
Feasibility of Drought Index Insurance for Livestock in Somalia

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AUTHORS

International Livestock Research Institute

Francesco Fava (f.fava@cgiar.org)

Nathan Jensen

Rupsha Banerjee

Njoki Kahiu

Duncan Khalai

Kibrom Abay

World Bank Group

Sonia Plaza (TTL, splaza@worldbank.org)

James Muli Sinah

Asta Bareisaite

DRAFT

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Table of Contents

Acknowledgements.....	4
Acronyms and Abbreviations	5
Executive Summary.....	7
1. Introduction.....	12
1.1 Context and Objectives.....	12
1.2 Index-Based Livestock Insurance: Case Studies of Kenya and Ethiopia.....	13
2. Assessing the Feasibility of Livestock Insurance in Somalia	16
2.1 Contribution of Livestock to Somalia’s Economy.....	16
2.2 Socioeconomic Feasibility	19
2.3 Technical Feasibility	27
2.4 Operational Feasibility	34
3. Conclusion and Recommendations.....	45
3.1 Product Design.....	45
3.2 Product Demand and Supply	46
3.3 Implementation Modality of the Scheme.....	46
3.4 Financial Literacy, Insurance Awareness Creation, and Capacity Building.....	48
References.....	50
Appendix A. Framework for Implementation of Drought Index Insurance for Livestock.....	53
Appendix B. Technical Feasibility Methodology	54
Appendix C. Socioeconomic Feasibility Datasets and Methodology	56

List of Tables

Table 1. Relationship between Livestock Ownership, Poverty, and Food Insecurity	22
Table 2. Poverty and Food Security Status as Well as Different Types of Shocks that Households Have Experienced in the Past 12 Months	23
Table 3. Shocks, Livestock Ownership, and Food Security	26
Table 4. Simulation of an IBLI-Like Contract in Somalia, 2003–18	33
Table C.1 Distribution of the Sample of Households.....	56
Table C.2 Summary Statistics of Households.....	56

List of Figures

Figure 1. Schematic of IBLI Evolution in Kenya and Ethiopia from the Launch of the First Policy in 2010	Error! Bookmark not defined.
Figure 2. Main Sources of Income of Various Groups, by Percentage of Households	20
Figure 3. Poverty Rates across the Two Waves of the Somali High Frequency Survey, and by Population Type.....	21
Figure 4. Poverty Rates across Income Activities	21
Figure 5. Livestock Ownership (TLU)	22
Figure 6. Recent Incidence of Hunger, by Population Type (left) and Income Source (right).....	24
Figure 7. Livestock Losses, 2016/17	24
Figure 8. Reported Main Causes of Livestock Losses.....	25
Figure 9. Percentage of (a) Rangeland Cover and (b) Cropland Cover	28
Figure 10. Example of Average Seasonal Rainfall and NDVI Profiles for Districts in Somalia, Showing Areas of Low (a,d), Medium (b, e), and High (c, f) Vegetation Productivity	30
Figure 11. Rangeland and NDVI Intensity Maps	30
Figure 12. Overall Technical Feasibility of Drought Index Insurance for Livestock in Somalia.....	31
Figure 13. Spatial Distribution of Drought Experience by (a) Remote-Sensing-Based Forage Availability, 2017, and (b) Percentiles Indicating Forage Availability, 2002–17	32
Figure 14. Historical Annual Average Percentage Payouts in Districts Where IBLI Would Be Feasible, 2003–18	32
Figure 15. Potential Areas of Support of Livestock Insurance Development.....	42
Figure A.1 Phases of Preparing, Implementing, and Monitoring the Provision of Drought Index Insurance for Livestock in Somalia	53
Figure B.1 Regions and Districts of the Federal Republic of Somalia	54

List of Boxes

Box 1. Normalized Difference Vegetation Index	14
Box 2. Government Support of Agricultural Insurance in Kenya	Error! Bookmark not defined.
Box 3. Key Findings—Importance of the Livestock Subsector	19
Box 4. Key Findings—Socioeconomic Feasibility.....	27
Box 5. Key Findings—Technical Feasibility.....	34
Box 6. Key Findings—Operational Feasibility	44

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Acronyms and Abbreviations

APA -	Apollo Pan-African Insurance
ARC –	African Risk Capacity
ASALs –	Arid and the semi-arid Lands
AU	African Union
CHIRPS	Climate Hazards Group InfraRed Precipitation with Station data
DINA	Drought Impact Need Assessment
ECHO	European Commission on Humanitarian Aid and Civil Protection
eMODIS	Earth Resources Observation and Science (EROS) Moderate Resolution Imaging Spectroradiometer
EOS	end of season
FAO	Food and Agriculture Organization of the United Nations
FAO SWALIM –	FAO Somalia Water and Land Information Management
FGS	Federal Government of Somalia
FISO	First Somali Takaful & Re-Takaful
FSNAU	Food Security and Nutrition Analysis Unit
GDP	gross domestic product
IBLI	Index-based livestock insurance
IBLT	Index-Based Livestock Takaful
ICT –	Information Communication Technologies
IDP	internally displaced person
IGAD –	Intergovernmental Authority for Development
ILRI –	International Livestock Research Institute
IRA –	Insurance Regulatory Authority
JRC -	Joint Research Centre
KLIP	Kenya Livestock Insurance Programme
KYC	know your client
LRS	long rain season
MFI	Microfinance institutions
MNOs -	Mobile network Operations
MODIS -	MODerate Resolution Imaging Spectroradiometer
MTBs -	Money Transfer Businesses
NDP	National Disaster Management Policy
NDVI	Normalized Difference Vegetation Index
NGO	nongovernmental organization
NGS	number of growing seasons
OIC	Oromia Insurance Company
PMU	Program Management Unit
PPP	public-private partnership
RRF	Resilience and Recovery Framework
SC	Steering Committee
SCALED-UP	Somalia Capacity Advancement, Livelihoods and Entrepreneurship, through the Digital Uplift Project
SCORE	Somali Core Economic Institutions and Opportunities Program
SHFS	Somali High Frequency Survey
SOS	start of season
SRS	short rain season
TIA	Takaful Insurance of Africa
TLU	tropical livestock unit
TWG	Technical Working Group

UAI	unit area of insurance
VIPs	village insurance promoters
VSLA	village savings and loans associations
WFP	World Food Programme

Executive Summary

Objective

This study investigates the feasibility of drought index insurance for livestock in Somalia, with the overall goal of informing the Federal Government of Somalia (FGS) and other stakeholders about the potential to launch an initiative in the country, and of contributing to efforts to seek sustainable solutions to cushion pastoral households against the impacts of severe drought shocks in Somalia. The feasibility analysis takes into consideration: (i) the centrality of livestock for Somalia's economy; (ii) the socioeconomic conditions affecting demand for this type of product; (iii) the technical design of the index insurance product; and (iv) operational conditions for supplying the product.

The study notes that insurance is one of many financial instruments that FGS and stakeholders involved in development and humanitarian assistance might consider, as part of a broader drought risk management strategy. The study does not recommend substitution of existing drought mitigation investments or humanitarian support under current arrangements, neither does it consider other insurance designs beyond the pasture degradation insurance product. It does not undertake an in-depth comparison of insurance and other potential disaster risk financial instruments. Therefore, it does not provide qualified comparison of all disaster risk financial instruments at the disposal of FGS.

The study's focus is on whether it is technically, operationally, and financially feasible to launch a livestock insurance scheme in Somalia. Once this is determined, a detailed analysis should be undertaken to clarify how livestock insurance fits alongside existing or potential disaster risk financing instruments in Somalia. The selection criteria for would-be beneficiaries of livestock insurance should account for these other instruments and financial support systems to reduce the potential for double-dipping. Several other interventions would also be needed to address issues with the livestock sector including: i) supporting market linkages and value chain development, including quality and standards; ii) securing access to resources (water, pasture, forage); iii) improving animal health, distribution of veterinary medicinal products, increasing vaccination coverage, among others.

Livestock and Drought in Somalia

Livestock is central to Somalia's economy. The livestock subsector contributes about 40 percent of the country's gross domestic product (GDP) and 80 percent of all exports earnings.

Over 465,000 households, equivalent to 3 million Somalis, are classified as nomadic, constituting 25 percent of the total population (UNFPA 2014). Livestock is the major productive asset for these pastoral communities, and their stock of animals is estimated at 53 million (2014 figures). The camel population is the largest in the world, at 7.1 million, and the market value of animals producing milk is \$2.7 billion, by 2017 figures. Pastoral households have few options for holding other more durable, productive assets and have limited opportunities to diversify their income portfolios and livelihood base. Many are low-income and particularly vulnerable to shocks.

Drought has severe impacts on Somalia's economy, for example, over 12 percent (6.4 million) of animals was lost during the *Deyr* 2016 and *Gu* 2017 seasons. Lack of sufficient pasture and fodder was the main cause of livestock mortality. The loss and damage in the 2016/17 season to Somalia economy exceeded \$3.25 billion, amounting to 50 percent of annual GDP.

As the primary cause of livestock illness and mortality, drought is the most pressing, immediate risk pastoralists face. Drought also heightens food insecurity, reduces terms of trade, and increases the

incidence of conflict. In the first half of 2017, pastoralists lost between 25 and 75 percent of their herds due to low birth rates coupled with high death rates and distress sales.

Vulnerability to climate change is high for Somalia. A report places Somalia at the top of the list among 167 countries ranked globally for overall vulnerability to Climate Change, when adjusted for coping capacity (Wheeler, 2011).

Since droughts have increased in frequency and severity, the existing traditional coping strategies during exposure have become less effective, and hence it is of critical importance to prepare and to undertake efforts to mitigate risk.¹ Poor pastures, degraded lands, and a lack of stored water make the impact of droughts more pronounced. The reduced purchasing power of pastoral households due to the collapse of the market system in Somalia acts as a disincentive to investing in the production of fodder and water trucking systems.

An insurance mechanism designed to pay when a forage deficit is recorded provides an opportunity to stimulate investment in water tracking systems or the production of fodder. Early payouts provide funds at the opportune moment for pastoral households to undertake proactive measures to protect their livestock against the negative impacts of drought through the purchase of veterinary medicine, fodder, or water. The proposed pasture degradation index insurance product is designed as an asset protection that makes a payout when pasture conditions deteriorate to a certain agreed threshold.

International Experiences of the Use of Index Insurance to Protect Herds during Drought

Index-based livestock insurance (IBLI) has been implemented in Kenya and Ethiopia since 2010 to enhance the resilience of vulnerable pastoral households. In Kenya, for example, IBLI is mainly used as a social safety net whereby the government subsidizes the premium for vulnerable households, to cushion them against the impact of severe drought. Substantial financial support is necessary at the outset of such schemes to generate enough premium volumes to interest the private sector, to encourage pastoralists to see for themselves how insurance works, and to create essential and much-needed awareness of formal insurance.

IBLI relies on low-cost, accessible, and widely used satellite indicators of drought (i.e., the Normalized Difference Vegetation Index, or NDVI) to trigger compensation to covered pastoralists during periods when rains received are not adequate and pasture conditions deteriorate to a certain agreed threshold. Payouts are made early, immediately after the end of the rainy season, and can be used to purchase feed, water, and veterinary medicine and other inputs to protect and keep the core breeding stock alive.

Experiences in Kenya and Ethiopia, where IBLI has been offered to pastoralists by private insurance companies as a microinsurance retail product since 2010 and 2012, respectively, show that **pastoral households across the socioeconomic spectrum purchase insurance.** There are no strong patterns of discrimination in the adoption of IBLI across gender, wealth, or age. The uptake has been modest, and voluntary purchases, even when subsidized, will take time to reach commercial sustainability. A highly subsidized scheme, especially for vulnerable households, would need to be considered to create enough business volume for the private sector to start developing systems to promote voluntary purchases.

¹ More frequent and longer droughts are also degrading the capacity of rangelands and pastures to recover during good rain periods.

Robust research evidence demonstrates a range of positive socioeconomic impacts to pastoral households and shows that the marginal benefit/cost ratio of IBLI substantially exceeds that of unconditional cash transfers.

IBLI in Kenya and Ethiopia has provided insurance coverage for over 300,000 cattle equivalents with a value of more than \$145 million. The program has rapidly evolved from the two pilot studies to the Kenya Livestock Insurance Programme (KLIP), a large public-private partnership spearheaded by the Government of Kenya, and to an ambitious expansion program in Ethiopia.

IBLI currently covers approximately 25,000 households both through subsidized insurance under the KLIP (18,000) and unsubsidized commercial sales by private insurance companies (7,000).

Feasibility of Drought Index Insurance for Livestock in Somalia

Overall, the findings of the feasibility assessment in Somalia indicate **good potential market uptake and socioeconomic effects** of drought index insurance for livestock scheme, similar to that already operational in Kenya and Ethiopia. Thus, there is a strong rationale for the instrument's implementation, provided that investment is sufficient and well directed.

Livestock insurance is expected to fit well within the broader context of disaster risk financing, as poor households without livestock would continue to benefit from existing social safety and humanitarian support provided by various agencies. As has been noted, meanwhile, the livestock insurance scheme would specifically target those with livestock assets. The support to the most vulnerable households without livestock should continue under different arrangements. Systems for coordination and sharing data about beneficiaries of various ongoing programs would help align the various interventions.

Somalia will need to undertake a benefit/cost analysis on the potential savings and losses that could be envisaged in the future in the case of another drought if a livestock insurance mechanism is put into place. Risk transfer through insurance constitutes an appropriate response mechanism that guarantees resources to mitigate risk and protect assets before a weather shock becomes a crisis or a disaster. An early response² also results in a substantial savings of humanitarian aid cost, when compared to a response after the fact (USAID 2018). For example, every \$1 invested in rapid resilience-building assistance saves about \$2.90 on average, thanks to avoided losses and a reduction in humanitarian spending (USAID 2017). If the ex post response to drought comes too late, the productive assets have been already destroyed making it difficult to recover.

Different possibilities for offering part of the insurance product to specific target groups, including in conjunction with judiciously administered public subsidies to lower the cost of premiums, could be considered. Such a subsidy program should be carefully devised to provide adequate financial incentives, and its costing should be carefully analyzed to avoid unsustainable public costs. The proposed subsidy is intended to help insurers overcome initial establishment problems of this new financial product. However, the subsidy could be time bound. Initially, the subsidy could be covered by external funding since the government will have limited resources to fund premium subsidies. In the case, the subsidy is intended to continue on a longer term basis, donor financing for subsidies that aim to improve the equity of coverage is only advisable if there is a plan on how to raise government revenue to finance them in the long run. Without this long-term financial strategy, insurance will be small scale or short-lived or subject to annual fiscal budget negotiations. A benefit/cost analysis on the premium subsidies for livestock insurance compared to the fiscal cost impact of another drought will be needed.

² The data for determining the Kenya Livestock Insurance Programme (KLIP) payout are provided one month after the index calculation period, and payouts are made within one month after the announcement of results.

Initial findings indicate market potential and stakeholder support for livestock insurance schemes in Somalia. The success of such schemes would be conditional on: (i) strong private sector participation, potentially in the form of a public-private partnership; (ii) close consideration of the unique Somali context, including cultural sensitivities, Sharia (Islamic law), the security situation, nascent financial and insurance markets, and low government capacity for implementation; (iii) alignment with other financial sector disaster risk management strategies and livestock value chain development activities ongoing in Somalia.³

- **Centrality of livestock.** Livestock play a central role in Somalia's national and rural economy, and drought shocks have a dramatic impact on the national GDP and on pastoralists' welfare. An ex ante intervention that focuses on a clear, transparent, and timely response would cushion poor pastoral households against a loss of livelihood.
- **Socioeconomic feasibility.** The socioeconomic conditions for implementing drought index insurance for livestock are favorable overall. There is supporting evidence that such insurance could help pastoralists and agro-pastoralists reduce drought-related livestock losses. Household survey data show that rural and nomadic populations are critically affected by weather-related shocks, and that droughts worsen the already-high rates of poverty and food insecurity among these populations and have dramatic impacts on livestock assets. Livestock ownership is negatively correlated with poverty and food insecurity, and livestock assets serve an important role in absorbing some of the adverse effects of drought shocks, indicating that protecting these assets would help households endure drought.
- **Technical feasibility.** Extensive rangelands dominate a vast portion of Somalia, particularly in the northern and central regions. Only in the southern regions of Juba, Shabelle, and Bay present mixed systems with dominance of agro-forestry and crops sufficient to make this product design unsuitable. Therefore, the technical conditions for the design of a satellite-based drought index insurance product are favorable for about 70 percent of Somalia, suggesting the opportunity for large-scale implementation in the country. In addition, a risk-modelling exercise indicates that Somalia has similar risk profiles as northeastern Kenya, where the IBLI program is being successfully implemented.
- **Operational feasibility.** Factors considered include the insurance market, institutional and regulatory framework, distribution channels, physical infrastructure for financial service delivery, institutional and private sector capacity, beneficiaries, and product design.

Although the general institutional and private sector context appears conducive for implementing drought index insurance for livestock, significant challenges and investment needs should be anticipated. Key steps include building the capacity of financial institutions and other private sector players, supporting the establishment of a well-functioning regulatory and legal framework, as well as making efforts to build the demand of targeted beneficiary communities. Product formulation would need to address the following issues: (i) affordability; (ii) defining a proper role for the government; (iii) financial sustainability for private insurance companies; and (iv) compliance with Sharia and Somali cultural norms. During the initial stages, FGS is unlikely to be able to financially support the scheme with subsidies of complementary investments. In this context, international donor support will be necessary.

Next Steps

³ Including, in particular, the industry dialogue and regulatory design being conducted under the Somali Core Economic Institutions and Opportunities Program (SCORE), as well as the FinTech and other outreach modalities for financial inclusion being implemented under the Somalia Capacity Advancement, Livelihoods and Entrepreneurship, through the Digital Uplift Program (SCALED-UP).

Responding to the challenges the livestock sector is facing in Somalia outlined above, the report recommends accompanying the disaster risk financing/insurance product with World Bank's support in the following areas to further contribute to risk reduction: i) Market linkages and value-chain development in Livestock sector. Interventions to increase pastoralists' linkage to profitable markets, volume, quality, standards and safety of livestock products will increase productivity and improve livelihoods; ii) access to finance and livestock credit. Given the impact of climate change in Somalia, the country will need to diversify its economy and explore developments in other sectors and value chains including services and manufacturing.

The report will be disseminated to the Government of Somalia and will explore possibilities of developing some interventions to generate economic transformation and jobs in value chains as well as to increase resilience of productive assets.

1. Introduction

1.1 Context and Objectives

With the Somali economy relying mainly on climate-sensitive agricultural activities, climate-related shocks will continue to result in a humanitarian crisis every time they strike. The severe drought of 2016/17 displaced over 1 million people, increasing the total number of displaced people from 1.1 million to 2.1 million. Over 90 percent of this total number is due to drought. While the humanitarian response to the 2016/17 shock was better than to previous severe shocks (1992 and 2011), only 15 percent of the required resources of \$1.8 billion was met. A subsequent income shock of the magnitude of the 2016/17 drought has the potential to increase rural poverty by 11 percent (Pape and Karamba 2019).

The livestock subsector is the backbone of Somalia's economy, contributing around 40 percent of gross domestic product (GDP) and 80 percent of all export earnings. The welfare and livelihoods of pastoral households are primarily dependent on livestock assets, and drought is the main risk faced by pastoralists. For example, losses due to the Somali drought of 2016/17 could have exceeded \$3.25 billion, amounting to 50 percent of annual GDP (World Bank Group 2018a). Livestock and environment and natural resources management were the sectors most affected. The pastoralists lost between 25 and 75 percent of their herds in the first half of 2017 due to low birth rates coupled with high death rates and distress sales (Pape and Karamba, World Bank 2019).

Risk transfer through insurance constitutes an appropriate response mechanism that guarantees resources to mitigate risk and protect assets before a weather shock becomes a crisis or a disaster. An ex post response to drought comes too late. The foundation for recovery has already been destroyed, making it difficult to get out of the poverty trap. Insurance, on the other hand, makes it possible to crowd in private sector capital and expertise to address the challenges associated with climate change. Insurance provides auditable, transparent, and timely risk management solutions that deliver funds before the impact of drought becomes a disaster. An early response⁴ also results in a substantial savings of humanitarian aid cost, when compared to a response after the fact (USAID 2018). For example, every \$1 invested in rapid resilience-building assistance saves about \$2.90 on average, thanks to avoided losses and a reduction in humanitarian spending (USAID 2017). Once demand for insurance schemes is sufficient, the cost of response may be transferred from government budgets to the private sector capital of the insurance and reinsurance industries.

Innovative drought index insurance products to protect livestock in arid and semi-arid pastoral regions of Kenya and Ethiopia with similar livestock systems, are proving to be cost-efficient risk transfer mechanisms with positive impacts on pastoral households' livelihoods and resilience to drought shocks. The lessons learned from these countries' experiences will help to identify the main areas and the degree of investment initially needed in Somalia, and offer insights into how to design and customize models and implementation approaches for Somalia's pastoral context.

The objective of this study is to investigate the feasibility of a drought index insurance for livestock scheme in Somalia. Specifically, the study seeks to inform the Federal Government of Somalia (FGS) and other stakeholders regarding the potential to launch such an initiative in the country, and of its feasibility as a sustainable solution to cushion Somalia's pastoral households against the impacts of severe drought shocks. The study relies on the experiences of bordering regions in Kenya and Ethiopia in the implementation of the index-based livestock insurance (IBLI) product, a satellite-based scheme specifically designed to protect pastoralists living in the arid and semi-arid lands of the Horn of Africa against drought

⁴ The data for determining the Kenya Livestock Insurance Programme (KLIP) payout are provided one month after the index calculation period, and payouts are made within one month after the announcement of results.

shocks. Using the IBLI product design and implementation experience as a reference, the study investigates the feasibility of implementing drought index insurance for livestock by assessing four issues:

- **The importance of livestock for the economy of Somalia, and the impact of drought.** From a national perspective, extensive livestock systems should be central to the national rural economy, rendering drought index insurance for livestock an option to be carefully evaluated in the framework of broader drought risk management strategies. From a development perspective, livestock assets are important to rural livelihoods and welfare, such that their protection would be critical for resilience building initiatives and policies.
- **The socioeconomic context and potential demand for the insurance product (socioeconomic feasibility).** Informed demand is an essential prerequisite for the successful implementation of the product. Protecting livestock assets is an important coping mechanism to minimize the impacts of drought. Findings indicate the importance of raising public awareness across the diverse stakeholder landscape, including among herders and herder groups. Increasing financial literacy and the understanding of insurance products among pastoralists would be a critical thrust of marketing activities for index-based insurance products.
- **The technical design of a satellite-based drought index insurance product for livestock (technical feasibility).** A simple, accurate, low-cost index design is a critical precondition for the low-risk implementation of the insurance scheme. Satellite-based indices provide a reliable assessment of the impact on forage availability, that in turn, is an early indicator of forthcoming impacts of drought on livestock. This product is designed for pastoralists. Although, the scheme could be adapted for homestead livestock.
- **Operational conditions (operational feasibility).** Designing and implementing an efficient supply chain for insurance in remote pastoral areas is challenging and often requires substantial initial investments. An assessment of existing infrastructure and networks for the delivery of financial services, institutional and private sector capacity and interest, existing legal and regulatory frameworks, and technical and financial constraints is therefore essential to inform the level of investment required to launch the initiative.

It should be noted that the scope of a feasibility assessment is limited to the determination of whether basic requirements for an initiative's development and introduction of a drought index-insurance initiative for livestock are met and to critical recommendations for subsequent planning and preparatory stages (see Appendix A for the implementation framework). As such, this assessment aims at providing critical information to government agencies, implementers, and donors to make an informed decision regarding whether and where investing resources in designing and implementing the insurance scheme is worthwhile.

The report is organized as follows. First, a general introduction of the IBLI scheme implemented in East Africa is given in section 1.2. Then the feasibility of a similar scheme in Somalia is analyzed in detail in chapter 2. Finally, conclusions and recommendations for the way forward are summarized in chapter 3.

1.2 Index-Based Livestock Insurance: Case Studies of Kenya and Ethiopia⁵

IBLI is designed to break the perpetual drought-asset depletion cycle in African pastoral lands and lay the basis for a more market-oriented paradigm of drought response, focused on asset protection. Several international organizations, local institutions, and private partners have since 2008 implemented an ambitious research-into-development agenda that would cushion pastoralists against the adverse impacts of

⁵ See Annex for a more detailed presentation of the case studies of Kenya and Ethiopia

drought through an innovative insurance product. Index-based insurance products represent a promising innovation for managing the climate-related risks facing pastoralists.

IBLI is based on satellite indicators of vegetation conditions, which are used to derive an index of the seasonal forage available in a given area. The IBLI product relies on low-cost, accessible, and widely used satellite indicators of drought (i.e., the Normalized Difference Vegetation Index, NDVI) and looks at forage availability specifically during the rainy season(s). The index is computed as the deviation of the cumulative NDVI (i.e., forage availability) across the rainy period (i.e., risk period) in a given area (unit area of insurance, UAI) from its historical average. When the index indicates that the forage availability falls below a predefined threshold, then insured pastoralists within the areas covered receive indemnity payments. The payouts are therefore designed to facilitate the implementation of early coping strategies (such as purchasing fodder, water, and veterinary services; destocking before emergencies; and planning migration, etc.) and mitigate drought impacts on livestock and livelihood.

Since 2010, IBLI products have been adopted by private insurance companies in Kenya and Ethiopia and have been sold and distributed on a commercial basis to pastoralist communities in the drylands of these countries. Value and Impact of IBLI

Evidence from ILRI’s multiyear impact evaluation of the IBLI program in Kenya and Ethiopia indicates considerable social and welfare benefits for pastoralists who have insured their livestock. During drought,

households with IBLI coverage have higher incomes and milk production (Matsuda, Takahashi, and Ikegami 2019), are 27–36 percent less likely to skip meals and 22–36 percent less likely to sell livestock—a practice known as distress selling because this is a period when prices are lowest (Janzen and Carter 2019). At the same time, there is also strong evidence that IBLI coverage increases investments in livestock as a productive asset. A study in Kenya found that over three years of IBLI coverage, average veterinary expenditures doubled, and livestock sales in nondrought years increased by an average of 46 percent of the mean (Jensen, Barrett, and Mude 2017).

Despite the challenges, since their introduction, the insurance programs in Kenya and Ethiopia have provided coverage for over 300,000 cattle equivalents with a value of more than \$145 million.⁶ IBLI has been commercially sold by various insurance companies since 2010 both in Kenya and Ethiopia. Uptake has increased steadily even if gradually, and the private sector continues to be the engine of the programs. A PPP launched in Kenya through KLIP in 2015 has shown the value of public support in rapidly expanding

Box 1. Normalized Difference Vegetation Index

The Normalized Difference Vegetation Index (NDVI) quantifies vegetation growth by measuring the difference between near-infrared and red reflected light. High NDVI values indicate healthier vegetation and low NDVI values indicate little or no vegetation. In the context of index insurance for livestock, NDVI is used as a proxy for forage availability, since during a normal wet year/season, vegetation has higher NDVI than during a drought year/season.

Despite being widely used in several operational systems for early drought warning, rangeland monitoring, and index insurance in Africa, the reported performance of NDVI in assessing rangeland conditions differs across agro-ecological contexts. Alternative satellite indicators of drought are also available, and may be used to compare data or as an alternative. For more on NDVI’s pros and cons and alternative drought indicators, see AghaKouchak et al. (2015).

Source: ILRI

⁶ As of January 2019, the total cumulative value of commercial IBLI purchases in Kenya was 20,577 cattle equivalents valued at \$2.6 million and in Ethiopia 20,700 cattle equivalents valued at \$2.9 million. Furthermore, Kenya’s State Department of Livestock provided coverage for 275,200 cattle equivalents totaling \$38.5 million (55,048 policies for five cattle each, and one cow has an insured value of \$140), through the KLIP.

the program and harmonizing it with a broader set of country-level initiatives for disaster risk management. Strategic public support through targeted subsidies and investments in critical components of a program—such as raising awareness or enhancing information and communication technology infrastructure—can, for example, help the private sector expand the market toward full commercial viability. Government subsidies have played a major role in crowding in the private sector, which is keen to expand into new markets. Insurance companies are now creating necessary infrastructure for sales and promotion of insurance products in general.

Unlike Kenya, where insurance agents are individuals, the model in Ethiopia is community based. Since 2012, when IBLI was introduced in Ethiopia, the insurance company has been working very closely with local cooperatives and microfinance institutions (MFIs) in the delivery of IBLI to pastoralists. The Ethiopian model has two levels of hierarchy: (i) village insurance promoters (VIPs) raise awareness of the product while (ii) sales agents ultimately sell it. The VIPs are responsible for creating the informed demand among the clients and then guiding them to the sales agents, who ultimately issue the policy to the clients/pastoralists. Both the VIPs and sales agents are chosen from cooperatives/MFIs at the kebele level (equivalent to a ward level in Kenya), in consultation with the community elders and the insurance company. The VIPs are given a commission of 8 percent, whereas the sales agents are given a commission of 4 percent for each sale made. Consideration is now being given to tapping into the extensive network of community animal health workers that exist in the kebeles, which could be used to strengthen and expand the scope of the existing agency model in Ethiopia, beyond the Borena region. In both Kenya and Ethiopia, further awareness is facilitated through local radio stations and word of mouth.

Since 2015, insurance companies in Kenya and Ethiopia started using mobile technologies to improve the efficiency and reduce the transaction costs of product distribution. Mobile money is used for premium payments in Kenya. Mobile-based applications are used for sales and clients' registration, and agents' training occurs both in face-to-face meetings as well as online. Though information and communication technology has facilitated a reasonable reduction in the cost of operations, transaction costs for operating in pastoral areas continue to be a significant challenge to achieving full commercial viability of the product. Efforts continue toward improving the product supply chain and delivery channels, while identifying additional services that could be bundled with insurance products to increase their value proposition.

2. Assessing the Feasibility of Livestock Insurance in Somalia

2.1 Contribution of Livestock to Somalia's Economy

This chapter aims to further understanding of whether and where drought index insurance for livestock in Somalia represents a worthwhile investment for the national government and international donors. The importance of the livestock subsector to Somalia's economy is outlined, as is the past and potential impact of drought on the national economy and rural livelihoods, based on a literature review and survey data. The centrality of livestock in Somalia's economy is an important factor, underlining the rationale for providing drought index insurance to protect this asset. Ongoing FGS-led initiatives for disaster risk management and resilience building are also reported.

2.1.1 Somalia: Economic Context

Somalia is the fifth-poorest country in the world; over 80 percent of the population is living in poverty (Pape and Karamba 2019). Extreme poverty is prevalent throughout the country. Eradication of poverty and reduction of vulnerability will continue to be among the most daunting challenges that the FGS must address. The country's poverty levels are estimated to be 26 percent higher than the unweighted average of low-income Sub-Saharan African countries in 2017.

The economy is starting to pick up after more than two decades of civil war, the collapse of the country's governance structure, and pressures from the impact of climate change. Somalia has been in a sustained period of economic and political progress over a decade, having made essential steps in the establishment of sustainable governance structures. There is a strong government commitment to emerge from decades of conflict and fragility by adopting a policy framework supportive of economic development. However, substantial challenges remain, including economic isolation, reconciliation, security sector reform, widespread malnutrition, recurrent drought, and poverty.

The challenges to Somalia's economic development remain daunting, and current growth is insufficient to reduce the vulnerability of a large segment of the population. Somalia's economy is still at a nascent stage; its per capita GDP increased only marginally, from \$435 in 2013 to \$511 in 2017 (World Bank Group 2018b). Such slow economic growth is a manifestation of continued exposure to natural disasters and instability, contributing to low investment levels. Shocks like droughts have a devastating impact, famine is common, and many citizens are displaced. Somalia's economy is overly dependent on foreign aid, remittances, and livestock income.

Furthermore, Somalia is not a member of any regional economic block and has few formal trading agreements, which limits access to global markets and foreign direct investment. As it is not yet a member of the World Trade Organization, businesses in Somalia face hurdles in accessing regional and global markets. Somalia's main export is livestock and 82.5 percent of its livestock exports are to three countries: the United Arab Emirates, Yemen, and Oman. Lack of certification and standards is another important barrier to trade. FGS lacks the capacity to participate in certification schemes or the ability to provide authentic documents to facilitate global business deals. Lack of laws and regulations have made access to formal finance very difficult. The absence of formal systems for regulating businesses results in reliance on systems of customary law and close clan ties. While such systems make it possible to do business in Somalia, lack of regulations and operational guidelines has limited access to finance and, in turn, the expansion of businesses.

2.1.2 Livestock Subsector Overview

The agricultural sector's contribution to GDP increased from 62 percent during the prewar period to over 75 percent. In the early 2010s, 93 percent of exports was from the agriculture sector, with livestock

being the biggest contributor. In addition to substantial contributions to exports, the livestock and crop subsectors remain the main sources of economic activity and employment in Somalia—46 percent of employed people work in the agricultural sector and related activities.

The livestock subsector is the primary contributor to GDP, contributing nearly 40 percent of total GDP. The livestock subsector accounted for over 75 percent of total exports in the 2011–14 period (World Bank 2019), though the figure fluctuates due to drought and international export bans in the past three decades. A significant number of animals are sold on the domestic markets, generating much-needed jobs for the local population, especially women. The production of milk and meat has grown steadily since the late 1980s to satisfy growing urban demand in the country supported by large remittance inflows, with milk consumption, for instance, reaching an estimated gross market value of about \$2.7 billion (World Bank 2019) (\$1.65 billion just for camel milk). The drought of 2016/17 reduced milk production by more than half for camels and up to two-thirds for goats and cows.

Somalia has three livestock production and management systems that include nomadic and transhumance pastoralism, agro-pastoralism, and urban and peri-urban rearing systems. The systems are determined by factors such as natural resource endowment, and pasture and labor availability. Nomadic pastoralism predominates, and is characterized by little or no cropping activities, and high mobility of people and animals in search of water and pasture. While nomadic and transhumance pastoralists are found throughout Somalia, they are concentrated in the northern rangelands of Somaliland and Puntland and the central rangelands. The population engaged in pure pastoralism is 3.2 million or about 26 percent of the total population as per 2014 estimates.

Agro-pastoralism is becoming a significant economic activity, with 22.8 percent (2014 estimates) of the population engaged in farming activities as a way of diversifying their food and income sources. Under agro-pastoralism, farmers graze their animals and grow rainfed crops, and crop residue is used as animal feed after harvesting. Agro-pastoralism is mainly practiced in the Juba and Shabelle river valleys, which receive good rainfall, and where land is more productive. Agro-pastoralism is also common in some areas in the north, where water is sourced from rainwater harvesting, natural springs, oases, and shallow wells. Livestock are also raised in urban and peri-urban areas. Farmers in urban and suburban regions supplement natural grazing with feed and supplements. Animals kept in urban and peri-urban regions tend to be of high value, especially dairy animals that provide milk to households. There are attempts to improve local breeds by mating them with exotic breeds like Friesians to enhance milk production. Such efforts to enhance supply are triggered by increased demand for milk and milk products in emerging markets in Somaliland, Puntland, and southern Somalia.

2.1.3 Drought Shocks and Coping Mechanisms

Drought shocks pose the main challenge faced by pastoralists in Somalia. Somalis are exposed to various idiosyncratic and covariate shocks, which contribute to vulnerability, poverty, and displacement. Drought is the most pronounced, affecting almost 66 percent of households. Crop and livestock loss is prevalent. In addition to weather-related shocks like drought, families are exposed to other shocks like water shortage, theft, insecurity, and high food prices. The impact of each shock becomes more pronounced when households experience multiple types at the same time. For example, the drought of 2016/17 resulted in a massive decline in the market value of animals and reduced milk production because of the deterioration of water and pasture conditions. The pastoralists lost between 25 and 75 percent of their herds in the first half of 2017 due to high death rates and distress sales, coupled with low birth rates (Pape and Karamba 2019). Damages from the 2016/17 drought likely exceeded \$3.25 billion, amounting to 50 percent of annual GDP (World Bank Group 2018a). Livestock and environmental and natural resources management were the sectors most affected.

Somalia currently has no formal safety nets, and, in their absence, self-insurance is the primary coping strategy for many households. Pastoralists rely on a combination of livelihood and production strategies. The strategies employed include accessing and managing natural resources, mainly pasture and

water sources. In addition, pastoralists maintain high mobility across large tracks of land to make the most effective use of scarce resources and in response to weather conditions. These strategies have made it possible to effectively address the challenges that characterize their environment and maintain a viable production system. However, global environmental changes have negatively impacted their coping strategies; the drought shocks have become more pronounced and more frequent. Other constraints associated with livestock production are also on an upward trend. Such constraints include water shortages and availability of and access to quality pasture and animal feed, especially during drought. The invasion of unpalatable plant species is reducing the area covered by useful pasture. Other challenges include land degradation due to increased deforestation and overgrazing. The increase of transboundary animal diseases is also becoming a major concern and a threat to pastoralism.

In the absence of organized mechanisms to respond to shocks, households resort to negative coping strategies that may exacerbate an already bad situation. Such mechanisms include migration, reduction of meals taken per day, forced selling of livestock at throwaway prices, and, in extreme cases, disposal of meager household goods. Drought outstretches people's ability to acquire food, provide adequate feeding and services, causes poor breed of animals and migration becomes an option when local resources can no longer provide adequate support. In Somalia, drought shocks result in an amplified influx of internally displaced persons (IDPs), as the camps hosting them become the only places that can guarantee access to food. Secondary negative impacts include increased conflicts among communities, as competition for scarce animal feed, water, and grazeable pasture becomes acute.

Remittances also play an important role in cushioning households from shocks. The flow of remittances increases during periods of severe shock. This is because family members in the diaspora send more money during economic downturns, disasters, conflicts, or other adverse shocks. A recent Somali Poverty and Vulnerability Assessment finds that international remittances help households cope with droughts. Transfers from friends and relatives abroad played a key role in reducing the distress caused by drought (Plaza and Wollburg 2019). The poor therefore are most affected during shocks because of the limited flow of external resources, including remittances or international aid. Access to external assistance is greatest in urban areas, leading to a disproportionate increase in rural poverty.

2.1.4 Government Efforts toward Addressing Drought-Related Vulnerabilities

The National Disaster Management Policy (NDP 2017–19) represents a strong government attempt to support both short-term recovery from and long-term resilience to recurrent drought-related shocks. NDP 2017–19 outlines the government's intentions and guidance in addressing resilience and social protection. The vision of this policy is to ensure that the most marginalized individuals become productive members of society and the economy, and the most vulnerable live with dignity and safety. The policy's priorities include disaster mitigation. The government sees a strong link between development and disaster management. A risk transfer mechanism could be a useful tool for reducing individuals' vulnerabilities, helping households cope with shock and stress, and helping communities withstand the adverse effects of disasters.

FGS, with support from the World Bank, undertook a Drought Impact Need Assessment (DINA) and then organized a Resilience and Recovery Framework (RRF) (World Bank Group 2018a) in 2017. The objective was to identify the risk factors of drought shocks and develop a medium- to long-term strategy for recovery and resilience. The DINA and RRF outline the government's role in addressing recurrent shocks faced by citizens. The RRF outlines a systematic path of progress from early drought recovery to longer-term resilience and disaster preparedness. Following this path would enable the country to break away from a vicious cycle of vulnerability and humanitarian crisis to a more organized and predictable set

of response systems. The RRF aligns well with the 2018 Humanitarian Response Plan and the NDP 2017–19, and sets Somalia on the path toward achieving the Sustainable Development Goals.

Box 3. Key Findings—Importance of the Livestock Subsector

Livestock plays a central role in Somalia’s national and rural economy, and drought shocks have a dramatic impact on the gross domestic product and pastoralists’ welfare. An ex ante intervention that focuses on a clear, transparent, and timely response would enhance rural resilience by cushioning poor pastoral households from loss of livelihood. In reference to the Kenya Livestock Insurance Programme, insurance mechanisms tested in other countries have proved to be a useful tool for stabilizing households’ incomes and addressing the negative impacts of climate-change-related challenges. The Federal Government of Somalia recognizes the need for anchor projects with the potential to catalyze Somalia’s long-term development objectives. Livestock insurance offers an opportunity to transfer risk to financial markets and crowd in private capital and is best considered as a component of a multilayered drought risk management strategy combining multiple instruments.

2.2 Socioeconomic Feasibility

The socioeconomic feasibility of drought index insurance for livestock depends on the expected demand for the product from pastoral and agro-pastoral households. This in turn depends on several conditions: the importance of livestock for livelihoods and welfare, households’ vulnerability to drought shocks, the potential impact of drought on livestock assets, and the importance of livestock as a coping mechanism. These preconditions, if in place, bolster the rationale for introducing financial innovations of the IBLI type.

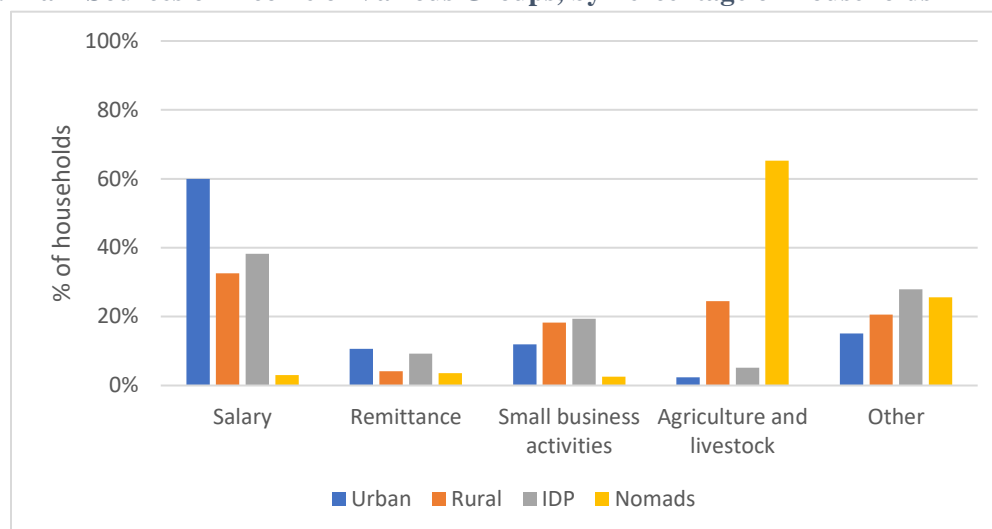
To assess feasibility, we employ two waves of the Somali High Frequency Survey (SHFS) data, which were collected by the World Bank.⁷ The first wave was collected in February and March 2016, just as the severe 2016/17 drought had begun. The second survey was conducted in December 2017, which is about the time that the rains arrived that would eventually end the 2016/17 drought. This second wave of the SHFS utilized a larger, more representative sample, so we depend on it and look at the first wave mostly for comparison purposes. A detailed discussion of the sampling design and sampling frame associated with the SHFS data is offered in Pape and Wollburg (2019a, 2019b). In this section, we focus on the relevance of risk-mitigating tools such as IBLI, while the World Bank (2019) provides a more broader poverty profile of the region using the same data. (See Appendix C for a more detailed description of the methods used.)

2.2.1 Importance of Livestock for Household Welfare and Food Security

Despite substantial differences in livelihood strategies across the various population groups, rural and nomadic populations rely heavily on agriculture and livestock production. More than 60 percent of Somalia’s nomadic population and about 25 percent of its rural population rely on agriculture and livestock production for their primary livelihood (figure 2).

⁷ See World Bank Group (2018c) for more information on the survey.

Figure 2. Main Sources of Income of Various Groups, by Percentage of Households



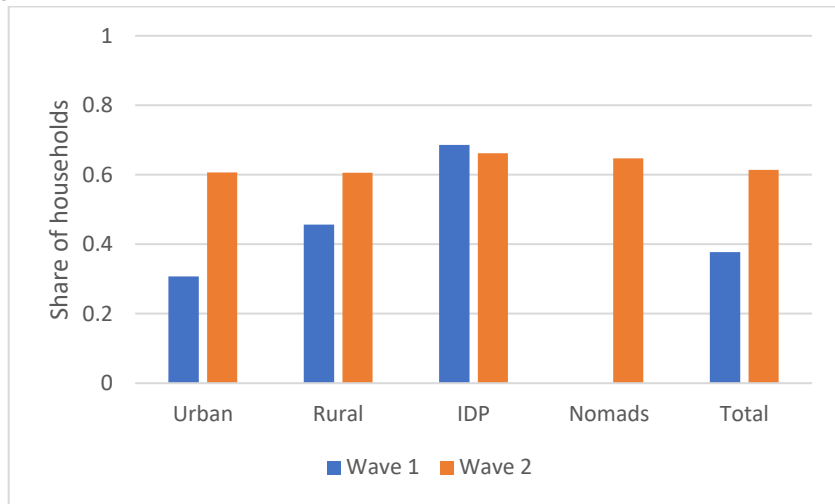
Source: Authors' calculations using data from the 2nd wave of the SHFS.

Note: Sampled households report five major sources of livelihood/income, including salaried employment, remittances, small business activities, agriculture and livestock, and other sources. Shares and values are weighted using sampling weights. IDP = internally displaced person; SHFS = Somali High Frequency Survey.

Poverty remains a dominant feature of most Somalian households, with IDP settlements and nomads having the highest poverty rates. These population groups are the most vulnerable, even in terms of other measures and indicators of poverty (Pape and Karamba 2019). For instance, the second wave of the SHFS shows that about 60 percent of the overall sample remain poor, with variations in poverty rates across population types and livelihood options (figure 3).⁸ Poverty rates are generally more pronounced in the second wave (2017) of the SHFS data than the first wave (2016). This may relate to the severe drought that hit many of the Somalian regions after the first wave of the survey. Other recent studies have also shown that this severe drought significantly affected households' well-being (Pape and Wollburg 2019b).

⁸ Households are classified as poor if their total daily consumption per capita falls below the international poverty line of \$1.90 (in purchasing power parity).

Figure 3. Poverty Rates across the Two Waves of the Somali High Frequency Survey, and by Population Type

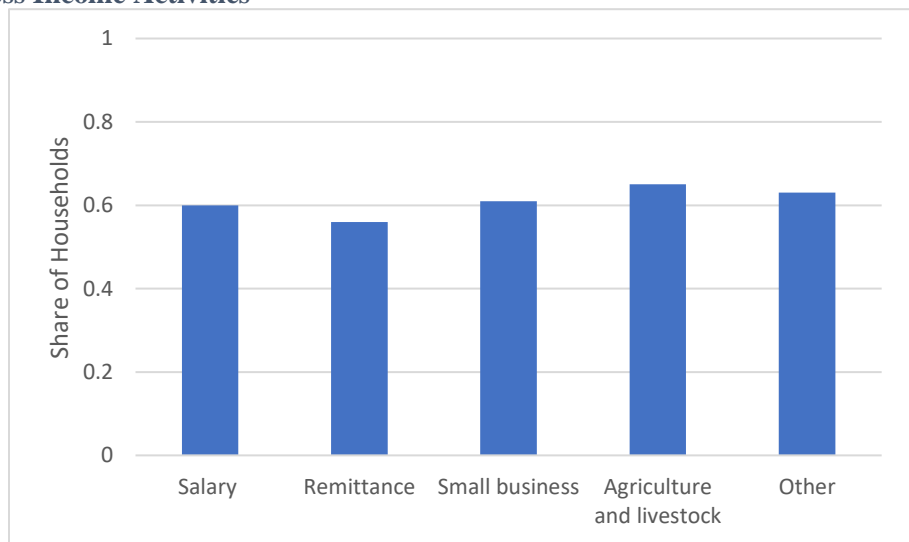


Source: Authors’ calculations using data from the 2nd wave of the SHFS.

Note: Households are classified as poor if their total daily consumption per capita falls below the international poverty line of \$1.90 (in purchasing power parity). IDP = internally displaced person; SHFS = Somali High Frequency Survey.

Those households relying on agriculture and livestock production exhibit the highest rates of poverty, followed by those relying on small business activities (figure 4). This is consistent with recent evaluations showing that the severe drought in 2016/17 in Somalia had the greatest impact on those households relying on agriculture (e.g., Pape and Wollburg 2019b). Those households receiving remittances show the lowest poverty rates.⁹

Figure 4. Poverty Rates across Income Activities



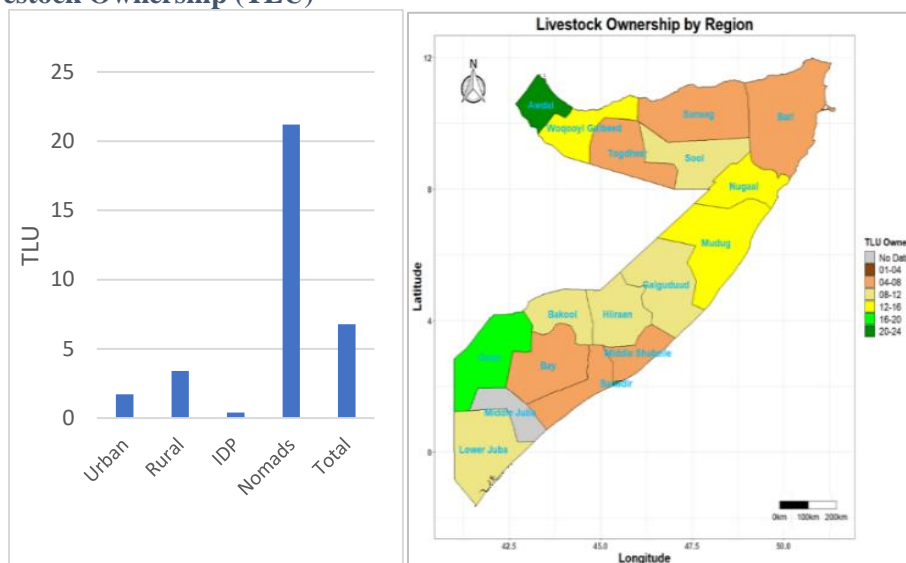
Source: Authors’ calculations using data from the 2nd wave of the SHFS.

⁹ In additional analysis, we find that poverty rates are inversely related to the amount of per capita remittance they receive. (Analysis available on request.)

Note: Households are classified as poor if their total daily consumption per capita falls below the international poverty line of \$1.90 (in purchasing power parity). SHFS = Somali High Frequency Survey.

On average, rural households own about 4 TLUs of livestock, whereas the nomadic population owns about 21 TLUs (figure 5). Those households relying on agriculture and livestock production own the highest number of livestock units. The right-hand panel of figure 5 maps the distribution of livestock ownership by region. The highest level of livestock ownership is in Awdal and Woqooyi Galbeed in the north, Nugaal and Mudug in the central region, and Gedo in the south.

Figure 5. Livestock Ownership (TLU)



Source: Authors' calculations using data from the 2nd wave of the SHFS.

Note: Livestock ownership levels, measured by tropical livestock unit (TLU), disaggregated across the different population groups (left), and livestock ownership by administrative region (right). IDP = internally displaced person; SHFS = Somali High Frequency Survey.

Poverty and food security improve with livestock ownership. For instance, 73 percent of the rural population with low or no livestock have daily per capita consumption levels below the poverty line of \$1.90, while 41 percent of households with the most livestock have daily per capita consumption levels above the poverty line (table 1). Similar patterns can be observed among the other indicators of food security (except in the case of the hunger experienced among nomadic households—the incidence of hunger seems to increase as herd sizes increase).¹⁰ Despite the challenges associated with establishing a causal link between livestock ownership and food security, these relationships highlight the importance of livestock in the livelihoods of the rural and nomadic populations in Somalia.

Table 1. Relationship between Livestock Ownership, Poverty, and Food Insecurity

Population Type	Livestock Ownership	No. of Obs.	TLU	Poverty (Share Poor)	Daily real per capita consumption (\$)	Hunger Experience	Remittance	Sell Livestock to Cope
Rural	Low	381	0.00	0.73	1.33	0.44	0.10	0.09
	Medium	357	0.76	0.78	1.06	0.55	0.14	0.14

¹⁰ Hunger experience is a binary variable equal to 1 if a household reports having experienced hunger within the household in the past four weeks.

Nomadic	High	368	13.7	0.41	2.10	0.35	0.13	0.41
	Low	169	5.70	0.76	1.11	0.39	0.10	0.39
	Medium	169	14.9	0.70	1.23	0.49	0.12	0.42
	High	169	41.6	0.53	1.88	0.62	0.18	0.53

Source: Authors' calculations using data from the 2nd wave of the SHFS.

Note: For each population type of interest (rural and nomadic), livestock ownership has been classified into terciles of TLUs. For each livestock ownership tercile, the table displays the average values of each poverty and food security indicator. SHFS = Somali High Frequency Survey; TLU = tropical livestock unit.

2.2.2 Impact of Drought on Livestock Assets

Both poverty rates and households' food security, as measured by their experience of hunger in the past 4 weeks, nearly doubled between survey rounds of the SHFS. This is as anticipated, since the first wave was collected early in the drought that struck many parts of Somalia, while households had lived through many months of drought by the time of the second survey wave. As shown in table 2, drought is the most frequently reported shock, affecting about 39 percent of households. Furthermore, most of the other types of shocks listed in table 2 are closely related to or are triggered by drought, for example, water shortage, crop failure, livestock mortality, and food price increases.

Table 2. Poverty and Food Security Status as Well as Different Types of Shocks that Households Have Experienced in the Past 12 Months

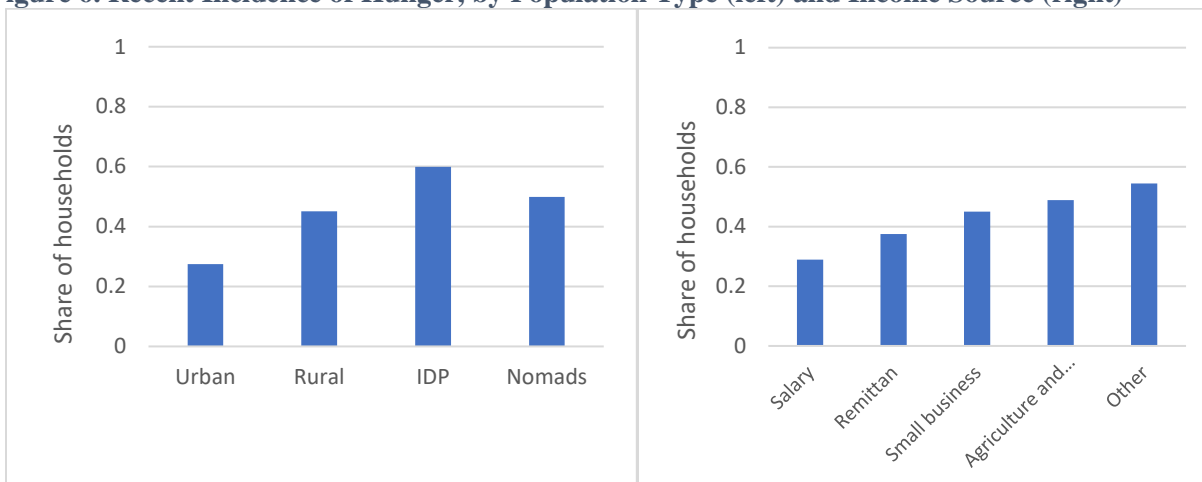
Variables of Interest	Wave 1 (2016)		Wave 2 (2017)	
	Mean	Standard Deviation	Mean	Standard Deviation
Hunger experience	0.227	0.419	0.401	0.490
Poor (poverty rate)	0.377	0.485	0.614	0.487
Shock: Drought experience			0.388	0.487
Shock: Water shortage			0.177	0.382
Shock: Crop failure			0.123	0.328
Shock: Livestock mortality			0.117	0.322
Shock: Food price rise			0.221	0.415

Source: Authors' calculations using data from the SHFS.

Note: Shock type was not collected during wave 1. SHFS = Somali High Frequency Survey.

IDPs suffer from the highest levels of food insecurity, followed by rural and nomadic populations. Moreover, those households relying on agriculture and livestock production reported the highest rate of food insecurity (figure 6). These relationships are consistent with the poverty rates shown in figure 3. Overall, these figures suggest that IDPs and those households relying on agriculture and livestock production are particularly vulnerable to food insecurity problems.

Figure 6. Recent Incidence of Hunger, by Population Type (left) and Income Source (right)

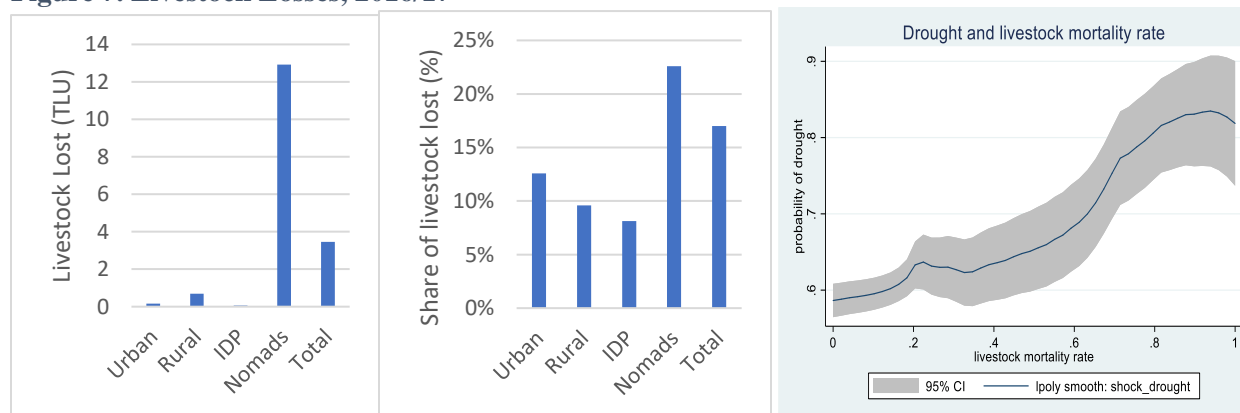


Source: Authors' calculations using data from the 2nd wave of the SHFS.

Note: IDP = internally displaced person; SHFS = Somali High Frequency Survey.

Livestock assets are prone to weather-related shocks that financial tools such as IBLI can protect against. Financial innovations of the IBLI type can provide households with financial resources to buy fodder and forage, and hence instrumentally protect these important productive assets. The nomadic population, which owns the highest number of livestock units, experienced the highest livestock mortality levels (figure 7, left panel) and rates (figure 7, center panel). The nomadic population lost about 23 percent of its livestock assets over the 2016/17 drought year. To uncover the relationship between livestock mortality and self-reported weather-related shocks, the right panel in figure 7 shows a positive association between livestock mortality rates and drought experiences; households experiencing weather-related shocks report higher livestock mortality rates.

Figure 7. Livestock Losses, 2016/17

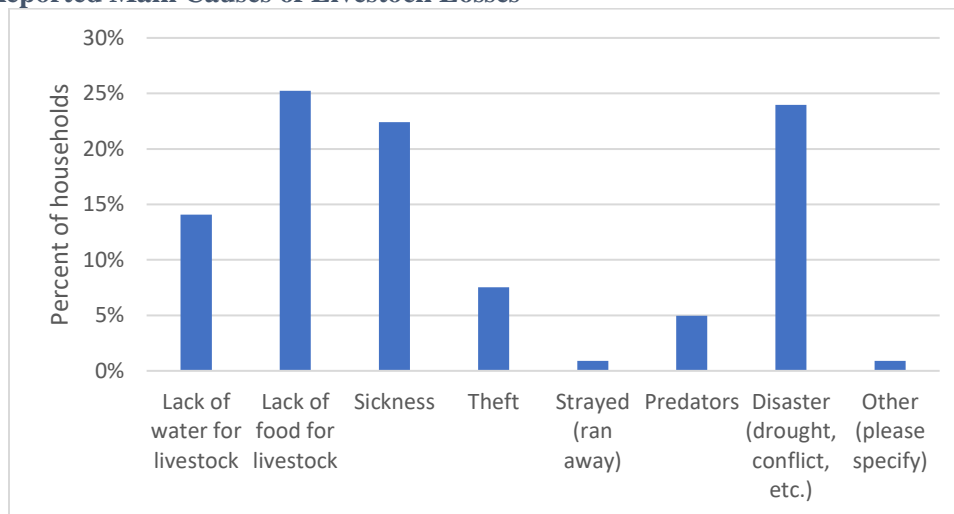


Source: Authors' calculations using data from the 2nd wave of the SHFS.

Note: The left-hand panel illustrates the mean livestock mortality levels across different population types. The center panel illustrates the livestock mortality rates across population types. The right-hand panel illustrates the association between livestock mortality rates (x-axis) and likelihood of reporting a drought shock (y-axis). CI = confidence interval; IDP = internally displaced person; SHFS = Somali High Frequency Survey; TLU = tropical livestock unit.

Lack of food for livestock is the most commonly reported cause of livestock losses, followed by drought and sickness (figure 8). Furthermore, sickness and lack of water, both of which are often correlated with drought, are also important causes of livestock mortality. Disaster, which includes drought generally as well as conflict, has a significant impact. Again, the evidence highlights the adverse effects of weather-related shocks and implies that, despite the fact that rural households and pastoralists may face several sources of production risk, insuring against weather-related shocks can have important implications for households relying on livestock production.

Figure 8. Reported Main Causes of Livestock Losses



Source: Authors' calculations using data from the 2nd wave of the SHFS.

Note: SHFS = Somali High Frequency Survey.

2.2.3 Household Vulnerability to Weather-Related Shocks and Coping Mechanisms

Exposure to various types of shocks is associated with a higher rate of hunger experience, but livestock assets have important roles and implications in absorbing some of the adverse effects of weather-related shocks. In table 3, the coefficient estimates in the second (Livestock: 2nd tercile) and third (Livestock: 3rd tercile) rows show that hunger is most often experienced by households with larger herds—that is, households depending more on livestock. Conditional on the hunger experience, those with larger livestock holdings (those in the 2nd and 3rd tercile of livestock ownership) are less affected by each shock than those with smaller herds. Alternatively, those with the smallest herds are most effected by shocks.

Current data do not allow for an analysis of affordability or projected demand in Somalia. But pastoralists' purchase behaviors around IBLI in neighboring Kenya and Ethiopia offer key insights. Assessments of how household characteristics relate to demand find that men and women, young and old, purchase insurance. Further, even those households with smaller herds and relatively less wealth purchase insurance, although there are some differences in uptake patterns (Bageant and Barrett 2017; Jensen, Mude, and Barrett 2018). Importantly, neither herd size nor income seems to be a determining factor; households with large and small herds, and big and small incomes purchase insurance (Jensen, Mude, and Barrett 2018). The basic principle that allows uptake to be mostly detached from income is that households can sell a single animal to insure the remaining herd, which is very consistent with the insurance model of the intertemporal reallocation of resources.

Price, on the other hand, has a large impact on demand for insurance. Recent research shows that the price elasticity of demand for IBLI among pastoralists in Kenya is -1.18 on average, meaning that a subsidy of 10 percent is expected to increase uptake by 12 percent (Jensen, Mude, and Barrett 2018). A different study in the same region also concludes that subsidies would likely have a large impact on demand for IBLI, and suggests that they be applied to increase uptake (Chantarat, Mude, and Barrett 2009).

Households in Somalia have used various strategies to reduce risks to their livelihood from livestock losses during bad years, such as drought years. The most important strategies are the production of livestock feed to store for bad years, purchase of livestock feed to store for bad years, and the saving of money (cash) so that livestock inputs can be purchased. It is important to note that in many pastoral communities, informal risk pooling strategies, such as redistributing livestock or lending livestock to help rebuild herds, are common. This refers to basic breed where those who have given cows to those who do not have normally done to ensure the household receiving the cows benefit from the milk and calves. But such risk pools are usually local, providing effective support in response to idiosyncratic risks but are vulnerable to the large covariate risks that IBLI-type index insurance for extensive rangelands target (Hurst et al. 2012).

Table 3. Shocks, Livestock Ownership, and Food Security

Explanatory Variables	Hunger Experience	Hunger Experience	Hunger Experience	Hunger Experience	Hunger Experience
Shock: Drought	0.127** (0.020)				
Livestock: 2nd tercile	0.010 (0.025)	0.019 (0.021)	0.017 (0.021)	0.018 (0.021)	0.063*** (0.024)
Livestock: 3rd tercile	0.112*** (0.022)	0.142*** (0.017)	0.134*** (0.016)	0.141*** (0.016)	0.152*** (0.016)
Shock: Drought #2nd tercile	-0.033 (0.042)				
Shock: Drought #3rd tercile	-0.047 (0.032)				
Shock: Water shortage		0.169*** (0.035)			
Shock: Water shortage #2nd tercile		-0.118* (0.063)			
Shock: Water shortage #3rd tercile		-0.162*** (0.042)			
Shock: Crop failure			0.107*** (0.041)		
Shock: Crop failure #2nd tercile			-0.103 (0.066)		
Shock: Crop failure #3rd tercile			-0.067 (0.048)		
Shock: Livestock loss				0.187*** (0.049)	
Shock: Livestock loss #2nd tercile				-0.158** (0.077)	
Shock: Livestock loss #3rd tercile				-0.163*** (0.056)	
Shock: Food price rise					0.070*** (0.023)
Shock: Food price rise #2nd tercile					-0.177***

					(0.045)
Shock: Food price rise #3rd tercile					-0.078** (0.034)
Constant	0.329*** (0.009)	0.346*** (0.009)	0.349*** (0.009)	0.348*** (0.009)	0.343*** (0.009)
No. observations	6,030	5,895	5,812	5,849	5,849

Source: Authors' calculations using data from the 2nd wave of the SHFS.

Note: This table provides the association between various forms of weather shocks and household food security as well as between livestock ownership and food security, in particular regarding the role of livestock assets in absorbing the adverse effects of weather-related shocks. The potential of livestock ownership in absorbing the adverse effects of shocks can be shown by interacting livestock ownership and the incidence of different types of weather-related shocks. Livestock ownership is classified into terciles, with the first tercile standing for the lowest level of ownership and the third tercile representing the highest level of livestock ownership. Hunger experience is an indicator variable for those households experiencing hunger in the last four weeks. Hence, results represent linear probability model estimates. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. SHFS = Somali High Frequency Survey.

Box 4. Key Findings—Socioeconomic Feasibility

Information collected during wave 1 and wave 2 of the Somali High Frequency Survey provides suggestive evidence that there are favorable socioeconomic conditions for implementing drought index insurance for livestock and that this could help pastoralists and agro-pastoralists manage drought-related livestock losses. Rural and nomadic populations are critically affected by weather-related shocks. Drought reinforces the already-high poverty and food insecurity rates among this population and has dramatic impacts on livestock assets. This offers a strong rationale for insurance as a worthwhile investment. Livestock ownership is negatively correlated with poverty and food insecurity, and livestock assets serve important roles in absorbing some of the adverse effects of drought shocks. Finally, existing coping strategies do not completely absorb the adverse effects of drought on food security. Despite the important roles of remittances and other coping mechanisms, these instruments and mechanisms cannot completely protect against or capture the adverse effects of drought.

Analysis of pastoralists' purchase behaviors around index-based livestock insurance in nearby Ethiopia and Kenya shows that some pastoralists will purchase insurance at commercial rates, but empirical assessments of uptake show that they are extremely price sensitive. Such price sensitivity highlights the important role that subsidies can play in increasing uptake.

2.3 Technical Feasibility

The technical design of IBLI is based on a satellite indicator of forage availability, the Normalized Difference Vegetation Index (NDVI; Vrieling et al. 2016). For successful implementation, three major premises must be met, including:

- (i) **Dominance of extensive rangelands to provide a clear linkage between satellite NDVI values and ground forage conditions.** The estimation of forage indices is built on spatial aggregation of predefined units, referred to as unit areas of insurance (UAIs). Thus heterogeneous landscapes, such as agropastoral systems, mixed crops, agroforest areas, etc., are challenging to IBLI design.

- (ii) **Sufficient forage production to be detected by clear satellite NDVI signals.** Since NDVI is used as an indicator of forage availability for determining insurance index and payouts, rangelands that have little or no forage resources, such as barren lands, must be identified and eliminated.
- (iii) **Clear seasonal patterns for both wet and dry seasons to allow identification of the risk period and related insurance parameters.** (i.e., coverage period, sales windows, time of payouts). Other factors, such as drought history and migration patterns, are also important elements to be considered when designing the index.

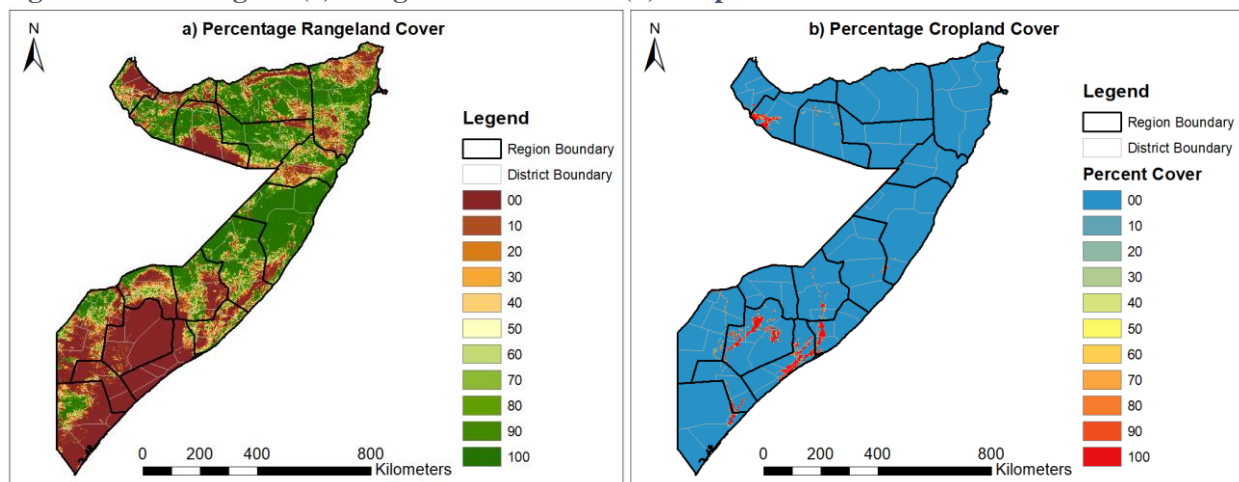
Thus, analysis is based on satellite data, including NDVI time series, rainfall estimates, phenological metrics, and land cover characteristics defining cropland/rangeland extent. Additional geospatial data sets include those of district-level administrative units, used as the basic building blocks for identification of UAs (Chelang’a et al. 2017).

An IBLI-like product was simulated for Somalia to assess its consistency with reported livestock losses and drought experiences in 2017, as obtained from the 2nd wave of the SHFS (see chapter 2.3). In addition, to assess drought history and run a preliminary risk analysis, a simulation exercise was carried out assuming an IBLI-like contract to estimate the historical payouts for Somalia for the short rains in 2002 through the short rains in 2018. Further details on data and methods and a map of Somalia’s administrative units are presented in the Appendix B.

2.3.1 Feasibility of Product Design

Extensive rangelands dominate a vast portion of Somalia, particularly in the northern and central regions. Only the southern regions of Juba, Shabelle, and Bay present mixed systems with dominating agroforestry and cropping systems. These southern areas are therefore not fully suitable for IBLI implementation (figure 9).

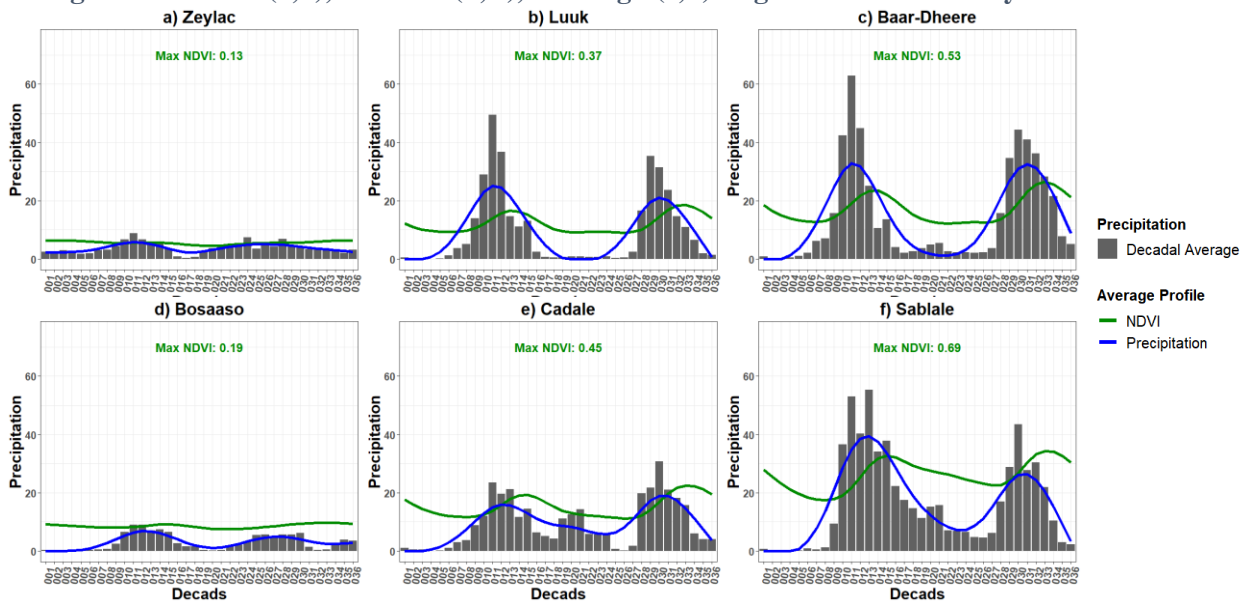
Figure 9. Percentage of (a) Rangeland Cover and (b) Cropland Cover



Source: Author’s own elaboration. Derived from the Joint Research Centre cropland and rangeland masks used in the Anomaly Hot Spots of Agricultural Production (ASAP) early warning system.

The rainfall and vegetation growth patterns show a well-defined bimodal seasonality, allowing for a clear definition of two distinct risk periods. This is a typical pattern observed in the Horn of Africa, including the Kenyan and Ethiopian regions where IBLI has been implemented. The main seasons are between March/April and June/July and between September/October and January. In the northern coastal region, a small area has unimodal or unclear seasonality, and more detailed analyses would be required to design the contract for those locations (figure 10).

Figure 10. Example of Average Seasonal Rainfall and NDVI Profiles for Districts in Somalia, Showing Areas of Low (a,d), Medium (b, e), and High (c, f) Vegetation Productivity

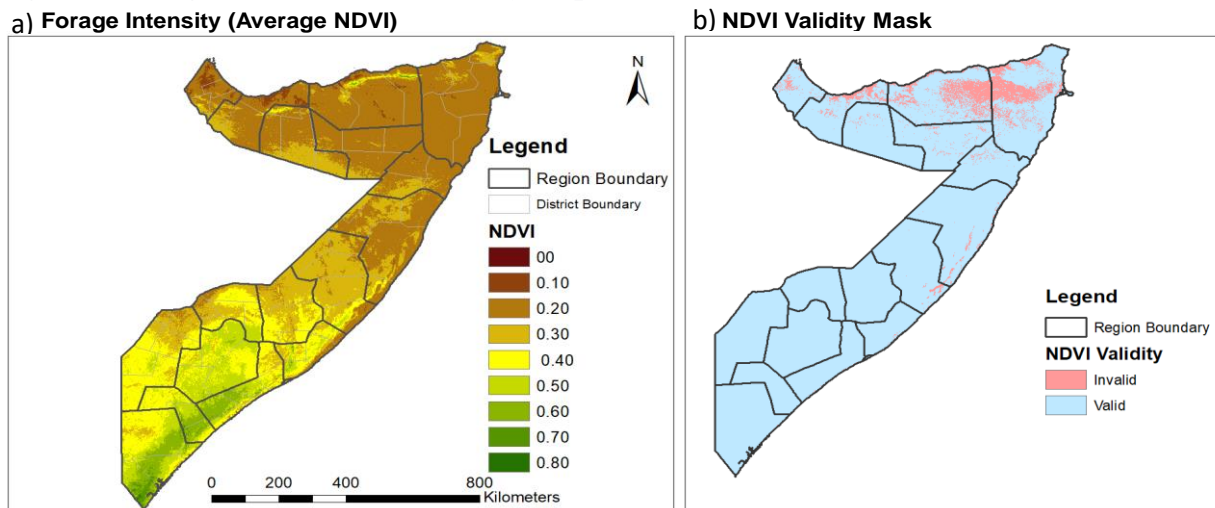


Source: Authors’ own elaboration. Derived from CHIRPS and eMODIS, NDVI datasets

Note: eMODIS = Earth Resources Observation and Science (EROS) Moderate Resolution Imaging Spectroradiometer; CHIRPS = Climate Hazards Group InfraRed Precipitation with Station data; NDVI = Normalized Difference Vegetation Index.

The NDVI signal is sufficiently clear and strong for the majority of Somalia. A significant portion of the northern regions of Bari and Saanag have a very low signal because they are dominated by barren lands (figure 11). To address these issues, it would be advisable to conduct a more in-depth analysis to evaluate the product accuracy and alternative product design options in low vegetated areas.

Figure 11. Rangeland and NDVI Intensity Maps



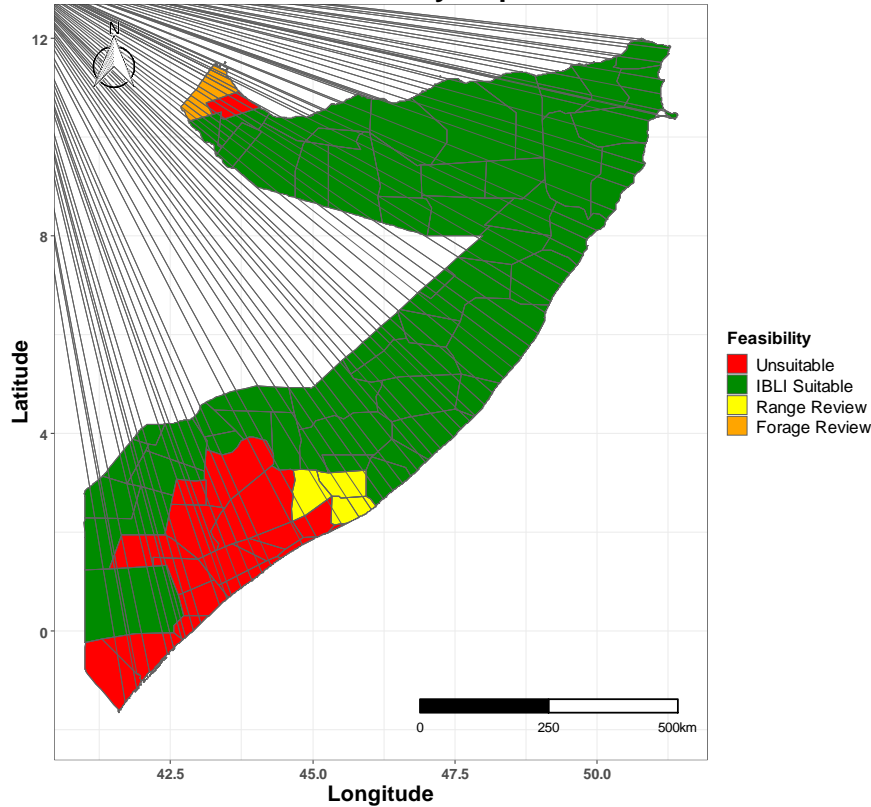
Source: Authors’ own elaboration. Forage intensity measured using the long-term average of NDVI for years 2003–2018 from the eMODIS data set; and NDVI validity mask derived from the NDVI time series data.

Note: eMODIS = Earth Resources Observation and Science (EROS) Moderate Resolution Imaging Spectroradiometer; NDVI = Normalized Difference Vegetation Index.

Overall, about 70 percent of Somalia has the agroecological characteristics suitable for IBLI implementation while about 6 percent, mainly in the northern regions, would require a more in-depth analysis to assess if an accurate index could be designed and to what extent these areas are effectively

accessible and used by pastoralists. About 24 percent of the UAIs (districts) found unsuitable for IBLI are generally found in the southern region, where crop or forestry production systems dominate (figure 12). In some of the northern districts, where the NDVI signal is low (figure 11b), the application of a mask to remove bare lands would be necessary.

Figure 12. Overall Technical Feasibility of Drought Index Insurance for Livestock in Somalia
IBLI Feasibility Map

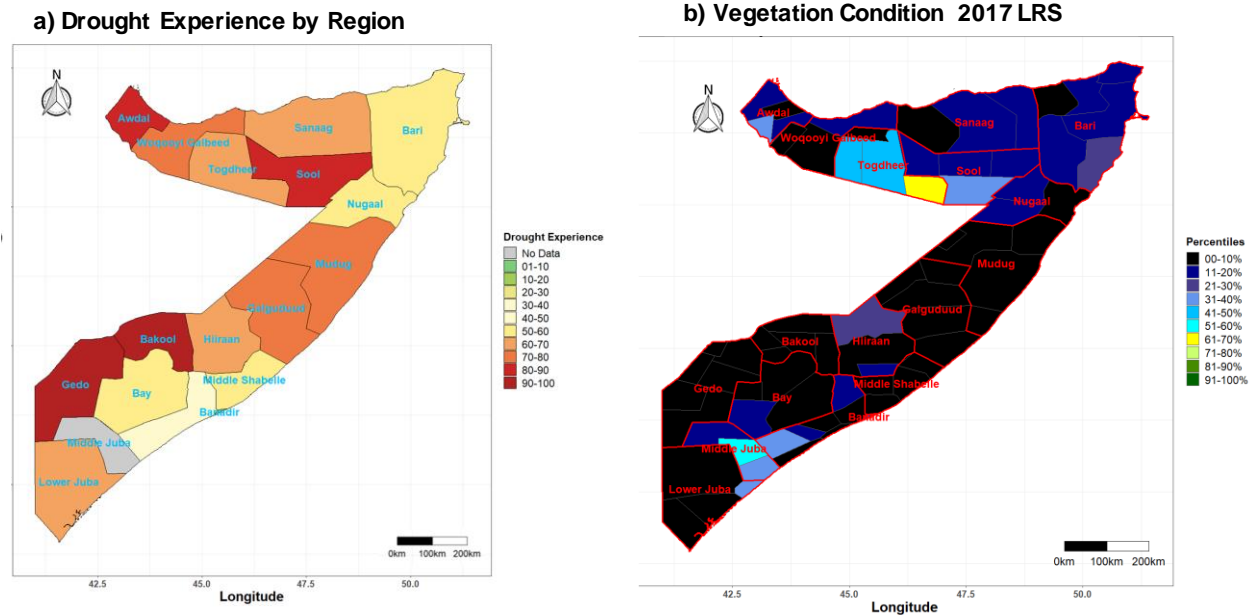


Source: Authors' own elaboration combining multiple indicators of technical feasibility as described in Appendix B.
Note: IBLI = Index-Based Livestock Insurance.

2.3.2 Application of an IBLI-Like Product and Scenario Analysis

SHFS data for 2017 show that the highest drought experience that year was reported in Gedo and Bakool in the south and Sool and Awdal in the north. The IBLI index map for the long rains of 2017, expressing the forage availability at the end of the growing season and the payout areas (black), shows consistent spatial patterns with the drought experience map, especially for southern and central Somalia (figure 13). In the north of the country the spatial consistency is less evident, perhaps reflecting a need to improve the product design, given the vast extent of areas with limited rangeland cover. Overall, although more in-depth analyses would be necessary to test the accuracy of the model, this suggests a clear connection between perceived drought conditions and forage availability as measured by the IBLI index.

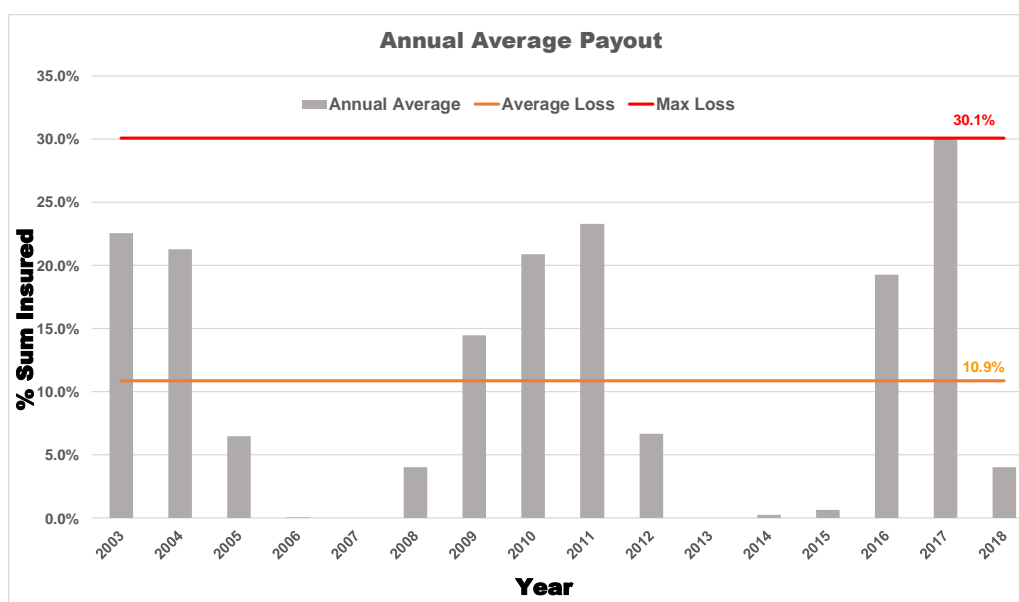
Figure 13. Spatial Distribution of Drought Experience by (a) Remote-Sensing-Based Forage Availability, 2017, and (b) Percentiles Indicating Forage Availability, 2002–17



Source: Authors’ own elaboration using a) data from the second wave of the SHFS, and b) eMODIS NDVI dataset 2003-2018

The simulation of an IBLI-like scheme between 2003 and 2018 in Somalia shows that there would have been insurance payouts in 7 of the 16 years (figure 14). The simulated average seasonal historical payouts for the feasible IBLI units were 6.2 percent and 4.7 percent for the first and second rainy seasons, respectively, amounting to an annual average loss of 10.9 percent and an annual average maximum loss of 30.1 percent observed in year 2017. Future analysis might identify trends (climate change susceptibility) to understand how these trends impact severities of drought.

Figure 14. Historical Annual Average Percentage Payouts in Districts Where IBLI Would Be Feasible, 2003–18



Source: Authors' own elaboration from eMODIS NDVI dataset 2003-2018

To provide a simplified overview of the working principle and cost implications of IBLI, table 4 illustrates cost scenarios (i.e., from a small-scale study covering 5,000 beneficiaries to a large-scale one covering 100,000 beneficiaries) for a hypothetical IBLI-like scheme over the period 2003–18 in Somalia. The simulated scheme covers 5 TLUs per beneficiary and a total sum insured of \$140 per TLU (similar to the Kenyan scheme). A commercial premium rate of 15 percent has been set, assuming a commercial loading on the pure premium rates of about 30 percent. In the scenario analysis, costs of a 70 percent subsidy are also reported. According to this simulation, a medium-sized program covering 20,000 households, for example, would require a yearly investment in premiums of \$2.1 million. During a major drought such as that in 2016–17 (i.e., two seasons), payouts would have been in the order of \$7 million, and beneficiaries would have received on average approximately \$350 to protect their livestock.

Table 4. Simulation of an IBLI-Like Contract in Somalia, 2003–18

YEAR	SCENARIO 1 (USD)	SCENARIO 2 (USD)	SCENARIO 3 (USD)	SCENARIO 4 (USD)	SCENARIO 5 (USD)
2003	790,364	1,580,727	3,161,455	7,903,637	15,807,274
2004	744,275	1,488,551	2,977,102	7,442,755	14,885,509
2005	227,046	454,092	908,185	2,270,461	4,540,923
2006	660	1,321	2,642	6,604	13,208
2007	0	0	0	0	0
2008	140,999	281,999	563,997	1,409,993	2,819,986
2009	505,865	1,011,731	2,023,462	5,058,654	10,117,308
2010	731,174	1,462,348	2,924,695	7,311,738	14,623,476
2011	814,520	1,629,040	3,258,080	8,145,200	16,290,400
2012	233,896	467,792	935,584	2,338,961	4,677,922
2013	0	0	0	0	0
2014	8,601	17,202	34,405	86,011	172,023
2015	22,332	44,664	89,327	223,318	446,635

2016	674,997	1,349,994	2,699,987	6,749,969	13,499,937
2017	1,053,046	2,106,091	4,212,183	10,530,457	21,060,915
2018	140,600	281,199	562,399	1,405,996	2,811,993
Average Payout	380,523	761,047	1,522,094	3,805,235	7,610,469
Maximum Payout	1,053,046	2,106,091	4,212,183	10,530,457	21,060,915
Annual Premium	525,000	1,050,000	2,100,000	5,250,000	11,200,000
Maximum Annual Loss	528,046	1,056,091	2,112,183	5,280,457	9,860,915
70% Annual Subsidy	367,500	735,000	1,470,000	3,675,000	7,840,000
Total Premium	8,400,000	16,800,000	33,600,000	84,000,000	179,200,000
Total Payouts	6,088,375	12,176,751	24,353,502	60,883,754	121,767,509
Total 70% subsidy	5,880,000	11,760,000	23,520,000	58,800,000	125,440,000

Source: Authors' own elaboration from eMODIS NDVI dataset 2003–2018

Note: Assuming a coverage of 5,000 (S1), 10,000 (S2), 20,000 (S3), 50,000 (S4), and 100,000 (S5) beneficiaries. The simulation assumes the coverage of five tropical livestock units (TLUs) per beneficiary, a total sum insured of \$140 per year (58 percent allocated to the first season, 42 percent allocated to the second season), and a commercial premium at 15 percent. The estimated outputs in U.S. dollars are average annual payouts (including all districts in the technically feasible area of implementation), average payouts (all years), maximum payouts (all years), annual premium, maximum annual loss, cost of 70 percent subsidized scheme, total premium paid 2003–18, total payouts 2003–18, and total fiscal cost for 70 percent subsidies

Box 5. Key Findings—Technical Feasibility

The conditions for the technically feasible design of a satellite-based drought index insurance product are favorable across about 70 percent of Somalia, suggesting the opportunity for a large-scale implementation in the country. In addition, a risk-modelling exercise suggests that Somalia has similar risk profiles as the northeastern Kenyan regions where index-based livestock insurance (IBLI) has been successfully implemented. Major droughts occur on average every five years and persist for two to three consecutive seasons. The pure risk premium is estimated in the order of 11 percent. Finally, the application of an IBLI-type product in Somalia for the 2016–17 drought season suggests that the drought experience reported by pastoralists and the index values derived from the model are comparable.

2.4 Operational Feasibility

The operational feasibility of drought index insurance for livestock depends on the conditions required for supplying the insurance product and supporting the development of an enabling environment (institutional, regulatory, social) for the large-scale provision of insurance. Thus, it depends on existing financial infrastructure and services, the policy and regulatory environment, potential distribution channels, and existing private and public stakeholders (insurers and financial service providers, rural associations, intermediaries, NGOs, etc.) and their capacity in the financial sector. This analysis is largely built on a literature review, as well as interviews with multiple stakeholders.

2.4.1 Availability of Key Services

Services, for the purposes of this discussion, refer to financial, insurance, and mobile services; along with existing delivery structures for these services, which henceforth are referred to as networks.

Financial Infrastructure and Identification System

A large portion of the rural population does not use banks. The overall penetration rate of banking services is at 16 percent, and most customers are in urban centers. Expanding financial services is difficult where managing liquidity, securing deposits, and clearing imbalances depend on manual operations. However, financial access is expected to improve when the Central Bank of Somalia implements a core banking system with clearing and settlement capabilities.

Several MFIs exist, complementing the services provided by banks, but their outreach and coverage mirrors that of banks. One of the most popular and well-established banks in Somalia, the Dahabshil Bank, has a microfinance service through its foundation that is working with small businesses unable to meet the requirements of commercial banks for securing loans. The microfinance scheme provides microloans, creating opportunities for youth, small-scale farmers, and small businesses in fisheries, livestock, manufacturing, education, etc. Lending is done through a group of five members, with the group members supplying collateral for one another. It is important to note also that financial systems in Somalia are underregulated and financial transactions are mostly not secure (World Bank 2018e). Financial institutions also have poor access to global banking, and remittance and insurance networks, limiting secure channels for remittance and trade-related finance.

Currently, Somalia’s identification system is among the least developed, both globally and within Africa. Although data on ID coverage are scarce, recent surveys indicate that an estimated 8–12 million people in the country lack an official proof of identity, especially women. The lack of a robust and inclusive foundational ID system poses challenges for access to broader service delivery, to financial products (due to anti-money laundering/countering financing of terrorism [AML/CFT] and know-your-client [KYC] regulations), and to economic growth.

The World Bank is supporting FGS in the design and implementation of its digital ID system through the recently approved Somalia Capacity Advancement, Livelihoods and Entrepreneurship, through the Digital Uplift Project (SCALED-UP). The envisioned foundational digital ID system will be implemented in alignment with the Principles on Identification for Sustainable Development (World Bank 2018d). The ID system will strive to provide a unique identity from birth to death, with close linkages to civil registration. Only minimal data, as necessary for unique identification and to facilitate access to some basic services, will be collected at the time of registration. Following biometric de-duplication, a unique and random ID number will be issued to registrants. During the duration of the project (2019–23), the project aims to support the enrollment of (at least) an initial 1 million individuals, including at least 500,000 women. In addition, the World Bank just approved the Shock Responsive Safety Net for Human Capital Project, which aims to provide cash transfers to targeted poor and vulnerable households and establish the key building blocks of a national shock-responsive safety net system.

Several humanitarian and development agencies maintain separate lists of beneficiaries for cash transfers, but these are not linked, raising concerns regarding effectiveness and targeting. For example, the SCOPE initiative—a data management platform of the World Food Programme (WFP)—has a database of 5.5 million registered beneficiaries (1.2 million households). This platform is used to provide cash transfers to most of the households via mobile money. The platform supports beneficiary identification and registration for multiple humanitarian NGOs operating in Somalia. The registration process for SCOPE involves gathering household information, though biometrics are gathered for only the household head and one alternative member. The World Bank’s project “Shock Responsive Safety Net for Human Capital” would support the development of consolidated beneficiary lists across programs, enhancing coordination and collaboration and also efficiency. This would also serve as a first step toward a national social registry that in the future could be used to coordinate service delivery to the poor and vulnerable, and for emergency assistance, thereby bridging existing humanitarian and development efforts. Such a registry could also serve as a useful registration platform for livestock insurance. The World Bank SCALED-UP project is being

implemented in close coordination with other international organizations that have been registering beneficiaries for implementation of cash transfer programs and food aid, as part of emergency responses.

A few insurance companies, such as Takaful Insurance of Africa (TIA), which has been operational in Somalia since 2013, have introduced SMART cards for registering their clients, along with providing hospitals with computers, Internet access, and the infrastructure necessary for the provision of seamless services.

The European Commission on Humanitarian Aid and Civil Protection (ECHO), another organization that works on cash transfers, is in the process of piloting a registration platform using the biometrics of beneficiaries, in collaboration with the Ministry of Labour and Social Protection. The goal is to streamline cash transfer programs by creating systems that are interoperable by multiple organizations.

The World Bank is supporting FGS in the design and implementation of its digital ID system through the recently approved Somalia Capacity Advancement, Livelihoods and Entrepreneurship, through the Digital Uplift Project (SCALED-UP) financed by the Bank. The envisioned foundational digital ID system would be implemented in alignment with the Principles on Identification for Sustainable Development (World Bank 2018d). The ID system would strive to provide a unique identity from birth to death, with close linkages to civil registration. Only minimal data, as necessary for unique identification and to facilitate access to some basic services, will be collected at the time of registration. Following biometric de-duplication, a unique and random ID number will be issued to registrants. During the duration of the project (2019–23), the project aims to support the enrollment of (at least) an initial 1 million individuals, including at least 500,000 women. In addition, the World Bank just approved the Shock Responsive Safety Net for Human Capital Project, which aims to provide cash transfers to targeted poor and vulnerable households and establish the key building blocks of a national shock-responsive safety net system.

Insurance and Reinsurance Services

Only two insurance companies are officially operating in Somalia, but the insurance sector is starting to emerge. Although the concept of insurance is not unknown or new in Somalia, as there was a government-run national insurance scheme before the war, the industry is weak and underdeveloped. Penetration of insurance products is very low in the country, and 90 percent of it is medical insurance coverage provided to NGOs and expatriates by the only two insurance companies operating in Somalia. These are the Takaful Insurance of Africa (TIA) Somalia and First Somali Takaful & Re-Takaful (FISO). TIA is the largest in terms of underwritten premiums. Its primary business is the medical insurance cover that constitutes around 90% of the underwritten business, though the total gross is below \$6 million. NGOs and development partners operating in Somalia drive the medical insurance business. The insurance companies also offer motor insurance, marine cargo insurance, travel insurance, and business insurance. The products are Sharia compliant. Both companies rely on external reinsurers, such as Kenya-Re, First-Re, and Tunis-Re, to cover their risks in a self-regulated environment due to the current lack of insurance laws and regulations and the associated supervisory regime. The World Bank supports the government of Somalia in drafting insurance laws and regulations under the Somali Core Economic Institutions and Opportunities Program (SCORE) and the SCALED-UP project. An insurance law is expected to be completed by December 2019.

Insurance companies have a strong desire to expand their businesses and are willing to pilot innovative ways of increasing insurance uptake. TIA Somalia is affiliated with TIA Kenya, which is underwriting KLIP. The headquarter offices of TIA Somalia are in Hargeisa, Somaliland. FISO was established in 2014, with its headquarters in Bosaso, Puntland, and a second office in Mogadishu. Both companies have limited capacity to underwrite agriculture insurance but are willing to explore opportunities to start underwriting livestock insurance. Building the capacity of these insurance companies to underwrite livestock insurance would be essential, considering that this is a new line of business that they are not conversant in.

In addition to local insurance companies, there is interest from insurance players operating at the continental level; for example, African Risk Capacity (ARC). ARC is a specialized agency of the African Union with a mandate to assist member countries in improving their capacity to respond to disasters. ARC is currently providing macro insurance coverage to governments against drought shocks, and has expressed interest in underwriting microinsurance products that target natural calamities, including drought shocks. ARC collaborates with Africa Union member countries to strengthen disaster risk response systems by adopting an insurance mechanism that guarantees rapid access to predictable financing when disaster strikes. ARC's interest in getting involved in underwriting livestock insurance products could increase the operational viability of such a scheme. If ARC decides to underwrite a livestock insurance scheme in Somalia, it will come with a wealth of experience and expertise that could be transferred to local insurance companies. Livestock insurance aligns well with ARC's focus on creating pan-African climate response mechanisms that enable countries to limit the impact of natural disasters on their citizens.

The reinsurance market is largely unregulated; however, some international players are interested in expanding into the Somalia reinsurance market. Swiss Re and Africa Re are the leading reinsurance companies providing reinsurance services to KLIP. The two reinsurance companies are keen on expanding their agriculture insurance business and would consider offering reinsurance services for Somalian businesses. Both Swiss Re and Africa Re have accumulated experience in underwriting index insurance products and could lead in building the underwriting capacity of local insurance companies if they get involved. Stimulation of the insurance business by raising public awareness and subsidizing premiums could incentivize insurance providers to invest in Somalia. Other reinsurers providing reinsurance services in Somalia, including Kenya-Re, First-Re, and Tunis-Re, could have interest in the livestock insurance scheme.

Telecommunications Infrastructure and Mobile-Based Financial Services

Literature suggests Somalia has one of the most well-developed mobile networks in Africa and almost three-quarters of the population above 16 years of age are regular mobile users. Mobile network operations (MNOs) and money transfer businesses (MTBs) are also relatively developed in Somalia, with over 73 percent of the population using mobile money. The country's failure to print paper money after the collapse of the Siad Barre regime enabled the economy to leapfrog into digitization. There are 11 MTBs registered by the Central Bank of Somalia. They have agents across the country with monthly transaction levels of \$2.7 billion (2018 figures). Payment systems are increasingly converging, and mobile money customers are increasingly being offered financial solutions integrated with banks. Funds move quickly from banks to mobile money accounts and vice versa, enabled by financial service integration. However, there is still a considerable distance to total integration, because of system interoperability challenges. Clusters formed between banks, MNOs, and MTBs restrict the movement of funds beyond the institutions involved. There are no cross-system backbones that facilitate clearing and settlements of both small- and large-value exchanges between operators outside the clusters.

MTBs are highly integrated with international financial systems, making it possible for the flow of funds to Somalia. However, in the recent past, there has been a strong move to limit their use; the international de-risking of banks has resulted in the termination of relationships facilitating funds' movement. MTBs' vital role in providing services for funds' movement is expected to continue before appropriate infrastructure in Somalia develops. Domestically, MTB institutions are able to manage liquidity across their distributed agent networks, ensuring there are enough funds for transactions. The major MTB providers have integrated information management systems that allow for the accounting of transactions and balances across their networks.

The use of mobile money is limited to money transfers and there is minimal use of savings, credit, and insurance. A lot of international development organizations depend upon this digital infrastructure to carry out their operations, especially to reach places of high security concern. However, the biggest challenge remains tracking the users of mobile money. The absence of centralized personal identification systems is an important challenge affecting the KYC obligations necessary for facilitating legal, financial

transactions. A weak system for identifying mobile owners, and no way of tying a mobile number to a specific individual, could pose a considerable challenge to distributing insurance payouts. Rigorous registration systems for potential beneficiaries, by which a mobile number is tied to a biometrically registered beneficiary, could limit payout-related dispute cases. Currently, the lack of a national ID system makes the use of mobile banking susceptible to use by insurgents. There is also risk that individuals can register more than once, along with high risks of money laundering and financing of terrorism. The FGS, supported by the World Bank's SCALED-UP project, is in the process of designing and implementing the rollout of the digital ID system across the country. The system will provide a unique individual identification number thus significantly helping to address the KYC issues related to the use of mobile money.

Existing Agent Networks for Service Provision

Some of the institutions referred to in the previous section have networks for financial service delivery. As mentioned earlier, Dahabshil Bank's MFI lending process is based on a group of five members, with the group members providing collateral for one another. Though each group has a KYC number, they do not seem to have a formal registration process. Bank representatives claim to have a widespread network of agents on the ground for administering loans and monitoring the process, but it remains unclear how many agents there are, or where they are located. The hawala system is another alternative remittance channel that exists outside traditional banking systems and is widely used in Somalia, though security remains a concern, since there are few means of tracking the users of the hawala system. Another system proposed by representatives of financial institutions is the use of agency networks for payouts, though agency banking is still at a very nascent and experimental stage.

Of the two insurance companies, TIA has about 150 agencies across Somaliland and Mogadishu. These agencies are similar to field offices. Each has agents responsible for creating awareness of their insurance products, and also for selling insurance on commission. The agents are individuals who are generally selected based on recommendations from the community and are also recruited from universities. FISO—the other insurance company functioning in the country—has offices and agents in Puntland and Somaliland, along with some private agents¹¹ operating through kiosks and supermarkets. These agents are trained by the insurance companies, after which they have to get authorization from the Central Bank of Somalia to sell insurance products. This existing infrastructure could be used for a drought-insurance-like product; however, better understanding needs to be obtained regarding the capacity of the agents and the geographical spread of the offices, which may or may not include pastoral areas. All of these details have implications for the design of the sales and distribution model of a drought insurance product.

The WFP's SCOPE program, besides having cash transfers, which can be loaded to an e-wallet, also has a system of vouchers, which are mainly for food transfers. This element of beneficiary support is for areas where commercial bank branches have a limited presence. The vouchers can be used by the beneficiaries to buy food from certain designated retail shops in the communities and villages, which have a preexisting contract with SCOPE. Usually the contract is for a year and is renewable. This system has been functional since 2015. The retail stores involved include small kiosks in villages, as well as moderately sized shops. Before the shops can become retailers for SCOPE, a capacity assessment is conducted. The retailer should have a bank account and a stock in their kiosks and shops. According to the representatives of SCOPE, it appeared that being an agent of SCOPE had made these designated retailers creditworthy, enabling them to access credit to expand their business while still working with SCOPE. These retailers could be leveraged as potential agents under a shop model. However, like insurance companies and microfinance agents, a thorough assessment would have to be done of their capacity and the modalities under which a drought insurance product can be provided through such a retail system.

¹¹ According to the representatives of FISO, any registered entity/body could become an agent.

Other Services

Though there are some ongoing interventions, there is limited public sector capacity to monitor, collect, collate, and apply data relevant to the implementation of a livestock insurance type product. Most of the climate data, for example, are currently monitored and provided by international organizations such as the Food and Agriculture Organization's (FAO's) Somalia Water and Land Information Management (SWALIM) and Food Security and Nutrition Analysis Unit (FSNAU), which are some of the leading entities currently supporting data collection and environmental monitoring in Somalia. In addition, there seems to be an emerging presence of complimentary services for enhancing community livelihoods. Some of these efforts are around:

- (i) **Domestic fodder production.** If the export of livestock is to be large scale, there needs to be feed and fodder sufficient to have healthy animals to export. Diaspora members have expressed interest in supporting this production, both as an emergency response and a business proposition. In addition, the FAO has been providing fodder seeds, and fodder choppers have been provided through the World Bank in riverine areas.
- (ii) **Water provision.** The FAO has been involved in the distribution of water tanks of 10,000-liter capacity to villages, along with water trucking facilities. In addition, the FAO is working with local organizations in Somalia to survey water resources and gauge their the quality. The recently approved World Bank Water for Agro-pastoral Productivity and Resilience project aims to develop water and agricultural services among agro-pastoralist communities in the dryland areas of Somalia.
- (iii) **Cash-for-work.** An initiative undertaken by some of the state governments of Puntland and Somaliland, in collaboration with development organizations. The cash distribution is done through community elders.

2.4.2 Policies, Regulatory Frameworks, and an Enabling Environment

The Ministry of Planning in the federal government has the role of coordinating all ongoing interventions. In times of drought, floods, or other emergencies, the Ministry of Culture and Ministry of Livestock along with the Ministry of Planning work together on relief activities. The government has nominated a National Drought Response Committee, through the Ministry of Humanitarian Affairs, which has representatives from line ministries, such as planning, women's representatives, religious groups, and other relevant entities. The committee is designed to work toward self-reliance and to identify problem areas for response and recovery. This committee is still a work in progress. The initial steps are to prepare a baseline for preparedness for droughts and prevention of acute drought situations, while also working on mitigation strategies. Though an assessment of drought needs is currently not part of this committee, it is being considered as part of its medium-term plan. Moreover, the government ministries work with local and international development and aid agencies to create awareness and provide relief through the supply of fodder and water. One of the reasons local organizations are called upon is security, as some of these organizations have access to places that the government may not. Besides drought and disaster relief, the government is working on projects to enhance livestock production and trade in collaboration with the European Union, the Somalia Health Services, and the Intergovernmental Authority for Development.

The government recognizes the critical role of insurance in the economy and, through the Ministry of Finance, is developing insurance laws and regulation. Currently there is no insurance law or regulation governing insurance in Somalia; however, as mentioned earlier, the Ministry of Finance, along with the Ministry of Commerce, is drafting insurance laws and regulations with support from the World Bank under the SCORE project. In the absence of insurance laws and regulations, the government has allowed the insurance industry to self-regulate, with the Ministry of Finance playing an oversight role. The government has shown commitment to working closely with the private sector to ensure the development of the insurance market in Somalia.

The federal government seems committed to exploring the potential for a livestock insurance program to prevent disasters from destroying lives and livelihoods and escalating the risks of violent conflict,¹² as part of a broader crisis risk management agenda. Government representatives from several ministries that met during consultations concur that livestock insurance would protect herders from a catastrophic loss of income and livelihoods, and understand that by providing financial compensation in advance of disasters the livestock insurance would preempt the adverse impact of drought-related shocks. Also, by addressing drought-related shocks, insurance has the potential to reduce displacement and tensions, and hence the risk of violent conflict (World Bank and UN 2018). The government officials felt that the livestock insurance could be included within the National Disaster Management Policy, but there were doubts regarding the capacities of the associated ministries, such as for planning and livestock, to implement such a scheme.

The government is financially constrained, with a limited tax base; therefore, it is unlikely to make a meaningful financial contribution from its revenue. Nevertheless, there is a willingness on the government side to take an active role in identifying potential sources of funds to support the livestock insurance initiative. The government is acutely aware that poor farmers/pastoralists are unlikely to have enough liquidity to purchase insurance on their own. To start implementing livestock insurance might require external financial support before the government's own funding capacity improves, and before pastoralists purchase insurance voluntarily. Yet, there is also a strong desire to wean the people from depending entirely on external support, so pastoralists can contribute even if they were to be assisted in doing so.

While the federal government and member states' governments are crucial actors in the long-term sustainability of the livestock insurance initiative, relevant challenges might arise because of limited financial resources and technical capacity. Therefore, in the early stage of implementation a comprehensive institutional capacity development strategy should be put in place.

For any livestock insurance product to be introduced, it would be mandatory for it to be Sharia compliant, especially if the final beneficiaries would be expected to contribute to the premium payment. Sharia compliance is a major requirement for most products to be operated and accepted in Somalia. Most companies have their own Sharia¹³ board, which is overseen by a Sharia council. The Ministry of Sharia is an independent body that works in collaboration with the Ministry of Education. Insurers would need to offer certainty to clients by explicitly stating the exact amount of fees, deductions, commissions, earnings, and expenses for each party on the policy.

2.4.3 Social and Cultural Environment

Somalia has very high social capital, and so far, most of the interventions done by international and local NGOs and consortia working in the country are community based. The absence of formal insurance providers has encouraged the traditional methods of addressing personal risks. However, while the existing informal risk management system has been very effective in assisting families to cope with risks affecting individuals, they have proved ineffective in addressing covariate risks like drought. It is

¹² The National Disaster Management Policy (2017–19) and Drought Impact Need Assessment (DINA) undertaken with support from the World Bank, together with the subsequent Resilience and Recovery Framework (RRF) in 2017, are examples of the FGS's efforts to develop policies aimed at improving risk management. A Famine Action Plan will be developed for Somalia as part of the Famine Action Mechanism (FAM), a financing mechanism to support global famine prevention, preparedness, and early action efforts.

¹³ A Sharia-compliant product cannot charge interest, and must meet certain requirements for certainty and purity. Purity is preserved by segregating Sharia premium donations from non-Sharia premiums. Sharia funds must also be kept in an account separate from the insurer's capital funds. This assures Sharia clients that their donations are neither used to derive interest revenue from on-lending, nor used to conduct any business, like the sale of alcohol, which contravenes the Sharia precepts of community and purity.]

expected to take time before potential demand is turned into sales of formal insurance in Somalia. Nevertheless, interventions by some international and local organizations have led to community-based organizations, which have helped in livelihood development. In addition, service provider associations and pastoral associations might play a critical role in determining and designing the delivery model of livestock insurance. It should be kept in mind though, that years of civil war followed by subsequent recovery efforts by donors have rendered the general population highly dependent on postdisaster compensation both directly and indirectly in case of shocks such as drought, floods, etc. According to Coate (1995), high dependence on postdisaster assistance yields a “Samaritan’s dilemma,” whereby postdisaster assistance discourages participation in programs that provide more efficient financial solutions, such as livestock insurance, that are aimed at reducing the magnitude of losses of future events.

Village Savings and Loan Associations (VSLAs), initiated by the SomRep consortium, promote milk production and quality control, and skills training, among other activities. According to VSLA representatives, most VSLAs are located in peri-urban or agro-pastoral areas. To assess whether VSLAs might productively help sell a drought-insurance-like product within a group format, or to individuals within a group, further investigation is needed to understand their geographic presence, the scope of their activities, and their eligibility for drought insurance products.

Before the civil war broke out, there was a robust extension system, especially within the Ministry of Agriculture and Livestock. However, years of civil unrest weakened the system. Nevertheless, in the northern parts of Somalia some extension services are used from time to time. One example is the community animal health workers’ network used by regional governments for vaccination campaigns. These workers not only carry out the vaccination process but also raise awareness among communities before the campaigns. The training of community animal health workers is done by the Ministry of Health, in collaboration with the FAO and International Committee of the Red Cross (ICRC). Moreover, the government bodies rely on the use of SMS alerts, television, and radio¹⁴ to not only raise awareness of different extension services, but also for alerts of emergency and disaster preparedness. A network of local organizations works with the regional governments to receive the information, translate it, and disseminate it to the communities.

Multiple stakeholders highlighted the importance of generating awareness among financial service providers, government agencies, and intended beneficiaries. A critical point of consideration should be that most of the potential target populations in Somalia are pastoralists owning a fair amount of livestock or beneficiaries of various aid programs, with liquidity constraints. In general, these populations are likely to perceive themselves as poor despite owning some livestock or receiving donor aid. Those receiving donor aid (e.g., cash transfers) might also need great convincing to direct their income toward insurance. On the supply side, affordability could be a challenge if insurance companies are to load all the costs incurred in delivering the product to the target population. Therefore, consideration should be put into the nature of the livestock insurance product itself (that is, the livestock insurance could be a social protection, group- or individual-based kind of program) with the program being initially subsidized. Beneficiary contributions could be scaled up after awareness and understanding of insurance is generated among communities.

Although there seems to be a certain amount of institutional infrastructure, challenges remain in terms of capacity gaps at the level of the service providers, private sector, public sector, and communities themselves. As mentioned earlier, the prolonged civil war eroded previous existing systems such as insurance and financial services, with MFIs doing the work of the banks, but with limited coverage. In addition to this is a lack of insurance infrastructure, which the federal government is working with international organizations to build. There is a significant lack of understanding of insurance among the larger population, which in turn also speaks to the lack of financial literacy among the general population. Therefore, if a livestock-insurance-like product were to be introduced in Somalia, significant effort would have to be put into capacity development among the service providers, private sector, and public sector—

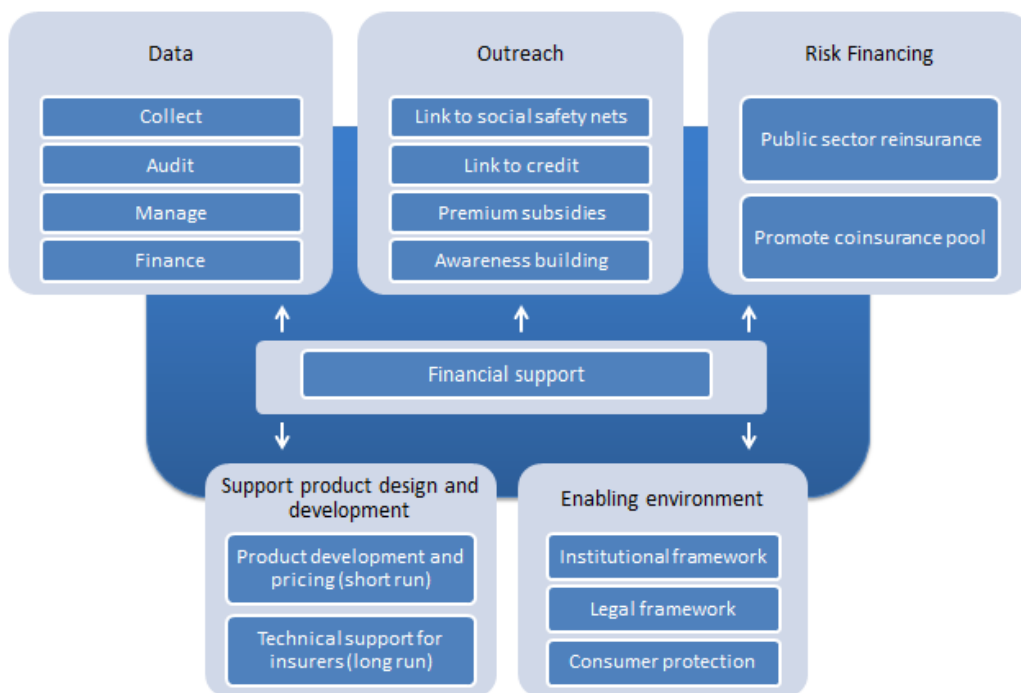
¹⁴ According to government officials, most of the pastoralists, largely follow the radio, in particular BBC radio.

and this would have to be backed by a very well thought-out awareness campaign on financial literacy in general and livestock insurance in particular.

2.4.4 Potential Implementation Roles

Figure 15 provides an overview of the areas requiring financial support for the implementation of a livestock insurance product. This subsection (based on interactions with government officials, private sector players, international development organizations, and some local NGOs) gives a brief summary of how a scheme for Somalia could be designed, and the potential roles that different entities could play in the design and implementation of the livestock index insurance product.

Figure 15. Potential Areas of Support of Livestock Insurance Development



Source: Mahul, O and Stuley, 2010.

Potential Role of the Public Sector

Based on interactions with government officials suggest a delineation of roles between the roles of the FGS and state governments. FGS would be seen working closely with international development organizations to create an enabling environment and a regulatory and legal framework for index insurance, touching on elements of consumer protection, the identification and registration process, Sharia compliance, etc. On the other hand, state governments could be directly involved in the coordination of activities at the regional and local levels by working closely with implementing partners in the implementation of the scheme.

Gargaara Company Limited (Gargaara), the development finance institution set up by FGS in April 2019 and implementing entity for the US\$15 million MSME Financing Facility, could manage the financial implementation of the scheme. Gargaara may be involved in the selection of private sector implementing partners as possible distribution partners based on their operational capacities. Another role for Gargaara could be facilitation of an iterative process for product improvement based on feedback received from the field during the implementation period, in which product design and pricing will be followed by product evaluation, and sharing of feedback with key stakeholders, leading to further modification that feeds back

into the produce design and pricing loop. There is, however, clear indication that Gargaara would not have the capacity to financially support the scheme in the early stages of implementation, thus requiring external donor support.

FGS would also coordinate the effort of collecting and providing the necessary data and would guarantee appropriate mechanisms for data transparency and quality assessment. FGS is currently working with FAO SWALIM and FSNAU to obtain data for early warning and food security and is in the process of creating institutional bodies to manage these data independently.

Finally, a key role of the government both at the federal and state levels would require raising awareness, in cooperation with local and international partners, especially during times of national emergency or disaster. This is a very critical activity, and the government could take a lead in endorsing and providing knowledge about the product, thus paving the way for the private sector to implement it.

Overall, both public and private sector players engaged in consultations for this report clearly indicated the need to set up an FGS-led Steering Committee and Technical Working Group (TWG) for designing drought index insurance for livestock. It was suggested that the steering committee could comprise key public and private sector stakeholders, as well as international organizations, who would be involved in the implementation of the livestock insurance schemes. The steering committee could be supported by the TWG, which would have the mandate to develop a workable structure for implementation, a framework for monitoring awareness, and a strategy for product evaluation and to provide insights on the suitability of the scheme to the target pastoralists (in relation to various types of subsidies). The TWG would need to work closely with FGS agencies related to livestock to ensure coordination of policy and implementation activities.

Potential Role of the Private Sector

Experiences from Kenya and Ethiopia suggest the importance of a market-driven approach in which the private sector leads the implementation of drought index insurance for livestock to guarantee the scheme's long-term sustainability. The private sector in Somalia seems to be picking up after a long period of civil war, but structural weaknesses persist. The country's few insurance companies could take advantage of a positive phase of the economy and reach out to local and international organizations and leverage their position to implement the product. Though the main work of the private sector would be to underwrite the product, it would do well to support public sector entities, local organizations, and international donor agencies in designing the product, especially given Somalia's long history of humanitarian assistance. The aim would be to build a conducive market system, while still providing a framework of social safety nets and space to access other financial services.

Potential Role of International Organizations and NGOs

As a way of starting the process off, research organizations and NGOs could work with both public and private sector entities in designing the product, identifying an efficient and effective model for delivery of the product, supporting capacity development and awareness creation, and designing monitoring and evaluation and impact studies. NGOs have a strong presence and network in Somalia, which can be used for capacity development and for initial support to private companies willing to invest in livestock insurance. This could be done by drawing lessons from models being used in countries such as Kenya and Ethiopia. These organizations could play an instrumental role in further understanding the community structures, the formal and informal networks that exist, and the role of gender in household decision making, based on which they could support the public as well as the private sector in designing awareness and extension materials, which would help in the delivery and uptake of the product among pastoralists.

African Risk Capacity (ARC), an agency established by the African Union to assist African governments plan and better respond to extreme weather events through a 44 sovereign insurance cover, could also play an important role in supporting the implementation of the scheme (both capacity building and underwriting) and in introducing a wider drought risk management strategy, with complementary instruments. Several countries have so far purchased insurance cover from ARC, creating a pan-African owned pool index insurance fund to underwrite catastrophic weather events, especially drought. The underwriting is carried out by ARC Insurance Company Limited (ARC Ltd.) and is reinsured by specialist international reinsurers of this class of business.

Box 6. Key Findings—Operational Feasibility

Although the general institutional and private sector context appears favorable for implementing a drought index insurance for livestock, significant challenges and investment needs should be anticipated to develop capacity at all levels. This would include building the capacity of financial institutions and other private sector players, expanding the private insurance sector and financial institutions, supporting a well-functioning regulatory and legal framework, as well as interventions to build up demand from targeted beneficiary communities. Political turmoil and the collapse of the economy has affected financial intermediation, leaving the formal financial sector severely undeveloped and the institutional capacities, as well as legal and regulatory frameworks, limited. However, the situation is changing rapidly, and an emerging political stability is encouraging investment in financial institutions and attracting the interest of the private insurance and reinsurance sector. In addition, the mobile-money infrastructure is very well developed in rural areas and could open up opportunities for efficient financial service delivery. Significant investments should be also expected to create awareness and support financial literacy in the pastoral areas. Despite the lack of institutional extension services in most of the country, a dense network of nongovernmental organizations could facilitate this task.

3. Conclusion and Recommendations

The central role that livestock plays in Somalia's GDP and exports, and in the livelihoods of pastoral households, as well as the extreme vulnerability of the system to drought shocks, highlight the need for a risk-management mechanism dealing with the ex ante management of income generation (income smoothing). This would allow households to build resilience by anticipating and preparing for the effects of a shock in a timely and efficient manner.

An index insurance scheme, as a strategy to prevent drought-induced livestock losses, could help to protect the assets of pastoralists. In the envisioned scheme, pastoralists could use the cash received from the payout of the insurance to purchase fodder, water, veterinary services and medicine, and other services that would help keep their livestock alive during the drought period.

An assessment of such a scheme's feasibility in the context of Somalia highlights strong potential for market uptake and positive socioeconomic impacts, like those already seen in Kenya and Ethiopia.

This study finds that it is technically possible to develop the insurance product for approximately 70 percent of Somalia. These areas have similar seasonality and risk profiles as those in Kenya and Ethiopia, where index-based livestock insurance is being sold. The essential socioeconomic conditions for supporting the demand and uptake of the product are also favorable: livestock are central assets to pastoralists' welfare, and vulnerability to drought shocks increases the potential for their uptake. But to support uptake and efficiently target the scheme, there is a need for a conducive institutional environment, strong support from public and private stakeholders and humanitarian organizations, and a good money transfer infrastructure. The operational feasibility analysis also highlighted challenges for the successful implementation of the scheme, requiring significant initial investments and a medium-term (e.g., 5-year) implementation strategy: (i) limited awareness and financial literacy in the rural areas, (ii) limited capacity and experience of public and private stakeholders in the agricultural insurance sector, (iii) limited financial capacity of the government to support the scheme from its revenue, and (iv) a poorly developed regulatory and legal framework. **These structural limitations in Somalia's public and private sectors clearly highlight the need for support from international donors in the early stages of implementation to financially support premium subsidies, and for complementary interventions in capacity development, awareness creation, and financial and data infrastructure development.**

Findings from this study assessing the overall feasibility for a drought index insurance for livestock in Somalia, and lessons learned from implementation in the bordering countries, support the following considerations, relevant to implementation in the future.

3.1 Product Design

- **There is clear evidence that in Somalia conditions are feasible for a satellite-based index insurance product with low risk.** However, a more in-depth technical design review and customization study also involving local stakeholders would be essential to fully understand the specificities of the grazing and migration patterns in the country and to tweak the design of the product to the local context. The local stakeholders can provide guidance on determining UAIs and analyzing whether the product captures historical events accurately. The involvement of local stakeholders raises awareness and enhances better understanding/acceptance of the product, a critical condition for effective implementation.

- **Preliminary risk modelling analyses suggest that the country risk profile is similar to that of the Kenyan and Ethiopian regions where the program has already been implemented.** More work is required to refine the product in terms of trigger levels, return period and exit levels, and sums insured, among other important parameters. Critical decisions about parameters determining the cost of the scheme both in terms of premiums and subsidies, such as the timing and frequency of payouts and the total sum insured, should be carefully reassessed and customized for the local context (at the subnational scale). This should be also informed by in-depth market demand studies.
- **The provision of data sets and tools for early warning and food security assessment in Somalia is largely based on international organizations.** It would be important to reinforce and, when necessary, establish institutional bodies with the capacity to collect and disseminate agrometeorological information and provide agricultural extension services.

3.2 Product Demand and Supply

- While socioeconomic indicators suggest there is potential demand for the product, **a robust market demand study remains a priority for the next stage of implementation** and would inform the product, pricing, and sales/distribution model design. Indications from preliminary stakeholders' engagement suggests that it is unlikely for pastoralists to have the liquidity required to purchase the premium. It would be important to assess to what extent and under which circumstances pastoralists could afford the insurance premiums and to assess the sensitivity of demand to costs.
- **Sales and distribution models other than direct purchase by individual pastoralists should be considered.** Given the strong social capital and community organization of the region, group-based insurance policies could be an alternative approach to investigate (see next paragraph). In addition, alternative sources of funds such as remittances being sent by families abroad could be used to pay for the insurance. Families living in urban centers could also be interested in buying the product to protect their family against droughts.
- A Somali cultural practice resembles communal insurance: a clan provides insurance against extreme perils incurred by one of its own. This could hinder or encourage the uptake of drought index insurance, depending on the approach. A proper understanding of such cultural practices is necessary. The product could be sold to individuals or to a group of herders. Group-based purchasing could be considered, including clan-level purchasing, VSLAs, etc.
- **Sharia compliance is a major requirement for most products to be operated and accepted in Somalia.** Insurance companies have their own Sharia board which is overseen by a Sharia Council. A product needs to fulfill three criteria to be considered Sharia compliant: prohibition of the charging of interest, and certain requirements for certainty and purity. Insurers would need to offer certainty to Sharia clients by explicitly stating the exact amount of fees, deductions, commissions, earnings, and expenses for each party on the policy. Purity is preserved by segregating Sharia premium donations from non-Sharia premiums. Sharia funds must also be kept in an account separate from the insurer's capital funds. This assures Sharia clients that their donations are neither used to derive interest revenue from on-lending, nor used to conduct any business, like the sale of alcohol, which contravenes the Sharia precepts of community and purity.

3.3 Implementation Modality of the Scheme

- **Public-private partnership (PPP).** Institutional stakeholders indicate the importance of designing a product that addresses both the social and market dimensions of providing livestock insurance for

all types of herders without imposing a strain on the government's limited fiscal resources. Since Somalia does not yet have a system of safety nets, it would be important to consider developing a PPP that could facilitate the creation of a livestock insurance market, enabling pastoralists to engage in risk financing strategies. At the initial stages, donor resources could be leveraged by FGS since access to financial resources of domestic insurers and to the international reinsurance market is limited.

- **Affordability and smart premium subsidies.** Different possibilities for offering the insurance product, including in conjunction with judiciously administered public subsidies to lower the cost of premiums, should be considered. The viable scenarios should distinguish between types of pastoralists and their potential options for livestock insurance. Options include channeling premium subsidies to small and marginal pastoralists through FGS. Such a subsidy program should be carefully devised to provide adequate financial incentives, and its costing should be carefully analyzed to avoid unsustainable public costs. Initially, the subsidy could be covered by external funding since the government will have limited resources to fund premium subsidies. Any external support could be directed through the government to create ownership and start building government systems for responding to shocks. However, donor financing for subsidies that aim to improve the equity of coverage is only advisable if there is a plan on how to raise government revenue to finance them in the long run, as they will probably be in place for a long time. Without this long-term financial strategy, insurance will be small scale or short-lived or subject to annual fiscal budget negotiations.
- **Role of other stakeholders.** Existent networks and initiatives implemented by international organizations and NGOs should be considered to support the private actors in the provision of the insurance product and to raise awareness and develop capacity. Somalia is characterized by a capillary network of organizations in the humanitarian domain, with a high level of fragmentation. An ongoing initiative by ECHO, aimed at harmonizing the existing networks and systems available in Somalia for humanitarian support, could provide essential support in the implementation of an insurance scheme. One relevant example of the existing infrastructure is the SCOPE cloud-based digital solution implemented by WFP, which involves the registration of beneficiaries and issues them smart cards for accessing aid during the time of shocks. Over 5.5 million individuals (1.2 million households) are already registered under the SCOPE platform. SCOPE provides cash transfers to most of these households via mobile money. This platform supports beneficiary identification and registration for multiple humanitarian NGOs operating in Somalia. Moreover, the regional government seems to have a better-established extension network as compared with the federal government. Leveraging this existing network (that includes community animal health workers) could be a good starting point for raising awareness and also a prospective means of product delivery. However, a thorough understanding of such networks, and the level of functionality and community presence they have in various regions of Somalia, is essential.
- **Institutional framework.** If FGS would like to implement a livestock insurance, it is recommended that it set up a Steering Committee (SC) and a Technical Working Group (TWG) for designing the product. The SC would welcome all public and private sector stakeholders who might be involved in the implementation of the livestock insurance schemes. The SC would be supported by a TWG having a mandate to develop a practical structure for scheme implementation, a framework for scheme monitoring and evaluation, awareness creation, product evaluation for suitability to the target pastoralists, and subsidy consideration. The TWG would need to work closely with Somalia's government agencies promoting financial intermediation and livestock to ensure coordination of policy and implementation activities.

- **Insurance should be considered as part of a more comprehensive strategy for the development of the livestock subsector and financial intermediation.** Complementary interventions might be considered in the following areas:
 - (i) **Market linkages and value chain development in livestock.** Interventions to increase pastoralists' linkages to profitable markets, and improve quality standards and safety of livestock products will increase productivity and improve livelihoods.
 - (ii) **Securing access to resources (water, pasture, forage).** This could include support to drought/risk management, feed and fodder development, forage conservation, and water access.
 - (iii) **Improving animal health.** Government representatives stated the importance of better control and distribution of veterinary medicinal products, reduction in antibiotic resistance, and increase in vaccination coverage, among others.
 - (iv) **Access to finance and livestock credit.** Putting in place livestock insurance could help to address the credit access issue.

- **Multilayered country-level drought risk management strategy.** Considering the ongoing efforts in Somalia to develop early warning systems and scalability mechanisms for social protection programs during drought, it would be extremely important to integrate and harmonize drought index insurance for livestock within a multilayered country-level drought risk management strategy from the early stages of implementation to avoid unnecessary replication and optimize synergies among instruments. This should also be carefully considered in the identification and layering of potential beneficiaries for subsidized insurance or other type of interventions (e.g., unconditional cash transfers). Synergies with the sovereign-level drought insurance products offered by ARC should be evaluated.

- **Security.** Although index insurance schemes for livestock have been successfully implemented in other regions with high levels of insecurity, the next stages of implementation should take into careful consideration security-related constraints in the demand, supply, and scaling of the product. There are still areas in Somalia experiencing acute insecurity conditions that could limit implementation of livestock insurance. The private sector has the capacity to operate in the whole country, but it would be recommended that it prioritize areas with relative peace and well-organized regional governance structures for the rollout and consolidation of the scheme.

3.4 Financial Literacy, Insurance Awareness Creation, and Capacity Building

All stakeholders engaged indicated the high priority of raising public awareness across the diverse stakeholder landscape, including among herders and herder groups, government officials, insurance companies, commercial banks, money transfer operators, and other MFIs, NGOs, and donor organizations. Increasing financial literacy and the understanding of insurance products among pastoralists would be a critical thrust of marketing activities for index insurance products. Face-to-face training campaigns, radio, television programs, and workshops could increase financial literacy. Equally important would be to enhance the understanding of livestock insurance by the staff of financial intermediaries (insurers, banks, MTBs, mobile money operators).

Dependency on donor aid could pose a challenge to successful implementation of a livestock-insurance-like product as it may be confused with other humanitarian assistance programs. Therefore, it is critical that capacity assessments are carried out, followed by capacity development in the form of awareness creation, extension, and education at different levels of the product chain to create better

understanding of insurance in general and livestock insurance in particular. Low risk awareness coupled with cultural practices of risk mitigation pose another challenge that could act as a barrier for communities embracing the idea of adopting a livestock insurance product. It could be possible that a holistic extension and awareness campaign could look into specific areas of financial literacy and management (each with different target groups) along with livestock insurance. Further understanding would be required regarding the capacity and the role of the private and public sector along with that of service providers in the design and execution of such a campaign, and how issues of pricing and payment of premiums and payouts of the livestock insurance product could be resolved without it being a burden on either the service providers or the service consumers. Designing such a campaign would have to take into account the culture and traditions of Somalia. Moreover, if awareness and capacity development are to be effective, they have to separately target men and women. This would require a thorough understanding of a household's decision-making gender dynamics, of the type of businesses that are run by men and women, and if informal community groups along with the formal ones can be the entry points of such campaigns.

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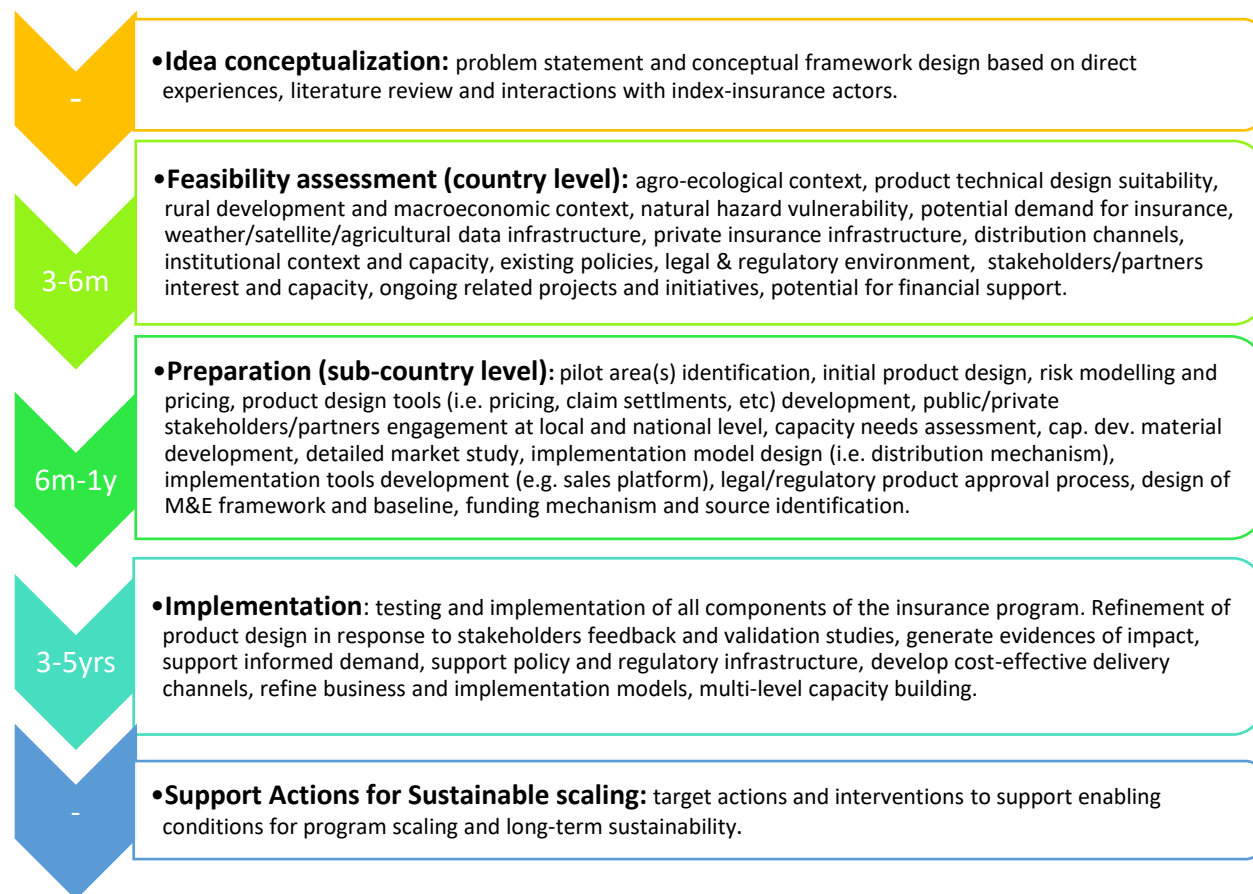
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Appendix A. Framework for Implementation of Drought Index Insurance for Livestock

Figure A.1 Phases of Preparing, Implementing, and Monitoring the Provision of Drought Index Insurance for Livestock in Somalia



Source: Fava et al. 2018, with modifications.

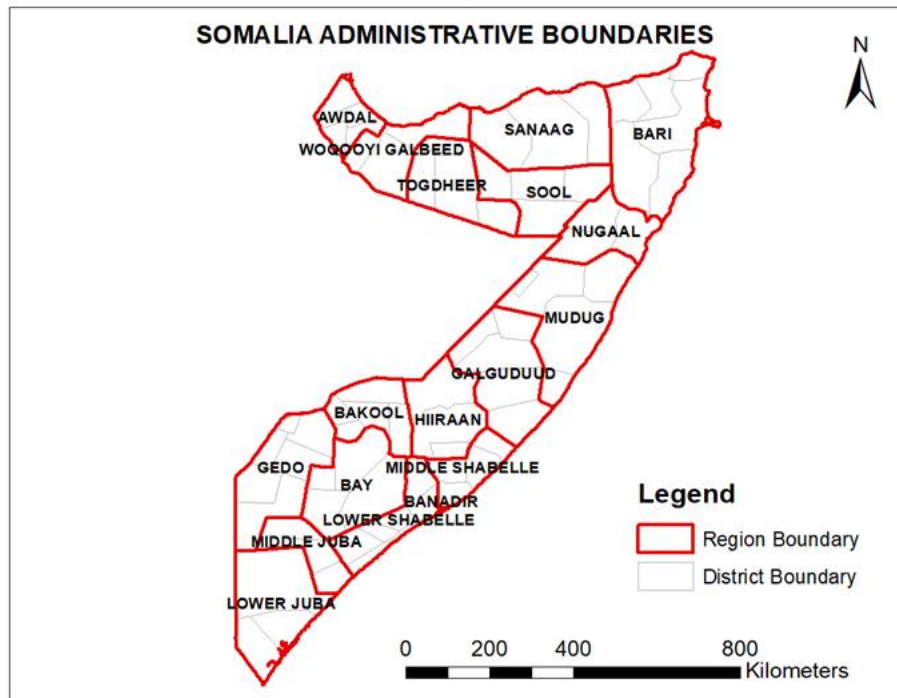
Note: M&E = monitoring and evaluation

Appendix B. Technical Feasibility Methodology

In this section, the methodology for the technical assessment of the feasibility of providing drought index insurance for livestock in Somalia is presented. As described in section 2.3 of the main study, rangeland dominance, forage availability, seasonality, and drought history were determined as premises for product implementation. The analysis was based on the 10-day eMODIS¹⁵ Normalized Difference Vegetation Index (NDVI) time series at 250 meters spatial resolution, decadal rainfall estimates from the Climate Hazards Group InfraRed Precipitation with Station (CHIRPS) data available at a spatial resolution of 0.05° for the period 2003 to 2018, cropland/rangeland extent masks and phenological metrics for the number of growing seasons (NGS), and start of season (SOS) and end of season (EOS) dates from the Joint Research Centre. Ancillary geospatial maps are also presented from a variety of sources.

This analysis was conducted for the Federal Republic of Somalia, comprising 18 regions that are further subdivided into 74 districts. Implementation of NDVI-based index insurance requires the use of administrative units as the basic building blocks for identification of insurance units (Chelang'a et al. 2017). Although administrative boundaries are not always representative of the biophysical and socioeconomic traits of an area, they help identify community groupings for the pragmatic implementation of insurance. Thus, in this prefeasibility analysis, district administrative units were used as the basis for delineating possible units of insurance (UAI) (figure B.1).

Figure B.1 Regions and Districts of the Federal Republic of Somalia



Source: Food and Agriculture Organization (FAO), Somalia Office.

For the implementation of index insurance for livestock, clear seasonality in pasture growth with distinct dry and wet periods is a critical parameter used to determine the risk period and definition of insurance contracts, that is, coverage period, sales windows, time of payouts, etc. In the analysis, the main seasonality metrics assessed were clarity, length, and variability. Various satellite-derived metrics, including precipitation, NDVI, and phenological parameters, were used to assess seasonality. Three phenological

¹⁵ Earth Resources Observation and Science (EROS) Moderate Resolution Imaging Spectroradiometer.

parameters were used, including NGS, SOS, and EOS from the Joint Research Centre, derived from the long-term average of eMODIS NDVI data produced by BOKU university at a 1 kilometer resolution for the period 2003 to 2016 (Klisch and Atzberger 2016). To extract the NGS, SOS, and EOS metrics, the majority phenological metric per district was extracted, which was further refined using decadal average precipitation and NDVI profiles. Since Somalia has bimodal seasonality, which is typical for the Horn of Africa (Herrmann and Mohr 2011; Vrieling, de Leeuw, and Said 2013), metrics for both seasons were analyzed. To define seasonal variability and aid in identification of productive land areas, another condition was tested using the NDVI time series data, assuming seasonality is not well defined in barren lands and evergreen dense woody vegetation areas. Thus, seasonal variability was assessed using NDVI's dynamic range by computing the difference between the 95th and 5th percentiles of NDVI, which should be >0.1 for a pixel to be valid.

Since pastoralists depend on forage resources for their livestock, index insurance for livestock implementation requires forage production areas sufficient to be detected by the satellite NDVI signal. In Somalia, vast areas of the country are arid and semiarid lands (ASALs), some of which are characterized as barren, especially in the northern region. To eliminate areas considered unsuitable for the product implementation, NDVI and land cover products were used to define the extent of productive lands within Somalia's districts. Barren lands were mapped using the 10-day eMODIS NDVI time series data in the period 2003 to 2018, where pixels with maximum NDVI <0.2 were eliminated, as proposed in Vrieling et al. (2016). Another condition that was tested was the validity of NDVI for land areas. Here pixels that comprised nonland NDVI values in the range of 0–1 were disregarded if the NDVI time series comprised <60 percent of valid NDVI values for land areas. Further masking was done to define seasonal variability and barren lands. This step was necessary before spatially aggregating NDVI at the district level to further extract statistics to determine the suitability of index insurance for livestock.

Assessing Drought Frequency

Drought is a recurrent phenomenon in Somalia and is one of the largest cause of livestock mortality for pastoralists in the country, as is common in the African drylands. Using the already established method for estimating the forage index in Kenya and Ethiopia, we estimated the historical payouts for Somalia for the short rains in 2002 through the short rains in 2018. The temporally smoothed 10-day eMODIS NDVI for 2002 through 2018, available at a 250 meter spatial resolution, was used to estimate the seasonal forage index for determining the historical payouts and burn rate. In this context, the district administrative units were used as the UAIs. To compute the forage index for each UAI, the following criteria were used: (i) extraction of the 10-day NDVI aggregated by the district boundary, the UAI (figure A2.1); (ii) computation of monthly average NDVI time series by averaging the three 10-day NDVI values in each month; (iii) temporal cumulation for computing seasonal cumulative NDVI for the short rain (SRS; October–December) and long rain (LRS; March–June) seasons in every year; (iv) standardization of the cumulative NDVI data (z-score) for each season with reference to the 2002 SRS and 2018 SRS average and standard deviation; and (v) determination of the percentage payouts for each UAI in every season using a linear function between the *trigger* set at the 20th percentile of the index and *exit*, corresponding to the minimum observed index in the archive at which the maximum payout is realized at 100 percent of the sum insured. The analysis was restricted to the suitable districts in Somalia (figure A2.1).

Further using the estimated percentage payouts, cost implication scenarios were formulated assuming a varying number of beneficiaries at intervals of 5,000, 10,000, 20,000, 50,000 and 100,000 for the years 2003–18. The scenarios assume coverage of five tropical livestock units (TLUs) per beneficiary covered at a total sum insured of \$140 per TLU, similar to the Kenya Livestock Insurance Programme.

Appendix C. Socioeconomic Feasibility Datasets and Methodology

We employed two waves of the Somali High Frequency Survey (SHFS) data, which were collected by the World Bank to examine the socioeconomic feasibility of IBLI-type products.¹⁶ The first wave was collected in February and March of 2016, just as the severe 2016/17 drought had begun. The second survey was conducted in December 2017, which was about the time that the rains arrived that would eventually end the 2016/17 drought. These data are cross-sectional household-level data and provide information on households' livelihood strategies, food security, livestock ownership, and the potential dynamic associated with these outcomes.

The first wave collected information from a sample of urban, rural, and internally displaced person (IDP) households. The first wave included 4,117 households sampled from and representative of 9 of 18 Somali prewar regions. The second wave expanded the coverage to include all prewar regions, which meant adding a sample from nomadic populations, and data collected from 6,092 households. A detailed discussion of the sampling design and sampling frame associated with the SHFS data is given in Pape and Wollburg (2019a, 2019b). Because of the limited coverage and representativeness of the first wave, we rely heavily on data collected during the second wave of the SHFS. To ensure the representativeness of our sample and draw inferences about a broader population, we weigh our descriptive and predictive estimates using the sampling weights provided in the SFHS. Table C.1 provides the distribution of the sampled households across the different population groups. Most of the sampled households come from the urban population.

Table C.1 Distribution of the Sample of Households

	Wave 1 (2016)		Wave 2 (2017)	
	Share of Sample	No. of Observations	Share of Sample	No. of Observations
Urban	0.70	2,864	0.66	4,011
Rural	0.20	822	0.18	1,106
IDP	0.10	431	0.08	468
Nomadic population	-	-	0.08	507
Total	1.00	4,117	1.00	6,092

Note: IDP = internally displaced person.

In Table C.2, we provide summary statistics of household characteristics across both waves. While most of the demographic characteristics of households are available for both rounds, some of them are only available in the second wave, especially those related to infrastructure access. Although our data are based on repeated cross-sections, we can compare the patterns of the two waves of the data. Most of the demographic characteristics remain comparable across both periods.

Table C.2 Summary Statistics of Households

Variables of Interest	Wave 1 (2016)		Wave 2 (2017)	
	Mean	Standard Deviation	Mean	Standard Deviation
Age of household head (HHH)	38.43	12.79	37.79	11.93
Gender of HHH	0.487	0.500	0.504	0.500
Education of HHH	0.440	0.490	0.390	0.490
Household size	5.107	2.407	5.442	2.045
Proportion of males in household	0.455	0.212	0.490	0.178
Number of adults	2.551	1.461	2.630	1.305
Source of drinking water	0.490	0.500	0.538	0.499
Roof cover	0.743	0.437	0.756	0.429
Access to arable land			0.138	0.345

¹⁶ See World Bank Group (2018c) for more information on the survey.

Home ownership	0.576	0.494
Distance to school above 30 min.	0.255	0.436
Distance to health center above 30 min.	0.349	0.477
Access to road	0.362	0.481

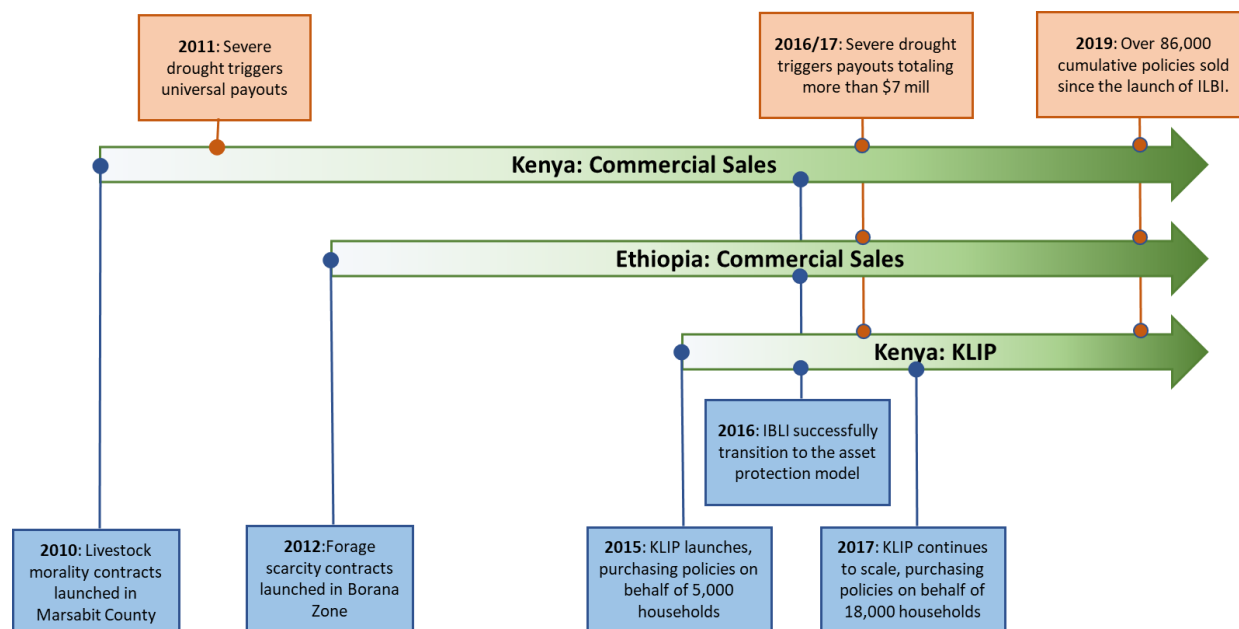
Appendix d. Socioeconomic Feasibility Datasets and Methodology

The initial launch and associated commercialization and outreach efforts were met with slow but steady demand for the product. Critical factors affecting the demand of IBLI include the product design and payout timing, the distribution model and delivery channels, household and policy characteristics (e.g., financial liquidity, gender issues, basis risk), and awareness and education. In response to these challenges, the product has evolved and adapted over time, supporting accelerating demand. The product is sold commercially in Kenya and Ethiopia, and its adoption promises to increase over time (i.e., about 7,000 policies were sold commercially in 2018).

In 2015, index insurance for livestock was scaled up in eight counties in Kenya through a government-led public-private partnership (PPP) known as the Kenya Livestock Insurance Programme (KLIP) supported by the International Livestock Research Institute (ILRI) and World Bank. KLIP currently provides subsidized insurance coverage to 18,000 pastoral households, representing over 80,000 beneficiaries, across 8 counties of northern Kenya, and intends to scale to 100,000 households across 16 counties by 2020. The 2016/17 drought was among the worst in Kenya in the past 20 years, and KLIP paid out \$7 million to pastoralists. In Ethiopia, IBLI has been commercially sold in Borana since 2012 and preparations are underway to establish a viable process of mainstreaming insurance as an agricultural risk transfer mechanism into policy. A similar product is being piloted under the World Food Programme's Satellite Index Insurance for Pastoralists in Ethiopia (SIPE). In several other East and West African countries that house significant pastoralist populations and millions of heads of livestock, ILRI and the World Bank are undertaking or planning feasibility studies to initiate drought index insurance for livestock keepers.

Figure 1 summarizes the evolution of IBLI in Kenya and Ethiopia, both in terms of commercial sales and KLIP-subsidized coverage.

Figure 1. Schematic of IBLI Evolution in Kenya and Ethiopia from the Launch of the First Policy in 2010



Source: ILRI.

Value and Impact of IBLI

Evidence from ILRI’s multiyear impact evaluation of the IBLI program in Kenya and Ethiopia indicates considerable social and welfare benefits for pastoralists who have insured their livestock.

During drought, households with IBLI coverage have higher incomes and milk production (Matsuda, Takahashi, and Ikegami 2019), are 27–36 percent less likely to skip meals and 22–36 percent less likely to sell livestock—a practice known as distress selling because this is a period when prices are lowest (Janzen and Carter 2019). At the same time, there is also strong evidence that IBLI coverage increases investments in livestock as a productive asset. A study in Kenya found that over three years of IBLI coverage, average veterinary expenditures doubled, and livestock sales in nondrought years increased by an average of 46 percent of the mean (Jensen, Barrett, and Mude 2017). These and other changes to production strategies among the insured seem to pay off, increasing the milk productivity of livestock and the total value of milk produced (Jensen, Barrett, and Mude 2017). Positive impacts on other indicators of well-being were also observed, including greater household income per adult equivalent and improvements to mid-upper-arm circumference (MUAC), a strong predictor of child malnutrition. Even in the absence of severe drought or indemnity payments, IBLI improves purchasers’ well-being by providing ease of mind (Tafere, Barrett, and Lentz 2018). Studies also indicate that IBLI may provide households with incentives to invest in livestock by reducing the risk inherent in keeping livestock in a vulnerable system while at the same time enhancing financial deepening in pastoral areas and catalysing related market opportunities. In sum, the empirical evidence suggests that insurance relaxes risk constraints, allowing farmers to increase investments in productivity-increasing activities, and protects households from the full impacts of shocks, directly

sheltering them from immediate effects and from reliance on coping strategies known to have longer-term negative impacts.

The marginal benefit/cost ratio of IBLI exceeds that of unconditional cash transfers in risky environments (Jensen et al. 2017). Amid recurrent drought situations in the Horn of Africa, pastoralists living in the region are among the top recipients of humanitarian response in Africa. Aid is usually in the form of food, cash transfers, support for emergency destocking of livestock herds, and restocking after droughts to help build herds. But reactive responses such as humanitarian aid are unsustainable in the long term, thus creating the need for sustainable ways of dealing with recurrent climactic shocks. Further, humanitarian aid is not dependable—food aid distribution is as much a reflection of political and programmatic dynamics as it is of need and is therefore stochastic from the perspective of the recipient—so that households cannot make production and consumption decisions in response to this support. Investment in IBLI can have strong, positive impacts on a variety of indicators of well-being directly through payouts during drought and indirectly as households change their production and consumption strategies in response to their insurance coverage. A four-year longitudinal study in northern Kenya, where an IBLI pilot and a large and sustained unconditional cash transfer scheme were active in parallel, found that those impacts per dollar are at least on par with those from cash transfers programs and, at the margin, can be considerably higher. This is because, once an insurance scheme is set up, the marginal cost of subsidizing insurance for an additional client is generally much lower than the repeated costs of enrolling a new beneficiary into a sustained cash transfer scheme.

An independent impact study of KLIP led by the German development agency (GIZ) (CED 2018) shows it is cost-effective to use insurance to respond to severe weather shocks. Self-reported satisfaction with the program was high and most beneficiaries reported using at least part of the payouts for their livestock (maintenance, restocking, production equipment) and for household needs. In addition, qualitative evidence of community spillovers, such as sharing payouts with neighbours, was observed. Despite the short life of the program, households with insurance subsidized by KLIP experienced slightly lower levels of food insecurity and greater awareness of insurance in general.

KLIP is a faster, efficient, more transparent, more accountable, and better-targeted method to support vulnerable households than the alternatives analyzed (food aid, water trucking etc.). KLIP makes payment soon after rains have failed,¹⁷ while mobilizing support ex post could delay payouts to beneficiaries by up to six months. Insurance companies use their capital to make timely payouts. The rules are clear: payouts are made when a certain threshold is reached. KLIP has provided proof that it is possible to use private sector risk capital to manage risk, reducing pressure on public funds. The livestock insurance scheme, therefore, gives the government fiscal space to continue to implement high-yielding development projects, which can be delayed or cancelled in the event of severe shocks.

There is a positive gender dimension to this as well. A study in Ethiopia indicated that women were purchasing insurance at higher rates than men (Bageant and Barrett 2017), while a study in Kenya showed that women tended to have better access to credit if they were IBLI policy holders (Gesare et al. 2016). Furthermore, administrative data from insurance companies show that about 45 percent of IBLI policy holders are women. Anecdotal evidence shows that women in the northeastern parts of Kenya started by insuring small livestock such as sheep and goats and are now insuring bigger livestock such as cattle (Banerjee, Mwaura, and Bashuna 2019). This corresponds to findings that women in these regions are

¹⁷ On average, payouts reach insured beneficiaries within a month after the announcement of the trigger.

entrepreneurial and invest their savings in small businesses and enterprises (Chelang’a, Banerjee, and Mude 2015)

Implementation of IBLI

Pastoralist communities living on dry pasture lands do not represent “low-hanging fruit” for short-term profit-making ventures given the commercial viability. Various limitations—including poor infrastructure, low levels of awareness and experience of insurance, low literacy levels, as well as frequent migratory movements—may discourage the private sector from venturing into such regions, because of the high initial investments and transaction costs required to support product demand and supply. On the other hand, these markets have a strong growth potential that may be realized in the long term.

Despite the challenges, since their introduction, the insurance programs in Kenya and Ethiopia have provided coverage for over 300,000 cattle equivalents with a value of more than \$145 million.¹⁸ IBLI has been commercially sold by various insurance companies since 2010 both in Kenya and Ethiopia. Uptake has increased steadily even if gradually, and the private sector continues to be the engine of the programs. A PPP launched in Kenya through KLIP in 2015 has shown the value of public support in rapidly expanding the program and harmonizing it with a broader set of country-level initiatives for disaster risk management. Strategic public support through targeted subsidies and investments in critical components of a program—such as raising awareness or enhancing information and communication technology infrastructure—can, for example, help the private sector expand the market toward full commercial viability. Government subsidies have played a major role in crowding in the private sector, which is keen to expand into new markets. Insurance companies are now creating necessary infrastructure for sales and promotion of insurance products in general.

Currently, index-based insurance is sold as a retail microinsurance product (without subsidies in) both Kenya and Ethiopia. In Kenya the commercial model runs in parallel with the KLIP PPP, a macrolevel fully subsidized product, although efforts are in place to integrate the two models by introducing voluntary purchase options with partial subsidies under KLIP. The following subsection summarizes how IBLI has been implemented as a commercial and PPP-supported product.

Commercial Product

The implementation of commercial IBLI started out in Marsabit County, Kenya, in 2010, and in the Borana zone of Oromia, Ethiopia in 2012, with only one insurance company in each country enlisted to provide promotion, sales, and underwriting services. International organizations supported field operations, contract design, product pricing, extension, and awareness creation through donor-funded projects to bolster the private sector commitment to invest both financial and human resources toward venturing into regions that otherwise would have very limited or no access to financial services. Subsidies were also initially provided by donor funds to insurance companies based on their seasonal sales. Various insurance companies took up and dropped IBLI over the initial phase of implementation. Insurance provision continuity over time and gradual market expansion were then granted by Apollo Pan-African

¹⁸ As of January 2019, the total cumulative value of commercial IBLI purchases in Kenya was 20,577 cattle equivalents valued at \$2.6 million and in Ethiopia 20,700 cattle equivalents valued at \$2.9 million. Furthermore, Kenya’s State Department of Livestock provided coverage for 275,200 cattle equivalents totaling \$38.5 million (55,048 policies for five cattle each, and one cow has an insured value of \$140), through the KLIP.

Insurance (APA) and Takaful Insurance of Africa (TIA) in Kenya and by the Oromia Insurance Company (OIC) in Ethiopia.

In 2013, TIA launched a Sharia-compliant IBLI product, known as the Index-Based Livestock Takaful (IBLT), in Wajir County (a predominantly Muslim-inhabited county of Kenya). This helped generate interest in the IBLI product among pastoralists who otherwise would not have purchased it. A Sharia compliance board that undertakes the approval of all Islamic finance products in Kenya worked hand in hand with the Insurance Regulatory Authority, to ensure that the product complied with both Sharia and legal insurance requirements. TIA expanded IBLT to Isiolo (2014), Garissa (2015), Mandera (2015), Tana River (2016), and Turkana and Samburu counties (2017). In Ethiopia, the Oromia Insurance Company (OIC) launched the product promotion, sales, and distribution of IBLI in the Borana region in 2012.

Insurance companies both in Kenya and Ethiopia employ agents in the sale and distribution of IBLI/IBLT. Initially, the model in Kenya relied upon local out-of-school youth, who would be identified and recruited through local mechanisms, for example, chiefs and elders. The youth would then undergo face-to-face training at a central location. At the end of the training, the agents were sent out to specific villages where they knew the communities, to promote and sell the products under the supervision of a project coordinator based at the project headquarters in Nairobi. The sales agents were remunerated on a retainer basis of approximately \$60 a month and a commission of 8 percent of sales.

Using young insurance agents proved to be inefficient. The bimodal seasonality of pastoral areas in Kenya and Ethiopia presented a challenge in the retention of trained agents, as most of them would drop off between seasons,¹⁹ forcing the insurance companies to recruit and train new agents at the start of every new season.

An alternative model, based on local shopkeepers, was introduced in 2015 (Chelang'a, Banerjee, and Mude 2015). Shopkeepers are employed as insurance agents, and supervised by a lead agent responsible for identifying and training them. The lead agents are expected to promote and raise awareness of the IBLI product in various forums across their UAI. The local agents are retained on an 8 percent commission on individual sales at the end of each sales window, while the lead agents are remunerated on a retainer of approximately \$200 per month and are also entitled to a 2 percent commission on their UAI's combined sales. This new model helped solve challenges such as finding trustworthy agents, since the shopkeepers have limited mobility, already own and operate their own businesses, and seek to maintain a good reputation within the community for the sake of their business.

Box 2. Government Support of Agricultural Insurance in Kenya

In 2013 the Government of Kenya made a firm commitment to strengthen agricultural insurance provision by allocating funding under the Second Medium Term Plan (MTP2), 2013–17, for (i) the implementation of a National Livestock Insurance Scheme, and (ii) to increase producers' access to credit and financial services including crop insurance (Ministry of Devolution and Planning 2013). In the same year, the International Livestock Research Institute was invited to the National Agricultural Insurance Policy task force, which led to the publication of the seminal "Situational Analysis for National Agricultural Insurance Project (NAIP)." These efforts culminated in the design and launch of a large-scale livestock insurance program known as the Kenya Livestock Insurance Programme.

¹⁹ Following the bimodal seasons (two-period season), IBLI is sold two times a year in both Kenya and in Ethiopia.

Unlike Kenya, where insurance agents are individuals, the model in Ethiopia is community based. Since 2012, when IBLI was introduced in Ethiopia, the insurance company has been working very closely with local cooperatives and microfinance institutions (MFIs) in the delivery of IBLI to pastoralists. The Ethiopian model has two levels of hierarchy: (i) village insurance promoters (VIPs) raise awareness of the product while (ii) sales agents ultimately sell it. The VIPs are responsible for creating the informed demand among the clients and then guiding them to the sales agents, who ultimately issue the policy to the clients/pastoralists. Both the VIPs and sales agents are chosen from cooperatives/MFIs at the kebele level (equivalent to a ward level in Kenya), in consultation with the community elders and the insurance company. The VIPs are given a commission of 8 percent, whereas the sales agents are given a commission of 4 percent for each sale made. Consideration is now being given to tapping into the extensive network of community animal health workers that exist in the kebeles, which could be used to strengthen and expand the scope of the existing agency model in Ethiopia, beyond the Borena region. In both Kenya and Ethiopia, further awareness is facilitated through local radio stations and word of mouth.

Since 2015, insurance companies in Kenya and Ethiopia started using mobile technologies to improve the efficiency and reduce the transaction costs of product distribution. Mobile money is used for premium payments in Kenya. Mobile-based applications are used for sales and clients' registration, and agents' training occurs both in face-to-face meetings as well as online. Though information and communication technology has facilitated a reasonable reduction in the cost of operations, transaction costs for operating in pastoral areas continue to be a significant challenge to achieving full commercial viability of the product. Efforts continue toward improving the product supply chain and delivery channels, while identifying additional services that could be bundled with insurance products to increase their value proposition.

Public-Private Partnership

KLIP is anchored in a PPP approach that includes local private insurance companies, the State Department of Livestock, and the Insurance Regulatory Authority. Research organizations and development partners are also supporting the program. The overall objective of KLIP is to reduce the risks of livestock mortality due to drought, and to build the financial resilience of vulnerable pastoralists and enhance sustainable food security through the provision of IBLI. Further, KLIP is expected to build the capacity of pastoral communities and stakeholders in the use of insurance for weather-related risks and the rebuilding of livelihood support systems, and enhance PPP engagement in the provision of Index-Based Livestock Insurance.

Private insurance companies underwrite the insurance product. In the initial stages of the program a call for tender was opened by the government every year before the beginning of the contract season (i.e., a yearly policy including two risk periods) to select the KLIP underwriter according to a set of criteria. More recently, to support the product's financial sustainability and the risk transfer for the private sector, the tender has been extended to three years and given to a pool of insurance companies. A significant portion of the risk is transferred from local insurance companies to reinsurance companies.

Since the inception of the program, the Kenyan government has fully subsidized insurance coverage for five Tropical Livestock Units²⁰ (TLUs) to a selected range of beneficiaries, thus being the policy holder under the scheme. Plans are underway to introduce a partial subsidy scheme to incentivize further

²⁰ Tropical Livestock Units are livestock numbers converted to a common unit. Conversion factors are: cattle = 1, sheep = 0.1, goats = 0.1, camels = 1.4.

voluntary purchases and to encourage insurance companies to continue expanding the market and investing in IBLI. The KLIP is managed by a dedicated Program Management Unit (PMU) under the State Department of Livestock, comprising technical officers, administration officers, and a process management adviser. The PMU is responsible for the day-to-day operations of the KLIP program. The process management adviser is responsible for training the technical and administrative staff and for developing the advising and reporting systems to be adopted by the program.

The target beneficiaries of KLIP are pastoral communities whose livelihoods are mainly dependent on livestock and are prone to the effects of recurrent droughts. They have limited alternative sources of livelihood, and any disruptions to livestock assets may lead to destitution. The beneficiaries are therefore targeted based on three main criteria: (i) own at least five TLUs; (ii) have the ability, for example, through a bank account or through another provider (e.g., mobile money service) to receive KLIP payouts; and (iii) are not the beneficiaries of any other safety-net program. Counties are involved in the process of the identification, selection, and registration of beneficiaries. A county KLIP coordinator is appointed as the contact person at the county level. With support from the KLIP PMU, the KLIP desk officer leads the beneficiary selection process at the village level, through public participation forums convened by elders and local leaders. A quota system is applied in the sharing of beneficiary slots across all the eligible UAs within the county.

In case payouts are triggered, insurance companies make payouts directly to the beneficiaries, using either mobile money or banks. The government provides a list of beneficiaries who will receive payouts before insurance covers inception. The list captures relevant client data, including their identity numbers, and mobile phone and bank account numbers. Payouts are made through either mobile or bank accounts. In case beneficiaries do not have either mobile or bank accounts, they are issued a bank cheque. County and provincial administration infrastructure is used to distribute cheques to beneficiaries as needed.

The index and payouts are calculated by an independent entity (either from the private or public sector), called the calculating agent, who is required to provide accurate, timely, transparent, and independent information about the index and payout values to all interested stakeholders. The tasks of the calculating agent include the management and maintenance of data and the documentation of the data processing chain for full replicability, the determination of the seasonal index values and percentage payouts, communication of index updates and final payouts to all involved stakeholders, and the maintenance of a backup data set. Currently, ILRI is the calculating agent of the program.

International institutions, government agencies, nongovernmental organizations (NGOs), and other key stakeholders are also important players in the KLIP PPP. ILRI and the World Bank have been providing technical and capacity support to the State Department of Livestock in the following key areas: KLIP beneficiary targeting and selection, optimal use of public funds to support a long-term sustainable livestock insurance market/program, contract design, implementation of smart subsidies, extension, awareness and capacity building, policy and institutional design, coordination of roles and responsibilities between the national government and county governments, contributions to high-level policy discussions around KLIP and IBLI, and support in the drafting of key policy documents as well as institutional design and legislation.