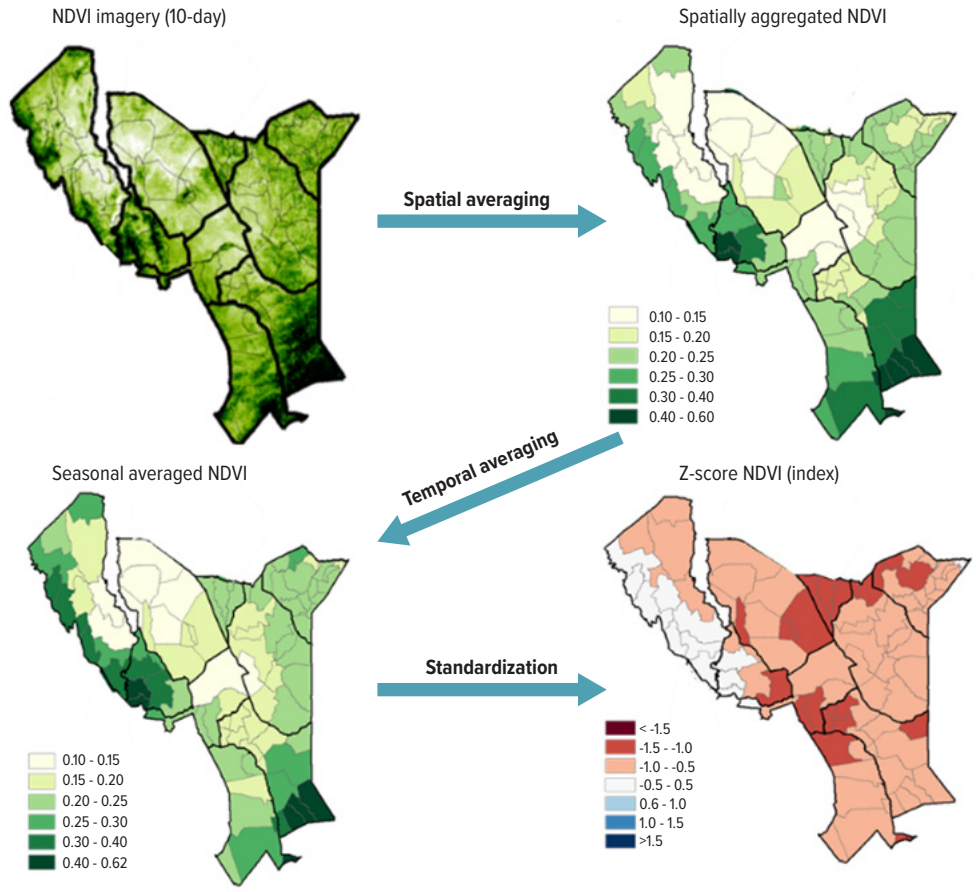
NDVI time series are elaborated to obtain an area-aggregated index of relative seasonal forage availability (Figure 1 and Annex 2). The unit areas of insurance (UAIs) are determined by combining local knowledge from pastoral communities about their grazing and migratory patterns, agro-ecological maps, and administrative borders (Chelanga et al. 2017). When the index falls below a predefined threshold, a payout is triggered and increases proportionally to the severity of estimated forage scarcity. This payout approach is based on the assumption that forage scarcity is an indicator of the early stages of drought progression toward more severe impacts (that is, livestock losses and food insecurity). Pastoralists could then use insurance payouts to make production decisions that mitigate the upcoming impacts, for example, by protecting their herds to prevent high mortality or emergency sales.

KLIP is currently operating in arid and semi-arid counties of Kenya characterized by bimodal rainfall distribution and provides an annual insurance cover for the two risk periods, the short rains short dry (SRSD) season, from October to February, and the long rains long dry (LRLD) season, from March to September. During the two risk periods, potential payouts can be triggered at the end of the wet months based on temporally averaged NDVI values (Figure 2).

The State Department of Livestock (SDL) under the MALF provided guidance on the critical parameters for the KLIP insurance policy, such as the sum insured per TLU, the attachment index thresholds, and the exit index thresholds. These parameters provide the basis for product pricing and are a result of negotiation between the underwriter and the GoK, which needs to consider the trade-off between frequency of payouts, magnitude of payouts, and premium rates. The SDL chose an attachment threshold correspondent to one expected payout out of five seasons, a fixed exit threshold (that is, currently, -1.61), and a minimum payout every 5 percent (Annex 2). In terms of sum insured, the SDL calculated the cost of feeding 1 TLU to maintain it alive during a major drought, correspondent to US$140 per year. The annual KLIP policy allocates 42 percent and 58 percent of the sum insured to the two potential payouts (Figure 2), respectively. The premium rate is determined by the underwriting company(s) in consultation with their reinsurers.

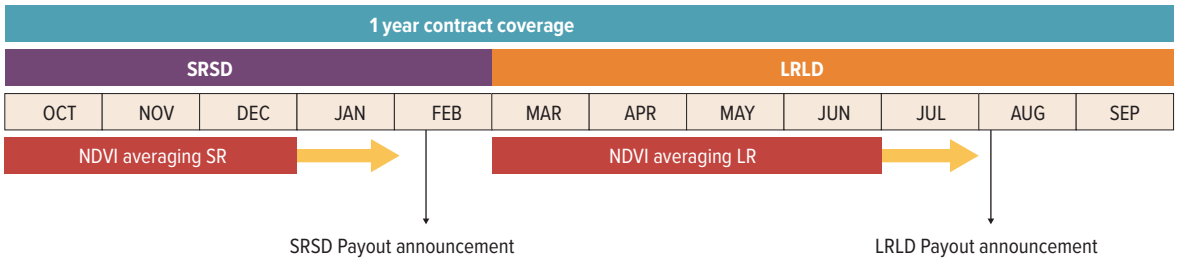
The current KLIP product design resulted from a continuous process of refinements since the launch of the IBLI program in response to the feedback from stakeholders and to the evolution of satellite technologies (Chantarat

**Figure 1: KLIP index calculation steps**




*Source: Vrieling et al. 2016, with Authors' modifications.*

**Figure 2: KLIP contract cover period, index calculation period, and time of payouts**




Source: Authors' elaboration

et al. 2013; Vrieling et al. 2014; Vrieling et al. 2016; Fava and Vrieling 2021), taking into close consideration the importance of keeping the product simple, accessible, and transparent. KLIP is now planning to expand the coverage from the current eight arid counties to additional six semi-arid counties. A feasibility study (Kahiu and Fava 2018) emphasized that for some counties this would require a refinement of the product design because of differences in seasonality and heterogeneity in land uses (including cropping). In this perspective, alternative approaches have also been proposed (De Oto et al. 2019). Similarly, under circumstances of climatic changes, the product requires periodic revisions to account for possible increasing frequency of extremes or climatic trends (for example, shift in seasonality, and rainfall increase/decrease).

In terms of basis risk, there is a large body of scientific literature supporting a high correlation between NDVI anomalies and biomass in African drylands (for example, Diouf et al. 2015; Garba et al. 2017; Mahyou et al. 2018; Schucknecht et al. 2017; Tian et al. 2016). However, the lack of time series of ground observations of rangeland biomass in Kenya has prevented undertaking of a rigorous assessment of the KLIP index accuracy in detecting drought-related forage scarcity. However, the index has been shown to be relatively well correlated with livestock mortality observations (Jensen et al. 2019).

# 3 KLIP implementation

KLIP is implemented under a PPA where the public sector supports an enabling environment (that is, regulations and infrastructure), provides subsidies, and creates necessary awareness about the product, while the private sector prices the product, provides underwriting services, and manages payouts when triggered. The successful launch of KLIP involved close collaboration between private and public sector actors with clear roles and responsibilities for key stakeholders. To facilitate implementation, the SDL set up a Program Management Unit (PMU) that coordinated the design and implementation of KLIP. The private sector formed a technical committee that drew membership from interested private insurers, with reinsurers actively involved for structured interaction with the SDL. Private sector engagement from the design stage and during implementation ensured that the roles between the private and public sectors were well articulated, facilitating the launch of the scheme.

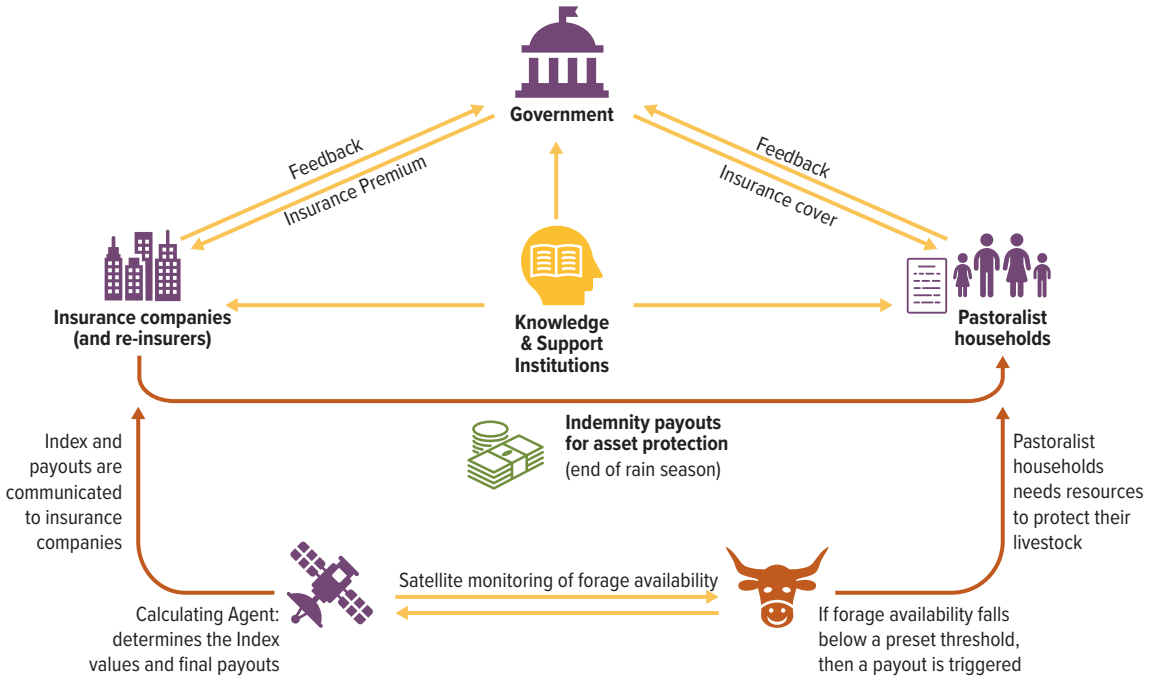
Figure 3 provides a graphic picture of institutional interaction that has taken place during KLIP implementation, while in Annex 3 a detailed description of the roles of the public and private sector actors is provided. The GoK, working closely with other institutions and organizations involved in natural crises response, developed beneficiary criteria to identify those who should benefit from subsidized insurance cover. The SDL, in close collaboration with county governments, administrative officials, and local communities, then used that criteria to select the vulnerable households that could benefit from free cover. The number of beneficiaries for each UAI is pre-determined and forms important input to calculating total paid premium. The roster of beneficiaries is shared with the insurance company providing underwriting services to KLIP. The roster includes relevant client data such as the name of the beneficiary, identity number, mobile phone and/or bank account numbers, and next of kin. The GoK also coordinates awareness creation campaigns and broad communication efforts for pastoral communities (Figure 3 upper half).

A calculating agent determines index performance and percentage payouts for each risk period, following the approach described in Section 2 (Annexes 1 and 2) and the parameters indicated by the policy. The calculating agent is required to provide accurate, timely, transparent, and independent information to all the interested stakeholders. The calculating agent also manages and maintains the data set used for loss adjustment, documents the data processing chain for full replicability, provides in-season updates and maintains a backup dataset (Figure 3 lower half).

The index values and payout amounts are shared with stakeholders and officially announced at the predefined dates (Figure 2). The contracted insurance company(s) makes payouts directly to the beneficiaries as per the list provided by SDL, using either mobile money or bank transfers. Bank checks have been used to pay those who lack mobile or bank accounts with the bankers' checks distributed using county and provincial administration infrastructures.

At the initial stages of KLIP, both the registration and payout processes were mostly done manually, causing significant delays and mistakes in the payments. The utilization of existing financial service

**Figure 3: Schematic of KLIP main stakeholders (upper) and working mechanisms (bottom)**




Source: courtesy of D.C. Khalai, with Authors' modifications.

infrastructure (that is, M-Pesa, agent banking) for payments of premiums and payouts, mobile-based applications for sales and clients' registration, and a blended face-to-face and mobile-learning approach for insurance agents have helped increase efficiency across the program. In addition, monthly updates about the progress of the season are currently provided to inform the government and the underwriter about the probability of payouts, so that they can start planning accordingly.

Knowledge institutions have played an important role in (a) providing technical and policy guidance to the GoK, (b) supporting the private sector and its agency networks to implement effective sales and distribution channels for voluntary market, and (c) conducting actionable research and impact studies to inform product/process improvement. Support has also been offered by developing and delivering training to extension officers and agents who have in turn created awareness among the pastoral communities.

# 4 KLIP performance and impacts

KLIP impacts can be summarized at the macro level, including markets and private sector support and financial protection of the government budgets, and micro level, related to the livelihood and welfare of vulnerable pastoralists. Figure 4 provides an overview of KLIPs impacts, which are discussed more in detail in the next subsections. Overall, evidence suggests significant benefits from KLIP both in terms of establishing a positive feedback loop of mutual benefits (that is, a win-win) between the public and private sector, a key element for long-term sustainability, and in terms of delivering positive outcomes for the welfare and livelihoods of pastoralists during crisis and noncrisis periods. However, there is still a great need for better understanding of the short- and long-term impacts of KLIP on individual, community, and environmental outcomes. Moving forward, investments in a broader and more robust monitoring and evaluation infrastructure and a rigorous impact assessment study should remain a key priority to fully understand the value of initiative for resilience building of pastoral communities.

## Macro-level impacts on markets and private and public sectors

IBLI products were adopted by private insurance companies in Kenya and Ethiopia and have been sold as a microinsurance retail product to pastoralists in the drylands of northern Kenya and southern Ethiopia since 2010 (Figure 4). The initial launch and associated commercialization and outreach were met with slow but steady demand for the product. In response to these challenges, the product has evolved and adapted over time, thus supporting a sustained demand for the product which is still commercially sold in Kenya and Ethiopia and increasingly adopted (that is, about 7,000 policies sold commercially in 2018) (Figures 5 and 6). The retail pilot has been instrumental in incubating the innovation in the Kenyan and Ethiopian context and in supporting the improvement of the product over time. However, the level of uptake and profitability for the private sector remained a major challenge (Jensen et al. 2018, Zewdie et al. 2020).

At its launch in 2015, KLIP initially provided fully subsidized coverage to 5,000 pastoral households from Turkana and Wajir counties. The program rapidly expanded and, since 2017, 18,000 pastoral households have been covered, representing over 80,000 beneficiaries, across eight counties of northern Kenya (Turkana, Wajir, Marsabit, Mandera, Garissa, Tana River, Samburu, and Isiolo) (Figure 6).

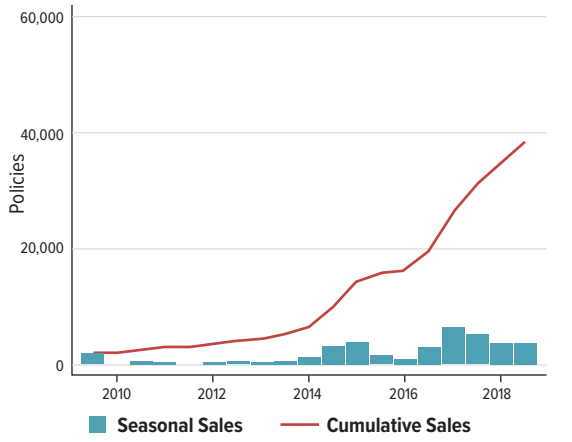
Since the program's inception, the local insurance sector in Kenya has largely benefited from the rapid expansion of KLIP not only because of the substantial increase of the premium volume but also in terms of the support received for increasing technical and operational capacity to implement agricultural insurance

**Figure 4: Overview of KLIP benefits and impacts**

| | | | | |
|---|---|---|---|---|
| 1 Protec gov. budget | | Risk transferred to the private sector | • Premium payment reduces public financial burden in case of drought<br>• Predictable and budgeted expenditures allow better resource allocation and harmonization with complementary initiatives | US$10 million payouts since inception made by the private sector |
| 2 Expand markets | | Public investment on subsidies and infrastructure | • Public sector premiums guarantee regular profit<br>• Investment in infrastructure facilities and crowds-in additional services<br>• More awareness on the product increases the potential for retail sales | IBLI coverage expanded from 3 to 8 counties<br>Number of IBLI policies increased from 4k to over 20k |
| 3 Protect vulnerable | Good Seasons | Reduced drought risk | Intensification: Increased investments in higher-returns production strategies<br>• Strategic livestock sales when prices are high<br>• Increased investments in veterinary services<br>• Reduced precautionary savings | Greater income |
| | Drought Seasons | Reduced income loss during drought | Less reliance on detrimental coping strategies during drought<br>• Less distress selling of productive assets<br>• Less "skipping" meals during drought<br>• Maintained investments in human capital | Improved post-drought economic and welfare outcomes |
| | | Payments in anticipation of drought | Early action to mitigate the impact of drought<br>• Destocking in anticipation of price and resource shocks<br>• Early purchase of inputs to sustain remaining herd during the coming drought | |

Source: Authors' elaboration

**Figure 5: IBLI commercial sales from 2010 to 2019 including Kenya and Ethiopia**




Source: Authors' calculation

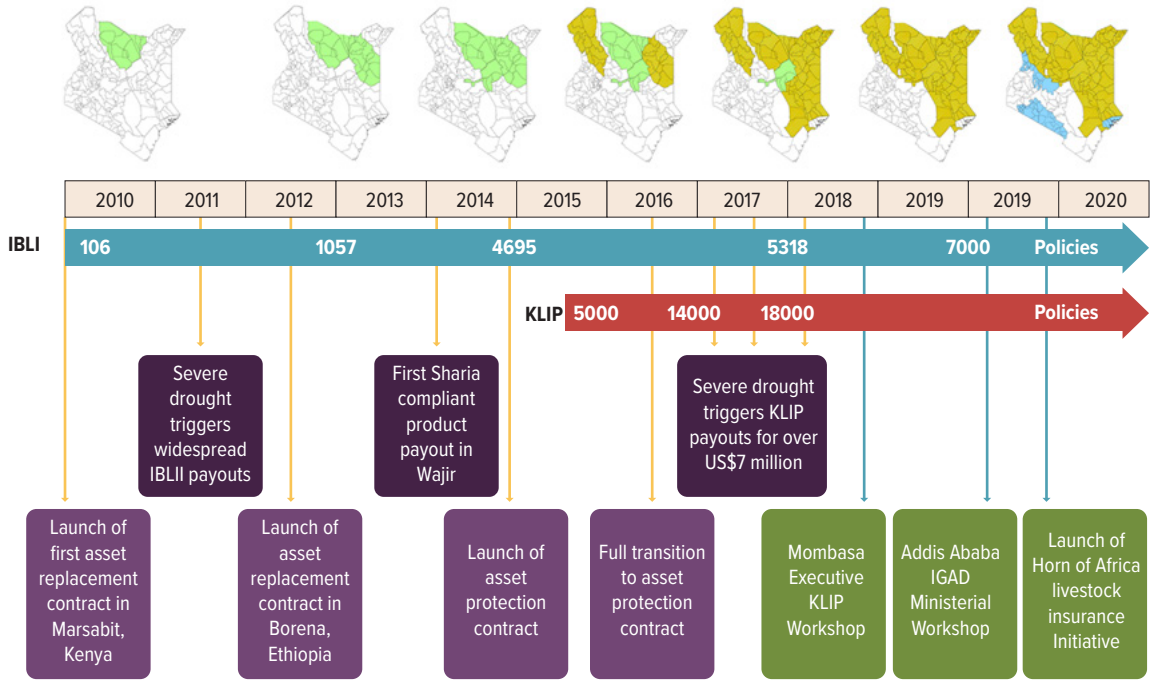
solutions. In addition, the deeper penetration of agent networks in pastoral areas and the need of establishing partnerships with telecom companies for digital financial services delivery have also stimulated new business opportunities.

All 18,000 beneficiaries have received at least one payout since KLIP was launched. The distribution of KLIP beneficiaries and payouts is shown in Figure 7. Some beneficiaries have received cumulative payouts amounting to over US$1,500, for example, in Tana River (Figure 7, right), a relatively high amount for Kenyan pastoral economy. The seasonal per capita payout maps for all KLIP UAIs since the launch of the program are provided in Annex 4.

In terms of premiums, government expenditure reached US$2.4 million per year in 2017–2018 (Table 1) and it is still approximately the same as of 2020. The GoK has also invested growing resources for capacity building, awareness creation, and monitoring activities (up to 15 percent of the total budget) and has committed to further increase the budget allocation for the next three years to support geographic expansion to 14 counties and to increase the number of beneficiaries to 100,000 households.

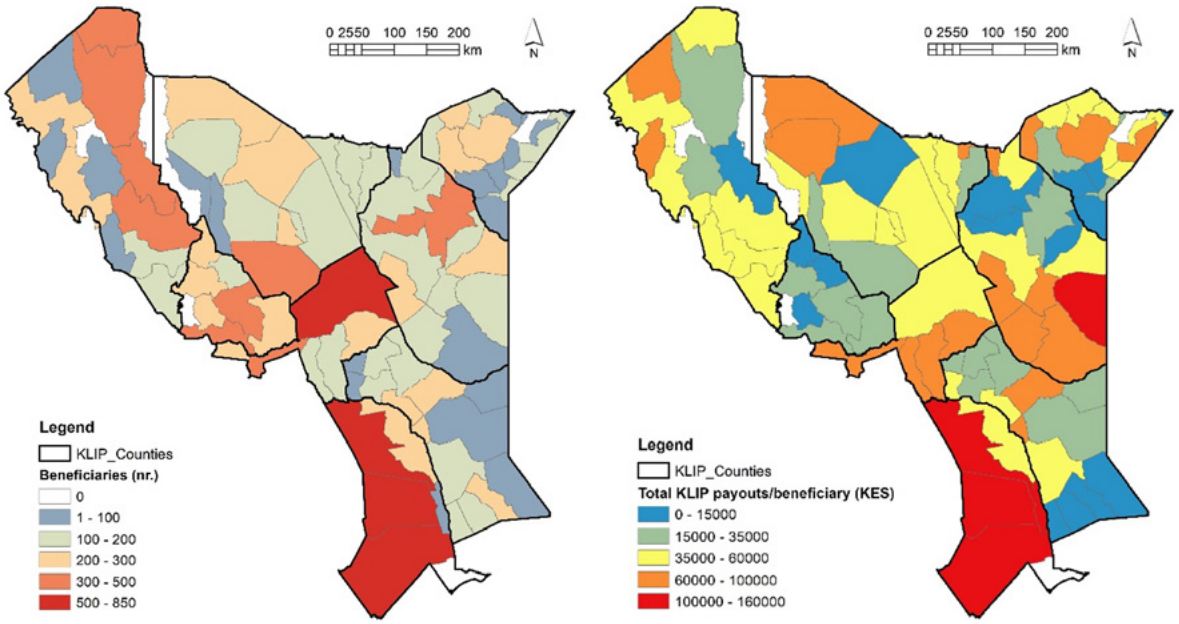
As of end of LRLD 2020 season, the GoK has paid about US$9.5 million in premiums and a total of about US$10 million in payouts have been made to KLIP beneficiaries. Payouts were triggered in at least one index unit during six of ten seasons (Table 1 and Annex 4). The severe drought occurring in 2016–2017 (Uhe et al. 2018) led to three consecutive widespread seasonal payouts for a total of over US$7 million. In 2016–2017, this led to a major loss for insurance companies, followed by

**Figure 6: Schematic of IBLI evolution in Kenya from the launch of the first policy in 2010**




*Note:* The map illustrates expansion of coverage with IBLI (green), IBLI and KLIP combined (yellow), and planned KLIP expansion (light blue) in Kenya.
Source: Authors' elaboration

**Figure 7: (a) Map of KLIP beneficiaries per UAI and (b) map of the total per capita payouts for all KLIP UAIs from the launch of the program in 2015 to the LRLD season 2020**




*Note:* KLIP started in different counties/UAIs in different years (see Figure 5). This is also reflected in the total payouts received by beneficiaries.
Source: Authors' elaboration

another significant payout in 2019 (Table 1). However, while the substantial payouts made have raised concerns about the financial sustainability of the program, particularly from the private sector, these outcomes have been well received by the GoK and insured beneficiaries. The payout has proven the reliability of the product, demonstrating the ability to make payouts to pastoralists during severe and protracted drought crises. Similarly, it has increased the confidence of the GoK to continue supporting and expand the program, showing that it is possible to use private sector capital to manage risk and reduce pressure to use public funds, thus giving the government fiscal space to continue to implement high-yielding development projects

**Table 1: Summary of KLIP premiums, seasonal payouts, loss ratios, insured households, and TLUs**

| Year | Season | No. of counties | No. of households | No. of TLUs | Total sum Insured | Premium[a] | Payouts[a] | Loss ratio (%) |
|---|---|---|---|---|---|---|---|---|
| 2015–16 | Short rains | 2 | 5,000 | 25,000 | 5.59 | 0.56 | | 6.24 |
| | Long rains | 2 | 5,000 | 25,000 | | | 0.035 | |
| 2016–17 | Short rains | 6 | 14,010 | 70,050 | 8.92 | 1.64 | 2.150 | 320.95 |
| | Long rains | 6 | 13,776 | 68,880 | | | 3.130 | |
| 2017–18 | Short rains | 8 | 18,012 | 90,060 | 12.61 | 2.46 | 1.750 | 71.02 |
| | Long rains | 8 | 18,012 | 90,060 | | | | |
| 2018–19 | Short rains | 8 | 18',012 | 90,060 | 12.61 | 2.41 | 0.880 | 160.75 |
| | Long rains | 8 | 18,012 | 90,060 | | | 2.990 | |
| 2019–20 | Short rains | 8 | 18,012 | 90,060 | 12.61 | 2.41 | 0.000 | 0.00 |
| | Long rains | 8 | 18,012 | 90,060 | | | 0.000 | |
| Total | | | | | 52.34 | 9.5 | 10.940 | 115.25 |

*Note:* a. US$, million.

which can be otherwise compromised in the event of severe drought shocks. To address the private sector's concerns, the exit threshold was modified through a joint agreement by KLIP stakeholders, as part of a more comprehensive actuarial review of the KLIP product that is currently ongoing.

## Impacts on vulnerable pastoralists

While impacts for vulnerable pastoralists are well documented under the IBLI program and can be broadly expected to be valid also for KLIP, no dedicated effort for continuous monitoring and impact assessment at the household level has been put in place for KLIP. As such, only few circumstantial studies are available specifically for KLIP, leaving an important gap in our understanding of the program's impacts. Notwithstanding this premise, some important considerations can be made that could also inform a future, more comprehensive agenda.

Robust multi-year impact evaluation surveys on the IBLI program in Kenya and Ethiopia have evidenced considerable social and welfare benefits for pastoralists who have insured their livestock (Figure 4: box 3 - protect vulnerable). During good years, insured households respond to their insurance coverage by increasing investments in livestock veterinary and vaccination services, selling more livestock, and reducing their herd size (Jensen et al. 2017; Matsuda et al. 2019). These changes to production strategies result in positive impacts on indicators of well-being in good and drought seasons, including increased household income per adult equivalent and reduced reliance on costly ex ante risk reducing strategies, such as distress selling of livestock or skipping meals (Janzen and Carter 2019; Jensen et al. 2017; Matsuda et al. 2019). It should be noted that the reported evidence is related to the impacts of insurance on households that choose to purchase insurance, whereas KLIP targets a particular group and transfers insurance to them. However, they should be broadly generalizable as long as the KLIP clients were equally informed on the details of their coverage.

A study using data from a survey of over 1,000 KLIP beneficiaries in Marsabit and Isiolo after the 2016–2017 drought examined how KLIP beneficiaries changed their coping strategies in anticipation of the coming of payments and then how they spent those funds once they were received. Nearly all respondents reported using some of the payouts for human food, but most also used payouts to buy forage/fodder, water, and veterinary services for their livestock (Taye et al. 2019). Such a pattern of expenditures provides strong evidence that many households do have access to these livestock input markets, which are critical to protecting livestock during drought, and can use KLIP payouts to this end.

Similar results were found by an independent impact study led by German Agency for International Cooperation (*Deutsche Gesellschaft fur Internationale Zusammenarbeit*, GIZ) (CED 2018). Self-reported satisfaction with the program was high and many beneficiaries reported using the payouts at least partly for expenses on their livestock (maintenance, restocking, and production equipment) and for household needs. In addition, there is qualitative evidence of positive spillovers, such as sharing payouts with neighbors. Despite the short lifetime of the program, KLIP households experience slightly lower levels of food insecurity and higher level of general insurance awareness.

# 5 Lessons learned and way forward

The first five years of implementation of KLIP have generated a huge amount of information on how to scale up a drought risk financing solution from the pilot stage to a national program. This is gaining considerable attention from other African countries, who are expressing interest toward implementing similar solutions. The following sections summarize key lessons learned.

## Design of a PPA model

The PPA model developed under KLIP, while still needing refinements, is one of the key innovations of the program. A PPA approach was preferred for KLIP because private sector-only implementation proved difficult to scale and keep the private sector interested in offering IBLI retail coverage, due to the costs of distribution and relatively low uptake. The PPA helped in developing a new model for sustainable livestock insurance provision and social protection. Two main considerations informed GoK decision to provide full subsidy to some households: (a) provide substantial subsidy to crowd-in private sector and put in place mechanisms to expand the voluntary component and (b) reduce SDL response cost when drought strikes. The full subsidy offered by GoK to vulnerable households could be considered as social protection, while voluntary purchases as commercial insurance.

**Government leadership.** KLIP originates from a clear commitment of the GoK to support and scale an innovative index insurance solution to build pastoralists' resilience to drought. The active participation and financial involvement of the public sector has been fundamental to the rapid expansion of the geographic scope and the number of insured households and is critical for continuation of the program, which aligns with agricultural insurance initiatives worldwide. The GoK is providing and supporting direct critical investments in awareness creation and financial infrastructure development (for example, registration systems) and is developing an enabling regulatory and policy environment. The negative side of a strong government leadership is the potential program vulnerability to changing political context, which also reduces the private sector confidence to make long-term investments. A strong involvement of the private sector into the planning and development of the program, together with a medium-term budget allocation framework from the government, can mitigate this challenge.

**Private sector centrality and clearly defined role.** The private sector has been the engine of KLIP, relying on the experience and capacity built over years of implementation of IBLI. KLIP relies on the private sector for the administration of the insurance policies and the associated financial transactions, the risk transfer to the reinsurance industry, and the actuarial analysis of the insurance product, among others. The private sector also plays a critical role for the long-term sustainability of the program by supporting awareness creation efforts and by stimulating the expansion of the retail insurance

market and associated financial and extension services. Operational challenges encountered during KLIP, discussed more in detail below, suggest, however, that the private sector's role needs to be carefully defined and that procurement and underwriting services commissioned by governments should include mechanisms (for example, performance assessments) to incentivize investments on the retail market and financial infrastructures to ensure that firms do not merely compete for the government's tender without investing in extension and on voluntary sales.

**Subsidized coverage.** KLIP has provided fully subsidized coverage to all selected beneficiaries. This has been instrumental in developing the PPA and in rapidly expanding the program. However, fully subsidized insurance does have some important drawbacks if used 'per se' rather than as part of a comprehensive strategy toward incentivizing more awareness about the product and the expansion of the insurance market in the target regions. In addition, the provision of full subsidies to the same target beneficiaries in KLIP has in some cases created double dipping and confusion issues with safety net or cash transfer programs. Possible solutions to overcome this challenge include, for example, asking target beneficiaries to pay at least a minimal contribution (that is, a token) for the coverage and introducing a graduation process from the subsidy. A balanced use of smart subsidy schemes targeting different types of beneficiaries and bonded to good practices from both the insurer and the clients could be an important step for the next stages of the program.

## Product design

Accurate product design has been a pillar for KLIP and continues to be a necessary component of the program in its upscaling trajectory. The capacity of the program to promptly adapt the product in response to stakeholders' feedback and to the evolving climatic/geographic context has been of paramount importance to creating confidence about the reliability of KLIP. In addition, while there is sound evidence that the KLIP index is overall robust (that is, the basis risk is low), the geographic scaling of the program to other Kenyan regions (especially to semi-arid or sub-humid drylands dominated by agropastoral livelihoods) or new countries will require careful product design work. This highlights the need for product design to become part of the planned government investments to support the program and/or the private sector.

**Early drought detection for early action.** A milestone for the program has been the shift from a livestock mortality–asset replacement index design to a forage scarcity–asset protection paradigm, thus from a logic of loss indemnification to a logic of early detection for early response. This proved to be more accurate and, even more importantly, more cost-effective in mitigating the impacts on drought, thus financially sustainable (by reducing the cost of the premiums). Similar programs should consider this innovative logic from the design phase and explore the use of the best technologies to achieve the goal of early assessment toward mitigation of catastrophic impacts.

**Basis risk and quality assessment.** The IBLI product implemented in KLIP has been proved to be simple, transparent, and, at least up to now, accurate in detecting major drought events. However, the lack of long-term spatially explicit ground data sets of rangeland biomass in Kenya did not allow a direct assessment of the index accuracy with respect to the selected indicator of the risk covered (that is, forage scarcity). Similarly, there are no reliable long-term and high frequency datasets linking drought impacts on forage availability to livestock conditions and household welfare/food security. These gaps prevent a more comprehensive evaluation of the basis risk and a comparative analysis of alternative indices and product designs. The need of robust, transparent, and actionable strategies and methodologies for quality assessment of index insurance products, backed by dedicated ground data collection efforts, is thus a priority for geographic scaling and product design improvement with emerging technologies.

## Operational implementation

Effective implementation is as important as technical design, as experience with inaccurate registration of beneficiaries and delayed payments in KLIP has shown that the benefits coming from a sound product design can be largely undermined by operational challenges. Accurate identification and registration of the beneficiaries and efficient payout delivery mechanisms are essential. However, difficulties persist due to the lack of a clear mechanism and workflow for preparatory steps to be undertaken in the event of a drought. Ensuring that the design of infrastructure for premium collection and payout distribution is robust before the launch of similar schemes is crucial to ensure development impact is achieved, trust is built in that scheme, and the scheme is sustainable.

**Payout management.** Drought shocks can be persistent and might pose considerable claim servicing challenges to the underwriting company(s). KLIP has paid out more than what has been collected as premium in some years, resulting in large loss ratio as it was seen in the 2016–2017 season. KLIP has paid out in six of ten seasons. This has raised a cash call challenge, putting serious strain on timely handling of payouts. While the product

is designed to immediately pay after the end of the rainy season, there have been delays in the range of more than three months after the result declaration. Such delays in payouts are detrimental to sustainability of the scheme because they erode government and beneficiary's confidence in the scheme. More efforts or weight should be attached to the ability to service large claims during the underwriter selection process. It is common for the underwriting company to focus on substantial premium collected through financing such scheme; however, if the underwriting capabilities are weak, it will struggle to service claims.

**Subsidy administration.** Several options for subsidy administration exist and the best one should be selected based on the country's procurement laws and regulations governing procurement of goods and services by the public sector. In situations where some households are benefiting from full subsidies, the government may adopt the normal goods and services procurement approach that in most cases involves expression of interest, selecting the most qualified firm and getting a comprehensive quote where the most competitive provider is selected. Experience in KLIP has shown that such an approach has undesired consequences, which include minimal investment to build necessary infrastructure for promoting voluntary uptake. The uncertainty that results from a winner-take-it-all procurement approach has negative impact on growth and development of the insurance market, so alternative options should be considered. In addition, the following considerations should be made when launching the subsidized insurance scheme with government support: (a) the full subsidy should be launched at the same time with a voluntary component (whether it is partially subsidized or not) and (b) an incentive-based structure to subsidies should be put in place, for example, by allocating the full subsidies proportionally to the number of voluntary policies sold, thus incentivizing the private sector to invest in developing infrastructure for voluntary purchase promotion. Such an approach could ensure that private sector players actively participate in the expansion of the program as per business growth strategy.

**Harmonized drought risk management.** KLIP is part of a complex multilayered drought risk management strategy framework in Kenya, including early warning systems, safety net programs, sovereign risk transfer, and insurance. Although they are complementary in principle, these tools often have overlapping areas which can create confusion among stakeholders, cause serious inefficiencies, and, without proper coordination, can result in missed opportunities for synergies. The future upscaling of KLIP would require a stronger effort of coordination and harmonization of KLIP with the other drought risk financing instruments, with the goal of promoting synergies between their finance mechanisms, targeting approaches, and management infrastructures.

## Making and monitoring impacts

KLIP largely benefited from the long-term market and capacity development efforts made in pastoral areas as well as from the robust household-level impact assessment conducted during the implementation of the retail IBLI initiative. However, considering its size, the program has shown limited capacity in carrying on with similar activities, especially at the level of pastoral communities. This is a serious drawback that needs to be addressed in the continuation of the program.

**Awareness creation and capacity development.** Awareness creation of clients and beneficiaries and capacity development at all levels in the public and private sectors (that is, policy makers, institutional and executive stakeholders, extension agents, insurance agents, program partners) have been important in the KLIP agenda from its inception. Awareness creation efforts have been led by the government with support from knowledge institutions and variable level of investment. However, targeting pastoral communities proved to be difficult for the government due to the cost and extension infrastructure deficiencies. When designing similar schemes in the future, it is critical to introduce smart subsidized coverage early in the rollout of the product, coupled with adequate budget provision to cover the costs of awareness creation and capacity development, using innovative techniques (such as e-learning and m-learning), workshops, and educational initiatives. This need for strengthening capacity at all levels is foundational and requires sufficient resources for such schemes to achieve sustainability**.**

**Program monitoring and impact assessment.** The few impact studies being conducted specifically on KLIP were of limited scope, and no monitoring and rigorous impact assessment strategy has been effectively implemented to assess or track the program's impacts over time. Several attempts have been made during KLIP to implement a simple monitoring and evaluation framework, but the lack of clarity on objectives and funding streams has hampered the process. As a result, there is still a strong need to increase understanding on the evolution of KLIP and its impact on a growing number of beneficiaries (including the environmental component). Such assessments are essential to ensuring that the insurance is operating as intended and improving the program. It is therefore critical to include monitoring, impact assessment, and cost-benefit analysis frameworks since the inception of such types of programs to ensure lessons and evidence are gathered.

**Linking financial resilience to physical resilience.** While KLIP is designed to contribute to building financial resilience of pastoral households, its long-term development

effectiveness also critically depends on complementary interventions supporting physical resilience (that is, targeting key livestock value chains), offering pastoralists multiple options for protecting their livestock and stimulating stronger markets. KLIP payouts have been used to buy forage/fodder, water, and veterinary services, providing evidence that many pastoral households do have access to these livestock input markets, but questions remain on the extent to which the limitations in the livestock inputs might be a serious constraint for the use of payouts in some areas or during catastrophic drought. While it is difficult to assess if the financial resilience intervention supported by KLIP could have provided a stimulus for the development of livestock input markets, it is essential that, in the continuation of the program, links with other livestock value chain interventions would be established, with targeted investments to create positive feedbacks loops toward comprehensive resilience building.

# 6 Conclusions

KLIP has provided evidence that it is possible to develop a PPA to scale up an index-based insurance scheme to provide critical insurance protection to vulnerable pastoralists in Sub-Saharan African drylands, previously a feat which was thought to be impossible. Furthermore, it demonstrates how a government, by creating an enabling environment and targeted subsidies, can crowd-in private sector capacity and expertise to support its achievement of policy priorities. Needless to say, with over five years of supporting the GoK design and then implementing KLIP, a significant amount of knowledge and practical experience about the opportunities and challenges of designing and operationalizing a PPA has been gathered. Key lessons learned, that should be generalizable to similar programs, include the following:

- Government leadership and direct investment in index insurance initiatives are possible and can be effective if associated with a strong partnership with the private sector with clearly defined roles and incentive structures. A mechanism for long-term public commitment needs to be established to guarantee the stability of the scheme.
- Subsidies for scaling and consolidating the scheme are important and instrumental, but they also need to be associated with smart targeting mechanisms and with incentives to the private sector to develop and expand the market.
- Creating awareness and strengthening capacity at all levels is foundational and requires enough resources for such schemes to achieve sustainability.
- Impact assessment requires investment, planning, and preparation. It is therefore recommended that a rigorous impact study and cost-benefit analysis of the program be included in the design phase, to ensure lessons and evidence is gathered.
- The shift from a drought assessment and impact response paradigm (livestock mortality–asset replacement) to a drought early detection and impact mitigation paradigm (forage scarcity–asset protection) has been a fundamental step to improve the value and cost-effectiveness of the scheme.
- Accurate product design is critical to create trust and deliver impacts, but the data infrastructure for assessing product quality and inter-comparison is weak if not absent. The need of robust, transparent, and actionable strategies and methodologies for quality assessment of index insurance products is thus a priority.
- Engaging with local and international stakeholders and tailoring the product to the specific agroecological and socioeconomic context and evolving environmental conditions is a fundamental necessity not just during the program design phases, but along the whole program implementation cycle.
- Effective implementation is as (if not more) important as technical design. Ensuring that the design of the premium collection and payment infrastructure is robust before the launch of similar schemes, also leveraging on existing financial service infrastructures, is crucial to ensure development impact is achieved, trust is built in the scheme, and the scheme is sustainable.
- The future upscaling of KLIP and similar initiatives would require a strong effort of coordination and harmonization of the different drought risk management initiatives to optimize their finance mechanisms, targeting approaches, and data and management infrastructures.

Moving forward, given the vastity of drylands in Africa and the millions of households considerably affected by drought shocks, there is significant scope to scale up KLIP-like approaches in other countries. The authors trust that the lessons documented in this note can support the effective design and implementation of future programs.

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# Annexes

ANNEX 1

# Remote sensing data processing

## Introduction

This annex describes the tasks required to process the remotely sensed NDVI time series data to obtain the Input for the index calculation.

KLIP uses satellite imagery for calculating a seasonal forage scarcity index for each UAI. By the end of a given season (that is end of June for long rains, end of December for short rains), the forage scarcity index for each UAI is compared to that unit's historical index readings to determine if a payout should be made.

Three main remote sensing data processing steps are required:

- Downloading the dekadal NDVI images from the internet during the seasonal coverage period for all the KLIP covered area;
- Detecting and removing pixels with limited temporal variability;
- Calculating a dekadal spatial average of the NDVI for each UAI.

The steps are detailed in the following sections.

## Downloading the NDVI data

- For KLIP, the eMODIS NDVI C6 product is the data source. This NDVI data set is obtained from the Moderate Resolution Imaging Spectroradiometer (MODIS) flown onboard NASA's AQUA satellite. The Earth Resources Observation Systems (EROS) Data Center (EDC) of the US Geological Survey (USGS) transforms the daily images into 10-day composites (10 days is often referred to as 'dekad'), which are referred to as eMODIS.
- To reduce the remaining atmospheric effects, such as clouds, a temporal filtering is applied on the data, which requires three dekads before and three dekads after the value (image) to be filtered. For this reason, final

filtered eMODIS images are only available about one month later. Filtered eMODIS data are currently provided for Africa in the framework of FEWS-NET activities. The eMODIS data for the target areas are available from January 2003 up to date.

- The long archive of data containing months with only filtered data is obtained for the East Africa region from https://earlywarning.usgs.gov/fews/datadownloads/East%20Africa/eMODIS%20NDVI%20C6 (last access 02/09/2020).
- The most recent 10-day composite usually is provided about three days after the end date of the compositing window. For example, the January 1–10 image is provided by January 13. Given the mentioned issues with filtering, the final filtered version of that same image will be available one month later, that is, by February 13.

## Spatial averaging and masking

- For each filtered 10-day NDVI image (for the nonoverlapping dekads), a spatial averaging of the NDVI values within a UAI needs to be performed (the updated shapefile should be requested to the SDL). The eMODIS pixels are assigned to a specific UAI if their pixel center falls within that unit. In principle, all pixels for which this is true are used for calculating the spatial average. The only exceptions are those pixels that have a very limited temporal variability (that is if the difference between 5$^{th}$ and 95$^{th}$ percentiles of NDVI values in the historical time series is below 0.05).

ANNEX 2

# KLIP index calculations

## Introduction

This annex describes the tasks required to convert the processed remotely sensed NDVI time series into a forage scarcity index and to calculate seasonal payouts according to the KLIP methodology.

The following calculation steps are necessary to convert dekadal NDVI values for each UAI into the insurance index:

- **Monthly NDVI calculation.** Dekadal NDVI time series in each UAI are converted into monthly NDVI time series by averaging the three dekadal NDVI values in each month.
- **Temporal aggregation.** The monthly NDVI data are averaged over time into a seasonal index (seasonal NDVI). Two consecutive rainfall seasons are observed in Northern Kenya, followed by respective dry seasons. They are referred to as 'long rains' (March–June) and 'short rains' (October–December). NDVI values for each UAI are averaged for the long rains and short rains months.
- **Standardizing aggregated NDVI data (standard score).** The standard score (Z-score) of each season's (that is, long rains and short rains) seasonal NDVI value is calculated with reference to the historical average and standard deviation (the benchmark period is from 2003 to the last available observation at the time the KLIP annual policy is issued).

## Index calculation

The following steps show the mathematical formulae for the index calculation process. The NDVI data used for constructing the index and parameterizing the range of insurance contracts are depicted as NDVI (NDVI i,d,m,y NDVI i,d,m,y) for each UAI $i$ in dekad $d$, month $m$, and year $y$ and are obtained by preprocessing pixel-level dekadal NDVI data of all pixels in each UAI. The following steps are required to calculate the index from NDVI (NDVI i,d,m,y NDVI i,d,m,y):

1. Monthly NDVI ($\mathrm{NDVI}_{i,m,y}$) for each UAI $i$ in month $m$ and year $y$ is obtained by averaging the three dekadal values in each month:
2. Seasonal NDVI ($Avg\,\mathrm{NDVI}_{i,m,y}$) for each UAI $i$ in month $m$ and year $y$ is obtained by averaging monthly NDVI from the beginning to the end of the long rain season (March–June) and short rain season (October–December):
3. Standard score (Z-score) of the seasonal NDVI for each UAI $i$ in each month $m$ and each year $y$ ($ZAvg\,\mathrm{NDVI}_{i,m,y}$) is then calculated using the historical mean (E) and standard deviation (SD) of the particular UAI and month:

$$ZAvgNDVI_{i,m,y} = \frac{Avg\,NDVI_{i,m,y} - E\left(Avg\,NDVI_{i,m}\right)}{SD\left(Avg\,NDVI_{i,m}\right)}$$

The KLIP index (I) is numerically equal to the $ZAvg\mathrm{NDVI}_{i,m,y}$:

$$I\,i,m,y = ZAvgNDVI\,i,m,y$$

## Payout determination

A payout of the insurance contract for each UAI $i$ is triggered when the index $I$ in the last month $M$ of the covered period (that is, June for long rains and December for short rains) in year $y$ falls below a predetermined value of $I_{i,M,y}$ for that month, called the attachment threshold. In case the index is lower than another predetermined value called exit threshold, the total sum insured allocated to that season is paid out.[3] Between the attachment and exit values, the payouts are a linear function of the index.

A minimum payout at 5 percent of the total sum insured allocated to that season is given when the index value falls below the attachment, but the calculated payout is below the minimum payout threshold.

## Attachment and exit determination

For each UAI and season (that is, long rains and short rains), the attachment and exit values are set according to the following procedure:

- The attachment values are set to the 20$^{th}$ percentile of the index values' empirical distribution including all the seasonal index data from 2003 to the date the policy is issued.
  The exit value is fixed to −1.61.

3 The sum insured allocated to the short rains and long rains seasons are 42 percent and 58 percent of the total sum insured annually, respectively.

ANNEX 3

# Roles and responsibilities of public and private sectors

The GoK, motivated by willingness to end drought emergencies, initiated the process of designing and implementing KLIP with technical assistance from both the World Bank and the International Livestock Research Institute (ILRI). Since the early stages of KLIP design the important role of both public and private sector players was recognized and a joint implementation approach was recommended with clarity on roles and responsibilities of public and private actors.

## Roles undertaken by the public sector during design and implementation of KLIP

- **Program management.** KLIP was initiated by the government; therefore, the SDL in the MALF played the leadership role. The SDL formed a dedicated PMU to guide implementation and to coordinate government institutions with stake in the implementation process, for example, Insurance Regulatory Authority (IRA). The PMU comprised technical officers, administration officers, and a process management adviser and continued to receive technical assistance from ILRI and the World Bank during design and implementation of KLIP. The PMU is responsible for the day-to-day operational running of KLIP, including awareness creation and coordination of beneficiary selection, and working closely with underwriting company(s) to ensure payouts are delivered as per service-level agreements. IRA provided advisory on matters relating to regulation and product approval.

- **Beneficiary selection.** The government provides full subsidy to vulnerable households, selected using criteria developed through consultative approach led by the SDL and involving other organizations or institutions working on drought risk management such as the National Drought Management Authority (NDMA) and development partners providing humanitarian response. The selection of KLIP beneficiaries considers the following: (a) livestock ownership; (b) whether the household is already a beneficiary from existing social safety net schemes, such as the NDMA-led Hunger Safety Net Program (HNSP) that operates in some counties; (c) whether households have formal financial access or demonstrate willingness to open a bank account or any other recognized formal payment system. The PMU, working closely with representatives from county governments and community leaders, undertook beneficiary registration, capturing all the necessary information, including names of the beneficiary, national Identification numbers, next of kin, and other relevant information. The PMU determined the number of households to receive subsidy from each UAI. The data on beneficiaries are shared with selected underwriter(s) for pricing and payout administration.

- **Subsidy administration.** The SDL pays premium on behalf of selected households to selected underwriters, chosen through tendering process. Premium budget is allocated within the MALF budget earmarked for livestock insurance purposes. The procurement of an insurance company to provide cover under KLIP is undertaken by the SDL with support from IRA. It involves preparing tender documents which outline the conditions for the cover, short-listing interested companies that should meet certain selection procedures as outlined in the tender documents. The insurance company offering the best quote and other support services is contracted to offer the IBLI product. Interested insurance companies can quote as individuals or as a consortium. The winning insurance company is encouraged to share the business with interested local underwriters and reinsure the

remaining portion. The winning underwriter receives premium from the SDL for the selected beneficiaries and makes payout directly to the beneficiaries if there is a trigger.

- **Awareness creation.** The KLIP PMU is also coordinating awareness creation and capacity-building efforts for pastoralists and institutional stakeholders through targeted campaigns in pastoral areas and county-level awareness creation events. Up to 15 percent of the GoK's annual budget for KLIP is allocated to this effort.

## Roles undertaken by the private sector

- **Underwriting.** The underwriting function is undertaken by private insurance companies which might choose to underwrite as individual insurance or form a pool of interested companies. The SDL chose to apply existing procurement laws to procure the right insurance company to underwrite IBLI under KLIP. Kenya procurement laws require the procuring entity to develop tender documents and invite insurance companies to express interest. The companies meeting a minimum selection criterion are invited to quote as per the terms and conditions of tender documents. The initial call for expression of interest resulted in a consortium of six insurance companies and one individual company being short-listed to provide quotation. The first and second KLIP cycles were insured by the selected consortium annually while in the subsequent tenders the government extended procurement from one year to three years after the private sector raised concerns of one-year contracts. The tender for the third cycle was won by a single insurance company to provide insurance cover for three years. The tender conditions encouraged business sharing and the winning entity could share the business with other interested insurance companies locally. The insurance companies consider KLIP insurance a high risk business and take just a small portion of risk by transferring a big part of the risk to reinsurance companies. At the design stages of KLIP, consideration was given to set up a Technical Support Unit (TSU) to house technical expertise centrally, given the costs of technical tasks related to livestock insurance. The TSU was expected to perform a range of services for the private sector that included (a) demand assessment; (b) product design and rating, including basis risk analysis; (c) design of operating systems and procedures; and (d) training of stakeholders and coordination of awareness creation. While the role to be played by the TSU was considered important for the private sector to play its role effectively, it was never set up. The World Bank and ILRI continued to support some of those tasks with the danger of leaving the private sector weak when the technical assistance comes to closure.

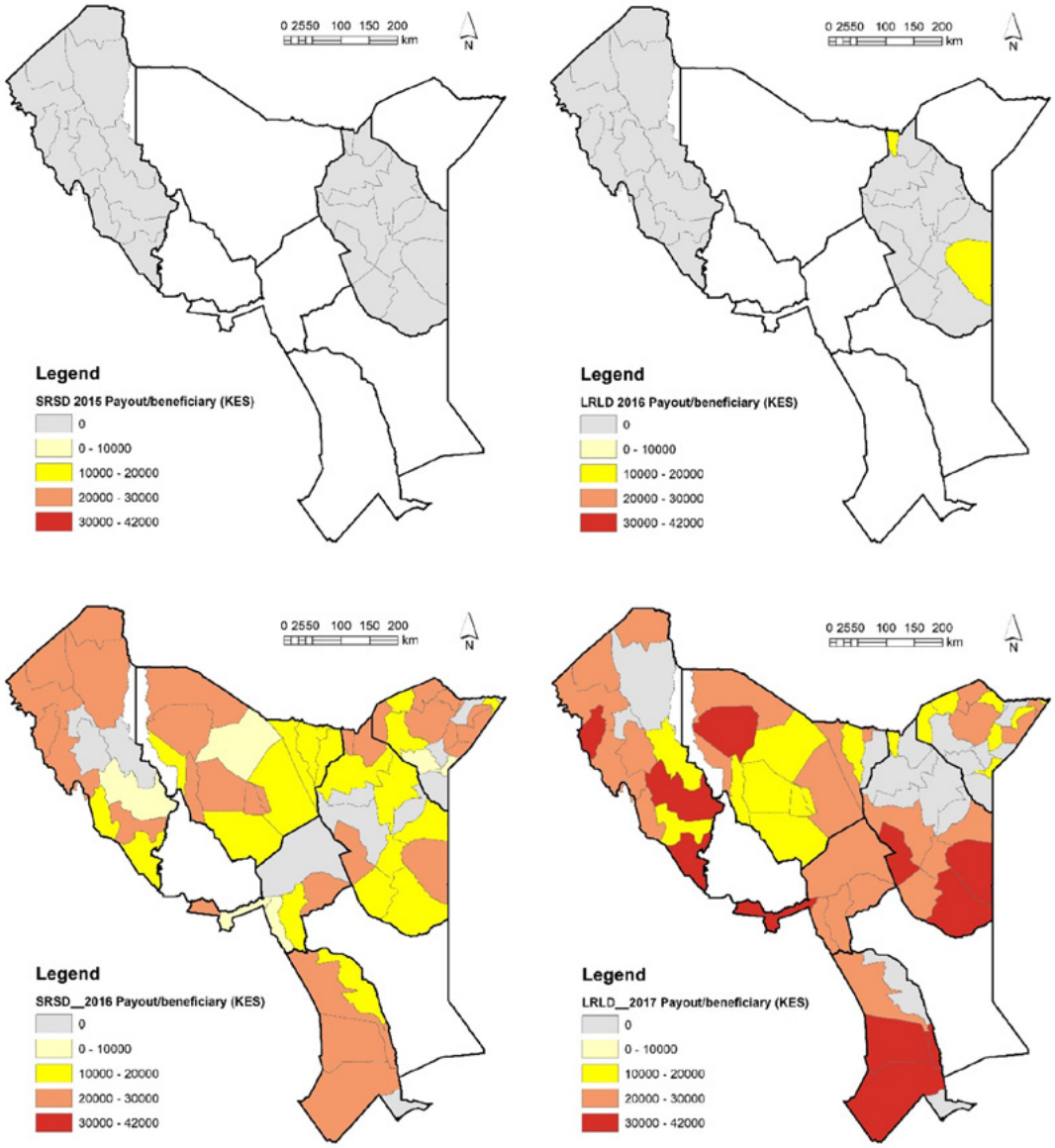
- **Payouts management.** Under KLIP's fully subsidized component, the SDL provides the underwriting insurance company with a list of beneficiaries. The underwriting company is expected to make direct payouts to the list of beneficiaries provided in case trigger conditions are met. The contractual agreement between the SDL and underwriting company stipulates the period required to deliver payout to the beneficiaries. The underwriting company is free to choose the most effective and affordable methods to deliver payouts. Bank and mobile money accounts are the preferred methods by insurance companies; bankers' checks are used when the beneficiaries lack bank or mobile money account. The underwriting insurance company is expected to organize payouts using its preferred model as long as beneficiaries receive the money without delay. There is a strong partnership between insurance companies, banks, and mobile money operators, which has been developed to deliver payouts. In addition, there is consideration to use banks' infrastructure (and other distribution channels) to promote the voluntary component, which is a requirement by the GoK.

- **Calculating agent.** The calculating agent is another private sector role. The underwriting company agrees with the SDL on a suitable calculating agent, expected to be knowledgeable on remote sensing and insurance to determine how the season has performed and the payouts. The initial calculating agent work was initially procured to the private sector by the underwriter. However, since the question on who should pay for the services (SDL or underwriting company) has not been adequately addressed, since 2016 ILRI has been providing the service on an interim basis while identifying a suitable approach for service procurement and payment.

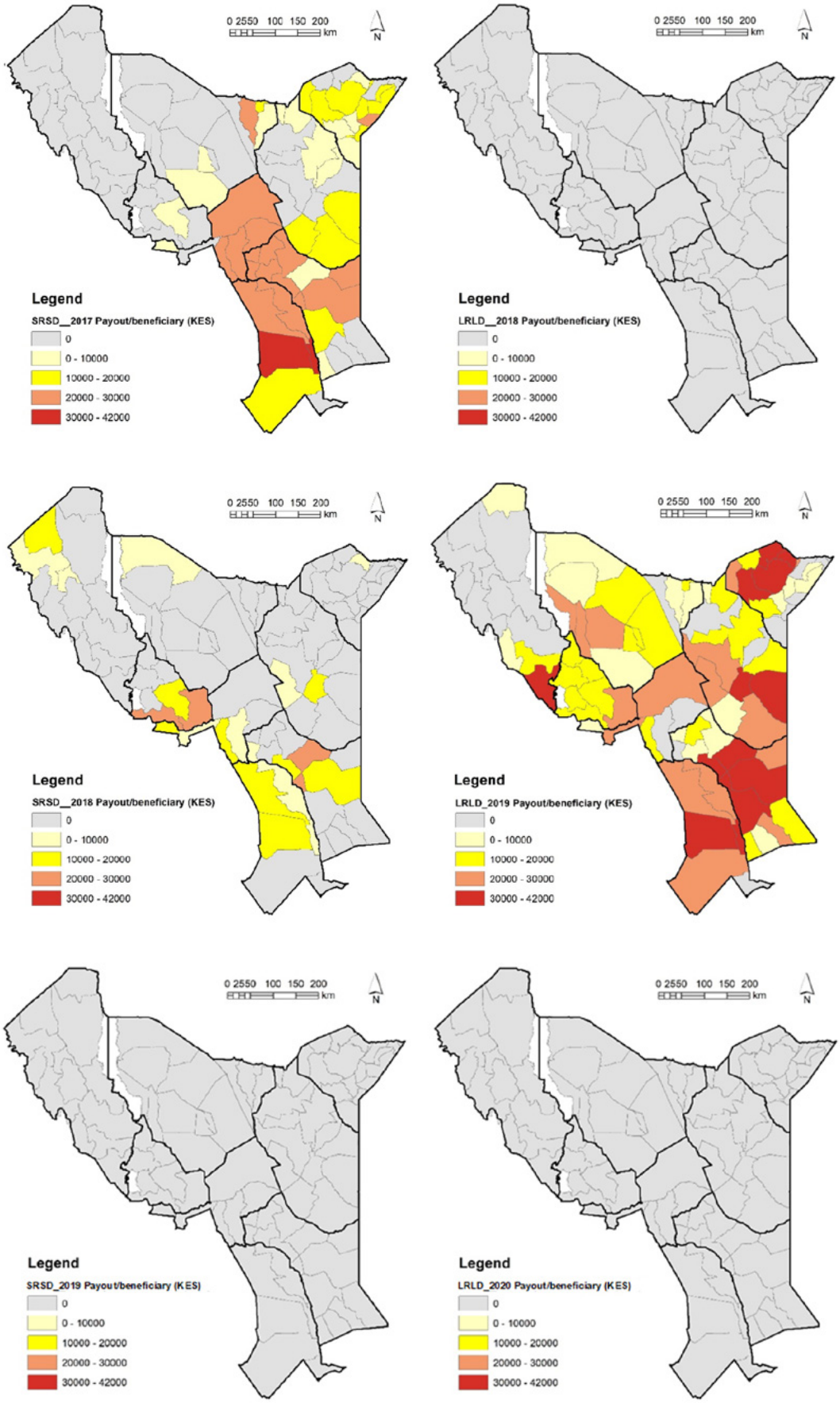
ANNEX 4

# KLIP payouts maps

The following maps illustrate the seasonal payout per beneficiary (in KES) from the launch of the KLIP in 2015 to the long rains of 2020. Areas in white are not covered by KLIP.




Source: Authors' elaboration




Source: Authors' elaboration

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