



**A University of Sussex PhD thesis**

Available online via Sussex Research Online:

<http://sro.sussex.ac.uk/>

This thesis is protected by copyright which belongs to the author.

This thesis cannot be reproduced or quoted extensively from without first obtaining permission in writing from the Author

The content must not be changed in any way or sold commercially in any format or medium without the formal permission of the Author

When referring to this work, full bibliographic details including the author, title, awarding institution and date of the thesis must be given

Please visit Sussex Research Online for more information and further details

**Financialisation of Risk among the Borana Pastoralists of Ethiopia:  
Practices of Integrating Livestock Insurance in Responding to Risk**

Masresha Taye Tadesse

A dissertation submitted in fulfilment of the requirements for the degree of  
Doctor of Philosophy in Development Studies of the University of Sussex

Institute of Development Studies

University of Sussex

May 2022

**Author's Declaration**

I hereby declare that this thesis has not been submitted for a degree to the University of Sussex or any other university, in the same or different form.

Signature: \_\_\_\_\_

## Summary

Pastoralists face multiple risks and uncertainties. Weather-related natural disasters, and economic, institutional and social factors have increased the risks and uncertainties pastoralists face in recent decades. Pastoralists have been responding to these in a variety of ways, including a range of local response strategies that aim to keep animals alive or help pastoralists restock. To add to these strategies, index-based livestock insurance (IBLI) has recently been offered by State and non-state actors. IBLI is a disaster risk finance instrument that employs a market-based concept through financialising drought risk. By remotely monitoring vegetation, the insurance pays out when the forage level falls below a certain threshold. This study investigates how different pastoralists in Borana, southern Ethiopia, combine livestock insurance with other response strategies.

The study explores pastoralists' exposure to, perception of and responses to risks and uncertainties in an extensive pastoral system, Dire, and an agro-pastoral area, Gomole. It employs a mixed method approach by combining quantitative (stratified household survey, N = 300) and qualitative (case studies, ethnography, photovoice and elite interviews, N = 230) techniques.

The thesis interrogates the assumptions behind the insurance product's design by investigating pastoralists' actual practices. The insurance is designed to protect the most vulnerable pastoralists from the effects of drought; however, insurance is primarily purchased by wealthier males as a means of protecting large livestock holdings or diversifying livelihoods. Other, poorer and/or female pastoralists do buy insurance; but many drop out, while others never take it up.

The findings also demonstrate how insurance is used in combination with different responses: consumption smoothing (via adjusting daily food intake, grain purchases, and livestock slaughter), market-based responses (via feed purchases, distress sales, water purchases, and veterinary services) and resource-based responses (enclosing land, moving animals, and farming).

The thesis concludes that insurance is necessarily embedded in social and political economy relations and is always part of a broader set of responses. Insurance, therefore, must be understood not just as a technical market intervention, but also in the context of pastoral settings.

## Acknowledgement

This PhD study would not have been accomplished without the continuous support and encouragement of several people. I owe a debt of gratitude to many individuals and organisations who helped me tremendously during my doctoral studies. I want to express my gratitude to the [International Livestock Research Institute](#) (ILRI) and the [PASTRES](#) (Pastoralism, Uncertainty and Resilience: Global Lessons from the Margins) program for their generous financial support throughout the study, without which this would have been impossible.

As someone who is passionate about pastoralism and pastoralists, finding supervisors that can provide academic and professional guidance is like a dream come true. I was fortunate to be under the supervision of pastoral gurus Ian Scoones and Jeremy Lind. Their unswerving and continuous support throughout my PhD was beyond my expectation. I am immensely thankful to them.

More than 600 pastoralists in Borana educated me about their culture, history, and way of life. They adopted me as a member of their clan and named me Gaayo, after a place in the Borana where the largest socio-political assembly takes place every eight years. They were there for me when I needed them the most. A million thanks to their willingness and openness to educate me on every facet of pastoralism, I was able to stand in their shoes and understand things from their point of view. I am forever grateful to everyone — *Galata Gudda Na'Bira Qabda!*

I was fortunate to sit with Borbor Bulle, a 'walking library' of the Borana, to discuss several aspects of pastoralism in Borana. Borbor and Saqo Korma facilitated the process of my adoption into one of the Borana's clans, Oidtu; this was a true blessing for me. I am also grateful to Jaba Guyo, for embracing me as his younger brother and performing the *Mogassa* rituals and Ahmed Waqo for creating the link.

My research assistants and in-laws, *Sodda* Waqo Gobu, Liban Godana and his wife Amina Guyo, Guyo Gobu, Alemayehu Nigussie and enumerators Kara Dida, Huta Jarso, Dida Gerbole, Galma Koropicha, and Roba Dhokina, were instrumental not only in data collection but also providing vital insights about pastoralism. Several local mobilisers, Godana Qarre, Golich Huqa, Sora Qararsa, Kuse Charti, Huqa Godana, and so many others, were super helpful in identifying pastoralists to take part in the research.

Former and current ILRI colleagues of the IBLI team were crucial in shaping and refining my ideas, and several of them were my inspiration throughout the process. Andrew Mude, Yihenew Zewdie, Philemon Chelanga, Francesco Fava, Nathan Jensen, Rupsha Banerjee, and Njoki Kahi deserve special thanks. Despite the financial help that comes from ILRI, I want to emphasize that none of this would have been possible without Polly Erikson's unwavering support, for which I am truly grateful.

The PASTRES team, which has evolved from a professional team to an extended family made the PhD process a meaningful and life-changing learning experience. My Amigos Palden Huadancairang (Pidil) and Giulia Simula (Giulia), as well as Linda Pappagallo, Tahira Mohamed, and Natasha Maru, have contributed immensely to making my PhD journey memorable and enjoyable.

I would also like to thank my friends who have contributed to the process. Although I cannot name you all, I want to say that I am greatly indebted to your support and encouragement - Michael C. Mammo, Ezana Haddis, Hallelujah Lulie, and members of the Adwa team for looking after my family during my absence and the encouragement. Thank you, Shiro.Com members for such a lovely experience during the PhD process.

When I became a father, I realised how tough it is to raise a child in Addis-in Kazanchis, the city's magma. I have no idea how my mother (Almaz Gebre) and father (Taye Tadesse) managed to raise their five children and three additional relatives. What did you do to make me fall in love with living in the rural parts outside of the city? What did you do to shape me into the person I am today? You pushed the boundaries of Ethiopia's educational system in order to provide me with the opportunity to pursue my dreams. You never cease to amaze me. I ran out of words to thank you for your role in my life. May you live longer in good health. My sisters and their partners – Lelo (Wubishet), Niya (Terefe), and Bontu (Samson), as well as my brothers Naol and Olana – I am grateful for your contributions in whatever you can. My in-laws, Gashe Belay Alene, W/ro Etenesh Worku, Meron (Berhane), and Feven—I owe you gratitude.

I am too speechless to thank my better half, Tsion Belay (*Birkuta/Boratti*). There are no words to express the contribution you made in this whole process. Your presence really mattered at every juncture of the PhD. I cannot even imagine if I would have done this without you. You are an amazingly generous and understanding person. You profoundly

shaped my intellectual and personal journey. I thank you every second of my life. Love and hugs to my sweet distractions, Amnon and Melal. The reasons I enjoy fatherhood.

Finally, I owe my gratitude to a great number of friends at IDS and in Ethiopia. Although this space will not allow me to name all, I want to say thank you to every one of you who have inspired me, encouraged me, and positively impacted my PhD journey!

Masresha Taye Tadesse

May 2022

***Dedicated to***

my OPFW, Tsion Belay, for the love, companionship, and for being my silent

force to be a better person every day!

my mother, my greatest mentor!

my father, my greatest roadmap!

my children, for spicing up my life!

## Table of Contents

Summary .....	iii
Acknowledgement .....	iv
List of Figures.....	xi
List of Tables.....	xii
List of Pictures .....	xii
List of Box.....	xiii
Glossary of Terms in Afaan Oromo.....	xiv
List of Abbreviations.....	xv
<b>Chapter One: Insurance in the Drylands of Ethiopia .....</b>	<b>1</b>
1.1 Background.....	2
1.2 Conceptualisation and assumption of index-insurance in African drylands .....	3
1.2.1 Pasture and Drought in the Drylands.....	4
1.2.2 Impact of Droughts .....	5
1.2.3 Asset Ownership (Livestock) and Protection .....	5
1.3 What has been done, and what remains?.....	7
1.4 Thesis Outline: Introducing the Chapters.....	10
1.5 Significance of the Study .....	12
<b>Chapter Two: Financialisation of Risk in the Era of Uncertainty: Locating the Debate in the Literature .....</b>	<b>13</b>
2.1 Introduction.....	14
2.2 Financialisation of Risk and Uncertainty .....	14
2.3 Risk and Uncertainty.....	16
2.4 The Growth of Insurance .....	20
2.5 The Social and Political life of Insurance .....	22
2.6 Understanding IBLI: Features and Assumptions in Constructing the Insurance Model.....	26
2.7 Risk and Uncertainty in the Drylands: what role for insurance?.....	31
2.8 Research Framework and Questions.....	34
2.9 Conclusion .....	37
<b>Chapter Three: Research Methodology.....</b>	<b>39</b>
3.1 Introduction.....	40
3.2 Research Approach.....	40
3.3 The Study Area: Why Borana?.....	41
3.4 Sampling Procedure.....	47
3.5 Type of Data (Data Sources) and Research Tools.....	50
3.1.1 Secondary Sources .....	51
3.1.2 Primary Sources .....	53
3.6 Positionality .....	67
3.7 Limitations and Difficulties .....	69
3.8 Conclusion .....	70
<b>Chapter Four: Dynamics of Change and Variability in the Borana Dryland System .....</b>	<b>71</b>
4.1 Introduction.....	72
4.2 Overview of the Borana Pastoral System .....	73
4.3 Changes in the Natural Environment .....	75

Rainfall Pattern and Variability .....	75
Land Use and Settlement .....	78
Change in Pastoral Production.....	82
4.4 Demography and Socio-economic Issues.....	84
Demography .....	84
Livelihoods .....	84
Income .....	88
Socio-Institutional Environment .....	90
4.5 Infrastructural Developments .....	92
4.6 Conclusion .....	95
<b>Chapter Five: Features of the Study Population.....</b>	<b>97</b>
5.1 Introduction.....	98
5.2 Demographic Features .....	99
Gender .....	99
Marital Status.....	99
Age   100	
Household Size.....	101
5.3 Settlement: Patterns and Changes.....	102
5.4 Livelihood: Status, Changes and Perceptions.....	103
Livelihood.....	103
Source of Income .....	106
Perception of Livelihood in different Gada Periods .....	108
5.5 Livestock and Assets .....	109
Livestock Ownership .....	109
Asset Ownership .....	111
5.6 Pastoral Resources (Assets): Water and Pasture .....	114
Water 114	
Pastureland (Livestock Feed) .....	117
5.7 Summary of Features and Patterns from the Study Population .....	119
5.8 Conclusion .....	121
<b>Chapter Six: Exposure to Risk - Index Insurance and Borana Pastoral Systems .....</b>	<b>122</b>
6.1 Introduction.....	123
6.2 Whose Drought Counts? The Index Insurance and Localised Droughts .....	124
6.3 Pastoral land Use Systems and Index Insurance .....	134
Macro-Level Dynamics .....	134
Meso-Level Dynamics .....	137
Micro-Level Dynamics.....	143
6.4 Where does the risk of drought fall under IBLI? .....	145
6.5 Conclusion .....	149
<b>Chapter Seven: Perception and Conceptualisation of Risk .....</b>	<b>151</b>
7.1 Introduction.....	152
7.2 Multiple Perceptions .....	154
Free listings of risk perceptions.....	154
Drought Risk: Perception and Experiences .....	155
7.3 Differentiated Conception of Risk and Uncertainty: Wealth, Age, Gender and Location.....	160
Wealth.....	161
Gender .....	163
Age .....	166

Location .....	169
7.4 How are Perceptions (Re-)Shaped? .....	171
7.5 Conclusion .....	178
<b>Chapter Eight - Responses to Risk .....</b>	<b>180</b>
8.1 Introduction .....	181
8.2 Factors contributing to drought responses .....	182
Economic Status .....	183
Gender .....	186
Age .....	187
Location .....	189
8.3 Practices of combining responses with insurance: Trends, logic and decisions .....	191
i) Explaining the data presentation and discussion - How did I analyse and present the data? .....	192
ii) Combining Insurance with Consumption-Smoothing Responses .....	193
iii) Combining Insurance with Productive Responses .....	198
8.4 Conclusion .....	208
<b>Chapter Nine: Financialisation of Risk: The Hype, Realities and Challenges of IBLI .....</b>	<b>211</b>
9.1 Introduction .....	212
9.2 Financialisation of Risk: A summary of assumptions vs practices .....	213
9.3 Self-Insurance, Social Insurance, and Market-based Insurance: Reflections on the Critical Literature .....	217
9.4 Disaster Risk Financing Tools: Considerations for Programmatic and Policy Issues .....	219
i) Exposure to Drought Risk: Ensuring different pathways .....	220
ii) Covariate Risk and Impacts: Acknowledging and embracing heterogeneous experiences and effects of drought .....	222
9.5 Conclusion .....	224
<b>References .....</b>	<b>226</b>
<b>Appendices .....</b>	<b>i</b>

## List of Figures

Figure 2.1 The ‘Uncertainty Matrix’ .....	19
Figure 2.2 Steps in developing the IBLI Product in Borana.....	28
Figure 2.3 Index Calculation.....	30
Figure 2.4 Research Conceptual Framework.....	36
Figure 3.1 Study Area – Borana, Ethiopia.....	46
Figure 3.2 IBLI Total Sales and Share of Insurance Clusters (2012-2020) .....	48
Figure 3.3 Site, Village and Household Selection Procedure.....	49
Table 3.4 How different sources of information are linked/integrated .....	74
Figure 4.1 Thirty-Year Rainfall Distribution in Dire and Gomole (in mm) .....	75
Figure 4.2 Monthly Coefficient of Variation– from Jan 1991- Dec 1999 (top), Jan 2000 – Dec 2009 (middle), and Jan 2010 – Dec 2019 (bottom) .....	77
Figure 4.3 Settlement Pattern and Land Use in Gomole.....	79
Figure 4.4 Settlement Pattern and Land Use in Gomole (Satellite Imagery) .....	80
Figure 4.5 Household Herd Size (in TLU) in Borana in different years.....	86
Figure 4.6 Mean household herd size (in TLU) (top) from 2012-2015 in Borana.....	87
Figure 4.7 Mean household level livestock lost from 2012-2015 in Borana.....	88
Figure 5.1 Households’ Age Distribution in Dire and Gomole (in percentage within each age group.....	101
Figure 5.2 Residence Type by Site (left) and Disaggregated by Insurance Category (right).....	103
Figure 5.3 Mean source of livelihood in Dire (per cent) in 2019.....	104
Figure 5.4 Mean source of livelihood in Gomole (per cent) in 2019.....	105
Figure 5.5 Primary Source of Income in Dire (per cent) .....	106
Figure 5.6 Primary Source of Income in Gomole (per cent) .....	107
Figure 5.7 Wellbeing Perception during different Gada Periods (per cent) .....	109
Figure 5.8 Change of Livestock Ownership between 2010 and 2019 in Gomole and Dire.....	110
Figure 5.9 Household Asset Ownership (mean numbers) .....	112
Figure 5.10 Household Level Farmland Size in hectares (ha) .....	112
Figure 5.11 Households Access to Water for Livestock (per cent). .....	116
Figure 5.12 Source of Animal Feed during Drought Seasons (per cent) .....	118
Figure 6.1 Spatial distribution of locations sampled for vegetation analysis.....	126
Figure 6.2 NDVI Values and Vegetation Conditions.....	127
Figure 6.3 eMODIS NDVI between 2010 and 2020 in Dire (top) and Gomole (bottom) clusters.....	128
Figure 6.4 Mean Monthly Rainfall and Vegetation distribution in 2018 in Dire and Gomole.....	132
Figure 6.5 Partial Areas in Gomole, in 2019.....	140
Figure 6.6 Partial Areas in Dire, in 2019.....	141
Figure 6.7 eMODIS NDVI in Dire cluster between 2010 and 2020.....	144
Figure 6.8 Annual Rainfall and Vegetation Trend from 2010 – 2019.....	148
Figure 7.1 First most important source of information on the upcoming rainfall and pasture condition.....	172
Figure 7.2 Second most important source of information on the upcoming rainfall and pasture condition.....	172

## List of Tables

Table 3.1 Sample size for each data collection tool.....	50
Table 3.2 Secondary data/information source and features.....	53
Table 3.3 Case Study: Modules, Timeline and Guiding Questions.....	58
Table 4.1 Monthly Source of Income in Birr (mean from 2012-2015).....	82
Table 4.2 Wealth Categories in Borana.....	83
Table 5.1 Number of Children – mean and variations.....	102
Table 5.2 Mean TLU Ownership based on wealth status (rich, medium, poor).....	102
Table 1.3 Household Land Ownership in Towns (per cent) .....	113
Table 5.4 Sources of Water in Borana .....	114
Table 5.5 Sources and Types of Feed/Forage .....	117
Table 5.6 Key Features of Studied Population – Dire and Gomole.....	120
Table 7.1 Foremost source of risk– Free list* (per cent) .....	154
Table 7.2 Impacts of different forms of risk and uncertainty (retrospective experience in 2019) ....	157
Table 8.1 Household/Individual attributes that (re-)shape response strategies.....	191
Table 8.2 Insurance with Consumption-Smoothing Responses in Dire and Gomole in 2019 (per cent) .....	194
Table 8.3 Combining Insurance with Productive Paths – Market-based responses in 2019 (per cent) .....	199
Table 8.4 Combining insurance with Productive Response in 2019 (Pastoral Resources) – Migration (per cent).....	203
Table 8.5 Combining Insurance with Productive Responses in 2019 – Pastoral Resources – Land-Use (per cent).....	205

## List of Pictures

Picture 3.1 Gumi Gaayo (Assembly of Gaayo) – Day 1 Meeting.....	60
Picture 3.2 Partial view of photovoice participants.....	62
Picture 3.3 One-to-one training on operating a digital camera – Dire (left) and Gomole (right) .....	63
Picture 3.4 The Process of Photovoice – discussion with photovoice participants.....	63
Picture 3.5 Selected pictures from community validation exercise in Dire.....	64
Picture 3.6 One of the informal photovoice validation discussions – Gomole.....	64
Picture 3.7 Distributing newspapers to photovoice participants and pastoralists.....	65
Picture 4.1 Roadside milk sale in Dire.....	94
Picture 5.1 Small Ruminants trade using a weighing scale (Photo by Wako Gobu) .....	105
Picture 5.2 Haro in Dire, Lafto <i>kebele</i> .....	115
Picture 5.3 A privately-owned Dollolo construction in Dire.....	117
Picture 6.1 Gumi Gaayo, Day 9 of the General Assembly on September 06, 2020.....	136
Picture 6.2 Verbal exchanges between livestock owners and youth who detained livestock found in communal property.....	143
Picture 7.1 Fenced compound to detain livestock – Photo by Sora, 2 <sup>nd</sup> October 2019, in Gomole...	159
Picture 7.2 Photovoice by Loko Doyo (52, wealthy female active insurance policyholder) in Gomole.....	161
Picture 7.3 Photovoice by Malich, 58, a wealthy, active insurance policyholder in Dire.....	162
Picture 7.4 Photovoice by Dida in Dire.....	167
Picture 8.1 Feed Reserve (left) and Accumulating Grains (right) .....	185

Picture 8.2 Poultry as a response by Qaballe (left, 38, female-headed) and Galmo (right, 18, single)	187
Picture 8.3 Village-level discussion on pasture enclosures – by Kusse in Dire	188
Picture 8.4 Smuggling Goods using motorbikes	189
Picture 8.5 Photo by Boru, an insured pastoralist from Dire, to display the physical condition of cows during drought periods, October 2019	196
Picture 8.6 Crop residue (from own farm or purchased) accumulation in Gomole. Photo by Sora (left) and Qaballe (right), in October 2019 and March 2020 respectively.	200

## List of Box

Box 2.1 Main Features of IBLI	27
Box 7.1 Golicha Galgalo, 64, wealthy male agro-pastoralist in Gomole	174

## List of Annexe

### ▪ Annexe I Primary Data Collection Instrument

Module I	Household Survey
Module II	Focus Group Discussion (FGD) Guideline on Risk and Uncertainty: Timeline, Perceptions, and Responses
Module III	Focus Group Discussion (FGD) Guideline on Land Use and Changes
Module IV	Focus Group Discussion (FGD) Guideline on Risk and Uncertainty: Timeline, Perceptions, and Responses
Module V	Case Study – Phase I
Module VI	Case Study – Phase II - Discussion Questions for extended case studies
Module VII	Case Study Phase III – Extended Version
Module VIII	Elite interview – Reflection Interview

### ▪ Annexe II List of Major Risk Response Strategies

### ▪ Annexe III Vegetation Trends for Sampled (Studied) Areas in Dire and Gomole

## Glossary of Terms in Afaan Oromo

<i>Aada'seera</i>	Rules
<i>Abba Gada</i>	Father of Gada (leader of the Gada institution)
<i>Abba Olla</i>	Head of a village
<i>Abba/Hadha Warra</i>	Head or father/mother of the family
<i>Aradda</i>	Sub-cluster
<i>Bussa gonofa</i>	Self-help association in Borana
<i>Derg</i>	Literally means committee, the name of a military government that rules Ethiopia between 1974 and 1991 (Geez term).
<i>Dheeda</i>	Rangeland
<i>Dureessa</i>	Wealthy ( <i>wealth category in Borana</i> )
<i>Gaaddisa abbaa qa'ee</i>	Meeting by village leader
<i>Gaaddisa eebbisa</i>	Blessings in the shade
<i>Gaaddisa</i>	Shade
<i>Gada</i>	Indigenous administration of Oromo ethnic group (Ethiopia and Kenya)
<i>Ganna</i>	Main rain season in Borana, also referred to as the long-rain season, usually lasts from March-May
<i>Godaana</i>	Move or to move
<i>Gumi Gaayo</i>	Assembly of Gaayo (a place in Borana)
<i>Hagaya</i>	Small rain season in Borana, also referred to as the short-rain season, usually lasts from October - December
<i>Hariyya</i>	Age class
<i>Harka qalleessa</i>	Poor (wealth category in Borana)
<i>Kebeles</i>	The lowest state-led administration structure in Ethiopia
<i>Kora dheebuu</i>	Meetings on watering of animals
<i>Kora dheeda</i>	Meetings on grazing
<i>Kora eelaa</i>	Meetings for water-wells
<i>Lubba</i>	Age-set
<i>Madda</i>	Well clusters
<i>Marroo</i>	Women self-help groups
<i>Matta-Tika</i>	Large pastureland
<i>Nama ufirraa bulu</i>	Medium ( <i>wealth category in Borana</i> )
<i>Oburu</i>	Land used for crop cultivation and privately owned
<i>Olla</i>	Village
<i>Ragga</i>	Forecast (local forecasters)
<i>Reera</i>	Sub-cluster (rangeland)
<i>Warra</i>	Family
<i>Woredas</i>	Second layer of state administration

## List of Abbreviations

AFD	African Development Fund
AfDB	African Development Bank
ASALs	Arid and Semi-Arid Lands
BZFEDO	Borana Zone Finance and Economic Development Office
CARE	Cooperative for Assistance and Relief Everywhere
CSA	Central Statistical Agency
CST	CAFOD, SCIAF, and Trócaire, are Catholic Relief and Development organisations
CTA	Technical Center for Agricultural and Rural Cooperation
CV	Coefficient of Variation
EDC	EROS Data Center
eMODIS	Moderate Resolution Imaging Spectroradiometer
EROS	Earth Resources Observation Systems
ESRI	Environmental Systems Research Institute
ETB	Ethiopian Birr or simply Birr (Ethiopian Currency)
FDRE	Federal Democratic Republic of Ethiopia
FGD	Focus Group Discussion
GoE	Government of Ethiopia
HoA	Horn of Africa
IBLI	Index-Based Livestock Insurance
ICPAC	IGAD's Climate Prediction and Applications Centre
IDDRSI	IGAD's Drought Disaster Resilience and Sustainability Initiative
IGAD	Intergovernmental Authority on Development
ILCA	International Livestock Centre for Africa
ILO	International Labour Organisation
ILRI	International Livestock Research Institute
IPCC	Intergovernmental Panel on Climate Change
KLIP	Kenyan Livestock Insurance Program
MoA	Ministry of Agriculture
NASA	National Aeronautics and Space Administration
NCAS	National Centre for Atmospheric Science
NDVI	Normalised Difference Vegetation Index
NGO	Non-Governmental Organisations
OIC	Oromia Insurance SC
PARIMA	Pastoral Risk Management Project
PASTRES	Pastoralism, Uncertainty and Resilience: Global Lessons from the Margins
PFE	Pastoralist Forum Ethiopia
PhD	Philosophiae Doctor (Doctor of Philosophy)
TLU	Tropical Livestock Unit
TSI	Total Sum Insured
UAI	Unit Areas of Insurance
USD	United States Dollar
USDA	United States Department of Agriculture
USGC	United States Geological Survey
WB	The World Bank
WFP	World Food Programme

## Chapter One: Insurance in the Drylands of Ethiopia

## 1.1 Background

The drylands of Africa are home to pastoral populations who rely heavily on livestock production. The livelihood, socio-economy, political, environmental and other aspects of pastoralists are strongly linked to these dryland systems (Scoones, 1995; McPeak et al., 2012; Behnke and Mortimore, 2016; Coppock, 2016; Ayal et al., 2017). The drylands of the Horn of Africa (HoA) constitute one of these systems, with their incredibly complex socio-political and environmental features (McPeak et al., 2012; Catley et al., 2013; Korf et al., 2015; Lind et al., 2016). For many decades, the region's drylands (also referred to as 'arid and semi-arid lands' – ASALs) have undergone multiple processes of change (Little et al., 2012; Lind et al., 2016 and 2020). Among the changes experienced have been the increasing incidence of natural and environmental shocks (disasters), land tenure changes (and the associated issues of sedentarisation, villagisation and territorialisation), rangeland fragmentation, the dwindling of indigenous and communal rules and practices, conflicts, the increasing population of humans and livestock, trade and market-related uncertainties, policies and political changes, infrastructural expansion and connectivity, and the heavy presence of foreign/external actors (Little et al., 2008 and 2012; Catley and Aklilu, 2013; Catley et al., 2013; Aklilu et al., 2016; Catley, 2017). As a result of these developments, pastoral communities are faced with multiple risks and uncertainties.

The ASAL regions in the Horn of Africa are increasingly vulnerable to environmental and humanitarian crises (Little et al., 2012; Catley et al., 2013). To respond to these challenges and to address the growing climatic impact on pastoral families and communities, state and non-state actors have been devising strategies and interventions. Financial inclusion and social protection/SafetyNet are two of the main strategies they recommend (Clapp and Isakson, 2016). A disaster risk financing tool combining both of these has been developed. For the proponents of such external interventions, such as Clarke and Dercon (2016), finance is believed to be the 'glue' for state/non-state interventions against natural disasters (like drought, flood, or cyclones), permitting reconstruction, social protection and financial inclusion of vulnerable groups. As a result, proponents argue disaster risk financing boosts smallholders' (farmers' and pastoralists') resilience and thereby improves their livelihoods.

Index-based livestock insurance (IBLI) is one of the latest interventions within the framework of disaster risk finance tools. It has been lauded as a novel, market-led risk management response for the pastoral population. IBLI evolved from social protection operations in the HoA to address climate-related risks faced by vulnerable pastoralists through a risk-financing

mechanism. What makes IBLI unique is that, unlike conventional insurance, it does not consider losses incurred by a pastoralist (individual) after a disaster such as drought. Using satellite technology to monitor pasture (vegetation) availability, IBLI makes pay-outs to individual pastoralists before a disaster (an insured peril) occurs. This is ascertained through an index when an estimated forage condition in an area falls below a certain triggering threshold.

However, various assumptions about how pastoral systems function and how pastoralists respond to drought are embedded in the development of the insurance product and its application in the pastoral systems. This thesis examines these assumptions, by focusing on the practices of pastoralists in combining index-based livestock insurance with the broader set of responses to risk and uncertainty.

## **1.2 Conceptualisation and assumption of index-insurance in African drylands**

To begin with, insurance is a security measure against the risk of loss of capital/assets (Ewald, 2019). However, conventional insurance, which indemnifies insured individuals/entities against the loss of property/capital, is not applicable or proves too expensive in most agricultural areas of the Global South, where financial markets are very weak (Clarke and Dercon, 2016). Linking with actual agricultural losses is costly or impractical (Isakson, 2015; Clapp and Isakson, 2016). As a result, in the early 2000s, index insurance was introduced to overcome the challenges of conventional insurance, particularly in marginal areas. Unlike conventional insurance, index insurance is not tied up with the actual losses; instead, it operates through an index of factors, including rainfall, temperature, and others (Fava and Vrieling, 2021).

The advantages of index-based insurance (crop and livestock) over conventional/traditional (indemnity-based insurance) are three-fold: i) the transaction costs of verifying damages/losses are low; ii) the problem of "moral hazard"<sup>1</sup> is minimised or resolved; and iii) it removes "adverse selection"<sup>2</sup> (Isakson, 2015; Janzen et al., 2016).

---

<sup>1</sup> Moral hazard can be understood as the incentive of an insured person to make unusual risk ventures.

<sup>2</sup> Adverse selection is a situation when one of the parties (seller/buyer of an insurance) has knowledge or information about the risk to be insured. In other words, it is information asymmetry/failure.

The IBLI product was first piloted in northern Kenya in 2010 and later scaled up to include southern Ethiopia after two years. It was developed to safeguard vulnerable pastoralists against weather-induced forage scarcity.

Below are key assumptions made in the literature on IBLI in the HoA (among others: Carter et al., 2008 and 2017; Chantarat and Mude, 2010; Chantarat, Mude, Barrett, and Carter, 2012 and 2013; Chantarat, Mude, Barrett, and Turvey, 2009 and 2013; Chelanga et al., 2017; Fava and Vrieling, 2021; Fava et al., 2021; Jensen, Barrett, and Mude, 2015, 2016 and 2017; Jensen and Barrett, 2017; Jensen, Mude, and Barrett, 2018; Jensen et al., 2019). Some of the assumptions and conceptualisations of the dryland system are explicitly stated in this literature, or in the development of the insurance products. Others, however, are indirectly expressed or integrated into insurance product development. For example, all livestock (camels, cattle, goats and sheep) are standardised to a certain unit measurement without appreciating the difference between grazers and browsers. I divide these assumptions and conceptualisations into three categories: pasture and drought, impacts of droughts, and livestock ownership in the dryland system, as follows.

### 1.2.1 Pasture and Drought in the Drylands

- First, in developing the insurance model, it is assumed that pastoralists in a given area have similar access to pasture, and their mobility is contained and can be demarcated and calculated during the monitoring months (the rainy season).
- Second, rainfall distribution is highly correlated with pasture availability (drought risk). Hence, by monitoring rainfall distribution during rainy seasons, it is possible to predict forage distribution (availability/scarcity) for dry seasons. Moreover, the latest season's vegetation status can be compared with all other periods from 2003, in order to calculate the deviations for insurance pay-outs. This assumes that both wet and dry seasons or months start and end at the same time across the years of calculation.
- Third, drought because of rain failure (shortage) is the leading cause of livestock mortality. In other words, there is a single peril that is insured against. In this way, the risk of drought from lack of rain in a given pastoral area can, it is assumed, be captured objectively by employing innovative remote technology.

The second and third framings in developing the model assume other risks (socio-economic factors) that might affect forage/pasture availability in a given area. However, lack of rain causes

forage scarcity and can be independently ascertained and measured without further risk to forage availability.

### 1.2.2 Impact of Droughts

- Fourth, the risk of forage scarcity/drought<sup>3</sup> is a covariate in an area; hence pastoralists, on average, are affected equally by it. As a result, vegetation in an area can be monitored and calculated objectively, and premiums/pay-outs can be associated with individual pastoralists' exposure to drought risk.
- Fifth, all types of livestock can be standardised using TLU (Tropical Livestock Unit)<sup>4</sup> so that the impacts of drought on livestock can be monetised; hence, cattle and sheep (grazers) and camels and goats (browsers) are standardised and assumed to be equally affected by forage scarcity in an area.

### 1.2.3 Asset Ownership (Livestock) and Protection

- Sixth, it is assumed that livestock is held individually and can be insured through individualised insurance protection. As a result, pay-outs are calculated based on the resources needed during the forage scarcity period per insured animal.
- Seventh, IBLI is a pro-vulnerable asset-protection mechanism against weather-induced shock. Hence, insuring against the loss of pastoralists' key household assets, namely livestock, reduces household vulnerability and asset depletion, and can ultimately save them from poverty. When first piloted in Kenya, it was argued that the insurance product appealed less to the wealthy, given their capacity to self-insure, whereas the poor could not afford it (and should therefore be part of a subsidised social protection scheme). However, when scaled up to include other dryland systems (first in Ethiopia), it is with the assumption that everyone would engage, even on a commercial basis, and so this was deemed to be an intervention that favoured the poor.

How valid are these assumptions regarding pastoral systems in the HoA? This thesis investigates this matter with a detailed study of what actually happens on the ground in Borana, southern Ethiopia. Accordingly, this study asks a central research question: "How do

---

<sup>3</sup> As used under IBLI, this study also uses drought, forage shortage and forage scarcity interchangeably.

<sup>4</sup> Several studies aggregated total livestock herded by a household using TLUs. IBLI also uses this standardisation for calculating premiums and payouts. The conversion factor for 1 TLU is equivalent to 1 cattle, 0.7 camel, 10 goats or 10 sheep.

pastoralists combine livestock insurance with other ways of responding to risk and uncertainty?"

This study interrogates the aforementioned assumptions and explores what happens in practice. Unlike much of the literature on disaster risk financing and index-based livestock insurance, the focus of the thesis is not on impacts alone, but rather on pastoralists' perspectives of the financialisation of risk through livestock insurance. To do so, I carefully investigate how the *exposure* to, *perception* of, and *response* to drought risk are conceptualised among insurance promoters and, in turn, how these concepts are constructed among different pastoralists in Borana. Below is an overall summary of the arguments and the three sub-questions that have guided the investigation for the thesis.

**Exposure to Risk:** *What risks and uncertainties have pastoralists in Borana faced over time?*

This study argues that pasture shortage is uneven at the insurance cluster<sup>5</sup> level and that pastoralists are exposed to forage scarcity in diverse ways, making it difficult to objectively show the risk levels that households experience. The risk of drought is not independent of other production risks (livestock and associated) in the pastoral system. Furthermore, pastoralists use varied resource management/governance frameworks, which are not taken into account while modelling the index insurance due to the heterogeneity of forage/pasture distribution over space and time. Pastoralism in dryland systems relies on these layers of institutions and behaviour to (re-)structure pasture supply and utilisation.

**Perception, Conceptualisation and Experience of Risk:** *How are risks and uncertainties perceived by different pastoralists (richer/poorer, men/women, young/ old)?*

Drought is conceptualised in a specific way among index insurance product-modellers, actuaries, underwriters, and brokers. Drought is a covariate risk that affects all pastoralists in an insurance cluster equally. Therefore, the 'perceptions' of insurance units, premiums, pay-out triggers, index measures, and purchasing clients are driven by this. As a result, the risk distribution is equal among all subscribers to that insurance unit.

Nevertheless, poor rainfall coexists with a plethora of other risks and uncertainties, including conflicts, disease, locust plagues, and other social, political, and environmental disasters, all

---

<sup>5</sup> Index Insurance contracts are based on geographical units/clusters that exhibit a similar risk profile regarding the insured risk (drought risk); they are also referred to as IBLI Insurance Units, Unit Areas of Insurance (UAI), index units, etc.

of which are linked and influence how drought is perceived and experienced. Individuals' views and conceptualizations of drought risk differ depending on their background — gender, wealth, and age — as well as the physical and socioeconomic context in which they live. As a result, it is more than just an individual risk, but a different impression of risk felt on a greater scale. So, drought risk intersects between personal (idiosyncratic) and broader (covariate) socio-environmental factors.

**Response to Risk:** *How is livestock insurance combined with other ways of responding to risks and uncertainties by different groups of pastoralists?*

Index insurance is meant to serve as an asset protection mechanism for vulnerable pastoralists. As a result, proponents of the insurance product foresee that when a drought hits a region and payouts are made to insured pastoralists, they will respond to the drought risk by investing in feed, water, and veterinary services to keep insured animals alive. Therefore, for the state and development actors in pastoral settings, IBLI is a "pro-vulnerable development intervention" that protects pastoralists from further poverty traps.

However, I argue that the practises of combining livestock insurance with other kinds of drought risk response vary (disaggregated by wealth, gender, and age) within an insurance cluster. Therefore, when index insurance is marketed commercially, the notion that it will benefit the most vulnerable people overlooks some very important characteristics of pastoralism, since the financialization of drought risk attracts wealthier pastoralists rather than the most needy. This kind of monetisation of responses doesn't always help protect assets (like livestock), as insurance modellers say it will, but rather replaces localised responses of pastoralists—among others, social insurance, collective risk sharing, and so on.

### 1.3 What has been done, and what remains?

As has been introduced above, IBLI was first introduced in northern Kenya in 2010 - the first index insurance in a pastoral system in Africa. After two years, it was scaled up to a similar agro-ecology, that of southern Ethiopia. By 2022, more than 60,000 pastoralists in different parts of the HoA have owned insurance cover (either commercially or subsidised by state or non-state actors) at least once in the last decade. The introduction and scaling up of IBLI in Kenya and Ethiopia were accompanied by rigorous longitudinal studies at the household level from 2012 to 2015.<sup>6</sup> These studies involved experiments that focused on understanding

---

<sup>6</sup> A complete list of studies and related materials can be found at <https://www.drylandinnovations.com/>.

the uptake behaviour of pastoralists. The existing literature adds to our understanding of the role of insurance in Borana (southern Ethiopia), northern Kenya, and beyond in three key aspects: IBLI product design and features, its impacts, and insurance uptake/demand. Below, I discuss the existing literature and identify the gaps.

*Product design and features:* Studies using models, particularly by Chantarat et al. (2009, 2010, 2012, 2013 and 2017) and Fava et al. (2021), provide three key findings. First, drought due to rain failure (low or lack of rain) is a covariate<sup>7</sup> risk making pastoralists vulnerable to poverty. Second, IBLI addresses the problem through an innovative approach of remotely monitoring forage performance by employing satellite technologies. Third, as a result, "IBLI is most effective in protecting households from otherwise uninsured catastrophic covariate risks" (Chantarat et al., 2013:229).

On the other hand, Jensen et al. (2016, 2018, and 2019) provide vital insights on the effectiveness of the insurance product, particularly from the perspective of basis risk – the mismatch between actual and predicted loss/insurance pay-out (estimated by the insurance model). IBLI's basis risk is substantial, primarily related to inter-household heterogeneity in an insurance area (Jensen et al., 2015). Nevertheless, existing literature on IBLI in Borana (broadly in all intervention areas across the HoA) does not set out pasture governance and institutions around resource management (linked to exposure to drought risk) that go beyond static monitoring of vegetation during rainy seasons. Moreover, the socio-economic aspects of exposure to drought risk and associated uncertainties are scant in the literature.

*IBLI's impact:* Most of the studies on IBLI focus on the positive impact of the insurance scheme (among others, Janzen and Carter, 2013 and 2018; Hirfrot et al., 2014 and 2017; Jensen et al., 2015; Carter et al., 2018; Takahashi et al., 2018; Taye et al., 2019). One of the key features of the studies is how livestock insurance benefits pastoralists during drought periods. Improved food security expressed as 'smoothing consumption and dietary improvements', is the first benefit of the insurance scheme. The second major area of impact studies addresses the ways in which the insurance product has helped pastoralists reduce distress livestock sales. Pastoralists tend to engage in a negative response to drought risk, adversely affecting their future asset base (livestock), but insurance helps them to avoid this. Third, Takashi et al., 2018, find that insurance does not crowd out informal risk-sharing

---

<sup>7</sup> Covariate drought risk under IBLI is a risk that affects households equally (on average) in a larger geographic area; details are discussed throughout the thesis.

mechanisms. Fourth, Hirfort et al., 2014 and 2017, indicate that livestock insurance, even without pay-outs, has a positive, subjective effect on wellbeing. Finally, in a new angle of understanding regarding the impact of the insurance scheme, Fisher et al. (2018) give evidence that the insurance scheme in Kenya fails to promote social equality among pastoralists of varying wealth statuses. While valuable, these studies have not investigated how insurance is combined with other responses, nor do most studies distinguish according to the pastoral background (such as wealth status, gender, age and location).

*Insurance Demand and Uptake:* Research on potential IBLI demand and uptake is mostly drawn from field experiments. The best example is that of discounted coupons used in Ethiopia and Kenya between 2012 and 2015, which provides good insight into insurance uptake and demand. From these experiments, key lessons can be drawn on the quality of the insurance product, the financial literacy of the clientele, and infrastructural and regulatory issues. For example, Chantarat et al. (2012), Jensen et al. (2016 and 2019), and Fava et al. (2021) discuss the fact that the quality of the product is one of the preconditions for the successful scaling up of IBLI. Takahashi et al. (2020) identify insurance uptake as being correlated to higher wealth status and education level of a household. On the other hand, Bageant and Barrett (2017) find no gender differences in IBLI demand.

Furthermore, financial literacy (including knowledge about livestock insurance) positively correlates with insurance demand (Banerjee et al., 2019; Taye et al., 2019; Takahashi et al., 2020). Sources of livelihood— pastoralism or agro-pastoralism- are also identified as factors affecting insurance demand, whereby those who rely heavily on livestock production invest more than farming households (agro-pastoralists, in other words, those involved in the integration of both crop and livestock production) (Amare et al., 2019). Finally, Jensen and Barrett (2017) and Banerjee et al. (2019) also examine capacity-building and institutional issues, including regulatory frameworks that are key for higher insurance demand. Furthermore, Johnson (2021) argues that in most regions of Africa, index insurance seeks to create an observable and measurable phenomenon of drought in time and place. However, subjective characteristics of drought are entrenched within economic-political domains.

To sum up, despite the vital contributions (programmatic, policy and critical literature) of most studies conducted on IBLI, there is no attempt to set out the practices of pastoralists in combining insurance with a broad spectrum of responses to risks. Consequently, my study is the first to focus on these issues, through the standpoint of 'thinking like a pastoralist' on

index-insurance in the HoA and based on an in-depth mixed-method study of pastoralist practices in southern Ethiopia.

## 1.4 Thesis Outline: Introducing the Chapters

The thesis is organised into nine chapters, as summarised below:

### **Introductory Chapters: One, Two and Three**

The first chapter aims at laying out the central questions of the research, gaps in the literature, a summary of the chapters and the significance of the study.

A review of related literature, which aims at locating the research in the available literature, is presented in Chapter Two. The research stands at the intersection of three thematic areas: financialisation, insurance and uncertainty. This is followed by a research methodology chapter (Chapter Three), where I set out the details of my research approaches (quantitative and qualitative), tools, sampling and limitations of the study.

**Chapter Four: Dynamics of Change and Variability in the Borana Dryland System:** This chapter explores the dynamics of change in Borana. First, it describes the environmental characteristics of rainfall, land use and pastoral resources. The study then delves into demographic and socio-economic features, focusing on population, livelihood, markets and income. Finally, it discusses the dynamics of infrastructural and institutional issues.

The key point to take from this chapter is that natural-environmental shocks are variable and heterogeneous. Second, the effects of these types of shock vary depending on the pastoralist's socio-economic status and the natural and physical environment in which they dwell. Third, there is a wide range of sources of income, wealth and livelihood; as a result, pastoralists' responses to a variety of risks and uncertainties vary greatly between pastoral groups.

**Chapter Five: Features of the Study Population:** This chapter is concerned with micro-level variations. Heterogeneity and dynamism are critical to understanding risk, uncertainty and the many sets of interactions that pastoralists manage with livestock insurance as a response mechanism. As a result, the chapter aims to show the characteristics of households under various insurance classifications. It depicts essential characteristics of pastoral communities associated with livestock insurance in the research settings of Dire and Gomole. The chapter

gives a complete overview of the important features (demographic and economic) of the surveyed households.

**Chapter Six: Exposure to Risk - Index Insurance and Borana Pastoral Systems.** This chapter explores the spatial and intertemporal distribution of vegetation/pasture at the macro-, meso- and micro-levels. It illustrates how a range of variables influences forage availability in the study areas. Furthermore, it asks if the risk of pasture scarcity within a cluster is shared by all pastoral communities. It also analyses how drought-related risks and uncertainties are allocated unevenly among different pastoralists, based on their interaction or experience with index-based livestock insurance.

**Chapter Seven: Perception and Conceptualisation of Risk:** Pastoralists and insurance promoters' perceptions of drought are examined in this chapter. In the design of IBLI - the construction of insurance units, premiums, index measures, premium rates and pay-out triggers are guided by the perception that livestock mortality is linked to severe drought. As a result, drought is regarded as having covariate incidence; it is assumed to not only be observed objectively, but also to affect all households equally in a given region. This chapter argues that drought is more than just a lack of rain; rather, it comprises a number of social, cultural and biophysical conditions. The perspectives and experiences of drought are diverse within an insurance cluster and its community.

**Chapter Eight – Responses to Risk:** This chapter expands on the preceding two chapters by demonstrating how risk exposure, experience and perception are linked to the responses of various pastoralists. Responses are bundles of actions undertaken by pastoralists to the many risks and uncertainties they encounter, either temporarily or in the long run. Furthermore, responding to many sources of risk and uncertainty might take many different forms. The chapter discusses how insurance is combined with several responses to risk by different pastoralists. It explores who benefits most, and how, from the insurance scheme. Furthermore, it seeks to show whether the protection of the most vulnerable is achieved through index insurance.

**Chapter Nine: Financialisation of Risk: The Hype, Realities and Challenges of IBLI:** This chapter concludes the thesis. It summarises the key assumptions of index insurance and how pastoralists integrate it into their risk response strategies. It also conducts an in-depth discussion of the key challenges facing the model in the dryland system. Finally, the chapter

presents the contributions of the study across programmatic (index insurance scheme), policy and critical literature areas.

### **1.5 Significance of the Study**

Many of the studies conducted to date on the index-based insurance in the HoA, and particularly in Borana, have focused on three major issues. As discussed above, these include insurance design (see Chantarat et al., 2009, 2010, 2012, 2013 and 2017; Fava et al., 2021; Jensen et al., 2015), patterns of demand/uptake (see Jensen et al., 2016; Takahashi et al., 2016, Johnson et al., 2018) and the impact of livestock insurance on livelihoods (see Jensen et al., 2015, Takahashi et al., 2016, Taye et al., 2019). However, these studies have not addressed how and why various decisions are made in response to risk, or where insurance fits into wider drought response strategies among different pastoralists.

Therefore, my study aims to fill this gap and investigate how pastoralists integrate livestock insurance with other response methods. The study concentrates on three overlapping elements: exposure to, perception of and response to drought risk, across two study sites. It further differentiates between those who are active insurance policyholders, those who have purchased insurance in the past but later dropped it, and those who have never purchased it. Therefore, the outcome of this study has both programmatic and policy relevance to financialisation, financial inclusion, politics of scaling, and social protection, by providing empirical and analytical evidence through the perspective of 'seeing like a pastoralist' (Johnsen et al., 2015; Semplici, 2019).

The debates on the financialisation of risk in the form of index insurance in the era of uncertainty involve two sides, namely proponents and critics. On the one hand, advocates of index-insurance provide evidence of the positive impact of such disaster risk financing tools. The major multilateral organisation, the World Bank, argues for substantial scaling up of such insurance products through market-based development models. On the other hand, critics reject these types of financial instruments, arguing against market-led financialisation of risk. A careful investigation of the index insurance model, its concepts, assumptions and practices, contrasting with pastoralists' conceptualisations, views, experiences and decisions on risk and uncertainty, fills an existing gap in the debate.

## Chapter Two: Financialisation of Risk in the Era of Uncertainty: Locating the Debate in the Literature

## 2.1 Introduction

This chapter locates the research in the broader debate around the relationships between risk, uncertainty and financialisation, particularly in dryland/pastoral settings. As introduced in Chapter One, my study focuses on an index-based insurance product that financialises the drought risk that pastoralists face, offering pay-outs when certain thresholds are met. I am interested in exploring how the insurance product is taken up in a pastoral setting and by whom, why, and how it is combined with other responses to known risks and unknown uncertainties in the daily life of pastoralists. My enquiry, therefore, cuts across three areas of literature and connects them: financialisation, insurance and uncertainty. In subsequent chapters, the thesis explores how risks and uncertainties play out in pastoral areas, how a financialised insurance instrument operates in practice; and how this contributes (or not) to asset protection for different groups of pastoralists.

This chapter has six sections. The first discusses financialisation, financialisation of risk, and uncertainty. It sets out definitions, concepts and applications. In the second section, I discuss the growth of insurance. This is followed by the social and political context of insurance, exploring in particular the literature on applications of insurance in different socio-political contexts. The fourth section presents key features of index-based livestock insurance. The particular context of dryland pastoral systems is discussed in the fifth section and the last section focuses on the research framework, which links the wider literature to specific research questions.

## 2.2 Financialisation of Risk and Uncertainty

A meaningful definition of the term 'financialisation' emerges after the debates about globalisation and neoliberalisation<sup>8</sup> (Christopher, 2015); notably, the term becomes popular in the literature after the 1990s (Karwowski et al., 2017). However, the global financial crises between 2007 and 2009 changed the pace and extent to which scholarly discussions and debates were held (Mader et al., 2020). In general, however, financialisation evolves from financial deregulation around the globe and is a typical neoliberal approach (Painceira, 2012).

---

<sup>8</sup> According to Harvey (2005:2) "neoliberalism is in the first instance a theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterised by strong private property rights, free markets, and free trade."

A larger body of literature defines financialisation as a term used in different disciplines (for example, Blackburn, 2006; Engelen, 2008; Fine, 2010; Lapavistas, 2013). However, the following three definitions are widely referred to. Epstein (2005:3) defines it as "the increasing role of financial motives, financial markets, financial actors, and financial institutions in the operation of the domestic and international economies." Recognising the broad definition provided by Epstein, Krippner (2011:4) specifies financialisation as "profit-making in the economy to occur increasingly through financial channels rather than through productive activities". Finally, Stockhammer (2004:720) (claiming it is still "ill-defined" and that he will offer a narrow definition) states that financialisation is "the increased activity of non-financial businesses on financial markets, and it will be measured by the corresponding income streams".

The definitions and applications, like many other concepts, invite scrutiny. For example, Christophers (2015) provides five limits of financialisation (analytic, theoretic, strategic, optic and empirical). By contrast, many others (among them, Lapavistas, 2013; Bush, 2012; Ouma, 2014; Lawrence, 2015; Karwowski et al., 2017; Mader et al., 2020) address multiple conceptual and empirical aspects in arguing for the utility of thinking in terms of *processes* of financialisation.

Debates on financialisation emerge from multiple disciplines, particularly economics, business, political science, sociology and behavioural sciences (e.g., French et al., 2011; Zwan, 2014; Karwowski et al., 2017). Financialisation processes cut across all economic sectors simultaneously; it is not a single process (Lapavistas, 2011 and 2012; Bonizzi, 2013; Karwowski et al., 2017). Although there are differences in approaches to financialisation across disciplines and sectors, the definition by French et al. (2011:814) as "the growing power of money and finance in contemporary processes of economic, political and social change" brings together the various aspects of financialisation.

For the present study, there are two interrelated aspects addressed within the term 'financialisation'. Firstly, financialisation as the role of financial and non-financial actors - individuals, agencies, institutes and their motives - in various issues of political economy and society (processes, changes, and interactions) in the dryland system (Stockhammer, 2004; Epstein, 2005; Krippner, 2011; Zwan, 2014). The second aspect involves the ways in which these features (financial and non-financial) cut across different layers of engagement: at the

micro-level (household/family/individual), at the meso-level (community) and at the macro-level (national, regional, or global) (Qi, 2019; Mader et al., 2020).

Turning to the focus of my study, the financialisation of agricultural risk evolves from financial liberalisation (Bonanno, 2016; Clapp and Isakson, 2018). Like the financialisation of nature (Loftus, 2015; Brand and Wissen, 2014; Ouma et al., 2018), culture and art (Upton-Hansen, 2018; Max Haiven, 2020) or finance and political economy (just a few examples - Foster, 2007; Krippner, 2011; Mitchell, 2011; Lapavistas, 2012; Zwan, 2014; Mader et al., 2020), the financialisation of agricultural risk is an attempt to turn uncertainty facing agriculture into manageable risk, using financial instruments (innovations) (Zwan, 2014; Chadwick, 2019; see below). It stems from the argument that "risks must be made auditable and governable" (Power, 2004:10). As a result, a wide range of economic activities and assets/capitals in the agricultural sector have been converted into quantifiable things (valuating them using derivatives), thereby managing the risk that might hamper their value in the future (for example, Wigan, 2009; Chadwick, 2019). Despite there being different methods of agricultural risk management practice, for many, insurance is a critical risk management tool (Banks, 2004; Rejda, 2008; Rejda and McNamara, 2017). Before discussing the details of insurance as a financialised risk management instrument, it is first necessary to discuss what we mean by risk and, indeed, uncertainty.

### **2.3 Risk and Uncertainty**

Risk and uncertainty are central to human life and embedded in daily routines, yet there is an on-going debate on these two concepts (Nowotny 2016; Scoones and Stirling 2020). By the end of the eighteenth century, much of the literature on these ideas focused on the consequences of industrialisation, agricultural mechanisation and production, and commerce. Since then, philosophers and scholars such as Smith (1776), Carey (1851), Engels (1884), Marx (1887 and 1894), Knight (1921), and Foucault (1977-78) have contributed to debates from diverse perspectives. Risk and uncertainty were seen both as a source of innovation and as a threat to modernisation and industrialisation, consequently hampering wealth and capital accumulation (Carey, 1951; Knight, 1921).

For this reason, the classic distinction between risk – as predictive knowledge about known outcomes - and uncertainty – where the outcomes may be known but the probabilities of them happening is not - is important. This contrast between risk and uncertainty follows the

classic explanation offered by Knight (1921), which denotes risk as "measurable uncertainty".

Scoones (2019) presents five broad perspectives of uncertainty. The first is a *social* feature of uncertainty, in which risks and uncertainties are created, constructed, and managed by the institutions that govern them in a society. The second perspective is *political*, which portrays how different players frame and regulate risk and uncertainty through discussions and power interactions between and within actors. Third, *cultural* views, as a result, have an impact on how people's realities, memories, experiences and social identities shape their understandings and responses to uncertainty. Further, fourth, Knowledge and experience are essential in shaping *practices*, as well as in understanding and responding to uncertainty. Finally, *individual* perspectives suggest neurological, psychological and individual intellectual capacities shape attitudes, beliefs and knowledge.

Taking these perspectives together, risk and uncertainty are about how different actors understand variable conditions and so relate to a politics of knowledge (Stirling, 2019). By distinguishing it from danger, Luhmann (1993) defines risk as "the consequence of a decision", and Nowotny (2016) defines uncertainty as something central to daily life. According to Beck (1992), how individuals and societies respond to risks and uncertainties, including those emerging from new technologies, is central to the contemporary politics of a "risk society." Managing and responding to risk and uncertainty, therefore, links knowledge to politics, based on what Foucault defined as a form of "governmentality": the conduct of conduct (Zinn 2004; Dean, 2010). The implications of the framing (construction) of risk and uncertainty for wider society and politics have long been discussed (e.g., Knight 1921; Beck, 1992; Luhmann, 1993; Stirling, 1999; Lash, 2000; Zinn 2004; Dean, 2010; Nowotny, 2016; Scoones and Stirling, 2020).

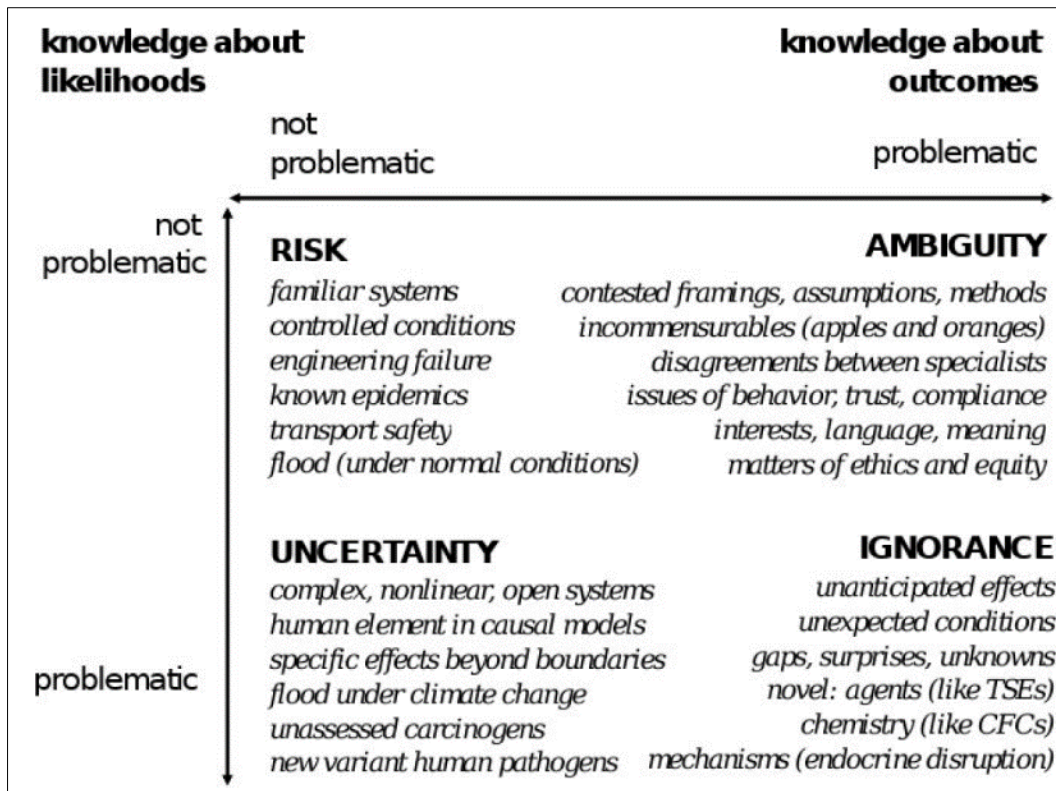
As an underlying characteristics of a pastoral production system, there is a high degree of spatial and temporal variability in the drylands (Sandford, 1983, Little 2001, 2005, and 2016; Catley et al., 2013). Given the importance of mobility (spatially and temporally) in the pastoral way of life, as well as its relevance to this study, the concepts of *time* and *space* are vital in our understanding of uncertainty. Cervantes et al. (2013: 9) state 'timing suggests that shocks may have a more severe impact in times of recession'. Furthermore, a shock may not occur everywhere; hence, spatial elements are often important in framing uncertainty in dryland systems (Smith et al., 2001). Pastoral systems are therefore subject to high levels

of uncertainty, where future outcomes are not known, meaning that pastoralists must always 'live with uncertainty' (Scoones, 1995). Insurance, as a parametric technology, is however developed with the assumption of being able to predict the future; linking it to notions of modernity and technological advancement (Scoones et al., forthcoming). Hence, uncertainty around the future in the pastoral system in relation to weather-induced shocks is converted to assumptions of risk through the use of insurance.

While in many studies, weather-induced shocks – such as drought - are identified as risks (Coppock, 1984; Dercon, 2001; McPeak et al., 2012), Jasanoff (2003:227) stresses that we should re-imagine the future through 'the unknown, the uncertain, the ambiguous, and the uncontrollable'. Accordingly, the advancement in our knowledge about the future creates another context-specific uncertainty (Pelling et al., 2020).

As far as this thesis is concerned, insurance deals with risk (and calculable probabilities of future events) and not uncertainty (where future probabilities are not known). As will be discussed later in the study, the assumption that all uncertainties can be treated as risks is a significant one. The risk that is converted into insurance is the set of risks and uncertainties associated with drought. Financialised risk management approaches such as insurance rely on predictions of future events; hence the definition of perils (such as drought) as calculable risks. Hence, for pastoralists, drought is not the absence of knowledge about its occurrence, but rather the knowledge about the likelihood and severity (Scoones and Stirling, 2020). For insurance to function, a clear definition and calculation of risk are required, so that risk can be transferred and the product marketised and exchanged.

However, as highlighted by Stirling (1999, 2010; see also Leach et al. 2010; Scoones and Stirling 2020), risk is only one dimension of 'incertitude'. As noted earlier, risk is where both outcomes and their likelihoods are known or can be predicted. Uncertainty by contrast is where possible outcomes are known, but the likelihoods of them happening is not. When there is debate about outcomes, then ambiguities arise. And finally, when neither outcomes nor likelihoods are known, then ignorance prevails – where we don't know what we don't know. This matrix, across two axes of knowledge – about outcomes and uncertainties – maps the different dimensions of incertitude. Risk is only one option yet is often assumed to be the dominant or major one, as with the design of insurance. Taking account of other dimensions – uncertainty, ambiguity and ignorance – opens up the debate about incertitude and challenges the narrow assumptions about risk (refer to Figure 2.1 below).



**Figure 2.1 The 'Uncertainty Matrix'**

Adopted from Stirling & Ian Scoones, 2009.

Knowledge about future events is always context-specific, and there is "ambiguity of revealed knowledge" among diverse actors—whether pastoralists, biologists, insurance modellers or policymakers (Pelling et al., 2020:137). This is where the conceptualisation of drought – and the associated risks, ambiguities, uncertainties and sources of ignorance - among different pastoralists and insurance modellers becomes critical, as will be discussed in detail in Chapter Seven.

Finally, as discussed in Chapter One, drought is assumed to affect all pastoralists in an area equally (on average) at the same time and is known as a covariate risk. This risk, it is assumed, can be calculated and therefore marketised and sold in the form of insurance products. Thus, for the proponents of financialising risk in the drylands, uncertainty due to climate-related shocks (disasters) can be reduced to risk and be governed through index-based agricultural insurance. This has major implications for how insurance is applied and the assumptions it carries. Central to the discussion is the questions of how a risk-based financialised product (insurance) encounters a wider 'risky landscape' (Müller-Mahn et al., 2018 and 2020) and the wider set of uncertainties that pastoralists must confront on a daily basis. However, before delving into my central argument, I will discuss below some of the historical aspects of insurance and its growth as a risk management tool.

## 2.4 The Growth of Insurance

In this section, I will present the key aspects of insurance, focusing on agricultural and micro-insurance, with the aim of examining the move to financialise risk through such market-based interventions.

Insurance emerged from the decline of cooperative forms of social support – including friendly societies and mutuals – and an increased individualisation and market orientation of welfare in Europe in the eighteenth and nineteenth centuries (Buckham et al., 2011). Subsequently, the growth of the Welfare State meant that insurance became more socialised in State-based support mechanisms (Ewald, 2020). In recent years, insurance has been governed by the neo-liberal policy of governing at a distance via the market, part of a broader trend in which everything is financialised- including disaster risk. For Crouch (2011) and Lapavistas (2013), financialisation is instrumental in stabilising crises of capital, thereby promoting growth. According to (Dorfman 1998: 2), risk management through insurance is "the art and science of anticipating the potential losses and developing an efficient plan to survive them". Hence, insurance is one crucial form of governing risks, thereby boosting agricultural production and the economy in general.

In the process of financialisation, defined calculable risks are converted into derivatives. Derivatives are "said to derive their future value from an underlying asset" (Chadwick, 2019:80). So, for example, risks that arise from natural disasters, including climate change, can be transferred using insurance and other financial instruments (IPCC, 2012). As a result, agricultural insurance, covering physical damage to an agricultural asset, has emerged as an essential way to manage risk in agriculture (Hohl, 2019).

Financialising risk through insurance relies on a number of important assumptions. As Komporozos-Athanasiou (2022:108) explains, insurance is "a significant technology in the financialisation and marketisation of uncertainty; it [*insurance*] transforms the latter into a risk that can be estimated and evaluated". Foundational assumptions include the process by which pooling losses through a market mechanism act to spread a loss incurred by some to a broader group across time (Rejda and McNamara, 2017). These losses are regarded as predictable risks ('perils' in the industry terminology) and are then transferred from the insured to the insurer (Banks, 2004); however, a loss that arises from an identifiable, singular risk/peril should be measured, determined and indemnified. Moreover, the chances of the losses must be calculable (Outreville, 1997; Banks, 2004; Rejda, 2014).

With a growing focus on 'natural disasters' and 'risks' as constraining the growth of agriculture, particularly as a result of climate change, there have been a number of initiatives to expand insurance coverage in agricultural settings across the Global South. International agencies have promoted these, including development banks and donors (Mechler et al., 2006; Churchill and Matul, 2012; Chadwick, 2019). According to index-insurance proponents, natural disaster risks (droughts, flooding, and so forth) can be financed through market-based mechanisms by developing robust derivatives (ILO, 2006; Alderman and Haque, 2007; Hochrainer et al., 2008; World Bank, 2011). As a result, given the variability and uncertainties in weather-induced shocks, numerous international organisations have called for disaster risk finance solutions in the form of insurance (Alderman and Haque, 2007; Clarke and Dercon, 2016). As discussed in Chapter One, Index-based livestock insurance (IBLI) is one of the disaster risk financing tools developed to protect pastoralists from weather-induced drought risk. IBLI was set up as a research programme at the International Livestock Research Institute (ILRI) and Cornell University, with financial support from USAID, DFID and other development partners. The programme evolved in 2015 into a government social protection programme in Kenya, following financial support from the World Bank.

Therefore, according to its promoters, insurance is a technical, market-based instrument designed to respond to defined risks. Conventional indemnity insurance identifies, measures, anticipates and calculates risks, and indemnifies a loss. Consequently, the peril identified, and the damaged/lost asset/property is in a direct relationship. On the other hand, index-based insurance (like IBLI) uses an external indicator index (such as rainfall, temperature, and vegetation), to measure, predict and indemnify a peril (like the drought that causes crop or pasture loss). Returning to my focus; for IBLI, vegetation (pasture) in a given area is quantified (converted as index) using the Normalised Difference Vegetation Index (NDVI)<sup>9</sup>. The level of index readings in a season (period) determines the availability (also the amount) of payout to insured pastoralists in the area. The indemnification relates to the resources needed for livestock, not the effect of pasture shortage on livestock. These, and other features of index-based insurance, overcome some of the drawbacks (to be expanded later in the thesis) that conventional insurance faces in rural areas.

---

<sup>9</sup> To monitor vegetation in a given area, NDVI integrates precipitation and evapotranspiration.

Widely promoted as part of a suite of financial instruments for disaster risk management, insurance has become central to development programmes aiming to offset risks while promoting production. Given that poor people in low-income countries face the brunt of disasters, insurance is hailed as a pro-poor development intervention, which makes use of the market for developmental gains. This thesis interrogates these assumptions and asks how insurance (in this case, IBLI) is understood and responded to in Ethiopian pastoral settings. For such technical, financialised, market-based development interventions are never neutral or without social and political consequences, as the literature on the social and political implications of insurance shows.

## **2.5 The Social and Political life of Insurance**

Insurance is never purely technical: it is always co-constructed with politics and society, so the social and political context has important implications for the outcomes of insurance arrangements. This is particularly important in the dryland systems of Ethiopia (for that matter, all African drylands), where exposure to drought affects pastoral livelihoods. However, rather than seeing drought exposure as purely technical (a transferrable risk through a financial instrument), I argue that drought exposure, perception and response are embedded in social, economic, cultural and political contexts.

To begin with, "nothing is a risk in and of itself; there is no risk in reality," as Ewald (1991: 199 and 2020) argues; rather, it is an individual's perspective and view of the possibility of an event that makes it a risk. As a result, insurance is "an attempt to make the incalculable calculable" (Dean, 1999:29). From an insurance standpoint, Ewald claims that everything can be a risk if it can be linked to a number (derivative) and a monetary value. A risk is an event that has been attributed to a person in relation to others (Ewald, 2019). Apparently, this is connected to the insurance concept of "loss pooling" "by socialising risks" (Ewald, 1991:203). Moreover, insurance individualises risk and protects the insured against groups of people (Ewald, 1991 and 2019; Knights, 1993; Dean, 1999; Zweifel et al., 2021). The same risk within the setting where losses are pooled/distributed, however, entails a variable "size of risk" for two covered individuals (Berliner, 1985:315 and 316). Under IBLI, a covariate risk of drought is part of pooling losses and distribution to a larger group of pastoralists. Individual pastoralists are then protected as a form of insurance, and are indemnified, based on the index readings.

However, indemnification does not prevent the occurrence of the risk, nor does it protect the insured from loss; it is also not a technique of "turning uncertainty into risk" (Outreville, 1997; Zweifel et al., 2021). Instead, insurance pays for what has been lost. A capital loss has only monetary value (financial). As a result, insurance does not take into account the application of human (psychological/emotional) values associated with the insured capital. Every emotion and experience related to the risk of being insured has a psychological interpretation (Taylor-Gooby and Zinn, 2006). These emotions, experiences, and other key personal attributes are intangible risks tied to the "value" of the insurance policy.

Several risks, including, in this case, drought risk, are (co-)constructed with various aspects of society. Although each insurance product or contract covers a particular peril in theory and practice, risk in society is an aggregation of numerous factors and is structured within it (cf. Beck, 1992). Moreover, every society has its own socio-cultural viewpoints, which are crucial in (re-) shaping how people perceive risk. In some societies, a particular risk causes anxiety, while in others, it does not (Luhmann, 1993; Lupton, 1999a and b). As a result, risk is ingrained in a society's cultural and historical characteristics (Sutherland et al., 2012). As a result, insurance plays a dual purpose in society: how society (co-) constructs risk (including cultural, historical, and other societal components) and how insurance is recognised and distributed within society.

Because risk is inherently (co-)constructed in social, political, cultural and historical contexts, and thus linked to perceptions, emotions and individuals' understanding of risks and uncertainties, the move to individualise and marketise risk through insurance, and thus reduce all uncertainties to calculable risk, is political (Ewald, 1991). Insurance thus becomes a political technology through which insurance programmes exert forms of 'governmentality' (by articulating moral claims about the importance of individualisation and market engagement, and hence, modernity) (Dean, 1998). Moreover, it tries to govern risk by measuring/estimating, quantifying and hedging it (Power, 2004). Furthermore, insurance is a technology that occurs with a "parallel deployment of moral and political discourses" as a type of risk indemnification (Knights; 1993:758). As a result, even within a calculable type of risk, such as insurance, various governmental and political interventions occur (Defert, 1991; Ewald, 1991; Dean, 1998). Different political discourses and governmental settings diagnose, understand and use the same risk type/feature in different ways (O'Malley, 2004).

The focus of this study is then on how this social and political process plays out in Ethiopia's drylands, where IBLI has been implemented to manage drought risk through a financialised market-based instrument. I investigate how broader risks and uncertainties that pastoralists as individuals, households, communities and society as a whole confront, are integrated with index-based livestock insurance in pastoral areas in the landscape of risk referred to as a "risky landscape" (Müller-Mahn and Everts, 2013; Müller-Mahn et al., 2018).

*The Socio-political life of insurance from an empirical standpoint*

I will now briefly discuss risk and insurance in the wider socio-political sphere from an empirical standpoint. To begin with, the State- as the political component of insurance and risk- has developed/promoted a new approach to managing risks in most index-based agriculture insurance. The validity and credibility of social institutions and procedures responsible for developing, administering and regulating the insurance system are regarded as being determined by their governance structures (Mechler et al., 2006; World Bank, 2011). These institutions include government authorities (at various levels), the private sector (particularly insurers and re-insurers) and other stakeholders. To give an example from East Africa, the Kenyan Livestock Insurance Program (KLIP) is a form of IBLI that is fully controlled by the Kenyan government and its funders. Drought risk is viewed by the government as a social protection component, with pastoralists getting insurance benefits based on their location, herd size, and sometimes their political activity. Drought risk, therefore, is more than just a natural event that impacts livestock; it is also a way of governing society.

Such governmentality is not limited to the State (Dean, 1998); in Ethiopia, for example, the World Food Programme (WFP) has classified pastoralists in Eastern Ethiopia as vulnerable or less vulnerable to drought risk, based solely on the size of livestock herds (WFP, 2017; Yihenew et al., 2017). To receive a full subsidy for livestock insurance, pastoralists are required to contribute labour to public works projects as part of the Productive Safety Net Programme (WFP, 2017). Therefore, external actors' (government and NGOs) technological, social and political assumptions are used in the implementation of these insurance products.

Insurance is entrenched in various daily social interactions among community members and their relationships. In a classic case from South Africa, insurance appears to have played a social and redistributive role (Seekings and Nattrass, 2005; Bähre, 2011 and 2020). In South Africa, state-sponsored or commercial insurances have disrupted social cohesion by allowing

insured households (life/health insurance) to avoid societal responsibilities (Bähre, 2020). This is a different perspective of how an individualised risk (the death of an insured household) is embedded in the wider society – with its attendant responsibilities and morality. The above two empirical cases are insurance risks in societal and political contexts. Notwithstanding the rich vein of literature covering the economic dimensions of insurance, evidence shows that it is embedded in a wide array of socio-political aspects of how risk is conceptualised and responses are structured, particularly in developing countries.

Index insurance individualises common risks – the risk of rain-failure or weather shocks for farmers or pastoralists. However, although the risks of rain failure can be insured by employing derivatives, such risks are embedded within various common ('covariate' risks) and individual/household risks (idiosyncratic risks) together (Janvry et al., 2014). As a result, responding to risk and investment in index insurance involves a wider array of risks and responses (formal and informal) and surrounding societal dynamics (Mobarak and Rosenzweig, 2012). For example, in India and Ethiopia, drought risk (due to rain failure) in the agricultural sector is simultaneously linked to various forms of risk, such as income and food security; and broadly to the wellbeing of a household (Dercon, 2004; Morduch, 2004; Da Costa, 2013).

Finally, insurance is not only re-orientated into various socio-economic and political risks and takes on different guises, but it also affects and restructures various responses. Insurance in rural economies reshapes the structure and disposition of risk management and responses (Taylor, 2013 and 2016). A wide range of social, ecological and environmental responses is undermined by index insurance (Isakson, 2014 and 2015a). Moreover, social means of responding to one or various risks are adversely affected (Isakson, 2015b). Index insurance is designed solely as a technical feature implemented from "above", resulting in the devaluation of local knowledge (Da Costa, 2013).

Hence, insurance selects certain aspects that impinge on risks and uncertainties, and objectifying (standardising) in a monetising (making it a tradable) form is superficial. This is crucial in the era of uncertainty where social, economic, political, environmental and institutional aspects intersect and go beyond objectifiable incidents. As a result, insurance – both conceptually and empirically - is not purely technical: it intersects with broader socio-economic, political and other fields (such as historical and cultural). How is this reflected in

the dryland systems of Africa? Before addressing some of the key aspects of such a system, I will present the key features and assumptions of IBLI as follows.

## **2.6 Understanding IBLI: Features and Assumptions in Constructing the Insurance Model**

In exploring the research questions further, I will examine IBLI in the Borana zone of southern Ethiopia (see Chapter One). IBLI represents many of the features of insurance, as discussed in general terms above. It is a technical, market-based intervention whereby drought risk is financialised with the aim of offsetting its impact. In this section, I highlight the particular features of the IBLI product, drawing out key assumptions, which in turn will be assessed through the field-based study discussed in subsequent chapters.

IBLI, like all index-based agriculture insurance products, does not calculate livestock losses but instead utilises an index related to predicted losses. Since 2015, IBLI's contract feature has switched from an asset replacement (paying out after a drought) to an asset protection feature (providing indemnity for insured pastoralists, based on predicted forage scarcity). There are major differences between conventional and index-based insurances (where individual losses are not considered). Index-insurance has advantages over conventional insurances such as reduced moral hazard, prevention of adverse selection, and minimal administration expenses. There are key terms and concepts pertaining to IBLI that are important to note (see Box 2.1, derived from Taye and Mude; 2018). However, the assumptions (construction) of the IBLI model are important for the study as presented below.

**Insured Peril** – the insured peril is drought risk (vegetation/forage scarcity) due to weather-induced (rain failure). The assumption is that it affects livestock in an area when a drought risk happens; hence, vegetation distribution is correlated with livestock mortality.

**Covered Assets** – IBLI covers camels, cattle, goats and sheep. These animals are standardised using the Tropical Livestock Unit (TLU), whereby a cow/ox is valued at one TLU. A camel is 1.3TLUs, and sheep and goats, 0.1 TLU each.

**Index** - the value/measurement of an external indicator, such as rainfall/vegetation/temperature that affects a bigger geographical area.

**IBLI Insurance Units or Unit Areas of Insurance (UAI) (Index Units/Insurable Units/Clusters):** Index Insurance contracts are based on geographical units/clusters that exhibit a similar risk profile regarding the insured risk (drought risk). They are determined, based on the migration pattern of local pastoralists, the location of accessible pasturelands and the administrative boundaries. As a result, pastoralists within a UAI are assumed to be affected by drought risk, on average, equally.

**Premium Rate:** Each Insurance Unit/Cluster's premium rate is determined by the degree of risk associated with it. The premium rate is determined by a historical analysis of each insurance unit's frequency and amount of payments made by the insurance contract. The cost of providing the insurance service will also be included in the premium rate. In the Borana Zone Insurance Units, the premium rate ranged from 7.27 per cent to 11.11 per cent. As the risk profile (exposure to drought risk) is the same across UAI, and the assumption all pastoralists residing in the unit are exposed equally, they all pay the same premium rate per TLU.

**Insurance Contract Cycle:** IBLI is a yearly contract that runs from January to December or from September to August.

**Annual Premium:** This is the yearly coverage fee that the pastoralist/client will pay. It is calculated by multiplying the premium rate by the total sum covered [Premium Rate X Total Sum Insured].

**Payout:** The indemnity (insurance payout) is the amount that insured clients will get if the contract is triggered. The payout is determined by the severity of forage scarcity, as measured by the calculated index and the total money insured for each client. With the same logic for UAI and Premium Rates, payouts per TLU are distributed equally for all insured pastoralists in an insurance cluster.

**Trigger:** The trigger level is the index threshold, below which payouts are made. The 20<sup>th</sup> percentile of historical index levels serves as the trigger (at payout frequency of 1-in-5 seasons).

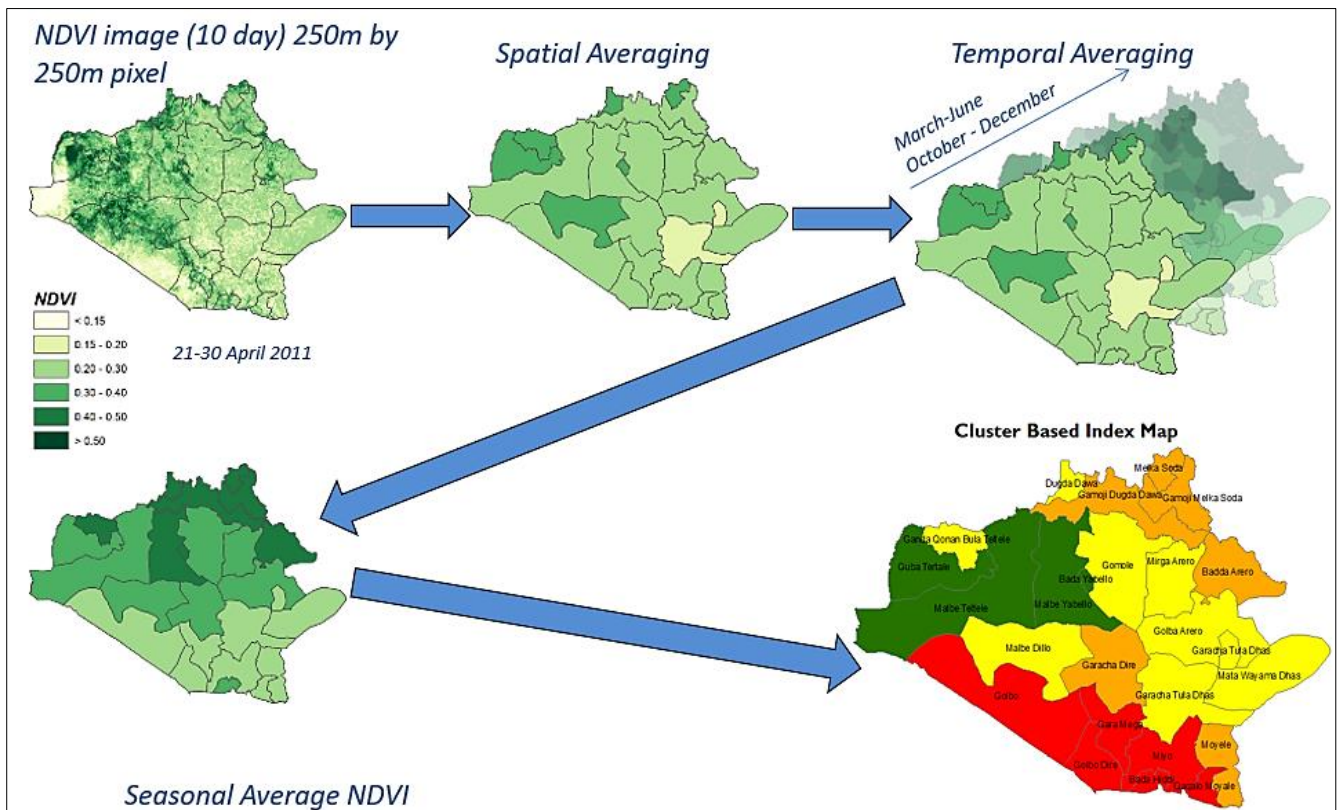
#### Box 2.1 Main Features of IBLI

### Constructing the IBLI model and assumptions

In Chapter One, I outlined the interrelated assumptions that went into developing the IBLI model. In the next sections, I connect critical aspects in building the insurance model that defines the assumptions employed in the HoA's dryland systems.

The initial phase in the insurance concept is to collect data remotely using satellites. The Earth Resources Observation Systems (EROS) Data Center (EDC) of the US Geological Survey (USGS) collects 250m<sup>2</sup> (250 square metres) of vegetation data on a daily basis and turns the daily images into 10-day composites (10 days is sometimes referred to as a '*dekad*'). This information is known as eMODIS (Moderate Resolution Imaging Spectroradiometer).

The second step is known as '*spatial aggregation*'. The dotted vegetation data (each dot is 250m<sup>2</sup>) are clustered into manageable geographical units for practical and operational purposes, as shown in the schematic image below (Figure 2.1). These aggregated geographical areas are referred to as insurance clusters/units. It is hypothesised that insurance clusters have similar agro-ecology and pasture access for all households in the area (mobility/migration is thought to be common in the demarcated insurance units throughout both wet and dry seasons).



**Figure 2.2 Steps in developing the IBLI Product in Borana**  
Source: Wandera *et al.*, 2018 and slightly modified by the author

The next step is *temporal aggregation/averaging*, which is a seasonal aggregation of forage levels (Fava and Vrieling, 2021). Borana has two rainy seasons followed by dry seasons; as a result, IBLI aggregates the long and short rainy seasons independently. The underlying assumption is that rain falls between March and June (also known as the 'long rain' season) and September and December (the 'short rain' season). Monthly NDVI values are obtained by averaging three *dekads* of vegetation data from each index/insurance unit<sup>10</sup>. For each season, the averaged NDVI value (vegetation data) is calculated. The model is static in this case and does not take into consideration differences in rain distribution outside of the defined months. For example, if rain begins before 1<sup>st</sup> March, the model begins by capturing vegetation on 1<sup>st</sup> March. This impacts the average vegetation status (calculating and estimating insurance payouts), which I shall cover in-depth in Chapter Six.

The next step is the *normalisation of the forage status*. This method compares present forage levels to historical vegetation trends from a similar season (the same season from 2003 through the year of the calculation season). It then determines whether the current season's forage level is lower than the 'normal' historical vegetation trend. For each season (seasonal NDVI value), a standard score (Z-score) is produced – the reference period being 2003. The variations of monthly, seasonal and yearly rainfall distributions are likewise expected to remain constant throughout the years. Long rains from 2003 to the year investigated (for example, 2022) are considered to begin on March 1<sup>st</sup> and stop on June 30<sup>th</sup> (as are short rains, from October 1<sup>st</sup> to December 31<sup>st</sup>); this allows them to be compared year to year.

Finally, for each insurance cluster/unit, an index result stated as a percentile is announced by the insurance underwriting company. This determines whether a pay-out (predicting the likelihood and extent of a drought) exists in a cluster or not. The announcement of an index result with a value less than the 20<sup>th</sup> percentile (triggering point) indicates an anticipated forage/pasture scarcity level for the dry season. A mathematical formula for the process is provided below.

---

<sup>10</sup> Under IBLI, an insurable unit is referred to as Unit Areas of Insurance (UAI). In this study I use index area, insurance cluster and insurance unit interchangeably but they all refer to UAI.

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

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

$$ZAvgNDVI_{i,m,y} = \frac{AvgNDVI_{i,m,y} - E(AvgNDVI_{i,m})}{SD(AvgNDVI_{i,m})}$$

**Figure 2.3 Index Calculation**

by Fava *et al.*, 2018:25.

In summary, when we consolidate the features of IBLI together with how it (the insurance model) is constructed, the assumptions that follow are a) rainfall distribution can be correlated with the vegetation of an area, and b) similar access to pasture and mobility in a given area can be demarcated/distinguished and calculated. As a result, drought risk can be monitored, calculated, and evaluated using satellite technology for an area. Moreover, the evaluation of vegetation trends considers rain starting and ending on the exact date of the monitored months over the years (from 2003 onwards). Vegetation index results carry the assumption that exposure to drought risk (on average) is the same for all pastoralists in an insurance cluster.

This is translated into insurance premiums and pay-outs. All pastoralists in an area (insurance unit/cluster) pay the same premium rate (because they are exposed to the same level of forage scarcity) and receive pay-outs as a result by standardising all insurable livestock into TLU (without considering the effect of drought/forage scarcity on browsers and grazers). In other words, the technical design carries with it some social and political assumptions about how the world works; but how, in practice, does this play out? This is the focus of the thesis, and the next section lays out the research framework, differentiating between exposure, perception and response. To begin with, I discuss risk and uncertainty in the drylands of the HoA and their implications for insurance.

## **2.7 Risk and Uncertainty in the Drylands: what role for insurance?**

Livestock production in Africa's dryland systems is a high-risk endeavour. Uncertainty is central to the ecology and economy of pastoral areas (Scoones, 1995; Kratli and Schareika, 2010; McPeak et al., 2012). Pastoralists are exposed to a wide range of risks and uncertainties, many of which are interrelated and complicated (Scoones, 1995; Homewood, 2008; Behnke and Mortimore, 2016). Many pastoralists are among the poorest and most vulnerable in the drylands, although mobile livestock herding is well suited to the vast arid lands, and there is evidence of its productivity and worth across the drylands (Little et al., 2001; Oxfam, 2008; Lininger et al., 2011).

The East African dryland system is one of the most complex systems (Catley et al., 2013). Rainfall variability (both temporally and spatially), droughts, floods and rangeland degradation are examples of environmental risks and uncertainties (Coppock, 1994, Desta et al., 2008, Liniger et al., 2011; Dandesa et al., 2017; Lind et al., 2020). In addition, there are risks and uncertainties associated with political marginalisation, community-wide instability and conflict, resource governance issues and a lack of investment in infrastructure expansion (Little, 2001 and 2013; Bassi, 2010; Lind et al., 2020b). Although markets create opportunities, they are also a source of risks, such as those associated with price volatility, market regulation and market access (Dercon, 2001; Doss and McPeak, 2006; McPeak et al., 2012).

Significant structural changes have occurred in East African pastoral systems in recent decades, and these are altering the characteristics of pastoralism in the region. There are several different transitions (discussed in detail by, amongst others, Fratkin, 2001; Smith et al., 2001; Bassi, 2010; McPeak et al., 2012; Catley et al., 2013; Fenetahun et al., 2020; Lind et al., 2020b), such as land tenure changes, rangeland fragmentation, establishment and growth of small towns, commercialisation/commoditisation of pastoral resources, sedentarisation, territorialisation, and the expansion of infrastructure and social amenities such as markets, schools, health facilities, roads and financial institutions (to name but a few). As a result of these developments, pastoral communities are confronted with both uncertainties and opportunities. The Borana pastoral system in southern Ethiopia is at the centre of such transitions.

These multiple risks and uncertainties affect pastoralists in different ways (Cossins and Upton, 1988; Scoones, 1995; Desta and Coppock, 2004; Doss, 2012; Catley et al., 2013; Little,

2013). As an example, socio-economic status - such as wealth and/or gender - and location are among the key factors of the diverse impact of different risks (Tache and Sjaastad, 2010; Flintan et al., 2011; Livingstone and Ruhindi, 2013). There are also various ways of responding to them, such as livelihood diversification, herd composition changes and livestock management (Little, 2013; Little and McPeak, 2014), crop production (Tache and Oba, 2010), commercialisation and intensification of livestock/production (Aklilu and Catley, 2010), mobility (Huysentruyt, 2008; Turner et al., 2014), and migration to urban areas/towns (Catley et al., 2013).

Drought has been emphasised as a key source of risk and uncertainty in the system (Benson and Clay, 1994; McPeak, 2001; Doss et al., 2012; Birhanu, 2015; CARE International, 2015). As a result, responses are devised to address drought risk; and, given the great variability of environments, markets and political institutions in dryland regions, such regions in the HoA are seen as ideal for insurance interventions. Yet, given the discussions above, how do they manifest in dryland areas in Africa? What are the social and political processes that emerge?

For some years, it has been argued that market-based risk transfer mechanisms, such as insurance, can play a key role in overcoming the impact of drought in the region (Carter et al., 2008; Clarke and Dercon, 2016). Drought is regarded as the chief cause of livestock mortality leading pastoralists into a poverty trap (Barret, 2008; Chantarat et al., 2009) and climate change is expected to make this worse. Therefore, ways of offsetting the impacts – such as insurance- are considered priority interventions by governments and donors. At the same time, the expansion of formal financial institutions has hastened the growth of the market-based financial system, which includes insurance (Carter et al., 2008). Growing formalised financial markets in the agricultural sector have attracted insurance companies, sometimes supported by development agencies and governments, to introduce insurance against the environmental risks facing agricultural production (Clapp and Isakson 2018).

As a result, development actors have started considering various market-based interventions to offset drought and associated risks in dryland pastoral systems. Multilateral organisations (the World Bank, USAID, DFID) and researchers (the ILRI and Cornell University) thus began to develop and pilot the first index-based livestock insurance for African drylands in Northern Kenya in 2010 (Chantarat et al., 2009; Zewdie et al., 2020). In August 2012, the insurance product was scaled up to include southern Ethiopia (Borana) due

to the belief that it possessed a similar agro ecology to that found in northern Kenya, and that the drought risk had a similar impact on the pastoral population.

As discussed in Chapter One, various studies have been conducted on IBLI. Like all other insurance technologies, IBLI is a technocratic model. The studies by Chantarat et al. (2009, 2010, 2012, 2013 and 2017) and Fava et al. (2021) state that IBLI's model strongly captures weather-induced droughts by remotely capturing vegetation in a relatively large geographic area. However, a study by Jensen et al. (2016, 2018, and 2019) demonstrates a mismatch between actual and predicted loss of livestock from drought, which is related to the insurance model's construction (basis risk). The basis risk of IBLI is significant and is primarily due to inter-household heterogeneity in an insurance area (Jensen et al., 2015). Basis risk is regarded as inevitable in index-based insurance (Miranda and Farrin, 2012; Jensen et al., 2016 and 2018; Fava and Vrieling, 2021). Nevertheless, this and other related literature do not empirically explain why there is a difference between actual vegetation distribution and what the model captures. For the most part, pasture governance structures, vital in creating heterogeneity of access to pasture resources in a given area, are not studied in depth by linking with the insurance model (the assumptions of covariate risk and its effect on large areas).

IBLI is interwoven with socio-economic and political dimensions of pastoralists' lives. For example, wealth and education are associated with increased insurance uptake, but on the other hand, IBLI demand is not gender specific (Bageant and Barrett, 2017; Takahashi et al., 2020). Although evidence from other developing countries suggests to the contrast (Isakson, 2014 and 2015a), Takashi et al. (2018) conclude that IBLI in East Africa has not replaced informal risk-sharing arrangements nor increased social justice (Fisher et al., 2018).

Although insurance contributed to increased food consumption (Jensen et al., 2015), Ethiopian pastoralists have invested in social activities (ceremonies, aiding others) after payouts (Taye et al., 2019). In a recent study, social entities, relationships, and behaviours (such as solidarity and power dynamics in a society) related to insurance are examined (Johnson et al., Forthcoming). Finally, insurance promotes high-risk, high-reward behaviours that go beyond risk transfer (Hirrfot et al., 2017). These and other studies imply that insurance is not a technical, but rather a social, economic, and political (and other comparable institutional) model.

But how do insured households of diverse wealth, gender, age, and location use insurance and combine it with other forms of responding to risk? This research focuses on answering this central question within the three contexts of exposure, perception, and response to drought risk in Borana, southern Ethiopia.

## 2.8 Research Framework and Questions

This section sets out a research framework to be employed for this study (Figure 2.3). As discussed above and based on the given definition of risk and uncertainty, the study explores pastoralists' exposure to, perception of and response to risk and uncertainty in the Borana area of southern Ethiopia, asking how index-based insurance is combined with other types of response.

As part of the conceptual framework, I argue that risk/uncertainty exposure<sup>11</sup> is distributed across time in different pastoral mobility zones (space) and that responses occur within available capacity (resources). Moreover, the timing of risk exposure and response is important. Finally, the scale relates to situations where the greater the severity of a risk, the higher the capacity that is needed to manage it.

Index-based livestock insurance relies on 'objectively measured risk exposure' – through vegetation/forage availability measures - across space and time. However, "expressed risk perceptions are based not only on objective risks but also subjective risk assessments of exposure to different shocks and their capacity to manage them" (McPeak et al., 2012: 73). Therefore, responses to risk and uncertainty are centred on subjective knowledge and individual experience from the past concerning future likelihoods and outcomes, differentiated across pastoralists. Although an asset protection contract linked to the livestock insurance product aims at increasing policyholders' knowledge of the likelihood of forage availability in their area through early index announcement (or pay-outs if it falls below an agreed threshold), how such information is understood and responded to will vary among different pastoralists.

To summarise the key aspects of the research framework developed for this study, I present below the three core elements of my research framework - exposure, perception and

---

<sup>11</sup> Some argue that it can be captured objectively but for others it cannot be, as views and experiences are quite different.

response to risk (discussed in detail in chapters six to eight) – and offer a short introduction to their application in a pastoral setting.

### ***Exposure***

Livestock producers face different types of risk and uncertainty – environmental, market-based and those originating from institutional/governance arrangements - that emanate from the nature of the pastoral production system (Coppock, 1984, Scoones, 1995, Desta and Coppock, 2004; Homewood, 2008, McPeak et al., 2012 and Lind et al., 2020). Risks and uncertainties include the consequences of change in land use, including territorialisation and fragmentation of the rangelands (Little et al. 2001; Lind et al. 2016 and 2020). Mainly focusing on climate variability, some argue that risk exposure is objective and can be measured across space and time (Smith et al., 2001). For instance, according to Doss et al. (2008), among others, the probability of below-normal rainfall, disease outbreaks, armed violence and weak livestock, grain or household commodity market prices can be objectively measured or at least estimated.

Intertemporal understandings of risk exposure are vital in assessing exposure. Homewood (2008: 56) argues that "it is not the absolute deficit of rain in a single year, but rather whether there is a run of successive years with poor rainfall, that will determine (*whether*) a community experiences major drought hardship". A longitudinal study conducted in the HoA, with a focus on Ethiopian and Kenyan drylands by McPeak et al. (2012: 22), maintains that due to the severe drought that occurred in 2005, subsequent seasons with good rainfall in 2006 were not accompanied by improving NDVI (an estimate of vegetation greenness), and therefore, "rangeland recovery takes more than one good season of rainfall".

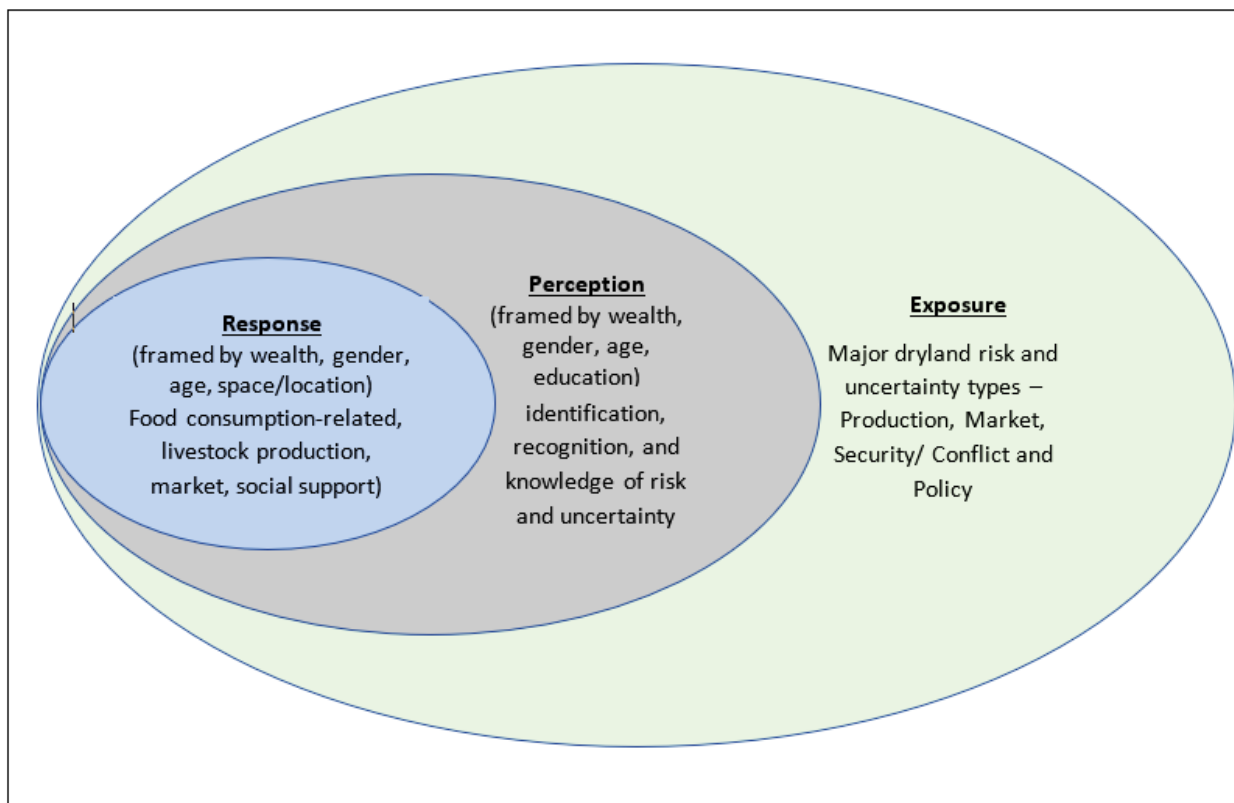
For my research, it is essential to ask how different pastoralists – rich/poor, men/women, and those more or less engaged in agriculture and other livelihood activities beyond livestock-keeping, view and experience exposure to drought and how this, in turn, affects their response. This theme will be explored in Chapter Six.

### ***Perceptions***

Risk perceptions are subjective and influenced by an individual's evaluation of conditions (Hansson, 2010). "Perceptions of this [*risk*] probability is (sic) embedded in culture and vary enormously over space and time" (Adams 2016: 83). Moreover, research from various fields

suggests that people's behaviour is influenced by risk exposure and, notably, by their subjective perceptions of risk and the consequences of certain events (Kahneman and Tversky, 1974). Marcus (2016) argues that the social differentiation of risk is vital in shaping risk exposure. The extent of concern “varies among different people living under objectively-identical risk exposures” (Smith et al., 1999: 9). Furthermore, perceptions can be *ex-ante* or *ex-post*. The former influences how people respond to the perceived risk and uncertainty, whereas the latter is the perception of how these responses address the risk/uncertainty under consideration.

In this study in Borana, I will explore how risk perception (views and experiences) varies by age, gender, wealth, and other related characteristics, and how these perceptions affect people's attitudes to and uptake of insurance. The theme of perceptions will be explored in Chapter Seven.



**Figure 2.4 Research Conceptual Framework**

## **Responses**

Risk response (either management or mitigation) involves finding the preferred combination of activities with uncertain outcomes and varying levels of expected returns (Harwood et al., 1999). Depending on the different risks they face, pastoralists respond differently. Risk responses evolve, and the mix of responses changes over time and space. Dercon (2004: 7) summarises coping strategies thus: "households do not just undergo the consequences of high risk... they have developed a mix of sophisticated strategies to reduce the impact of shocks." Such responses vary between and within households. For example, wealth dynamics are not linear, nor are responses and mixed strategies (Santos and Barrett, 2009 and 2019). According to Beal (1996), such strategies reflect households' risk perceptions; however, few studies focus on intra-household risk perception and response (Doss et al., 2008).

As a result, understanding responses to risks and uncertainties differs and can be distinguished based on the type of exposure and perception. Across the many studies undertaken in Borana, a long list of responses to risks and uncertainty has been compiled. McPeak *et al.* (2012) divide the responses into four categories: production, market, security/conflict and policy.

In this study, I investigate how these responses are combined (or not) with index-based livestock insurance and by whom (wealth, gender and age), taking note of the spatial and temporal dimensions across two sites; this will be discussed in more detail in the methodology chapter that follows (Chapter Three). The details of the differentiated responses and how they are combined with insurance are elaborated on in Chapter Eight.

## **2.9 Conclusion**

Financialising risk as a form of index insurance is new to pastoral settings. Intending to extend access to finance as a form of financial inclusion, multilateral organisations have intervened in the dryland systems to transfer environmental risks using market-based approaches. These organisations, researchers and insurance companies focus on designing and deploying a technocratic model that is believed to address the problem of climate-induced shocks faced by pastoralists in most parts of Africa. Put simply, they want to govern drought risk from a distance and through the market; hence, the IBLI product aims to protect pastoralists from the risk of drought by remotely monitoring vegetation. This insurance

model has a number of assumptions which have been elaborated above. By focusing on a single peril, namely drought risk, the uncertainties around drought and its impact within an area, are reduced to a monetised, tradeable and calculable risk.

Inevitably, insurance is interwoven with various social, political, environmental and other (e.g., historical and cultural) factors. Drought risk is not caused by a single factor; in fact, various issues (social, economic, institutional and others) influence and affect it. In order to understand this complexity, I have developed a comprehensive research methodology to understand the various characteristics and practices of pastoralists (disaggregated by wealth, gender, age and location) when combining IBLI with various responses to drought. Chapter Three offers a detailed overview of the methods I used to answer the primary research questions.

## Chapter Three: Research Methodology

### 3.1 Introduction

This chapter explains the methodology used throughout the research.

During my years of research into Africa's pastoral system, focused on disaster risk finance tools and innovations, I was able to witness and understand that pastoralists respond to these instruments in a variety of ways. Index insurance is one such instrument, designed with a specific framing and assumption of climate-induced drought and its management as a risk transfer mechanism in the dryland system. However, different pastoralists can have disparate and complex experiences of drought and ways of responding to it, along with many other uncertainties. Livestock insurance is also integrated into such risk response mechanisms by different pastoralists. It has been part of the broader market-based intervention for over a decade, and there are scholarly works on its impact, demand and upscaling.

Nevertheless, the literature does not provide an in-depth understanding of the practices of pastoralists in integrating livestock insurance into their risk response activities. As a result, this thesis examines the subject in detail by asking a central question, *"How do pastoralists combine livestock insurance with other ways of responding to risk and uncertainty? (Response)"*. However, before addressing this question, I analyse the various aspects of exposure, experience and conceptualisation of risk and uncertainty. Therefore, I pose two supplementary and substantial research questions: *"What risks/uncertainties have pastoralists in Borana faced over time? (exposure)"* and *"How are risks and uncertainties perceived by different pastoralists (wealthier/poorer, men/women, young/ old)? (Perceptions and conceptualisations)"*.

These interrelated themes of the research question - risk exposure, risk perception and risk response- demand different research methods and approaches. As a result, I have adopted mixed methods– qualitative and quantitative approaches, primary and secondary sources, various data collection tools and ways of analysis and presentation. It has also been possible to triangulate information.

### 3.2 Research Approach

Questions linked to each of the thematic areas in this research necessitate multiple approaches and purposes. There are three types of objectives in conventional social science research: explanatory, descriptive and exploratory (Bhattacharjee, 2012). The nature of my

research combines what, why and how questions; hence, I have adopted all three approaches whenever relevant to strengthen the central research argument.

Different pastoralists conceptualise risk and uncertainty differently, for example, using semi-structured interviews to answer the questions, '*What is uncertainty?*' and '*What is a risk for you?*' These have evolved into more focused, investigative inquiries and data-gathering approaches in order to acquire a better understanding of the research themes, which are risk exposure, perception, and response. During the early stages of the fieldwork, group talks were held to elicit information about the socio-economic, environmental and political situation in Borana. A precise and focused study technique was later developed based on the preliminary results of the fieldwork. This entire collection of actions can be considered an **exploratory** inquiry.

A household survey was used to obtain quantitative data, which was then analysed and presented **descriptively**. This entails statistically characterising survey data. It begins by introducing the characteristics of the study population- for example, age, wealth, family size, source of income and asset ownership. Additionally, this approach illustrates how pastoralists rank and give weight to the multiple risks and uncertainties they experience. The type and extent of response strategies combined with insurance are standardised, analysed and presented quantitatively.

The information and data analysis are **explained** by drawing a comparison between the assumptions advanced by index insurance proponents and perspectives expressed by pastoralists in their own words. In so doing, this study brings together all three objectives of the research.

### 3.3 The Study Area: Why Borana?

In this section, I will briefly discuss features of pastoralism in Ethiopia and present why the Borana pastoral system is selected for my study.

The Horn of Africa has the most mobile livestock producers in the world, where Ethiopian pastoralists take a major share (Markakis, 2011). Pastoralism in Ethiopia, like elsewhere in the ASALs, is an economic activity, land-use system, socio-cultural and in general a way of life (Coppock, 1985; Bassi, 2005). Pastoral communities represent 14 per cent of Ethiopia's 110 million population (CSA, 2021). Moreover, pastoral production greatly contributes to the national economy by providing 40% of cattle, 75% of goats, 25% of sheep, 20% of

equines, and 100% of camels (CSA, 2017; FDRE: MoFED<sup>12</sup>, 2017). Approximately 60 per cent of the land area of Ethiopia is considered to be under pastoral production (Gebremeskel et al., 2019). Out of the total ten regions that make up Ethiopia, pastoralists reside in half of them. The largest share of pastoralists comes from the Somali region, where a little more than half of the Ethiopian pastoralists live; followed by the Oromia region (20.4%), and the Afar region (17%) (CSA, 2017). The remaining (8.3%) live in Gambella and Southern Nations and Nationalities region.

The ASALs in Ethiopia are characterised by highly variable temporal and spatial rainfall patterns, resulting in unpredictable pasture and water availability for livestock rearing (Markakis, 2011; Desta and Coppock, 2004). Nonetheless, the pastoral system in the country is not uniform, but rather has specific characteristics. Scholarly publications, in particular, group together many facets of pastoralism in the country based on primarily the type of livestock production (herd composition), mobility, and socio-cultural organisation of pastoralists (Ahmed and Teka, 1999; Markakis, 2011; Little and McPeak, 2014; CARE, 2015). The new constitution, which was gazetted in 1991, outlines language as the major criteria to form administrative regions and also increased the clustering of pastoralists based on ethnic groups and other facets – socio-cultural and economic aspects (Bassi, 2005; Markakis, 2011).

Consequently, the three dominant pastoral groups are the Afar pastoralists (nomadic and agro-pastoralism around the Awash River), Somali pastoralists (nomadic and agro-pastoralism around the Wabi Shebelle and Shinille areas), and Oromo pastoralists (with distinctive location-based semi-mobile and agro-pastoral pastoralism-based system among the Borana and Karrayyu, and at smaller scale Bale and Hararghe pastoralists) (PFE, IIRR, TDF, 2010; Markakis, 2011; Tsegaye et al., 2013; Coppock, 2016).

Some pastoral practices among these groups are somewhat similar. In all pastoral settings, mobility follows the same logic, based on the seasonal availability of pasture and water—dry and wet seasons (PFE, IIRR, TDF, 2010; Tsegaye et al., 2013). However, animal ownership varies between pastoralists in the north-eastern (Afar and Karrayyu) and eastern (Somali) regions and those in the south (Borana), with the former largely domesticating camels, then goats, and the latter predominantly cattle (McPeak et al., 2012; Tsegaye et al., 2013; Coppock, 2016). Hence, transhumant pastoralism is important among Afar and Somali

---

<sup>12</sup> FDRE – Federal Democratic Republic of Ethiopia, MoFED – Ministry of Finance and Economic Development.

pastoralists. The Borana are characterised by semi-mobile pastoralism (Coppock, 1985). Therefore, access to water and pasture is influenced by species type as well as various socio-cultural organisations and pastoralist practises.

Pastoral resources are generally owned by the community in all pastoral areas of Ethiopia (Ahmed and Teka, 1999; Bassi, 2005; Gebremeskel et al., 2019). However, among Afar and Karrayyu pastoralists, family and then clan-based usufruct practices predominate (Markakis, 2011). Clans have a crucial role in the distribution of all resources in Somalia (Aklilu and Catley, 2010; Catley and Iyasu, 2010). There are complex, yet structured layers of resource governance in Borana, which will be discussed in chapter six, that mix spatial distribution of resources, proximity (village), and clan.

Because of natural (weather and vegetation distribution) and human factors (socio-cultural and political), all pastoral groups are at high risk and vulnerable to livelihood deprivation (Ahmed and Teka, 1999; Bassi, 2005; Markakis, 2011; Tsegaye et al., 2013; Coppock, 2016; Gebremeskel et al., 2019). Drought-related pasture scarcity, as well as the establishment of commercial farms (by the state and private sector) that immensely reduced dry-season pasture reserves, characterise vulnerability among Afar and Karrayyu pastoralists (Muller-Mahn et al., 2010). Despite differences in agro-ecology, such as altitude and vegetation distribution, weather-induced shocks have been identified as significant causes of uncertainty among Somali and Borana pastoralists (Catley and Iyasu, 2010; McPeak, 2012; CARE, 2015). Such weather-induced vulnerabilities are critical for constructing IBLI in dryland systems.

The Ethiopian government and its development partners have made attempts to address various complex, at times interrelated vulnerabilities and challenges that pastoralists across the country face over the years. Despite some successes, the impact of such interventions did not take into account Ethiopia's fundamental pastoral systems (Gebremeskel et al., 2019).

To start with, significant external initiatives entered the development agenda of most regions of dryland Africa throughout the 1960s and 1970s (Scoones, 1995). During this time, the government, World Bank, African Development Bank (AfDB), and African Development Fund (ADF) collaborated to take the first external intervention in Borana (Coppock, 1994). Recurrent disasters precipitated by drought have been experienced in the HoA, encouraging an extensive range of humanitarian assistance, social protection and resilience-building

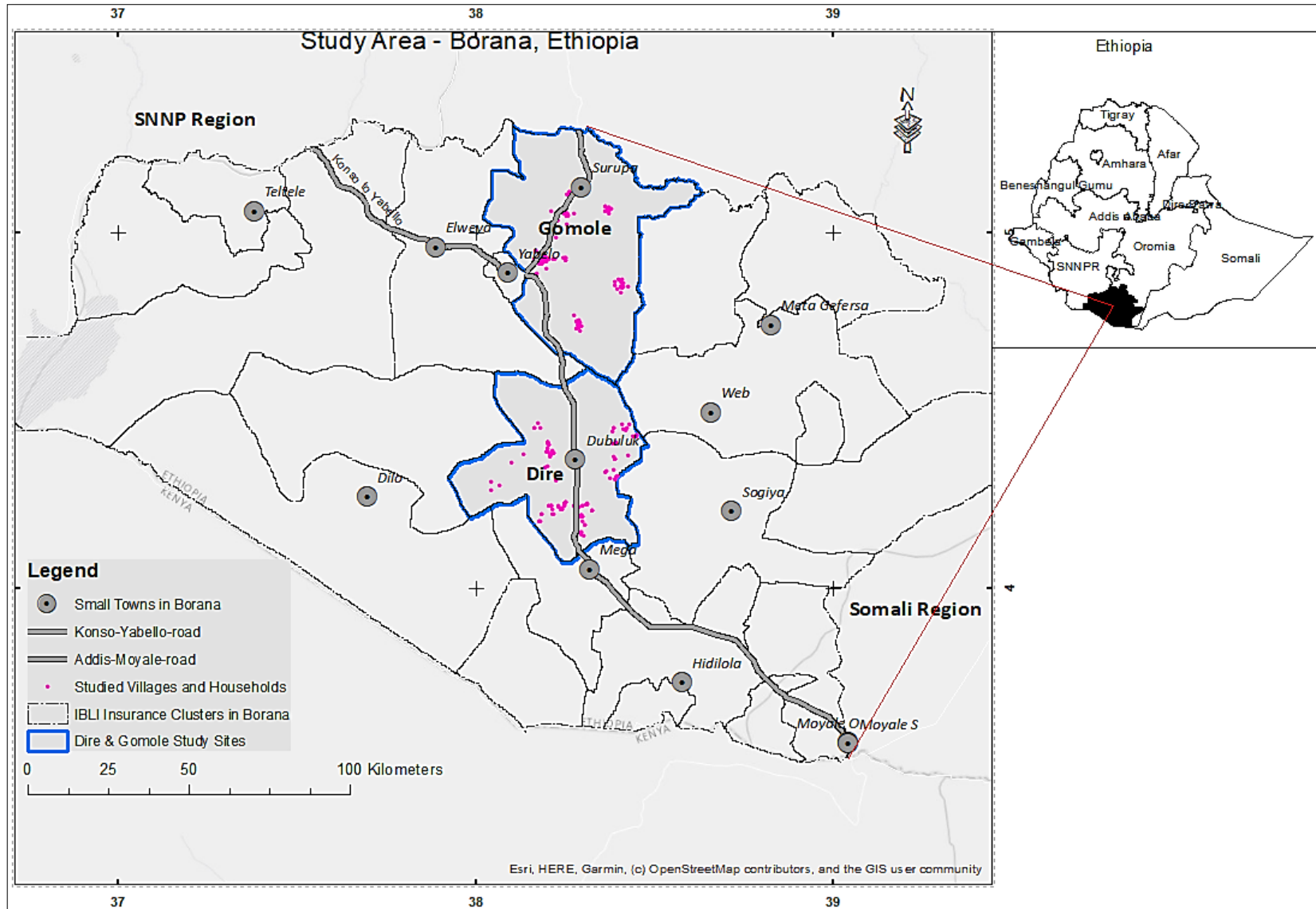
interventions over the past decades (Devereux, 2009; Carter et al., 2018). Insurance is one form of social protection that has emerged from disaster risk-financing mechanisms.

After the first pilot of IBLI in Kenya in 2010, there was a recognition that this innovation would support pastoralists during climate-induced shocks in the HoA (Yihenew et al., 2020; Fava et al., 2021). Therefore, IBLI was piloted in southern Ethiopia two years later. After multiple discussions and efforts by development actors, research organisations and private partners, the Kenyan Government decided to integrate the insurance product into the broader social protection programme in 2015/16. This effort came with a new programme known as the Kenyan Livestock Insurance Program (KLIP). Under KLIP, more than 18,000 pastoralists are registered, and the government provides coverage for their livestock (Lung, 2021). Although there are appealing research themes to explore, the heavy involvement of the government in the identification, targeting and registering of beneficiaries would make it incompatible with the central research questions and arguments set out in this study. Moreover, an understanding of the practices of pastoralists in this regard cannot be ascertained. By contrast, IBLI in Borana is a commercial product; it fits both the central argument and research questions set out in this study.

A pre-feasibility study of IBLI in Afar and Somali regions (Taye et al., 2017) found that the majority of Afar districts require extensive research to build the insurance product; thus, it is not totally suitable at the outset. In contrast, several districts in the Somali region are eligible to pilot IBLI. However, no commercial IBLI product is available in the region. The World Food Programme (WFP) provides an IBLI-type product to selected poor pastoralists in the Somali region. Nonetheless, this contradicts the study's research questions because pastoralists do not purchase the insurance product but rather use it as a safety-net programme supplied by the government and donors.

In Borana, although insurance sales were incentivised to selected pastoralists through discount coupons during the pilot years of the insurance product, since 2015, the insurance has been sold commercially in the majority of areas in Borana. As of 2021, more than 20,000 policies were sold by Oromia Insurance SC (OIC), the sole underwriter of the insurance product in Borana. The total sum insured is 120 million Birr (Ethiopian currency equivalent to US\$ 5 million). As a result, Borana is the only pastoral area in Ethiopia where IBLI is made available commercially to the market by a private insurance business.

Finally, I have been working in Borana for more than five years on dryland research and innovations. As a result, I have established a strong network of different pastoralists, extension workers and government officials. Furthermore, I am a member of the larger Oromo ethnic group, with whom I share language, culture, history and other aspects of the Borana Oromo. Borana dryland is thus a suitable research topic for this study due to its relevance to the research questions/arguments, as well as my understanding of the local system. Details of biophysical, demographic, socio-cultural and economic dimensions of the Borana dryland system are presented in Chapters Four and Five.



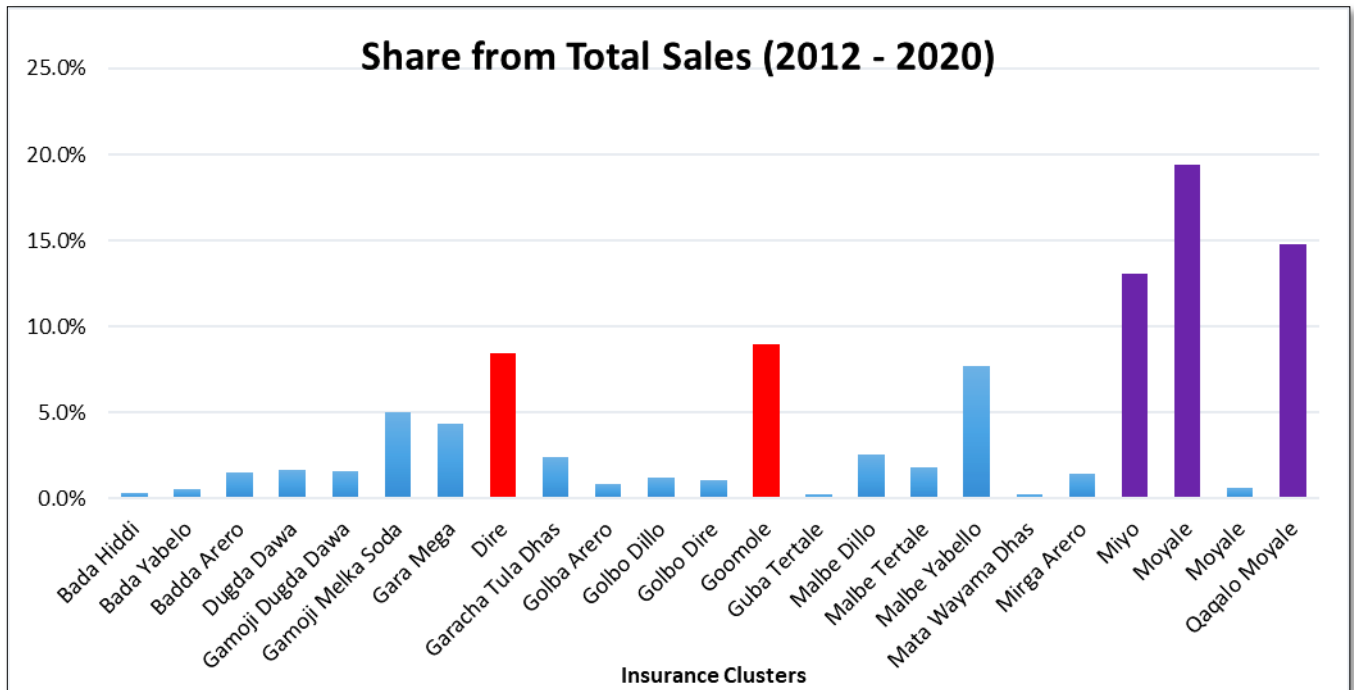
**Figure 3.1 Study Area – Borana, Ethiopia**

### 3.4 Sampling Procedure

This study was conducted using a well-thought-out step-by-step sampling technique. Pastoralists' interaction with the insurance product served as the impetus for developing the sampling method. The Borana dryland system is divided into pastoral (mainly in the zone's southern section) and agro-pastoral (the northern portion) production systems; I chose insurance clusters in both areas based on insurance sales history. Total sales (insurance adoption and disadoption) are critical for examining a variety of pastoralists' risk financialisation practices and addressing the primary research questions raised in Chapter One. Additionally, adhering to a single methodology for the many tools used to gather data is challenging, as the purpose and data required for each instrument vary. As a result, the sampling technique is both probability (for survey research) and non-probability. The probability sampling process employs stratified random sampling. I used purposive and quota (insurance category, age, gender and wealth) procedures for the qualitative approaches. The procedures for drawing samples are detailed in the following sections.

As previously explained, an insurance cluster is a geographic region defined during the development of an insurance model that assumes uniform exposure to the risk of drought (or a similar risk profile). As a result, all pastoralists in a cluster pay the same insurance premium for a given animal. Accordingly, insurance pay-outs per animal are the same for all insured households in that cluster. There are 24 insurance clusters (Figure 3.2), with six clusters in the northern region designated as agro-pastoral. The majority of regions and insurance clusters lie within pastoral zones, accounting for 75% of clusters.

The second phase was to assess each insurance cluster's overall sales since the product's debut in 2012. The objective here was to identify a representative sample population for the investigation. Each of the six insurance clusters, as shown below, contributes to more than 5% of the total revenue. Gomole and Malbe Yabello are agro-pastoral clusters, whereas Dire, Miyo, Moyale and Qaqalo Moyale are pastoral clusters. At the time of sampling, Malbe Yabello had a limited number of insured individuals; therefore, Gomole is the study's sole insurance cluster with a large sales volume from agro-pastoral zones. Pastoralists in the three insurance clusters (purple-coloured bar charts in Figure 3.2 below) receive a 35% reduction on their premium payments; hence, they were excluded from the research as comparisons to Gomole are impractical, leaving Dire as the sole insurance cluster.



**Figure 3.2 IBLI Total Sales and Share of Insurance Clusters (2012-2020)**

The third step was to classify households in the cluster into three categories based on the type of insurance interaction.

**Insured/Active Policyholder** – is a pastoralist/household with active insurance coverage during (2019/2020) and for one whole year before the time of the study.

**Dropout** – is a pastoralist who had purchased the insurance product and then left the insurance scheme during the study period.

**Uninsured/Non-Policyholder** – these are pastoralists with no investment history of livestock insurance.

The fourth step was to select villages (*olla*) where all the three categories of households (insured, dropout, and uninsured) could be found. In a situation where finding all categories proved difficult, villages located close to one another were chosen. The risk of drought is considered a covariate in the IBLI model; therefore, locating pastoralists close to each other provided the pre-requisite for a “homogenous” spatial risk exposure. For all types of data collection tools, 89 villages were selected, of which 53 are from Dire, and 36 from Gomole.

The final step involved mapping out the wealth and gender dynamics in the study areas. Group discussions with members of the pastoral community and a review of local statistics

indicated that there were three broad wealth categories, namely wealthy, medium and poor and locally referred to as *Dureessa*, *Nama ufirraa bulu*, and *Harka qalleessa*. Although detailed discussions and literature (Tache and Sjaastad, 2010) further divide each of the above into two or more, making up seven different wealth categories, the broader categories are representative enough from which to draw samples.

Taking gender into account, the average proportion of female-headed households participating in the study is 30% in Dire and 20% in Gomole. For the household survey, 17 per cent of households are female-headed in Gomole and 28 per cent in Dire. Finally, as outlined below, 529 individuals participated in the primary data collection instrument spread across seven research tools.

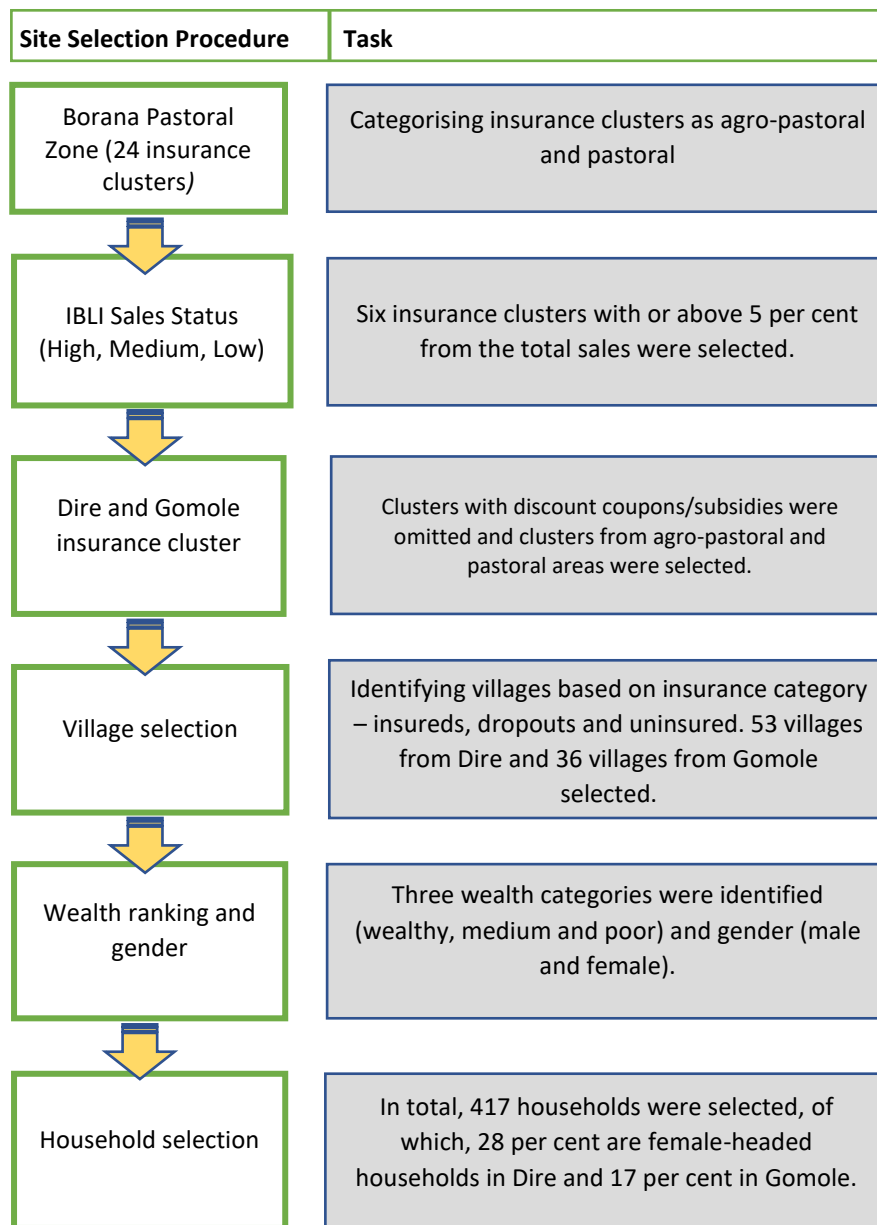


Figure 3.3 Site, Village and Household Selection Procedure

**Table 3.1 Sample size for each data collection tool**

Research Tool	Sample Size		Total
	Dire (pastoral)	Gomole (agro-pastoral)	
Survey	142 (53 villages)	158 (36 villages)	300
FGD	6	6	12 (96 individuals)
Case studies/interviews	38	34	72
Ethnography	10	8	18
Couple interviews	5	4	9
Photovoice	10	8	18
Elite Interview	Discussions and meetings with insurance promoters		16

### 3.5 Type of Data (Data Sources) and Research Tools

The types of data sets employed were also both quantitative and qualitative. Various published material on research methodology indicates that mixing the two provides complementary representations of the themes and research in question (Vanderstoep and Johnston, 2009; Bhattacharjee, 2012; Lune and Berg, 2017; and Li and Zhu, 2019). Consequently, any disadvantage of following one method is offset by the other; more importantly, the research questions set out in this study necessitate blending the two approaches.

In this study, quantitative data were generated from secondary and primary sources to understand the extent, counts, measures and distributions of various sources of risk and uncertainty. This approach also sets up patterns within the study population. The broader themes that rely on this approach are:

- historical vegetation analysis – correlation between rainfall distribution and vegetation trends;
- demographic and economic features of the study population;
- ranking severity of multiple risks and uncertainties and their impact on the household level;
- extent and type of various risk responses by pastoralists.

This study relies heavily on qualitative methods, and foremost the study's central research question, *“How is insurance combined with other forms of risk response strategies by different pastoralists?”* This necessitates setting out multiple supplementary questions that

can be answered using different qualitative tools. Moreover, key issues and questions that this approach captured for the study are:

- Perception and conceptualisation of multiple risks and uncertainties by different pastoralists.
- How do the pastoral backgrounds of age, wealth, gender and location influence such conceptualisations?
- How and why insurance is combined with specific responses to risk and uncertainties?
- What factors influence decision-making, and how?

This research is based on both primary and secondary sources.

### 3.1.1 Secondary Sources

There are many reasons for considering secondary sources in any research. Although budgetary, time, and personnel limitations are frequently cited as the primary reasons for employing secondary sources, the nature of the study also necessitates reliance (totally or partially) on these sources (Heaton, 2004; Andrews et al., 2012). Significantly, some raw data sets in monitoring historical vegetation changes are handled by a handful of organisations and companies today. Although they may pursue different objectives, previous panel surveys represent a good source of information in the understanding of changes and dynamics (Heaton, 2004).

Before collecting primary information, this study mapped out, identified and reviewed available raw and processed secondary sources. They were all subsequently linked with the research questions and used as inputs in developing primary data collection methods and addressing the central research questions. Below is the summary of all the different data sets identified and employed for this study.

- **NDVI** – This combines precipitation and evapotranspiration in monitoring vegetation in an area. In Borana, high-resolution (250m<sup>2</sup> spatial resolution) NDVI data has been available since 2000 at the National Aeronautics and Space Administration (NASA). A study conducted in the HoA by Meroni and Felix (2015) found that it is a good indicator of vegetation.
  - Chapter Six notably depends on this raw data to understand the heterogeneity of exposure to risk within each insurance cluster. Hence, raw data of NDVI eMODIS

from 2002 to 2020 were acquired, processed and analysed to illustrate the patterns of vegetation availability in Dire and Gomole (<https://modis.gsfc.nasa.gov/data/>).

- **Geo-Spatial Drought Incidence Data** – Spatio-temporal drought incidence is recorded by IGAD's (Intergovernmental Authority on Development) Drought Disaster Resilience and Sustainability Initiative (IDDRSI). This initiative is supported by IGAD's Climate Prediction and Applications Centre (ICPAC) (<http://www.icpac.net/>). ICPAC collects and monitors time series climate- and weather-related information. Since 1980, geo-spatially stored drought incidence has been available for Borana. For my study, this dataset was integrated with NDVI data to understand changing patterns of risk exposure in Borana.
- **Pastoral Risk Management Project (PARIMA) Panel Data** – the PARIMA project was established in 1997 to conduct research, training and outreach in northern Kenya and southern Ethiopia until 2009. A detailed panel of household data was gathered for three years between 2000 and 2003. In addition, six rounds of quarterly data on different pastoral aspects were collected. Details, including raw data, can be found at <http://barrett.dyson.cornell.edu/Parima/projectdata.htm>. The household panel survey has four sections, namely, 1) Pastoralist risk exposure and management behaviour, 2) Livestock Marketing, 3) Rural Financial Institutions, and 4) Public Service Delivery Systems. This data set has been used in three sections in Chapters Four and Seven.
- **IBLI Borana Panel Household Data** – Household panel data from Borana between 2012 and 2015 were collected over four rounds. IBLI panel data have many sections, including household characteristics, income, market, human health, livestock production and livestock insurance. I was involved in their collection and management in Ethiopia (2014 and 2015). These panel data were relevant to my study in order to understand linkages between household characteristics and insurance perception and uptake.

These secondary sources were then linked to the research argument and the study questions. Moreover, preliminary analysis of these data sets contributed to designing methods of data collection (tools and questions).

**Table 3.2 Secondary data/information source and features**

Secondary Data Sources		Limitations
Data Type	Data Features	
<b>NDVI – Vegetation Data</b>	<ul style="list-style-type: none"> <li>Vegetation trends from the year 2000 clustered at the insurance cluster level.</li> <li>The research dissects the data set into a 2km<sup>2</sup> area to understand localised vegetation trends.</li> </ul>	Historical exposure data analysis will rely on this information, by far the most reliable data source.
<b>Drought History Data</b>	Drought incidence in Borana distributed across <i>woredas</i>	
<b>PARIMA Household Panel data from 2002-2005</b>	<ul style="list-style-type: none"> <li>Risk types, perceptions and responses</li> <li>Climate forecast and perceptions</li> <li>Change of livelihood strategies</li> <li>Issues on risk and responses</li> </ul>	<ul style="list-style-type: none"> <li>Perceptions are not linked with drought incidents.</li> <li>Some data/information is outdated.</li> <li>No information on social insurance and formal insurance.</li> </ul>
<b>IBLI Panel Household data from 2012-2015</b>	<ul style="list-style-type: none"> <li>Household characteristics – demography, income, etc.</li> <li>Livelihood, risk and coping strategies</li> <li>Characteristics of pastoralists' risk response</li> <li>Knowledge of livestock insurance</li> </ul>	<ul style="list-style-type: none"> <li>No/limited links with risk exposure, perception with response</li> <li>No qualitative/in-depth information on perception</li> <li>Information is not disaggregated into the three insurance categories to set out risk exposure and response.</li> </ul>

I also utilised various secondary data sets (raw and semi-processed) at different stages of the research; among others, livestock insurance sales data from Oromia Insurance Company SC (OIC), socio-economic data from Borana zone's administration, multiple data sets from the Federal Statistical Agency of Ethiopia, and other raw and semi-processed secondary data sets. Finally, many published studies in Borana, the HoA, and the dryland system in general, were also reviewed and used throughout the study.

### 3.1.2 Primary Sources

I relied heavily on multiple primary data sources collected in two rounds to answer the central research question and subsequent questions. The first round of extended fieldwork was from September 2019 to October 2020, and the second round, a quick gap-filling data-collection period, took place in July 2021. Six different tools from both quantitative and qualitative approaches were used during the two rounds of the primary data collection (all types of data collection tools can be found in Annex I).

### *Quantitative Tool Survey*

The survey method within social sciences is long-established and widely used (Presser, 1985; Lavrakas, 2008; Saris and Gallhofer, 2014; Rea and Parker, 2014). I particularly sought to complement the research's empirical and analytical components through quantitative input. This type of data collection allows for an understanding of the patterns of risk perceptions and the extent of responses differentiated by wealth, gender, age and insurance. The features and characteristics of the study population's social features (age, gender, family size, etc.) and economic features (sources and share of livelihood, asset ownership, source of income, etc.) were gathered using a household survey. Moreover, the survey results expanded my understanding and analysis of the qualitative approaches I employed.

The implementation of the household survey started with qualitative data collection oriented to exploratory research. They involved group discussions, interviews, transect walks and field observation of the pastoral population's various socio-economic, physical and environmental characteristics. This enabled me to convert abstract concepts of risk and uncertainty into measurable outcomes. Most information gathered is either objective (source of income, livestock ownership, year of birth, etc.) or subjective (extent of the impact of drought) and requires assigning certain numbers – breaking down into measurable or quantifiable variables.

A great deal of time and effort was put into assessing the many variables in the study to ensure greater validity and reliability. Moreover, multiple iterations, discussions and revisions with academic supervisors before and after the pre-test helped to increase the validity of the research tools employed.

All variables considered to be subjective were converted into the Likert Scale. In social science this is a very popular scale with which to understand subjective responses; in this case, perceptions and experiences, are converted into numbers (Vanderstoep and Johnston, 2009). Despite its limitations, such an approach provides good information on the patterns of research participants' subjective responses (Vanderstoep and Johnston, 2009; Shaughnessy et al., 2012).

The survey questions are divided into five parts: introduction, including the objective of the research; consent and household identification, which are also presented in the first section. The second part focuses on household characteristics: gender, age, residence, family size,

sources of livelihood and asset ownership. The third part covers pastoral resources – water, pasture, and other key resources- and livestock ownership – number, type, and ownership type (ownership only, management only, or both). The fourth part focuses on the knowledge and practice of finance and insurance. The final part covers close to 60 per cent of the questions that focus on exposure, perception and responses to uncertainty. This section starts by asking respondents to free-list the multiple risks they have experienced in the last decade. It then ranks the top three risks in the study period, connected to the major drought that occurred in 2019. Using the Likert Scale, this is then linked to the extent to which a household experienced drought impact. A similar procedure was followed for responses – free-listing, ranking and scaling. This section also asks how insurance is combined and substituted with various risk responses. The data collection was finalised after two rounds of pre-tests with selected pastoralists of different backgrounds in both research sites.

Concerning the implementation of the survey, seven enumerators and four local mobilisers participated, all of whom are from Borana and have experience in similar research in the pastoral context. Ten enumerators were identified, interviewed, and assessed through formal (advertisement) and informal networks, and seven were selected. On the other hand, local mobilisers were selected through informal networks; the main criteria being where someone who has lived for many years in respective research sites and has previous experience of either social mobilisation or facilitating research. The seven enumerators were then given on- and off-site training. This also helped in conducting the second round of pre-testing data collection tools.

Data were collected from 300 households (divided equally among insured, dropouts, and uninsured households). KoBo collect<sup>13</sup>, an open-source data collection, is employed to collect the data using Android-based smartphones. In addition to the efficient gathering of data, the tool enables the on-site review and checking of responses, particularly those of outliers, as well as errors, and taking the necessary corrective measures.

### *Qualitative Tools*

The data gathered from the survey, a quantitative tool, cover almost a third of the information collected from primary sources. The remaining information was collected using five different types of qualitative tools.

---

<sup>13</sup> <https://www.kobotoolbox.org/>

### Focus Group Discussions (FGDs)

FGDs, or simply group discussions, are intended to understand broader/societal-level issues concerning the study's central question. This sort of research seeks to ascertain a specific community's economic, cultural and other features and systems (Berg, 2001; Lune and Berg, 2017). I developed three modules, and group discussions were conducted with two main goals in mind: first, to comprehend local settings of risk and uncertainty (a mix of situational, event, historical, relational and outcome analysis); and second, to establish essential inputs for other data-gathering instruments (including survey).

The three modules were developed with a focus on the thematic areas below:

1. land use and resource governance,
2. exposure and responses to risk and uncertainty, and
3. livelihood, financial institutions and market.

The modules were structured to respond to context analysis relating to the study themes and research questions.

There was a total of 12 semi-structured group discussions, four per module. Each group discussion had between eight and 12 purposely-chosen participants based on their interaction with insurance, and pastoral backgrounds (age, gender and wealth). Much work was put in to obtain representation as well as acquire reliable and relevant information. All the meetings took place in pastoral settlements/villages. Despite the Borana community's patriarchal lifestyle, women's participation in such meetings/discussions was comparable to men's. Furthermore, I attempted to thoroughly engage with all participants to share their thoughts on all topics discussed.

Despite the limitations of group discussions (Sussman et al., 1991; Berg, 2001; Shaughnessy et al., 2012), there is a synergic group effect when having such conversations with members of a community (Vanderstoep and Johnston, 2009). As such, the goal of holding community meetings was met, since the purpose of the discussion was to have a contextual analysis of risk and uncertainty (combining multiple analyses) with clearly defined modules.

### Case Studies

I employed this tool of data collection because the perceptions, experiences and views of many pastoralists, and the various risks and uncertainties they face, require a detailed understanding of the research question developed. Moreover, case studies enabled me to investigate and report on the interconnections of events, human interactions and other elements in relation to risk and uncertainty.

It was also possible to explore and investigate specific objectives of the study by sitting with many pastoralists in a formal (semi-structured) and informal (casual chats) discussion. The total formal case studies were 72, where a member of a household or couple sat with me at least twice. Although various types of information were captured using informal chats with pastoralists, they are not counted in the total sample here. Nevertheless, vital information was recorded using multiple media. If it were a tangible feature, I would take pictures or videos. If it were an idea or concept, I would write notes or record my voice on the phone. If neither was possible, I would take notes in my diary. Finally, all the case studies were conducted by employing three types of research: exploratory, descriptive and explanatory. With this research, I added a fourth approach - the interpretive approach to case studies. As suggested by Yin (1984), the interpretive approach is the process of inductively examining initial assumptions in research.

All case studies conducted with pastoralists were disaggregated by insurance category, wealth, age, gender and location. The case studies were designed in geographical, institutional, temporal, livelihood and other vital contexts. Geographical contexts included consideration of spatial issues attributable to the dryland system in Borana- extensive pastoral and agro-pastoral systems and access to critical resources. Institutional contexts involved networks of individuals in the village and community and their position and status in traditional and 'formal' institutions. Livelihood – source and type of livelihood, income and wealth status were considered. The discussions set out to understand pastoralists' views and experiences during multiple time horizons of resource/pasture abundance (last quarter of 2019 and early 2020) and drought/scarcity of key pastoral resources (September – October 2019, the third quarter of 2020 and mid-2021).

In setting out these multiple contexts of pastoral backgrounds, I systematically investigated research questions in a 'near real' situation pastoralists found themselves in. Although contemporary issues around risk and uncertainty are vital components of my research, each

participant's past events, experiences and stories were given due emphasis. This has enabled me to understand the dynamics and changes of perception and response regarding the multiple uncertainties that pastoralists face. Insurance was discussed in great depth, depending on the type of insurance interaction a pastoralist had. This started with participants' information and knowledge of livestock insurance, and the source of information. Then, pastoralists' initial impressions about the product were followed by more deliberations on it. What key features of it were appealing; how features had changed, or not, and if they had, why? This then extended to how cash was raised to invest in insurance and to identify the response strategies to insurance that were complementary and competing. The factors to consider when combining insurance with other responses included people consulted, resources mobilised, expectations and perceptions about pay-outs, etc. (See Annex I and II).

Consequently, three semi-structured yet interrelated question modules were developed. The modules' key features are summarised in the table below.

**Table 3.3 Case Study: Modules, Timeline and Guiding Questions**

Categories	Period conducted?	Module Type	Guiding Questions – focus areas
Module I	2019 (Q4) – 2020 (Q1) <ul style="list-style-type: none"> <li>▪ Main rainy season of March-May failed – a stressful period</li> <li>▪ Late 2019 and early 2020 have more than normal rain – resource-abundant period</li> </ul>	<ul style="list-style-type: none"> <li>▪ Setting the Scene</li> <li>▪ Conceptualising uncertainty</li> <li>▪ Decision-making – responses</li> </ul>	<ul style="list-style-type: none"> <li>▪ What are the sources of any changes to your livelihood?</li> <li>▪ Access to resources – types, rights and changes.</li> <li>▪ How is risk/uncertainty conceptualised among different pastoralists?</li> <li>▪ How are decisions on responses made?</li> <li>▪ How is insurance combined and substituted with other responses? Why?</li> </ul>
Module II	2020 (Q3) – normal to low resource availability period	Drought and responses	<ul style="list-style-type: none"> <li>▪ How do you describe the latest drought?</li> <li>▪ Have responses to resource availability/scarcity changed? If so, how?</li> <li>▪ Networks and institutions, deliberations, and decisions.</li> <li>▪ How is insurance combined and substituted with other responses? Why?</li> </ul>
Module III	July 2021 – very stressful period	Dynamics of responses	<ul style="list-style-type: none"> <li>▪ Have responses to resource availability/scarcity changed? If so, how?</li> <li>▪ Insurance – promises and failures.</li> </ul>

## Ethnography

I immersed myself in daily life events and understood the pastoral system by living in villages and attending events (pasture and water governance meetings, traditional administrative and cultural meetings, weddings and funerals), herding livestock with pastoralists, engaging in market activities and other aspects of livelihood. Although ethnography has been associated with cultural studies, it is widely used in the social sciences, education, health and other studies (Brewer, 2000).

Moreover, by living in the villages, attending events and herding livestock with pastoralists, I was able to capture daily life among different pastoralists and gain a better understanding of how people feel about risk and uncertainty, what their perceptions of such risks and uncertain events were, and how they combined responses. During such interactions, discussions about livestock insurance were held, and through attending IBLI sales, insurance pay-outs and sensitisation events, I acquired a greater understanding of pastoralists' perceptions. I was looking for specific moments, events and situations that highlighted the topics of my research. These included, for example, a dispute over insurance pay-out or a dramatic shift in participation (an increase of sales or dropouts) with IBLI before, during and after an IBLI marketing event; resource-based discussions, deliberations and decisions. Detailed observation, casual conversation and selected follow-up interviews were important in developing in-depth cases.

Although in-depth investigations were conducted through probing and follow-up questions, the topics had a focus on daily socio-economic and institutional activities. The broader areas of discussion for the ethnographic research were:

- How do people from different pastoral backgrounds (age, gender, wealth, location) interact – how do they discuss specific matters and contexts (social, economic, institutional)?
- How are decisions made at household, village and community levels? Deliberations and power dynamics.
- What types of discussions are conducted between insurance promoters and pastoralists?

The ethnographic study was conducted throughout the research period. However, most days during the first and third quarters of 2020 were used solely for this approach. In

September 2020, I stayed with councillors, elders, clan leaders and advisors to the leader of Borana (*Abba Gadda Kura Jarso*) for 16 days (picture below).



**Picture 3.1 *Gumi Gaayo* (Assembly of Gaayo) – Day 1 Meeting**

*From left Councillor of Oditu Clan, Hayu Saqo Korma, me, and Borana leader/Abba Gadda Kura Jarso (right)*

### **Elite Interviews**

Although there is no clear-cut definition of an elite within social science research, the researcher reorients the subject based on the type of information needed (Harvey, 2011). However, McDowell (1998: 2135) defines an elite as a “highly skilled, professionally competent, and class-specific individual”. I adopted this definition for my research. In this case, the elite are those insurance modellers, researchers and promoters. This type of interview is a detailed technical interview and discussion, with index insurance designers and promoters. Elites are not necessarily comprised of figureheads or leaders but individuals who hold superior knowledge on a subject/discipline (Harvey, 2011). Such interviews provide the opportunity to capture 'unique experiences as insiders' (Jupp, 2006: 85).

A common challenge faced by scholars is how to gain access to, and trust from such experts (for example, McDowell, 1998; Jupp, 2006; Harvey, 2011). I did not face such challenges, as I had worked for years with the interviewees. More importantly, I succeeded in genuine reflection on the discussion point. A total of 16 elite interviews were conducted, with respondents divided into researchers and practitioners at ILRI (8 interviews); insurance

promoters working for Oromia Insurance SC (OIC) (2); and village-level insurance promoters (6). The foci of the discussions were:

- IBLI contract design assumptions – reflections and debates;
- The conceptualisation of drought among insurance promoters and pastoralists – similarities and mismatches;
- How Insurance-scaling enabling factors and key features were missed;
- Drought, wealth and vulnerability – what would these mean to disaster risk financing programmes?
- Key issues to be considered in designing the insurance product.

### Photovoice

The concept of 'photovoice' was introduced into the literature by Wang and Burris (1997). Although multiple perspectives, concepts and uses have been put in place in recent times, this one focuses on the production of knowledge by people about themselves (on different social, economic, political and other aspects) through a photographic technique (Ruby, 1991; Wang and Burris, 1997; Mannay, 2016). There are debates and misunderstandings about visually-based research on the use and applications of photovoice and photo-elicitation (Rose, 2016). Although photovoice has been associated with participatory research techniques, centred upon health and feminist studies, the application in many other disciplines in social science has expanded through time, and the gap between the two conceptions has been bridged (Harper, 2012; Mannay, 2016; Zuev and Bratchford, 2020). As a result, the term 'photovoice' is used in this study's qualitative information-gathering approaches.

As a data collection tool, a photovoice was developed to explore how diverse pastoralists perceive various risks and uncertainties. The tool's purpose was to use images taken by pastoralists to better comprehend the numerous uncertainties they face. As a result, it offered an opportunity to approach uncertainty "like a pastoralist". "Empowering participants necessitates putting them in control of processes of image creation" (Mannay 2016: 23); hence, pastoralists were asked to photograph their households, community, environment, or just their daily interactions with risk and uncertainty in any context they preferred for two weeks.

This exercise was carried out following specific steps. It began by locating and choosing pastoralists from various research sites, considering insurance interactions and other relevant pastoral backgrounds, such as age, gender and wealth (details are described in the sampling section in this chapter). The purpose of the photovoice project was then explained to each participant individually. All the pastoralists in this exercise were familiar with me through various research-focused and casual meetings; as a result, carrying out this exercise was less problematic than it might otherwise have been.

I introduced the exercise to participants as follows:

'As you are aware, I am a student interested in learning about the risks and uncertainties that many pastoralists in Borana confront. Although I have been asking many people here, pictures taken by pastoralists like you are a central communication channel for me. Outsiders and pastoralists, in particular, may not necessarily see these two terms in the same light. I am going to give you a digital camera so you can capture pictures of risk and uncertainty from your perspective and experience, and multiple ways of dealing with them at the household and community levels...'



**Picture 3.2 Partial view of photovoice participants**

In this picture, two are insured (one medium and one wealthy), two are dropouts (medium and poor wealth status), and one is uninsured (young female).

The discussion was followed by a brief on-site training session on how to use the digital camera. Pastoralists were given a digital camera with a fully-charged battery to shoot photographs for several days. While taking photographs, ethical and consent issues were addressed in addition to camera operation. As they are members of the pastoral community, photovoice participants have better access to take images than outsiders. This might raise

ethical considerations on some occasions, which I made clear to participants, and when such concerns were raised, all images taken were deleted. Finally, despite the irregular availability of the internet, phone calls remain dependable in Borana. This made it easier for photovoice participants to communicate if they ran into technical difficulties.

The last stage was to meet with each photovoice participant personally, upload the photographs, and discuss what each image meant to them. Although participants were advised to take at least 30 photos exhibiting risk, uncertainty and responses at various levels, the average number of photographs taken was one hundred. The images below (Pictures 3.3 and 3.4) represent examples of this procedure. Participants were encouraged to propose a title, theme, quotation or descriptive term that might reflect/explain the notion of each image throughout the talks. This approach provided a greater understanding of how different pastoralists perceive risks and uncertainties, and trends were observed based on various pastoral backgrounds, including age, gender, wealth status and space/location.



**Picture 3.4 One-to-one training on operating a digital camera – Dire (left) and Gomole (right)**



**Picture 3.3 The Process of Photovoice – discussion with photovoice participants**

This process was completed by performing community validation on selected images with members of the pastoral community. In total, six community validations were held at both research sites. For the validation exercise, twenty-five diverse types of images were chosen. The photographs were selected based on the patterns observed during the one-to-one discussions with photovoice participants. During the discussions, specific patterns were noticed between male and female participants, and other similar pictures carry distinct meanings to wealthy or poor, younger or older persons. Several informal discussions/validations occurred during casual conversations with pastoralists. Figure 3.6 shows one of these when I visited a patient in Gomole. We discussed my stay, and he was interested in knowing about the photovoice exercises. He insisted on seeing the photographs I was taking for validation, and we began talking about the photovoice process and the pictures. Others who came to visit him also joined the conversation.



**Picture 3.5 Selected pictures from community validation exercise in Dire**



**Picture 3.6 One of the informal photovoice validation discussions – Gomole**

Selected images were printed in newspaper format and distributed to photovoice participants and other pastoralists (Figure 3.7). This happened during the second round of data collection (July 2021), when I sat with many pastoralists to catch up and discuss some of the risks they faced. Most were concerned about the lack of rain during the main season of 2021, as well as security problems (a war between the government and an armed group, which restricted pastoralists' mobility in search of pasture). As part of sharing views and conceptualisations of risks and uncertainties by different pastoralists to a wider audience, the photovoice project is shared online <https://seeingpastoralism.org/>.



**Picture 3.7 Distributing newspapers to photovoice participants and pastoralists**

### *Combining Mixed Methods: The Experience and the Challenges*

As stated in the preceding sections, I conducted my investigation using a combination of methodologies. This has helped me grasp the fundamental concepts of risk exposure, perception, and response. These are complex and interwoven aspects of a pastoral system. As a result, the datasets necessitate a systematic examination and integration of diverse forms of information. In this section, I will explain how I combined several sources of information to answer the research questions. In addition, I will discuss the difficulties experienced while merging several tools and information.

The type of data gathering instrument to be used is determined by the research theme and central research questions. For example, understanding drought risk requires integrating the layers of pasture governance and logic in a given area and among certain pastoral groups. Although insurance modellers use vegetation indices and satellite technology to evaluate vegetation distribution in an area, it overlooks some key community resource

governance practices. Again, such practices are not uniform across Borana, but rather scattered. By participating in and observing macro and meso-level resource governance meetings, ethnography informs how pastoral resource governance affects the design of the insurance product. Furthermore, I coupled individual drought experiences (seasonal pasture and water dynamics) with satellite trends. So, I compiled and analysed all of the information I gleaned through elite interviews (with insurance modellers), case studies (with pastoralists), and ethnography (with the Borana and at local level extended gatherings).

Some components of the research entail thinking like a pastoralist. Several data gathering tools, however, provide insight from the researcher's perspective, despite their importance in supplying critical information. As a result, in order to understand how various pastoralists, conceptualise and experience risks, I used visual photovoice methods in conjunction with other quantitative and qualitative tools. Pastoralists own the entire process of identifying complex themes that illustrate how they conceptualise danger and uncertainty in photovoice. They then explain what each photograph symbolises. As a researcher, I mapped patterns and collaborate with a group of pastoralists to validate the discovered trends. This data is eventually combined with case studies and quantitative household survey results. The following table is an overview of how I incorporated material from various sources for each research question and thematic area.

**Table 3.4 How different sources of information are linked/integrated**

<b>Research Theme</b>	<b>Research sub-questions</b>	<b>Source of information</b>	<b>How I integrate/link information</b>
<b>Exposure</b>	What risks and uncertainties have pastoralists in Borana faced over time?	<ul style="list-style-type: none"> <li>▪ Secondary data</li> <li>▪ Case Studies</li> <li>▪ FGDs</li> <li>▪ Elite Interviews</li> <li>▪ Photovoice</li> <li>▪ Ethnography (Participant observation)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Linking vegetation &amp; rainfall distribution (trend analysis) with individual stories</li> <li>▪ Linking community logics on pasture governance (ethnography and elite interviews) with insurance clustering.</li> </ul>
<b>Perception</b>	How are risks and uncertainties perceived by different pastoralists (richer/poorer, men/women, young/ old)?	<ul style="list-style-type: none"> <li>▪ FGDs (structured/semi-structured)</li> <li>▪ Ethnography</li> <li>▪ Case studies</li> <li>▪ Household Survey</li> <li>▪ Photovoice</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pictures as key sources of understanding the complex experiences of individuals and combining such stories with a survey (ranking experiences/perceptions).</li> <li>▪ Mapping trends of pictures taken and integrating with that of case studies (disaggregated by key pastoral backgrounds -wealth, gender, age, location).</li> </ul>
<b>Response</b>	How is livestock insurance combined with other ways of responding to risks and uncertainties by different groups of pastoralists?	<ul style="list-style-type: none"> <li>▪ Household survey</li> <li>▪ Ethnography</li> <li>▪ Case studies</li> <li>▪ Household Survey</li> <li>▪ Elite Interviews</li> </ul>	<ul style="list-style-type: none"> <li>▪ Combining insurance payout utilization with responses to drought (survey).</li> <li>▪ Understanding decision-making patterns on responses (case studies) with rankings of individual responses (survey).</li> <li>▪ Comparing logics of insurance modelers (elite interviews) and pastoralists' responses (case studies &amp; survey)</li> </ul>

Despite the substantial evidence that I was able to collect and analyse, there are some challenges I encountered. One example is quantifying risk perceptions among research participants. Numbers attempt to standardise some factors that are highly subjective by definition. As a result, they may not be a "true" reflection of how a certain drought risk is felt. To make matters worse, the death of a cow, which has a standard/objective market value, is experienced very differently by two pastoralists who live next door to each other. This is where ethnography, through living among pastoralists, and photovoice come in to help us understand such complex phenomena. As a result of such techniques, it was feasible to map trends and connect them to numbers in a mixed-method approach.

### 3.6 Positionality

This research has been both a professional and a personal journey. Prior to beginning the PhD programme, I worked at the ILRI, where I was in charge of overseeing the IBLI programme's implementation in Ethiopia. My responsibilities included, among other things,

leading and managing disaster risk-financing research efforts, as well as offering various capacity development and awareness workshops to several public and private partners. Despite numerous attempts by several partners, IBLI uptake in Borana remains limited. In the literature, willingness (financial literacy and catalysing customers' needs) and ability (capacity of pastoralists to invest in livestock insurance) to pay have been identified as factors to increase sales in addition to having a 'quality insurance product'. While these are essential factors, sales have been decreasing through the years.

As a researcher and development practitioner, it is natural to take a moment and ask, 'Why is this happening?' This is where my journey challenging the 'status quo' started. As a widely-heralded innovation in disaster and risk reduction, index insurance has failed to meet expectations. It is presented as an 'easily' understood and suitable insurance feature to pastoralists, deviating from conventional insurance schemes, and is claimed to be suitable for households across dryland systems of Africa; but do we understand what drought means to pastoralists, how exposure, perceptions and responses are combined? Furthermore, why do households disadopt or never invest in insurance, although they know about the product and notionally can afford to invest?

I had the opportunity to reflect on these and other similar, unanswered questions with my colleagues at ILRI, which facilitated the emergence of an in-depth and more extended period project under PASTRES (Pastoralism, Uncertainty and Resilience: Global Lessons from the Margins is a research programme funded by the European Research Council) – put simply, this PhD. Although I had been working within the insurance programme, I had to distance myself and conduct the study as an independent researcher. As someone trained in development studies focusing on quantitative research, I also had to expand my horizons and think about wider cultural, social and political dimensions of risk, expanding my methodological repertoire beyond quantitative surveys to in-depth ethnographic immersion and participatory engagements through photovoice.

When the research was carried out, recurrent shocks occurred in Borana, allowing me to witness various response measures adopted by multiple pastoralists. I began my fieldwork in September 2019, when pastoralists were under stress due to a lack of pasture in most parts of Borana. I observed insurance being paid to pastoralists during the same month due to the drought. After a month, the drought was followed by heavy rain for the short rainy season (of October and November), resulting in flooding in Gomole and above-average

precipitation in Dire. Immediately following these two instances, a swarm of locusts descended on most pastoral and agro-pastoral areas of Borana. During the second (short) round of fieldwork in 2021, the primary season's rainfall was light, making critical pastoral resources scarce. Conflicts between the government and rebel militants affected mobility, which exacerbated the challenge pastoralists faced. These, and other significant incidents, provided me with a composite understanding of the risks and uncertainties that pastoralists confront and their varied responses, allowing me to enhance the fundamental arguments of the research by addressing the essential questions listed above.

It was clear that investing in a strong network in Borana beyond the IBLI project – with elders, pastoralists and local officials – also helped me to learn whilst in the field. Ultimately, being accepted as a clan member<sup>14</sup>, I had the chance to understand risk and uncertainty 'like a Borana pastoralist', not just as a programme implementer.

### **3.7 Limitations and Difficulties**

Some aspects requiring long-term analysis were not possible during a time-limited PhD research programme. I benefited from the different raw data sets (IBLI PARIMA, discussed above in this chapter). However, I am aware of the limitations of collecting socio-cultural and behavioural variables outside of the research periods. This is particularly true in understanding the indirect effects of insurance and in (re-)shaping how responses to risk are strategised. As a result, I focused on factors and variables directly linked with drought risk, index insurance, and responses focusing on livelihood from livestock.

The purpose of this research is to better understand how pastoralists integrate livestock insurance into their various drought risk response strategies. When defining policy and programmatic choices and recommendations, this study did not define what type of insurance model should be utilised in the study area or, more generally, in the dryland system. It does highlight the critical components that must be examined when the government, development actors, insurance companies, researchers, and all other stakeholders consider establishing a comprehensive model.

Undertaking research at times of environmental crises is difficult. However, the context allowed me to understand the lived experiences of pastoralists in strategising their responses during drought and challenging periods. Nonetheless, I felt stressed observing the

---

<sup>14</sup> As per the Gada system's procedures.

challenges most pastoralists must go through, particularly during my ethnographic studies, as I was living with them.

The global COVID-19 pandemic was another major challenge. At the time the pandemic had become a serious public health issue in the UK, there was not a single case in Ethiopia, and the first case in Borana was identified in June 2020. However, in February, the University instructed researchers to halt field activities (data collection) without exploring country-specific cases. I am part of the Borana society, and leaving my community would have destroyed the trust I had built up with them, so instead, I followed strict public health guidelines to continue my ethnography.

### **3.8 Conclusion**

This chapter outlines the major components of the research methodology that I employed during the study. Since the research is aimed at answering three complementary questions, the data sources, data collection tools, sample procedures and techniques, and data analysis and presentation employ a variety of interconnected approaches. In this fashion, I was able to strengthen the fundamental arguments of the research. Before delving into the empirical and analytical aspects of the study, the next chapter provides a thorough overview of the characteristics and dynamics of change in the Borana dryland system.

## Chapter Four: Dynamics of Change and Variability in the Borana Dryland System

## 4.1 Introduction

“Pastoral systems are constantly changing” (Desta and Coppock, 2004:475). The Borana dryland system is located in a “highly dynamic political-economic region” (Catley et al., 2013:3). As a result, understanding the processes of change is critical in this research. This section aims to discuss some of the Borana dryland system's features and the changes that have been experienced in the last few decades. This chapter reviews the historical and contemporary processes and changes – environmental, social and economic – that have influenced pastoralism in Borana.

Under the IBLI model, there are a couple of assumptions that are relevant to this chapter. The risk-profiling technique of an area in the insurance model assesses the past two decades’ rainfall and the condition of vegetation. As a result, the insurance premium for an area is calculated according to the likelihood and severity of drought risk in an area. Moreover, it is assumed that the seasonality of rains, and thereby vegetation status is the same over the years and that the latest season’s vegetation availability is compared with past similar seasons objectively. Despite this, it is argued here that the Borana dryland system is experiencing various changes in the natural environment and patterns of rainfall and vegetation that make comparing the current season with those of the past somewhat superficial. This chapter, therefore, presents a picture of the various changes that have taken place using secondary raw data. It specifically assesses changes in the themes of a) rainfall, land use and pastoral resources; b) demographic and socio-economic factors; and c) how infrastructural and institutional issues interact.

Various studies have documented shifts in the Borana pastoral system since the first interventions were carried out in the region during the late 1960s and early 1970s. The International Livestock Centre for Africa (ILCA)<sup>15</sup>, established in Ethiopia in 1974, has been a key source of data and analysis over time. This study also used household data from two projects associated with the ILRI: PARIMA, which ran from 2002 to 2004, and IBLI collected between 2012 and 2015. Reports and raw data from Borana zonal administration have also been used.

---

<sup>15</sup> In 1995, ILCA merged with ILRAD to form the International Livestock Research Institute (ILRI) where the IBLI product with development partners was developed and piloted.

## 4.2 Overview of the Borana Pastoral System

The Borana pastoral zone is home to nearly 600,000 people, making it Ethiopia's third-largest pastoral cluster after Somali and Afar pastoral zones (BZFEDO, 2019). The zone is one of the least urbanised areas in the country, with 89 per cent of the population residing in rural areas (CSA, 2017). The Borana clan of the Oromo ethnic group accounts for nearly 80 per cent of the total population. The Gabra, Burji, Konso, Amhara and Gurage are other ethnic groups living in Borana, accounting for the remaining 20 per cent.

The zone comprises 13 districts (*woredas*), divided into 145 smaller administrative units known as *kebeles*. There are 11 towns, with a total population ranging from a few hundred to tens of thousands. In the last decade, there was a 15 per cent increase in the number of *kebeles* within the same administrative boundary. Different factors have influenced such changes, primarily the transition into a sedentarised life, and growing demand for public services and goods delivered through State channels. There is also a political move by zonal administration as the enlargement of such administration will result in a greater federal budget allocation. Such dynamics and demand for smaller politico-administrative units reflect the trends in governance and the politics of claim-making. This, in turn, alters the dynamics of the pastoral systems through pastoral resource use and ownership (surface and sub-surface resources), and the sources and types of livelihoods that pastoralists pursue.

Borana's socio-cultural and political structure is a direct mirroring of the indigenous *Gada* system. The *Gada* administration is an egalitarian system, according to Legesse (1973), and is based on age-based classes (every eight years) for economic, social, military and ritual obligations. A leader, locally termed *Abba Gada* (leader of *Gada*), is elected every eight years. He will hold the position only once. During the mid-term of the *Gada's* leadership, advisors, councillors of the local governance structure (*Gada*), and all members of the Borana community meet for weeks in a place called Gaayo in Dire. They deliberate on various aspects of social, economic, political and related institutional matters and amend, remove or introduce rules and regulations. This is the legislative organ of the *Gada* system, known as *Gumi Gaayo* - literally meaning the Assembly of the *Gaayo* – which last took place in September 2019. Through the years, the practices of the *Gada* and the assembly have evolved, which will be discussed later.

Boranas live in groups, whether in permanent or semi-permanent home settlements. These are located in an *Olla*, or village. A group of households, generally between 5 and 15, but

occasionally up to 30, settles together and constructs a large fence out of local resources and acacia trees. There are two levels of interaction within the *Olla*: household and village level.

A *warra* (family) is a unit that reproduces and disposes of resources, such as livestock and the labour required for pastoral output. In addition, and more recently, the *warra* has become involved with crop production, trading and off-farm economic activity. Other features include access to pasture and water, as well as specific rights and obligations for each *warra* within the *olla*. Resource management and use take place at both the household and community levels. *Abba/Hadha warra* (head or father/mother of the family) is the head of the household, while *Abba Olla* (head of a village) is a man who is elected by the village residents after a discussion.

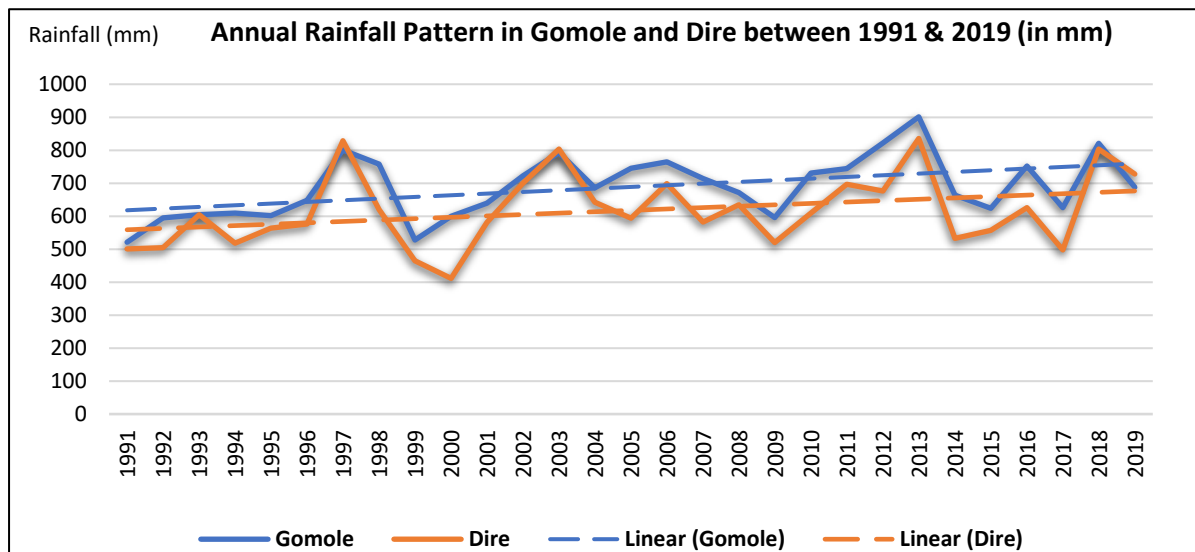
Natural resources are shared, in principle, among family members, *olla* and the community, although ownership of some productive resources, like land, is shifting. An *oburu* is a type of land used for crop cultivation held by a family. Unlike pastureland, there is no shared cropland. There are distinct (and gendered) divisions of labour between and amongst household and village members. Village meetings are held on a regular basis to discuss social, economic and, most importantly, resource management concerns. Within the *Gada* system, there are tiers of community discussion: from village to *reera*, then *aradda*, and finally, *dheeda* (rangeland) (Gufu Obba, 1998). *Madda* (well clusters) and *dheeda* (grazing land) are tightly linked to settlements. Each *Dheeda* resident relies on common water sources known as *Madda*. Individual well-clusters (*Madda*) are surrounded by large pastureland (*Matta-Tika*).

That said, these many layers of community discussions are not uniform across Borana. In the zone's agro-pastoral and extensive pastoral zones, resource use, land for farming and pasture, and water have noticeable distinctions. In some areas, the expansion of public amenities (schools, roads, health centres and the establishment of formal administration – *kebele*) and livelihood diversification have influenced how these institutions operate. However, their role is diminishing. In other more remote areas, their role is still intact (Tache, 2000; 2009; and 2013) and some aspects will be discussed later in this chapter.

### 4.3 Changes in the Natural Environment

#### Rainfall Pattern and Variability

The Borana inhabit a dryland with an aridity index<sup>16</sup> ranging from 0.2 to 0.5 (Dandesa et al., 2017; Worku et al., 2022). Although exact annual rainfall amounts are impossible to report due to intertemporal and geographical variability, researchers have produced several averages (Angassa and Oba, 2007). Borana receives a total annual rainfall ranging from 300mm in the south to 900mm in the north (Kamara et al., 2005). The zone has a bimodal rainy season, with varying timing and distribution within the system. The main rainy season, known as *Ganna*, lasts from March to May and accounts for over 60% of the annual rainfall (Desta and Coppock, 2005). *Hagaya* is a short rainy season that stretches from October to December in certain areas and September to November in others. Inevitably, the pastoral production system, resource management and mobility patterns in the area are all impacted by the varied aspects of rainfall distribution, both in terms of location and time (Tilahun, 2006).



**Figure 4.1 Thirty-Year Rainfall Distribution in Dire and Gomole (in mm)**

Raw long-term data was acquired from the UK National Centre for Atmospheric Science (NCAS) with the analysis made by the author.

As seen in Figure 4.1, three-decade rainfall distribution is compiled to understand the patterns in rainfall distribution and variability. Three key observations are highlighted here: Firstly, there has been a general upward trend in rainfall since 1991 (indicated by the broken lines). Secondly, compared to Gomole, Dire is drier and has higher annual variability in

<sup>16</sup> United Nations Environmental Programme (UNEP) defined an aridity index (AI) as a numerical representation of the degree of water scarcity at a certain location. It is a ratio of precipitation to potential evapotranspiration. represented by a number between 0 and 1. AI ratio closer to zero indicates high aridity level. (Middleton and Thomas, 1997)

rainfall distribution. However, there is a general inter-annual rainfall variability in the Borana pastoral system, which increases in unpredictability (Lasage et al., 2010). Thirdly, the irregularity of rain within a year has both temporal (quite different in the 1990s and the 2000s) and spatial (Dire and Gomole) features. Therefore, despite the fact that there is annual variability, the irregularity within rainy seasons (the start, duration and amount of rain) is significant (Kamara et al., 2005; Dandesa, 2015).

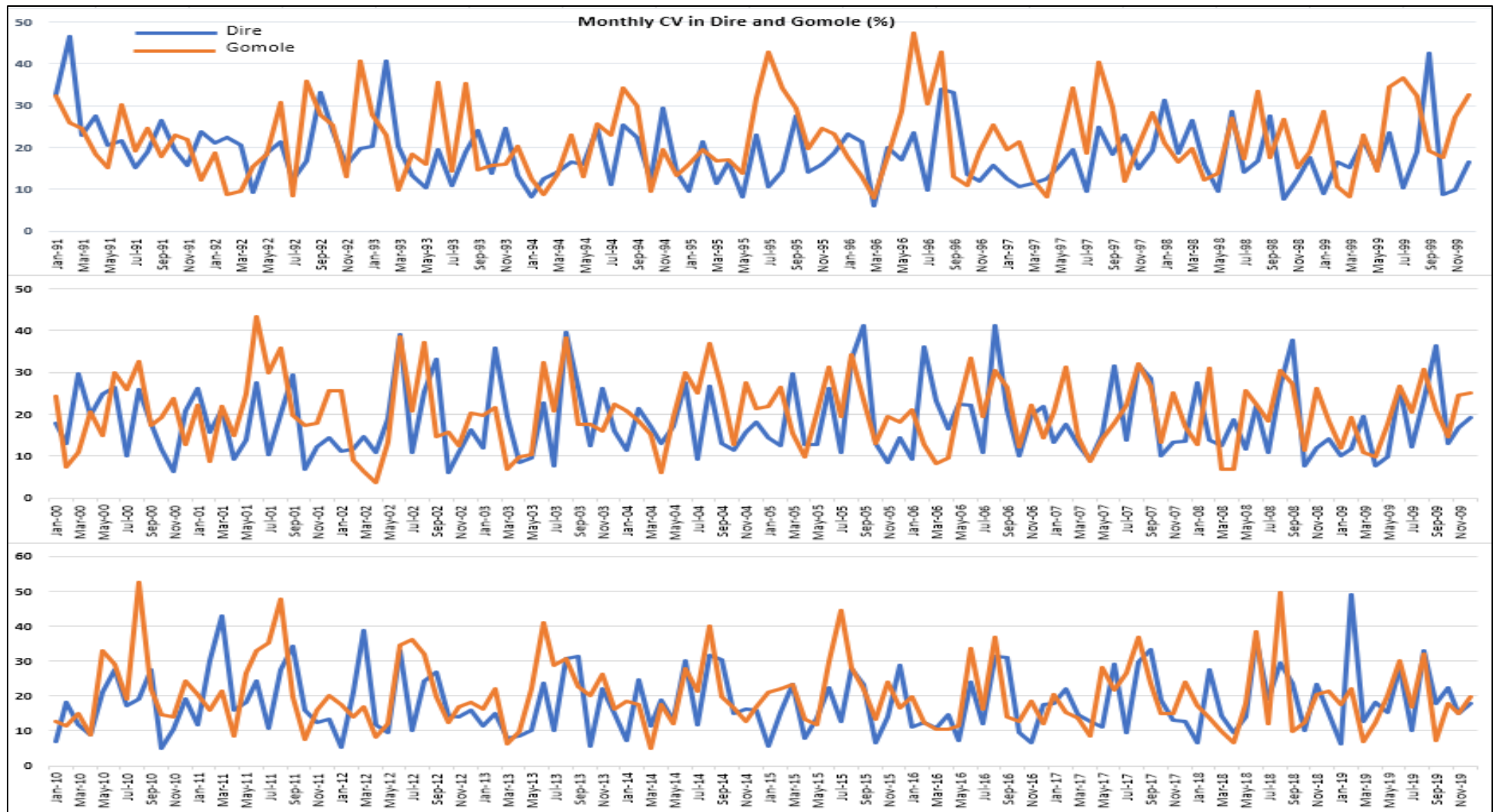
Similarly, according to Yilma et al. (2004), between 1965 and 2002, the coefficient of variation (CV)<sup>17</sup> of seasonal rainfall was 0.3 (30%) in southern Ethiopia. The increasingly unpredictable nature of rainfall — amount and spatial distribution — seasonally and inter-annually influences pasture utilisation and mobility patterns. Three decades of monthly rainfall distribution were examined to understand the seasonal dispersion of rainfall. Figure 4.2 below shows the monthly rainfall dispersion.

Both research sites had a CV of more than 30 per cent during each decade, indicating their vulnerability to drought. In Gomole, for example, there were eight seasons with a CV value of more than 30% from 1991 to 1999. In the same decade, there were six seasons with a greater than 30% CV in Dire. Although most of the areas in Gomole receive more annual rainfall than any other cluster in Borana (Cossins and Upton, 1987; Dandesa, 2015), there is high variability seasonally and annually. The maximum (257mm) and minimum (64.8mm) rainfall distributions in the Gomole for the primary rainy month (April) are broad, indicating variation within the season and cluster.

Between the 1990s and the 2000s, the number of months with significant unpredictability grew by 30% in Dire and doubled between 2000-2020. According to Tilahun (2006) and Legesse et al. (2010), the annual rainfall pattern (between the 1990s and the 2000s) rose slightly but became increasingly unpredictable. To sum up, the historical trend and analysis indicate that rainfall distribution within the region varies significantly and over many years was unpredictable across seasons and sites. This pattern has an impact on vegetation distribution. Comparing the current season's vegetation to past trends to determine an area's risk profile, presents practical difficulties when using an index insurance model. This again has an effect on determining premium rates and pay-outs of an insurance cluster.

---

<sup>17</sup> Coefficient of Variation (CV) is a measure of variation or dispersion, expressed using percentages; the higher the number, the more the variability within/between rainfall distribution in an area. CV of <20% is classified as less variable, from 20-30%, moderately variable, and highly variable if it is above 30% and vulnerable to drought (IWMI, 2010).



**Figure 4.2 Monthly Coefficient of Variation– from Jan 1991- Dec 1999 (top), Jan 2000 – Dec 2009 (middle), and Jan 2010 – Dec 2019 (bottom)**

*Source:* Long-term raw data were acquired from the UK National Centre for Atmospheric Science (NCAS) and the author's analysis.

## Land Use and Settlement

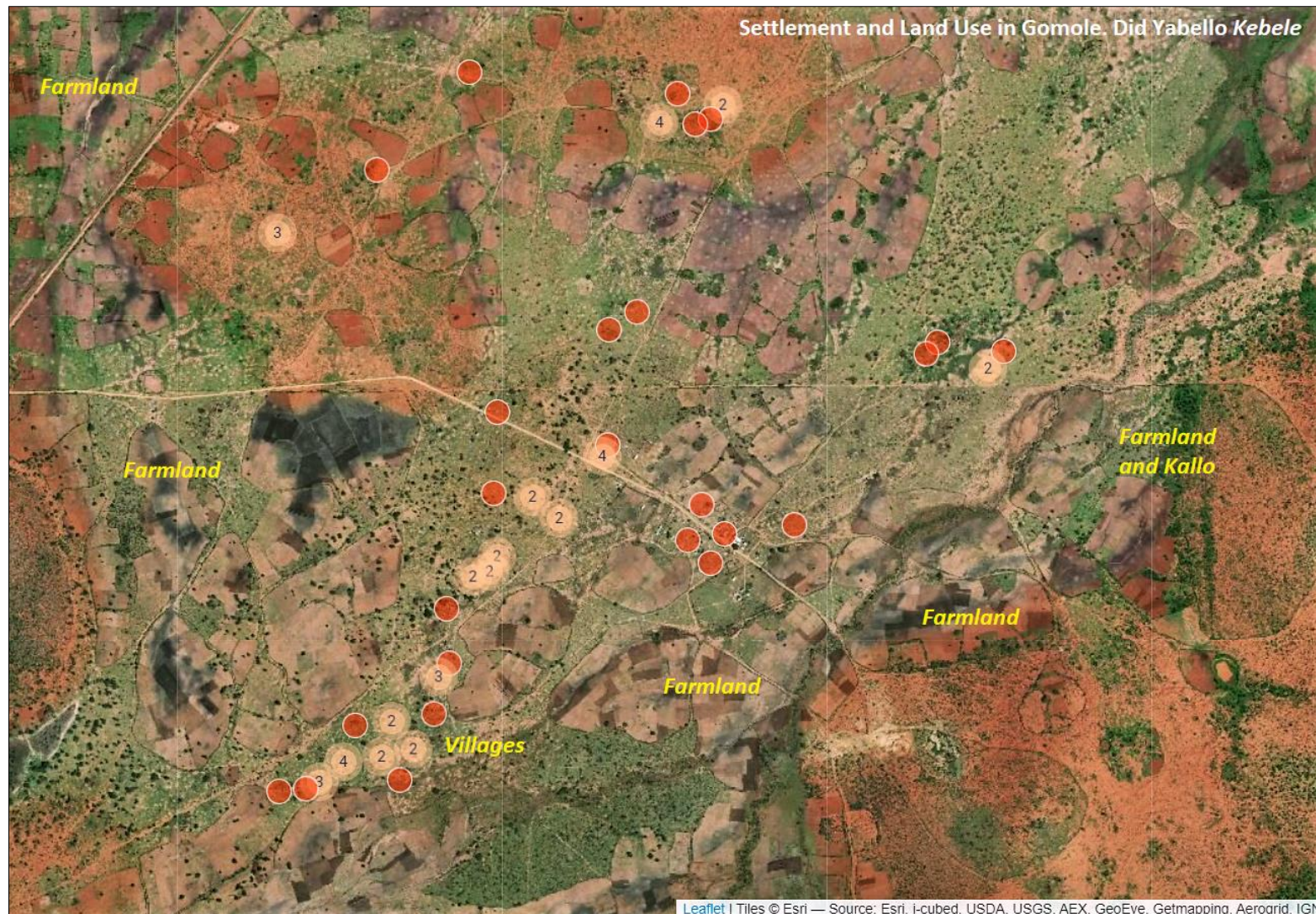
Several reports indicate that a mix of human, institutional and biophysical factors are reshaping land use patterns in Borana (Tache, 2008; Flintan, 2016; Lind et al., 2016; Catley, 2017). These different forms of land use are associated with new political power relations and uncertainties (Tache, 2008; Flintan, 2016). For example, the transition of communal *kallos* to private ownership and the establishment of farmlands (that are privately owned) were regarded as the first forms of privatisation and commodification of communal resources in Borana (Desta, 2006). These were part of a series of changes and contestations over pooled resources.

Territorialisation of local and regional lands and resources is not new to the pastoral system (Lind et al., 2020). The proliferation of *kebeles* and *woredas* created a web of widening political and administrative borders and jurisdictions. Such boundary-making, along with the establishment of language and ethnic-based regionalism after 1991, have significantly contributed to resource-based contestation in Ethiopia's drylands (Korf et al., 2015). On the other hand, environmental elements (particularly rainfall distribution – availability and variability, and temperature), are also crucial factors in reshaping the current land cover and use patterns (Tache, 2008; Flintan, 2016; Lind et al., 2016; and Catley, 2017).

However, these land-use changes are not uniform across Borana; rather, they are differentiated by locational, political and socio-economic factors. In Gomole, the most visible land-use change has been in the expansion of croplands. According to Coppock (1985), ILCA (1985), and Cossins and Upton (1987), farming was practised in areas surrounding towns, specifically around the towns of Yabello and Mega, where cultivation was largely undertaken by non-Borana. The appointment of Major Jatani Ali<sup>18</sup> as an administrator in various capacities in Borana, paved the way for pastoralists living near towns to turn to farming (Liban, 2014). All the older agro-pastoralists that I met, mentioned that Major Jatani was going from place-to-place persuading pastoralists to start farming. Due to its proximity to Yabello town and suitable agroecology, a shift to farming, as well as a more sedentarised way of life encouraged by Jatani, has been seen in Gomole. Figures 4.3 and 4.4 indicate the extent of land-use change that has taken place.

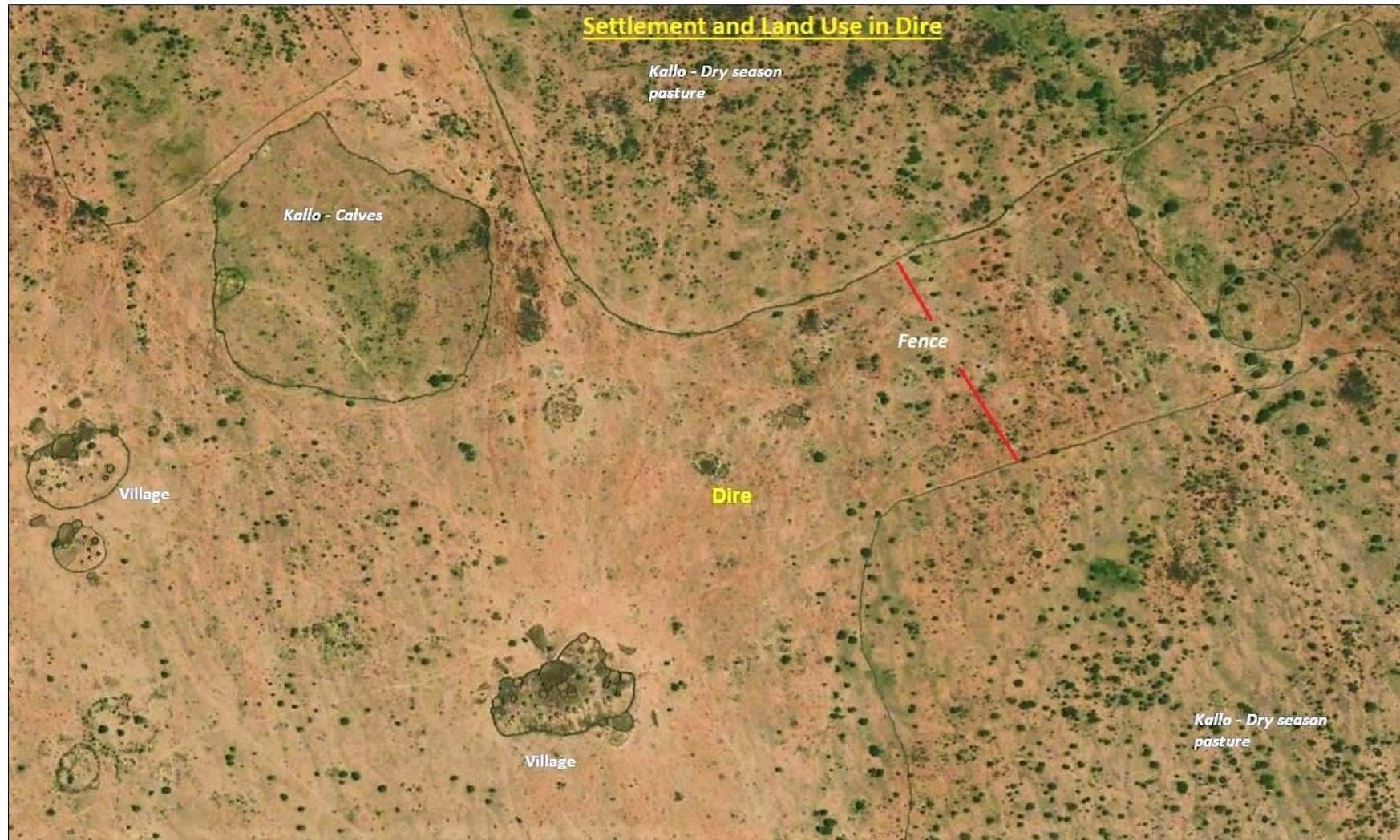
---

<sup>18</sup> Major Jatani Ali High School was comprised of the second batch of pastoralist children from Borana to receive formal education in Addis Ababa, by a direct order from Emperor Haile Selassie I (who ruled Ethiopia from 1930-74) (Liban, 2014).



**Figure 4.3 Settlement Pattern and Land Use in Gomole**

Source: ESRI, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, AeroGRID, IGN and the GIS Use Community (accessed on 20<sup>th</sup> January 2021)



**Figure 4.4 Settlement Pattern and Land Use in Gomole (Satellite Imagery)**

Source: ESRI, Maxar, GeoEye, Earthstar Geographics, CNES/AirbusDS, USGS, AeroGIRD, IGN and the GIS Use Community (accessed on 18<sup>th</sup> January 2021)

Land use in most parts of Gomole has shifted to private cropland/farmland, while community *kallos* have shrunk dramatically. The remaining communal *kallos* (pasture enclosures) in Gomole have been converted to farmland, as seen in Figure 4.3, middle-right. The fences that were created to preserve dry-season pastures are still in place, but they have progressively turned into cropland. The settlement patterns are also dense, as indicated by the red dots on the map, which represent groups of rural dwellings (the numbers in the dots indicate the number of villages/*ollas* grouped into one). On the other hand, communities are spread out in Dire (Figure 4.4), and *kallos* (enclosures) cover much of the area.

The satellite imagery in Gomole is supported by recent data from the Borana Agricultural Office (2019). According to data provided by the Zonal Agriculture Office, Borana is experiencing an increase in cultivation. Croplands accounted for 15,000 ha in 2010, and after a decade, had more than doubled to 30,931 ha. Following the 2017 drought, rain has been plentiful in most parts of Borana. As a result, the land has been converted into farmland. In the 2018/19 growing season, there was a 122 per cent increase in land cultivated (41,182.86 ha) over the previous year. Cropping practices vary greatly from household to household. Maize and bean farming are popular among newcomers since they require less agronomic expertise and fewer procedures. *Teff* (*Eragrostis tef*), a staple grain food in Ethiopia's highlands, has a high economic value for agro-pastoralists, but it demands sophisticated expertise and a large investment. Those that invest in *teff* have greater farming knowledge and can rent or lease machinery (ploughs, harvesters, and so on). As a result, varying levels and types of land use have been observed, based on different agro-climatic zones and socio-economic factors. Although its variability (seasonal and annual) is increasing, more individuals are trying farming because of the trend towards greater levels of precipitation over the last thirty years.

While farming is the dominant land use shift in Gomole, ranching has altered established land-use practices and pasture management in Dire more than in any other place in Borana. Pastoralists were pushed to leave prime dry season pasturelands in five separate places as part of the Borana rangeland development initiative by the government and development actors during the late 1960s and early 1970s. These ranches covered a total of 50,000 ha. The ranch in Dire is the biggest, taking up about a third of the total land set up for ranches. These ranches were divided into three forms of ownership after the military administration fell in 1991. Feed and breed enhancement initiatives have been carried out in the two ranches by the regional government (one in Gomole), establishing a form of State

ownership. The other two ranches function as communal dry pasture reserves after being handed over to the surrounding community.

Nevertheless, the local administration helped a group of pastoralists establish a cooperative, to which the ranch in Dire was handed over later. Due to strong connections with politicians at different levels, and access to finance and information, almost all members of the cooperative are wealthy male pastoralists. This property, which includes a large pond that is used by pastoralists in five *kebeles*, is now owned solely by these affluent pastoralists. The shift in control of the former ranch land in Dire is indicative of broader trends toward commodifying shared resources, which mostly benefit those who are wealthier (Angassa and Oba, 2008; Tache, 2008).

The proliferating number of political-administrative units, the establishment and expansion of centres and towns and the construction of infrastructure (roads, educational and health facilities) have all contributed to shifts in land use and settlement. These shifts, in turn, are associated with new uncertainties, but how these are experienced and addressed is differentiated. This serves as the focus for discussion in this chapter and the rest of the thesis.

### Change in Pastoral Production

The changes discussed above have influenced the pastoral production system. For example, according to McPeak (2003), the seasonal distribution of rainfall proves vital in orienting livestock production in Borana; however, pastoral production does not experience a linear form of change. Instead, it shifts from rainfall distribution to climatic, environmental, biophysical and socio-economic (livelihood and institutional) events, each of which has complex aspects. As illustrated in Figures 4.1 and 4.2, the increasing variability of rainfall across space and time presents significant risks and uncertainties in Borana, and those emanating from drought are inherent in the pastoral production system (McPeak, Little, and Doss, 2012). As grazing biomass depends mostly on rainfall (Cossins and Upton, 1988), shifts in the distribution of rainfall will impact how different pastoral resources can be managed and utilised (Scoones, 1995; Doss et al., 2006; and McPeak et al., 2012). Even during one rainy season, the unpredictability and unevenness within the system complicate mobility and resource mobilisation. In areas like Gomole, despite the high variability of rainfall distribution, the overall water availability is increasing, creating opportunities for farming.

The land-use types and customary practices have also changed accordingly in Gomole, shifting from communal to individualised.

Secondly, the changing patterns of land use and land cover are the leading causes of rangeland fragmentation in Borana, exacerbated by frequent drought (Coppock, 1994; Homann et al., 2008; Abate and Angassa, 2016). Such changes have also influenced herd size and species composition. The encroachment of woody plants on open grasslands and savannahs, and the turning of open and communal pasturelands into enclosures (*kallos*) increase the fragmentation of rangelands (Lind et al., 2020).

Due to the erratic availability of pastoral resources, and frequent incidents of droughts, *Gada* leader Goba Bulle (1969–77) discussed these issues with his councillors and allowed pastoralists the right to enclose grassland jointly (Napier and Desta, 2011). However, enclosures exacerbated rangeland fragmentation (Lind et al., 2020). Following the military government's fall in 1991, farming became a State- and community-led initiative by pastoralists living near towns in Borana (Tache, 2008). Therefore, these changes have forced pastoralists to alter the various governance mechanisms they consider through time. For example, *kallos* not only exacerbated rangeland fragmentation but also intensified the commodification of communal resources.

These changes influence livestock production, with the establishment of small towns and *kebeles* having increased the sedentarised form of livestock production and created high milk demand. This has increased milk income for livestock producers, primarily among women. Furthermore, pastoralists have been pushed to diversify their herds to incorporate greater numbers of small ruminants due to the increasing frequency and unpredictability of drought (Little et al., 2001; McPeak and Little, 2006; Little et al., 2012). As discussed above, the increasing variability of rainfall has influenced more pastoralists to consider farming.

Thus, pastoral production has evolved alongside changes in rainfall and land use in Borana. These wider changes are associated with new uncertainties as well as opportunities for some to diversify and generate income. However, the way in which uncertainties are experienced, and access to opportunities generated by evolving livestock production, are uneven across Borana's population. Likewise, livelihood diversification has a multi-faceted aspect in Borana (Doss et al., 2006; Homann et al., 2008; McPeak et al., 2012; Abate and Angassa, 2016; Lind et al., 2020).

This sub-section has set out the changes in the natural environment that have occurred. In the last decades, rainfall patterns, land use patterns and pastoral production have evolved. These dynamics of change are not the same across the region; rather they are heterogeneous across space and pastoral backgrounds (for example, wealth, as discussed above). These make comparing a risk profile of an area with the past questionable, something investigated further in Chapter Six.

#### **4.4 Demography and Socio-economic Issues**

##### **Demography**

One aspect of change in Borana is the continuous increase in human and livestock populations. The human population has increased by three per cent per year over the last decade, outpacing regional and national averages (CSA, 2018). According to the Borana Administration Office (2019), the natural fertility rate has increased due to better access to health facilities. The establishment of towns and a sedentarised way of life, along with a decrease in reported conflict incidents, are among the factors contributing to population growth. Moreover, different ethnic groups from other parts of the country have migrated to Borana in search of better livelihood opportunities. These people currently comprise a fifth of the total population residing in towns and areas where farming is dominant (BZFEDO, 2019).

Demographic change in Borana has two contradictory influences. On the one hand, it creates opportunities for livelihood diversification, innovation, increasing demand for livestock and its products, and a source of abundant labour (Desta and Coppock, 2004). Many educated youths are helping their communities by importing new skills and livelihood options. On the other hand, it intensifies pressure on scarce resources and increases competition and conflict of interest among different pastoralists and groups (Desta and Coppock, 2004; Homann et al., 2008). These, and other related factors, disrupt social cohesion.

##### **Livelihoods**

Livestock production has been central to the conceptualisation of livelihoods in pastoral systems (Desta and Coppock, 2004; Homewood, 2008). According to Swift (1988), a pastoral livelihood is when more than half of income, food or energy is generated from livestock. The proportion of the contribution of livestock to a family's food, income and other related

aspects has been recognised as the "agreed" definition of livelihood. However, focusing on a single aspect may misrepresent pastoral livelihoods (Little et al., 2008).

For pastoralists in Borana, cattle are the primary asset and source of livelihood and income. Their economic, nutritional and social value is high (Coppock, 1994; Desta and Coppock, 2002). According to the socio-economic profile of the Borana zone (2019), there were two million TLUs (Tropical Livestock Units)<sup>19</sup> in 2018. The per capita TLU is 3.81, and per household, the TLU is 19.07 (Figure 4.5). In recent years, however, the trend has been changing. Various annual reports produced from the Borana zone demonstrate that cattle share is declining, with a 1 per cent annual reduction since 2008 (close to 13 per cent between 2008 and 2017). Both Desta and Coppock (2004) and Angassa and Oba (2008) have noted that frequent droughts and the challenges of recovering from those shocks, influence pastoralists to make difficult decisions about shifting livelihoods, livestock species and herd compositions. Other factors influencing this trend are the high market value for small ruminants and camels, which are more resilient to the uncertain forage conditions (Little et al., 2012 and 2014).

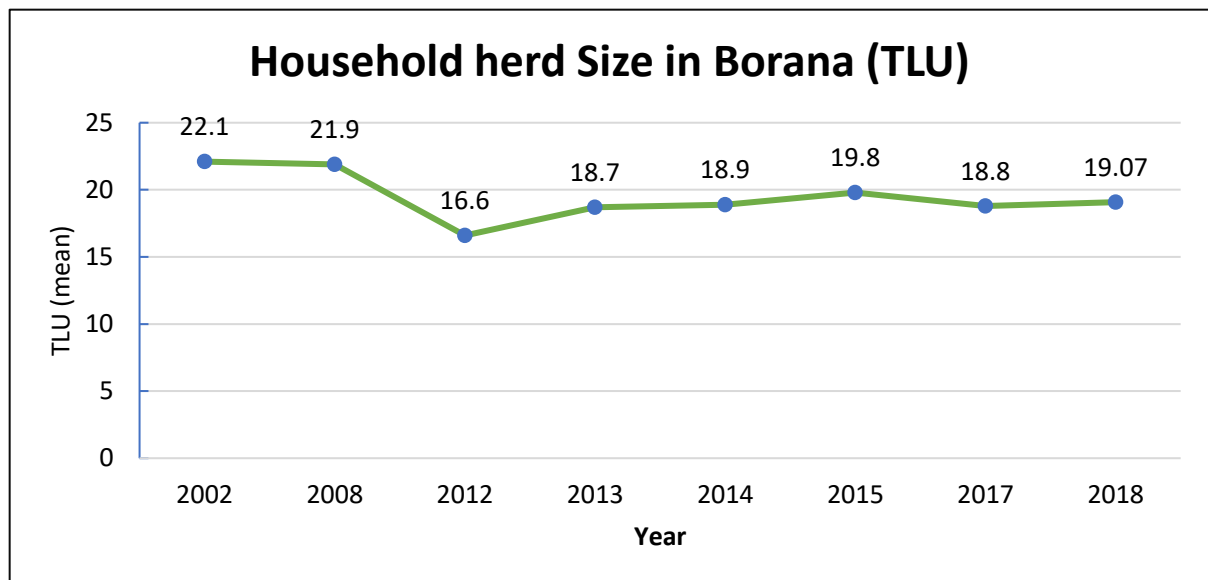
The domestication of camels in Borana dates back to the 1960s and 1970s (Helland, 1980; ILCA, 1985). The introduction of camels and, more recently, sheep into people's livelihoods required a change in pastoral resource management and utilisation (ILCA, 1985; Galma et al., 2017). The share of camels has increased from 8.1 per cent in 2008 to 15.1 per cent in 2018 (BZFEDO, 2019). In recent years, the importance of donkeys has also been on the rise. Among the notable economic assets they provide are the transportation of water, feed and grains, and also the income derived from renting them to others in the area for similar uses. Additionally, they require limited resources to feed them, and they exhibit a high tolerance to drought (results from FGDs in October 2019 in Gomole). In 2018, the share of a donkey in livestock composition increased by half as compared to 2008 (BZFEDO, 2019).

As presented in the chart below, there is a general but low per capita livestock ownership reduction at a macro level. According to Coppock (1994), the average TLU holding per household in Borana was around 21 in 1992/93 and after nearly three decades, the change in per household TLU ownership in Borana has been negligible, falling to 19.07 in 2018 (BZFEDO, 2019). As can be seen from the trend line below, in the last two decades, the per

---

<sup>19</sup> Several studies aggregated total livestock herded by a household using TLUs. IBLI also uses this standardisation for calculating premiums and payouts. The conversion factor for 1 TLU is equivalent to 1 cow, 0.7 camel, 10 goats, or 10 sheep.

capita TLU fell by 2. Moreover, after 2012, when a significant drop in livestock ownership was observed, the annual trend became stable.



**Figure 4.5 Household Herd Size (in TLU) in Borana in different years**

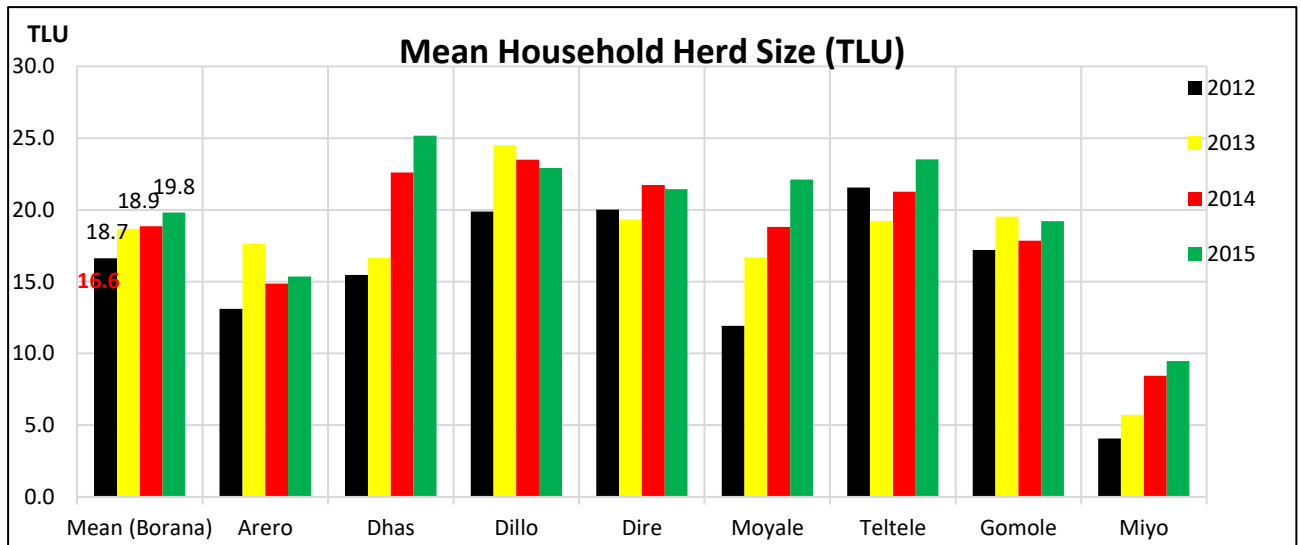
Source: Data compiled from Coppock (1994), PARIMA project data (2002-2004), IBLI project data (2012-2015), and BZFEDE (2008, 2010, 2017 & 2018)

Despite relatively stable per capita ownership at the macro level since 2010, with the exception of 2012, households with different socio-economic backgrounds have experienced a "boom and bust" livelihood cycle (Desta and Coppock, 2002). Pastoralists' livelihoods at broader/regional (macro) and household (micro) levels experience expansion and contraction due to both covariate and idiosyncratic shocks and due to other forms of changes in livelihood dynamics (Catley et al., 2013; Lind et al., 2016).

As illustrated in Figure 4.5 above, after the major drought events in 2011 and 2016, household-level TLU dropped in 2012 and 2017, respectively. In 2016, close to 200,000 livestock were lost (BZFEDE, 2019). As a result, the per capita TLU in Borana fell by one TLU in 2017 (Figure 4.4); however, in 2018/19, close to one TLU increase was observed at a household level.

Nevertheless, the vital aspect of the above dynamics (livestock ownership) is the uneven herd size and composition among different pastoral areas in Borana. IBLI's panel household survey validates these irregularities. As depicted in Figure 4.6, the mean herd size at the *woreda* (district) level is not the same, and there are significant disparities in some areas. The average household level TLU size between 2012 and 2015 is the lowest in the Miyo

woreda, at 6.9, and the highest in the Dilo woreda, at 22.68 TLUs. The agro-ecological characteristics (availability and size of rangelands) highly influence livestock ownership. These figures are *woreda*-level averages, meaning that variations in holdings within the woreda are masked; yet existing research has documented significant differences in livestock holdings according to wealth group (Tache, 2008). In Gomole, apart from in 2012, household-level TLU size was below the zonal (Borana) average. In Dire, the average household level herd size (TLU) was above the average in Borana.

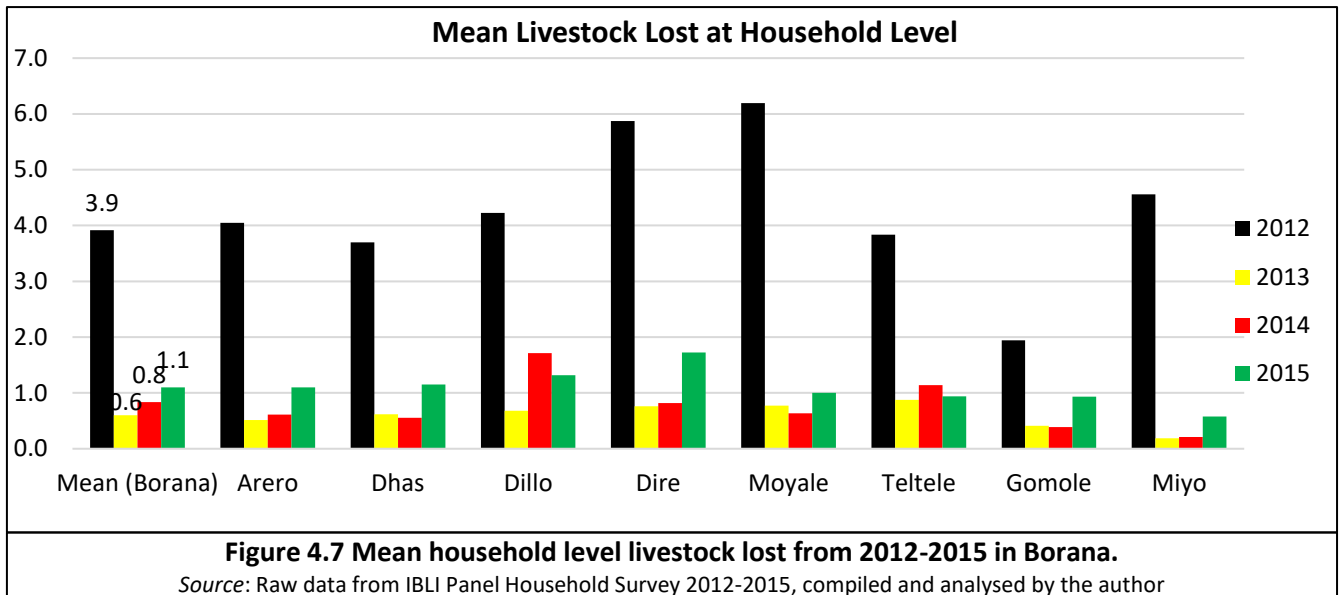


**Figure 4.6 Mean household herd size (in TLU) (top) from 2012-2015 in Borana**

Source: Raw data from IBLI Panel Household Survey 2012-2015, compiled and analysed by the author

Similarly, the impact of drought on households varies by location. Households in Dire, for example, have lost significantly more livestock than those in Gomole. The increasing trend of farming and non-pastoral livelihoods to support livestock has offset the impact of drought in Gomole, making it the least impacted of all areas. Losses associated with the drought in 2011 – which followed the failure of long rains – were particularly severe (Figure 4.7). As Figure 4.7 shows, households lost an average of 1.58 TLU between March 2011 and February 2012<sup>20</sup>. In Moyale and Dire, districts that were especially hard hit, losses approached 6 TLU per household. Put simply, in these two areas, on average, a household lost six cattle during that period, and it takes more than one good rainy season for the herd size to recover (McPeak et al., 2012).

<sup>20</sup> The survey covers the changes from March 2011 and changes during the 12 months of that year.



## Income

IBLI's panel data provides unique perspectives on income. As depicted in Table 4.1 below, livestock remains the single primary source of cash for pastoralists. Livestock contributes enormously to household incomes even in *woredas*, such as Gomole, where people have diversified into farming and other activities. Catley et al. explain (2013: 21) that pastoralists perceive crop production as "a temporary stopgap, but linked to pastoralism, primarily if based on flexible, locally controlled small-scale crop production". In Gomole, crop production covers much of the households' food demand, so a more significant portion of the herd is reserved as an asset or changed into cash. Table 4.1 also demonstrates that while Gomole ranks first in average monthly income secured from grain sales, its contribution to household incomes is still very low, at around 6 per cent, whereas income from livestock sales accounts for 89 per cent of income. Therefore, farming is important for households' own consumption rather than just generating a surplus for the market. Instead, livestock is the dominant sector among pastoral and agro-pastoral households in Borana.

After analysing PARIMA's panel survey data, Barrett et al. (2006) found that nine out of ten surveyed households either sold or bought livestock during the survey periods. However, they reported disparities in market participation across the study sites and among families. Specifically, higher livestock market participation was observed among households with large herd sizes (Little et al., 2001; McPeak and Little, 2006; Little et al., 2012). As presented in Figure 4.7 above and Table 4.1 below, Dire and Miyo districts confirm the findings from

PARIMA. This is not, however, the same in all areas of Borana; instead, areas with better market access have higher market participation. Therefore, having large herds is insufficient to predict participation in livestock marketing, as superior access to markets through proximity to infrastructure also increases the likelihood of participation. Nevertheless, this premise is valid at the meso (district) or macro (region/zone) level, where we find that there are household-level differences within sites.

The IBLI panel data indicate an enormous variability of income within households in the respective areas, even in areas like Dire and Gomole, where there is better access to the livestock market and large mean per capita herd sizes. The CV shows that there is more household level variation amongst (agro-) pastoralists in Gomole than in the other sites. The CV value in Gomole is twice that of Dire. The value in Dire itself is very high, at 1.6, which means the variability among households is 160 per cent. Finally, although livestock constitutes an important source of income both in extensive and agro-pastoral areas, there is considerable variability in income sources from livestock, both at the macro and micro (household) levels, across Borana and in the studied areas (Dire and Gomole).

**Table 4.1 Monthly Source of Income in Birr (mean from 2012-2015)**

Source of monthly income (2012-2015)	Dire		Gomole		Miyo		Dilo	
	Mean	CV	mean	CV	mean	CV	mean	CV
Livestock	5057.6	1.6	5194.4	3.3	1649.2	1.7	4042.5	1.3
Livestock Product	126.3	3.8	114.18	4.9	261.5	3.2	5.5	14.4
Crop/Grain	49	5.7	337.2	2.2	131.8	2.9	0.56	13.3
Business & Petty trading	64.85	7.1	157.5	3.9	387.8	2.7	198.1	4.4

Source: Raw data from IBLI Panel Household Survey 2012-2015, compiled and analysed by the author.

There are five types of pastoral classes based upon wealth in Borana, according to Tache (2000). Older age group discussants across both of the study sites confirmed the categories as being very rich (*dureessa jaama/fixxe/ciccitaa*), rich (*dureessa*), medium (*giddu galeessa* or *Ittia'ana*), poor (*iyeeessa - deega/harkaqaaleeyi*) and destitute (*qollee*). The criterion for setting wealth groups is size of herd, although, in recent years, farmlands and houses/lands in nearby towns have been considered additional criteria. However, pastoralists argue that these two assets are highly correlated with herd size. Moreover, they indicate that very rich and poor households are insignificant in number, such that just three categories are commonly used, namely rich (*dureessa*), medium (*giddu galeessa*), and poor (*iyeeessa/harkaqaaleeyi*).

**Table 4.2 Wealth Categories in Borana<sup>21</sup>**

Wealth Categories	Cattle	Small ruminants	Camels
Rich	More than 25	More than 100	More than 10
Medium	Between 10 and 20	About 30	3-5
Poor	Up to 5	20 – 30	1

### Socio-Institutional Environment

Several studies on the Borana pastoral system reveal the system's richness in various social and institutional dimensions (Legesse, 1973; Helland, 1980; Homann et al., 2008; Oba-Smdit, 2016). A detailed ethnographic study by Legesse (1973), Bassi (2005), and work at the ILRI (formerly ICLA, see Helland, 1980; Coppock, 1994) illustrate that complex social and institutional organisation in Borana under the *gada* system has complex structures for deliberation and negotiation on important topics, which helped to resolve tensions and to enforce resource-use rules. These rules and regulations are intended to govern pastures (the wet and dry seasons), water (underground and surface) and animals (livestock and wildlife). However, the rules are not static and have been changing under the impact of human, social, political and natural environmental factors.

Structural changes have brought about the modification of existing rules and regulations, and their implementation within the *gada* system and other socio-cultural institutions (Desta and Coppock, 2004; Bassi, 2005; Angassa and Oba, 2008; Abate and Angassa, 2016). A classic example is the introduction of enclosures, *kallo*. Cognisant of the need to spare pasture for calves during dry or forage scarcity seasons, *seera kallo*, the rule of enclosure or fenced *kallos* first became law during the time of *Abba Gada Goba Bulle* (1969-77) (Angassa and Oba, 2008). However, over the years, *kallo*, amongst others, incentivised the privatisation of communal lands, and this affected the unrestricted mobility of pastoralists, increasing competition over communal resources (Tache, 2013; Lind et al., 2020).

The formal *kebele* and *woreda* administrations are additional forms of institutional arrangement that contribute to the uncertainty faced by pastoralists. One of the many reasons for establishing these governance structures is to create a bridge between pastoral communities and decision-makers at the regional and federal levels. Through these

---

<sup>21</sup> Average livestock wealth was calculated from 8 FGDs in both study sites. This wealth categorisation will be employed throughout the thesis.

institutions, it is possible to channel key development demands to higher officials. Nevertheless, despite the positive intention and some interaction with the customary system, the State's governance structure frequently overrides pastoral communities in resource allocation and governance.

A good example is the establishment of cooperatives (such as livestock fattening and trade) and the transfer of government or NGO-owned resources. To demonstrate success, some government workers select individuals who have established businesses or those who live in towns (Napier and Desta, 2011). Similarly, after the *Derg* regime was ousted in 1991, some NGO-supported enclosures (ranches) were transferred to cooperatives by *woreda* administrators, including the ranch in Dire referred to above that was transferred to a group of wealthy pastoralists. These and other, similar aspects of resource distribution, particularly the organisation of pastoralists to freely access resources (financial, training and communal resources), exacerbate inequality and uncertainty over the resource (including pooled resource) allocation and utilisation.

The customary/traditional and State governance structures are not separate entities constantly contradicting each other instead, they intersect in some respects. In the past, the State's presence in pastoral areas was limited (Liban, 2014). However, following the new federal administration arrangement that highlights and strengthens language and culture through granting more power to regions, re-clustering local-level administrations was made easier. Due to this, and reasons mentioned above, such as the creation of multiple *kebeles*, pastoral areas became integrated into the State's administration and politics. As a result, the involvement of *gada* administrators and councillors in State affairs, and *vice versa*, became visible. For example, after years of discussion and advocacy, the regional government accepted communal land ownership and started certifying various land resources owned and managed by the community (Kenennisa, 2020).

Another element of socio-institutional concerns and conditions is conflict. Due to the presence of the State, a new feature of conflict is emerging, in particular, the inaccessibility of pastoral areas for policing. The maintenance of law and order by the regional or local government has been mentioned as another factor in exacerbating conflict. Some conflicts are politically motivated, either for political or personal gain (Catley and Iyasu, 2010). However, as mobility is inherent to pastoral production, resource-related conflicts are common in Borana (Bassi, 2005). Odhiambo (2012) listed major conflicts between Borana

and surrounding pastoralists (Garri, Somali ethnic groups, and Gabra and Guji of the Oromo ethnic groups) between 1990 and 2004, with eleven significant conflicts. These conflicts were over pasture and water, which are vital to various pastoralists during the dry season.

The features of the conflict in Borana have now evolved from inter-ethnic to intra-community, which was not common in the past. As discussed in this chapter, the increasing trend of private resource ownership linked to cropland expansion and private enclosures (*kallo*) incentivises privatisation and commodification of pastoral resources, intensifying intra-clan conflicts (Aklilu and Catley, 2010; Napier and Desta, 2011). Some disputes are characterised by wealth and position (business links between politicians and pastoralists). The transfer of the ranch in Dire to the wealthy, which limited access to dry pasture, is still a major intra-Borana area of contention that divided participants of the *Gumi Gaayo* in 2019.

#### 4.5 Infrastructural Developments

There has been an enormous expansion of infrastructural amenities in Borana. Road coverage is essential in connecting pastoralists, particularly to access markets and significant social services (Ibrahim, 2011; Mains, 2019). Moreover, it facilitates mobility in Borana. Although there has been a considerable investment by the regional and federal governments to expand road coverage (ERA, 2019), Borana's share is lower than the national average. As part of the Universal Rural Roads Access Program (URRAP), the national road density has increased from 90.5 per 1,000 sq. km in 2014 to 125.6 per 1,000 sq. km in 2019 (ERA, 2019).

According to Taylor *et al.* (2018), the URRAP road development in Ethiopia has, in general, increased household welfare, mainly in rural households in the remote areas of the country since 2010. Although the average road expansion in Borana is below the national average (34.82 km per 1,000 sq. km), the growth of road networks there in the last 15 years has brought significant changes.

The supply of drinking water and electricity have increased, with a coverage of 28.9 per cent, and 12.4 per cent across Borana, respectively. There is full telecommunication coverage in all towns, and more than half of rural areas have education and health facilities. However, the extent of infrastructure investment varies across Borana. There are better infrastructural amenities in Gomole than in any other part of Borana. For example, of the total number of asphalt roads in the zone, a quarter are located in Gomole (BZFEDO, 2018). Dire is ranked fourth, after Moyale and Miyo, in terms of road coverage.

These developments have created opportunities for pastoralists at different levels. The youth in Gomole have access to a better education than anyone in Borana. Access to vocational schools, both public and private, is easily the best in Yabello town, whereas it takes an average of one hour by public transport to reach them from most other parts of Gomole. Milk and other livestock products can be sold at a better price in Yabello town than elsewhere. Work opportunities exist for young people in towns and surrounding areas. However, households in Gomole also face uncertainties. At one of the study sites in Gomole, Did-Yabello, prime pasture and agricultural lands have been taken over by the government to construct a university and an airport. The government has informed half of the households that participated in this research that they will be displaced for the construction of an airport. Land registration and compensation levels, at USD 20,000 per hectare, were announced but have not yet been implemented. Moreover, the expansion of towns has forced poor pastoralists to retreat to remote areas as prime pasture and farmlands are seized.

Through technical and monetary support, the expansion of financial institutions by government and development partners has brought significant changes in the pastoral population's financial literacy, credit and saving culture (Ambachew et al., 2017). Data from the Borana cooperatives office indicate that 56 unions and 541 different cooperatives, with a total capital of more than US\$5.5 million, are in operation. Livestock-related operations such as fattening and dairy are the leading engagements, followed by the wholesale and retail sale of consumables. These cooperatives play an instrumental role for women by creating opportunities to coordinate their produce (milk and dairy products, Picture 4.1 below) and small ruminants, with other women to sell in bulk through contractual agreements to businesses in towns. They also fatten animals and sell them to traders, unlike in the past, when they had little power to bargain with local brokers. This has also strengthened the existing local support system. Specifically, if a member fails to deliver milk due to household-level demands, others will support her (Anbacha et al., 2019). It further creates sustainable income for women, positively influencing their resource control and decision-making power. Of the 37,354 members distributed across these financial institutions, 65.17% are women. The number of commercial banks has doubled in the last decade. Nevertheless, the concentration of these banks, 80% of the total number, is in the

two towns of Yabello (Gomole cluster) and Moyale. The remaining 20 per cent are concentrated in Dubluq town, Dire cluster and Mega town.



**Picture 4.1 Roadside milk sale in Dire**

Markets constitute the second layer of critical features of the pastoral system, after pasture and water. According to McPeak and Little (2006), in the HoA, pastoralists are generally more dependent on markets for their livelihoods than are farmers. The expansion of infrastructural amenities, such as road networks, telecommunications and markets, has contributed to the increased market engagement among pastoralists in Borana. A decade ago, pastoralists in Borana had no access to primary markets, except in border towns in Moyale, where intermediaries dominated (Aklilu and Catley, 2010). But this is an issue of the past. In less than a decade, with the establishment of cooperatives, and better communication and financial infrastructure, pastoralists in Borana have been able to access primary markets in Modjo and Adama (the hub for livestock exports). While the opportunities created have resulted in diversified income sources, they are also creating income disparities among pastoral groups. Aklilu and Catley (2010) reported that in three districts in Borana (Teltele, Dillo and Dire), middle- and better-income household groups' sales of small ruminants were six to eighteen times greater than those of poor households. Other studies have also concluded that income and wealth inequality is increasing in Borana,

although at different levels in different clusters (Little et al., 2012; Catley et al., 2013; Lind et al., 2016).

## 4.6 Conclusion

This chapter has explored dimensions of change in the Borana pastoral system by compiling and analysing secondary data and literature to understand the various aspects of change in Borana. Additionally, I have provided a macro-level analysis of dynamics and fluctuations in the natural environment, contextualised within socio-economic factors.

In doing so, the chapter challenges the basic assumptions of designing and scaling IBLI in Borana. For instance, comparing the present season against previous seasons as part of the insurance model development overlooks important characteristics of pastoralism in Borana. Although I have highlighted many examples of system change in Borana over the previous few decades, there are three key components worth addressing here that are also pertinent to the subsequent chapters.

Firstly, rainfall trends have evolved over the last two decades, both in terms of amount and dispersion (the IBLI model's reference point is 2002). Rainfall amounts have increased, but variability is increasing at the same time. Seasonal rainfall variability (both between and within seasons) is, nevertheless, significantly greater than annual variability. This has an impact on how the insurance model tracks the rainy seasons and compares them to similar seasons in the past. In the IBLI model, this is referred to as *temporal aggregation* (details of which are discussed in Chapter Two). As a result, the fluctuations in volume and seasonality have an impact on the insurance model's representativeness. Risk-profiling, in particular, entails determining the likelihood of forage scarcity, which is then converted into insurance rates that are less realistic of what is actually happening on the ground.

The change in land cover and use is the second important factor. Unlike in the past, when land use and cover were mostly centred on livestock-based use, they are now becoming more diverse. Farming has become a prominent land-use feature in one of the study sites, Gomole, particularly in the last decade. These shifts are not uniform across Borana and within insurance clusters. The natural environment and complex governance structures, which comprise a mix of customary institutions (*gada*) and state-led administrations, mediate these shifts in land use. Nevertheless, vegetation changes — from livestock to farming or different types of land use — are significant in determining an area's risk profile,

just as rainfall is. The model excludes such dynamics; hence it captures a portion of the wider reality.

Thirdly, these and other factors have had an impact on livestock holdings, notably in terms of livestock mortality over time and space (for example, in Dire). The effect of drought (forage scarcity) is not the same as a result. Premiums and pay-outs are based on the estimated cost of keeping an insured animal alive during times of resource scarcity. As a result, such comparisons fail to convey what is taking place on the ground.

There are multiple changes at the macro level that affect the various inputs used in the IBLI model's construction: rainfall, vegetation, and livestock ownership (impact of drought on livestock). Nevertheless, the changes discussed in this chapter have not been factored into the development of the IBLI product, and so challenged its assumptions. To sum up, exposure to drought is not the same now as it has been in the past: in other words, exposure cannot be reduced to risk but is, in fact, much more uncertain than the IBLI model assumes. Before discussing how pastoralists have engaged with the IBLI product, I will present the key features of the study population in the next chapter.

## Chapter Five: Features of the Study Population

## 5.1 Introduction

This chapter considers micro-level variability amongst households in Dire and Gomole. By mapping out the socio-economic characteristics of the research population, it has been possible to determine if there are comparable patterns of risk exposure, perception and response in an insurance cluster. To do so, I have categorised households based on their insurance categories. They are *insured household (active policyholder)* – a pastoralist/household with active insurance coverage during 2019/2020 and one year before the study; a *dropout* – a pastoralist/household that has purchased the insurance product in the past more than once but subsequently left in 2019 and 2020 and third, an *uninsured household (non-policyholder)* that has never invested in livestock insurance.

Therefore, this chapter describes the household characteristics under the three insurance types, as differentiated by gender, age, asset and wealth status, settlement patterns and access to essential pastoral resources. Based on the analysis, we can ask who is most likely to take up, or drop out of, insurance and thereby look at trends across factors within and across locations. This will allow us to investigate how insurance interacts with other aspects of pastoralists' livelihoods (assessed in Chapters 7 and 8) and how insurance is incorporated within response strategies that different pastoralists use, differentiated by wealth, gender, age, and location.

Finally, various categorisations may be used to display these differences in a research population, most commonly at the community, household or individual levels. While more qualitative insights are derived from village/community and individual levels, a household is used as a unit of analysis for the more quantitative assessments. This chapter discusses the study population in relation to five categories: demographic characteristics, settlement kinds and patterns, and socio-economic characteristics, including access to pasture and water, as well as asset categories and ownership.

## 5.2 Demographic Features

### Gender

In Borana, a household is either led by a man (de facto) with one or more wives or by a woman, who is usually widowed. Culturally, a widower through *hirba fuudha* (literally meaning, "running for marriage") will be re-married after losing a spouse. Women do not have this option, and in most cases, a woman will be widowed for the rest of her life.

Overall, the gender ratio in Ethiopia is somewhat skewed towards men in both rural and urban areas (FDRE, 2013). Although there are no significant regional disparities, the proportion of females in the Oromia region is 49.7%, with rural regions having a smaller proportion at 47.6% (BZFEDO, 2020). In Borana the male-to-female ratio is 101.48 to 100, which is similar to the regional average (Oromia). In Gomole and Dire, the male-to-female ratios are 98.47 and 101.53, respectively. Gomole has a lower male-to-female ratio than Dire. During group talks, pastoralists in Gomole pointed out that the zonal capital, Yabello Town, is nearby (approximately an hour by public transport), making higher education, career opportunities, and other social amenities more accessible. As a result, males are more likely to migrate to Yabello than females. Some parents agreed that for cultural and economic reasons, they preferred to send their sons rather than their daughters to high school.

When looking at the gender component of the household survey, females make up a little more than a third (35%) of the houses that took part; however, only one-third of them (33%) are heads of the household (widows). Nevertheless, the majority of them are either uninsured or dropouts in both research locations. Uninsured female-headed families are the most common in Dire (40%) compared to 38.5 per cent in Gomole. Female-headed families account for 35% and 53.8 per cent of dropouts, respectively.

### Marital Status

This study takes the household as the main unit of analysis. Of the respondents in Dire and Gomole, 77.46 and 88.61 per cent, respectively are currently married. Polygamy is practised more in Dire than Gomole, where 12.5 per cent of the married men reported that they had more than one wife. In Gomole, it is less than two per cent. Furthermore, Dire has more widowed households than Gomole. Out of the total females who participated in the

household survey in Dire, 27.78 per cent were widowed, whereas it was just 16.98 per cent in Gomole.

In relation to the insurance categories, widowed female-headed households account for the larger portion of respondents who are either dropouts or non-policyholders. Eighty per cent of widowed females in Dire are either dropouts (26.7%) or have never purchased livestock insurance (53.3%). On the other hand, more than ninety per cent of female-headed households in Gomole are dropouts (50%) and non-policyholders (41.7%).

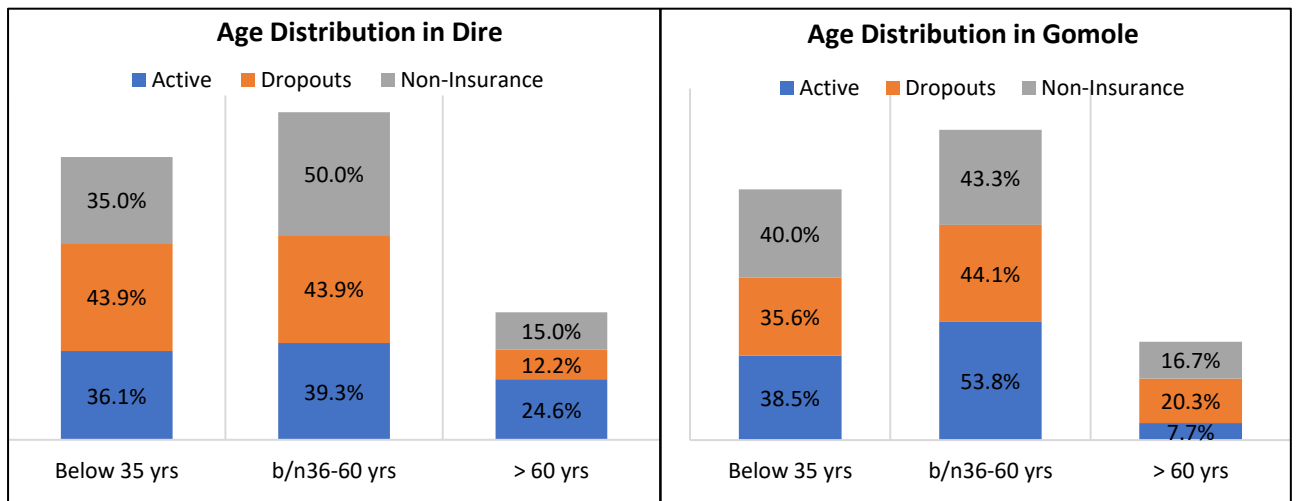
### Age

Age is one of the key factors in understanding insurance uptakes and various drought risk responses. As discussed earlier, Borana's traditional administration structure is based on *gada* periods, which are divided into eight years. These are important in various socio-economic aspects of the pastoral system. Hence, following several discussions based on traditional practices of livelihood and social activities around age, I divided the study population into three categories. Those who are below the age of 35 years are regarded as young; those between 35 and 60 are classed as the middle-aged population, and finally, those over the age of 60 fall into the category of the older population.

Accordingly, the respondents' mean age is 43.4 and 43.8 years old in Gomole and Dire, respectively. However, as the chart below shows, the respondents selected are from various age groups. Each site's demography was analysed and standardised using national census data (CSA, 2020) before determining which age group participates in livestock insurance from the study population. In Dire and Gomole, the youth (between 18 and 35 years old for this study) account for 44.8 and 46.9 per cent of the total population, respectively. Similarly, the middle-aged population (aged 35 to 60) is 34 per cent (Dire) and 34.6 per cent (Gomole).

Figure 5.1 below shows the breakdown of insurance categories for each of the age groups. Despite both sites having a youthful population, it is mostly those in the middle-aged and older groups that have had insurance. Pastoralists in the middle-aged group make up more than half of the active insurance policyholders in Gomole. Although not as high as in Gomole, the same population in Dire has the highest percentage of active insurance policyholders (39.3%).

When looking at Dire's age and insurance category, there is one noteworthy element. The older population (those over the age of 60), which accounts for 8.9 per cent of the overall population, accounts for nearly a quarter of active insurance policyholders (24.6%). Given that older males own a disproportionate number of livestock, and that ownership structures bias to them, those over the age of 60 (and men) are those most likely to have livestock insurance.



**Figure 5.1 Households' Age Distribution in Dire and Gomole (in percentage within each age group)**

### Household Size

The average household size in study sites is fairly comparable, with 8.1 people per household in Dire and 8.6 people in Gomole. The average number of children (including adopted children) is also similar, with 5.7 in Dire and 6 in Gomole. The average number of children, broken down by insurance grouping, reveals a fascinating trend. As seen in the table below, households with active insurance in both clusters have more children than the other two categories. In Dire, the average number of children among active policyholders is 6.3, whereas, in Gomole, it is 6.6. During group discussions, it was revealed that wealthy pastoralists tend to have more than one wife and are more likely to have a larger family.

Borana has a strong social support system in place, and there is a tradition of adopting children from extended family circles. Notably, children from poorer socio-economic backgrounds are adopted by more affluent families. In recent years, families who live in remote areas with no or limited access to educational facilities also send their children to relatives who live closer to towns or areas with more services. This survey inquired about the number of children adopted by each household in addition to the overall family size.

Although the difference is not significant among the insurance categories, insured households adopt more children than others.

**Table 5.1 Number of Children – mean and variations.**

Research Site		Insured	Dropout	Uninsured	Total Family Size
Dire	No. of biological children	6.3	4.6	4.7	8.1
	No. of adopted children	1	0.5	0.5	
Gomole	No. of biological children	6.6	5.9	5.7	8.6
	No. of adopted children	.8	.72	.75	

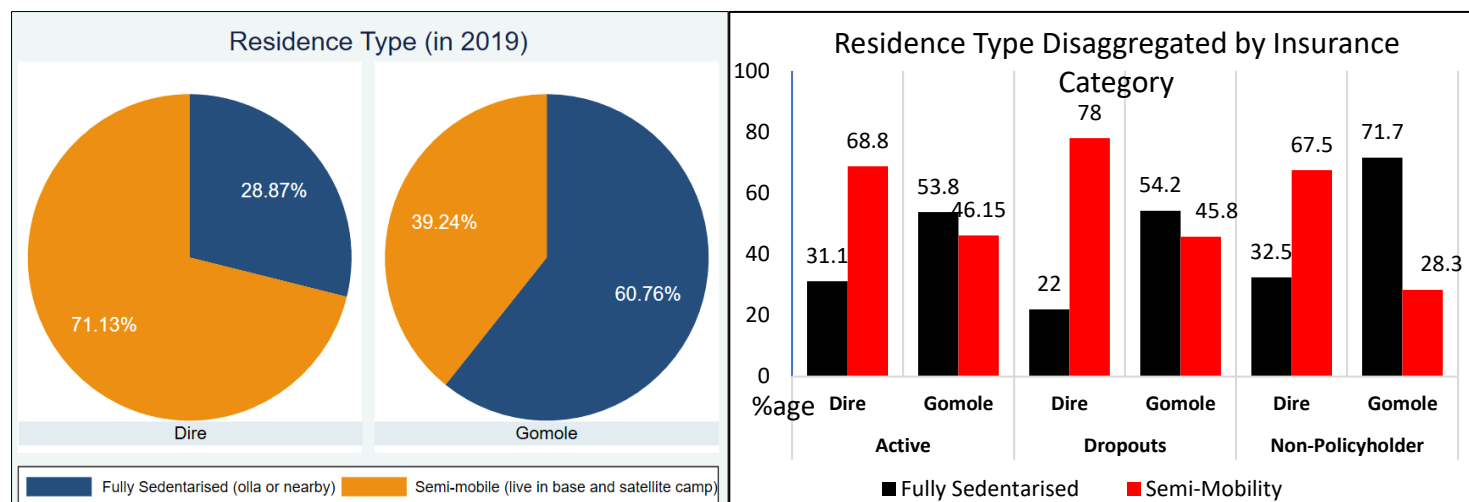
### 5.3 Settlement: Patterns and Changes

Chapter Four presented some major biophysical characteristics and variability in Borana, where there are distinctive land use and settlement patterns in Dire and Gomole. Dire is an extensive pastoral system, whereas Gomole has evolved into an agro-pastoral zone with a significant area of the land committed to cultivation. Various reports have shown (Oba, 1998; Tache, 2009; McPeak et al., 2012) that taking farming as an alternative livelihood strategy has fostered a sedentarised lifestyle. This, in turn, changed the land use and cover in Gomole.

In most parts of Gomole, land has been converted to private cropland/farmland. By contrast, community *kallo* (pasture enclosures) have been significantly reduced, with the remaining community *kallos* being gradually converted to private farmland. Fences intended to preserve dry-season grassland may be seen in most areas, although the land is turning progressively into cropland. Equally, the settlements are dense in Gomole. In Dire, Figure 4.4 (Chapter 4), on the other hand, communities are sparsely distributed, and much of the area is occupied by *kallos*, with farmland mostly consisting of small patches that are widely scattered.

Figure 5.2 indicates the type of residence and the level of mobility, and how these maps onto insurance-holding status. In Gomole, 60.7 per cent of respondents report being fully sedentarised, but in Dire, just 28.8 per cent are sedentarised, with the rest being semi-mobile. When asked about their residential-style ten years ago, fully-sedentarised households accounted for 40 per cent in Gomole and less than a quarter in Dire (23.2%). This indicates that sedentarisation is more prevalent in Gomole than in Dire. Developing the insurance model is a critical part of a change in land use, pasture governance and livelihood, covered in detail in Chapter Six. Finally, when disaggregating by insurance categories,

uninsured households tend to be more sedentarised in both insurance clusters than the other two insurance categories.



**Figure 5.2 Residence Type by Site (left) and Disaggregated by Insurance Category (right)**

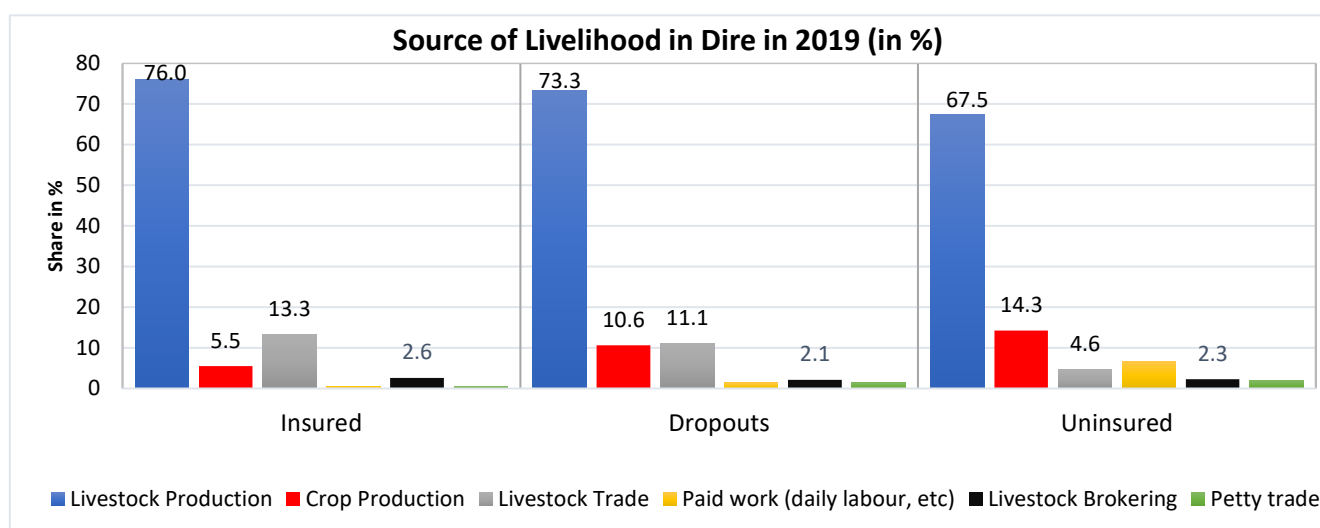
## 5.4 Livelihood: Status, Changes and Perceptions

### Livelihood

Although respondents identified six distinct sources of livelihood, livestock is the predominant source, followed by crop production (farming). Livestock trade paid work (daily labour, and so on) and non-agricultural trading (in other words, shops and outlets selling liquor/alcohol, and so on) are the other three sources of livelihood. The importance of remittances and working in the formal sector was negligible.

As an extensive pastoral system, livestock production (raising) is by far the most important activity in Dire (Figure 5.3). The percentage drops from 76 per cent for insured households to 73.3 per cent for dropouts and uninsured households (67.5%). Crop production is less important in general, though it is the second most important source of livelihood for those who are uninsured.

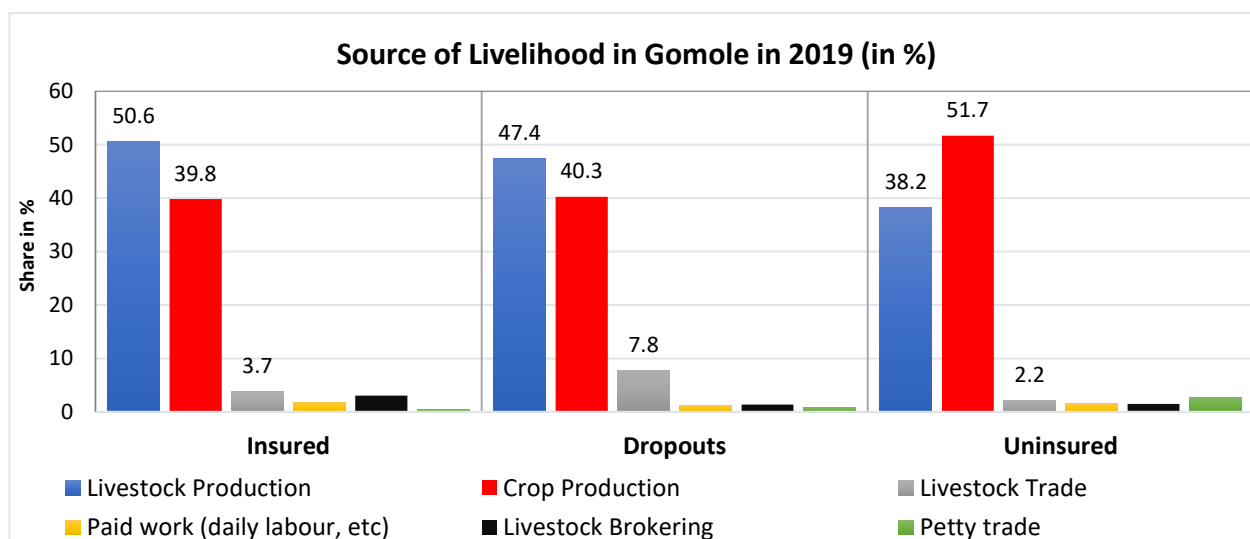
Among insured households and those who are dropouts, the livestock trade is the second source of livelihood following livestock production. Casual labour (daily or wage-based) is the third major source of livelihood among non-policyholders but is insignificant for the other categories.



**Figure 5.3 Mean source of livelihood in Dire (per cent) in 2019.**

In Gomole, livestock and crop production are equally important, as depicted in Figure 5.4. Among uninsured households, crop production (51.7%) is more important than livestock production (38.2%). It also plays a significant role amongst those who are insured (39.8%) and dropouts (47.4%). For both the insured and dropout categories, livestock production is the most important source of livelihood. Across all categories, all other reported sources of livelihood are of minimal importance by comparison.

Trade is practised either by selling livestock and its products or through small-scale local sales of milk in kiosks. Although pastoralists mix different livelihood sources, certain patterns emerge when the data is disaggregated by insurance category and location. In Dire, livestock trade and crop production contribute equally to livelihood. However, among insured households, livestock trading plays a higher role at 13.3 per cent than that of crop production (5.5%). In Gomole, livestock trade is the third source of livelihood but is very low compared to livestock or crop production. Although there is a sporadic sale of grains among pastoralists in Gomole, its role is insignificant. Live animal trading (large stock) is age- and gender-disaggregated and dominated by male pastoralists in the middle and older age groups.



**Figure 5.4 Mean source of livelihood in Gomole (per cent) in 2019**

*Dilala*<sup>22</sup> (brokering in the livestock trade) has emerged in recent years as a source of livelihood and cash. It is the practice of an adult or young male pastoralist, to collect livestock from villages and markets. Those with strong networks with intermediaries outside Borana purchase a cow or a camel in the morning, keep it for a couple of hours within the market area, and then sell it at a higher price. Others who own lorries (or through leasing) go around villages, collect and bring them to the market to sell to traders who then take them to the capital or bigger markets. The other form is the one seen in the picture below (Picture 5.1). Traders come with weighing scales, purchase small ruminants from pastoralists, and then resell them the same day to other traders outside of Borana.



**Picture 5.1 Small Ruminants trade using weighing scale (Photo by Wako Gobu)**

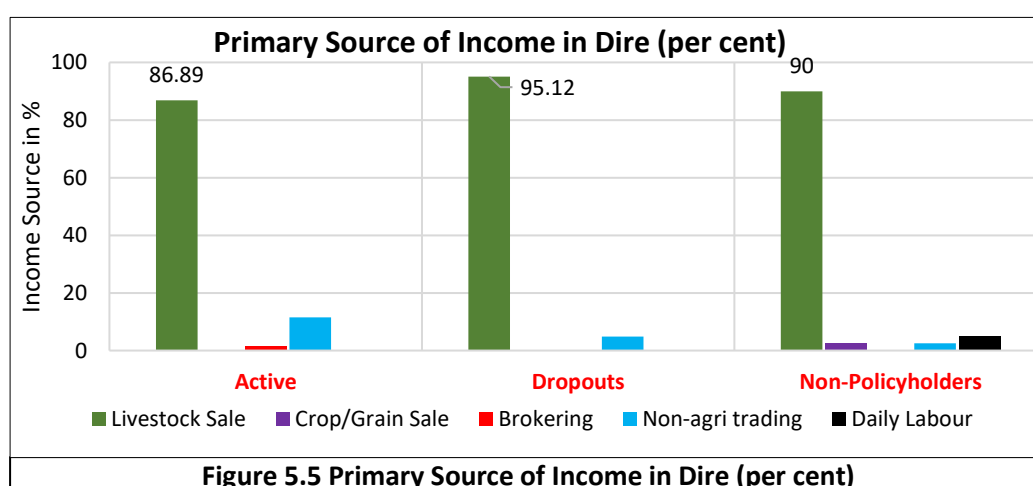
<sup>22</sup> For pastoralists, any type of livestock trading that does not involve raising/fattening is brokering or *dilala*.

Although the uninsured in Dire engage in farming, other sources of income are limited in contrast. Cultivation and livestock production are important sources of livelihood in Gomole for people of all socio-economic classes. Those who are insured are more inclined to cultivate, whereas those who are not insured are more inclined to raise livestock. Other activities, such as trading and brokering, are carried out, but these are insignificant sources of income compared to farming and livestock keeping.

### Source of Income

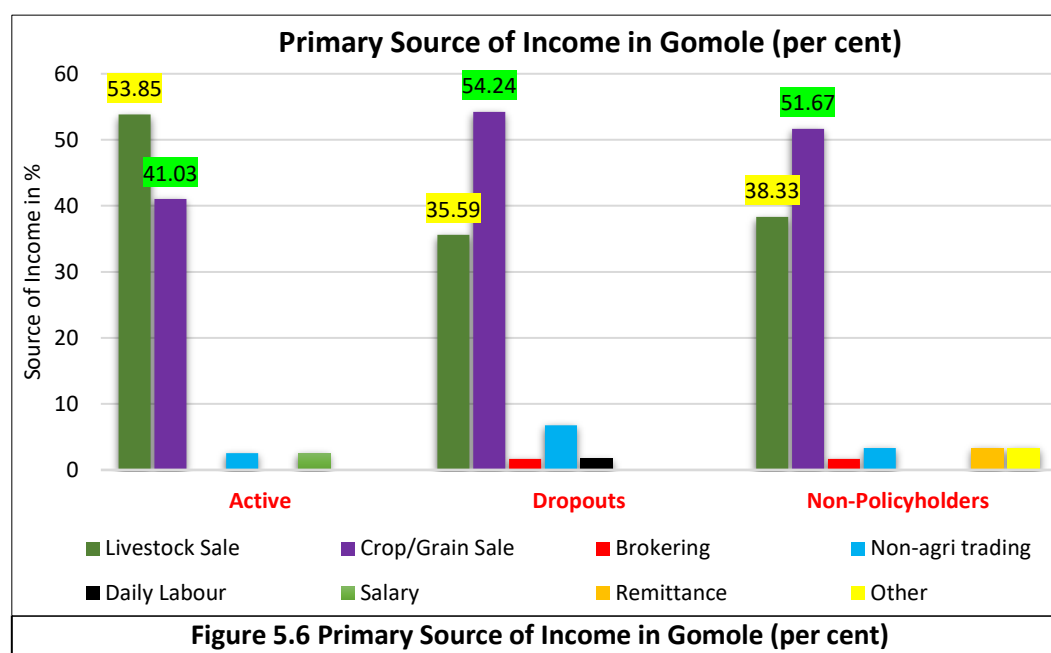
As the discussion on livelihoods above indicates, there are more income-generating options in Gomole compared to Dire. According to focus group discussions, there are eight different cash sources listed by pastoralists in Gomole compared to five in Dire. Group discussants report that proximity to towns and a relatively more significant concentration of villages in Gomole has contributed to more income-generating options. These include the sale of livestock (live animals and products), sale of grain, other types of trading (not related to livestock or crops), livestock brokering, daily labour, employed salary, remittance, and so on. Among these, the first five are selected as sources of income in Dire.

Nonetheless, of the five sources of income, livestock trading accounts for 90 per cent of the share, and non-agricultural trading is seven per cent. Thus, livestock trading is the most important source of income for pastoralists in Dire, aligning with findings on livelihood in the previous section. When income sources are broken down per insurance category, comparable patterns to the cluster-level can be seen (Figure 5.5). The most noticeable trend is that insured households engage in non-agricultural trading (11.5%) more than the other two categories.



Households also listed secondary sources of income. In Dire, survey results indicate that 85 per cent of the households had a secondary source of income. Non-agricultural trading is the most common source of cash, at 23 per cent of the total. The selling of grain and other commodities follows (community cash support, and government and NGO cash transfers as a form of SafetyNet). In contrast to the Gomole cluster, only 15 per cent of households in Dire reported that they had a tertiary source of income – the rest relied solely on primary and secondary sources. Finally, the share of livestock sales as a primary source of income is comparable among the three insurance categories in Dire. The key distinction between the categories is the amount of money generated from non-agricultural activity. Wealthy pastoralists in Dire often own small and large businesses in Dubluq town and their villages.

In Gomole, income from livestock-keeping and cultivation are both important sources of cash; half of the households identified grain grown on their land as their primary source of income. On the other hand, livestock trading, whether live animals or their products, is a primary source of income for 41 per cent of households. The remaining nine per cent of households received cash from the other six sources of income.



Livestock trade is a more important income stream for active policyholders (54 per cent) in Gomole than it is for the other two groups (see Figure 5.6). On the other hand, grain sales are the most important income stream for dropouts and non-policyholders, with 54 and 52 per cent of households respectively reporting that their primary source of income comes

from the crops they grow. Although livestock contributes to household income, it is more important to active policyholders than the other two groups. Non-policyholders indicate up to six other sources of income, although all of these are small compared to the income generated from cultivation and livestock-keeping.

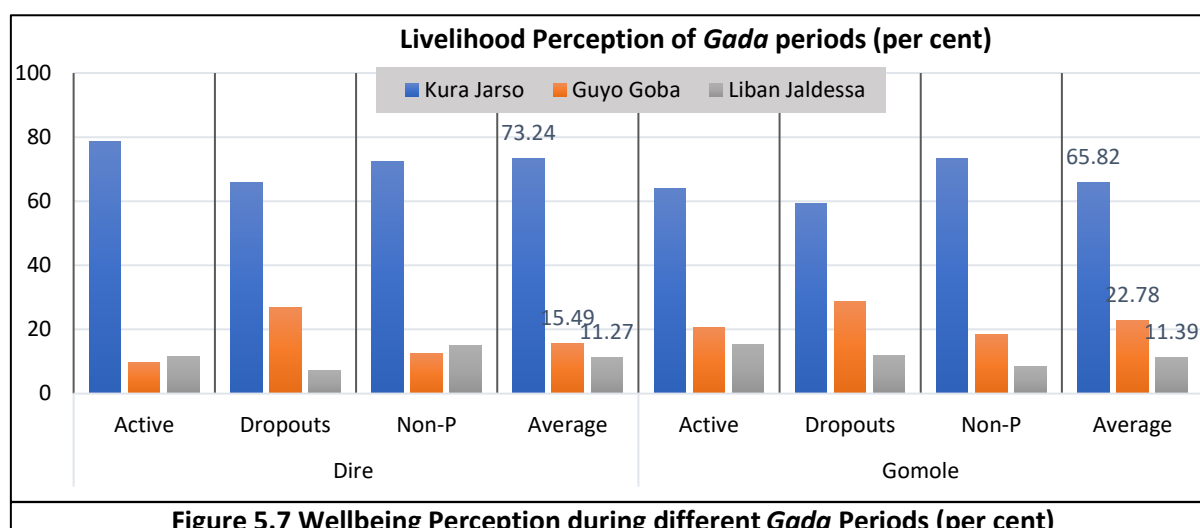
Regarding secondary sources of income, livestock trade takes the lead, with 53 per cent of households reporting it as their source of income in Gomole. A third of the households, on the other hand, stated grain sales. This means that for households whose primary source of income is livestock trade, grain sales become a secondary source of income and vice versa. Non-agricultural trade (running shops/kiosks), on the other hand, is more common among active insurance policyholders than the other two categories. Finally, even if the shares are modest, non-policyholders have a variety of income alternatives; whilst dropouts and active policyholders are in second and third place, respectively.

### Perception of Livelihood in different Gada Periods

The *gada* system, as discussed in Chapter Four, plays an important part in Borana's socio-economic, cultural and political life. Given the importance of the *gada* system for recalling the past, this study has looked at the last three *gada* periods: Abba Gada Kura Jarso (2016–2024), Guyo Goba (2008–2016) and Liban Jaldessa (2000–2008) to assess the changes in livelihood since 2000.

All participants were asked to rank each of these *gada* periods first, second or third, depending on whether they thought their livelihood and well-being improved or worsened during that period. Figure 5.7 displays the current Aba Gada period, Kura Jarso, as having the highest levels of wellbeing.

Households cited a reduction in conflict, higher market prices for their livestock, and the expansion of infrastructure as important contributors to their improved well-being. Guyo Goba's period is the second favourite period; while there were no major conflicts during this time, it was marked by a succession of droughts and livestock diseases. Liban's reign, on the other hand, is regarded as the worst due to a series of wars and droughts. Market prices for animals were low under his leadership, and non-Boranas had a tight grip over trading routes. When well-being perception in the three *gada* periods is linked to insurance classifications, there are minor changes.



## 5.5 Livestock and Assets

### Livestock Ownership

It is indicated that livestock is the key source of livelihood, to differing degrees, for all households in Dire and Gomole. The variations in livelihood and income sources between sites and insurance groups are linked to the livestock holdings of a household.

Starting with the cluster level features, average livestock ownership is higher for households in Dire (27.4 TLUs) than it is for households in Gomole (18.58 TLUs); however, these figures conceal considerable disparity in livestock holdings between households in each location. Per capita TLU figures for insurance policyholders in Dire are nearly double those of non-policyholders, and 67.5 per cent more than households who dropped out. In Gomole too, insurance policyholders have the highest TLU, followed by dropouts and non-policyholders.

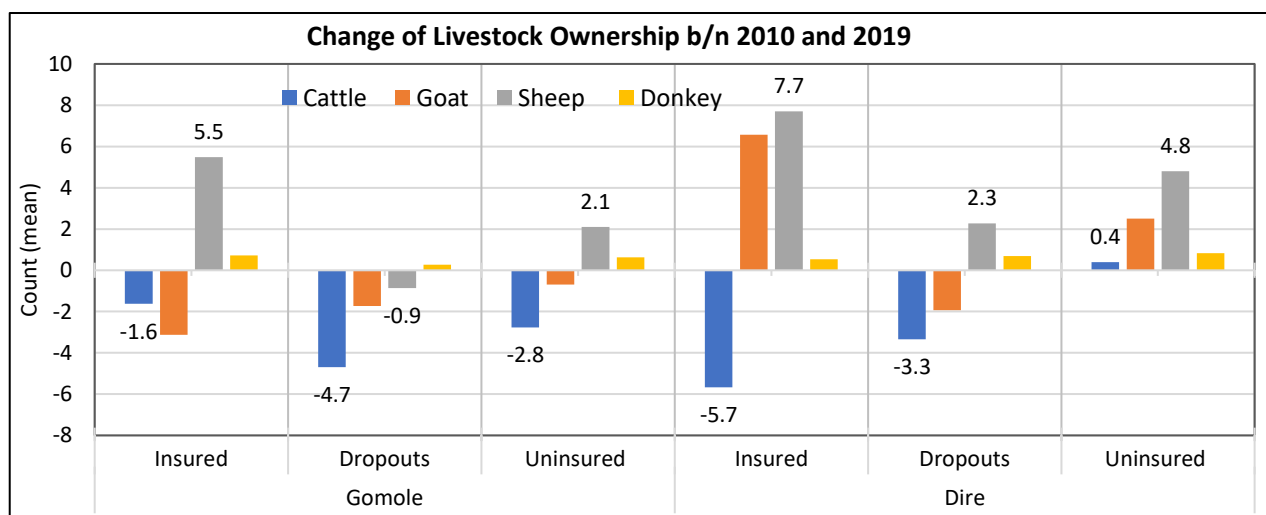
**Table 2.2 Mean TLU Ownership based on wealth status (rich, medium, poor)**

Wealth Status (criteria set by the community – Table 4.1)	Dire		Gomole	
	mean	SD	mean	SD
Poor	6.13	2.38	5.75	2.36
Medium	15.10	3.31	15.13	3.09
Rich	56.61	36.63	39.52	18.80
<b>Rich to poor ratio</b>	<b>9.24</b>	<b>15.42</b>	<b>6.87</b>	<b>7.95</b>

In summary, livestock holdings vary by location as well as across the insurance categories. The CV, which measures dispersion within a group/dataset, is 1.46 in Dire and 1.37 in Gomole. Among active policy-holding households, it is 1.35 in Dire and 1.1 in Gomole. In other words, the disparity of livestock ownership within insured households is lower compared to the cluster-level disparity.

During focus group discussions, participants detailed changes over time in livestock ownership – both in terms of overall numbers and herd composition. A great deal of effort was made during the survey to capture the livestock ownership in 2010<sup>23</sup>. Despite the possibility that some information was lost during the pastoralists' recalling exercise, the changes stated by focus group participants correspond to the trends recorded by the IBLI household panel and other regional numbers covered in the preceding chapter. In Gomole, per capita livestock ownership fell from 21.9 TLUs in 2010 to 18.6 in 2019, whereas it decreased from 26.1 to 24.2 TLUs in Dire.

Nevertheless, the reduction of livestock is not the same across households and species types. As depicted in Figure 5.8, there has been a significant decrease in cattle – which have a slower reproduction rate – compared to other species. The most considerable reduction was registered among insured households in Dire (5.7 cattle)<sup>24</sup>, followed by dropouts in Gomole (4.7). By comparison, there is little change in camel ownership in both sites, related to camels' drought tolerance and the availability of vegetation. Pastoralists in both sites are moving towards owning sheep. Moreover, the management of sheep (in terms of feeding



**Figure 5.8 Change of Livestock Ownership between 2010 and 2019 in Gomole and Dire**

<sup>23</sup> In calculating the mean livestock ownership, adjustment by omission was made for respondents who were very young to own assets in 2010.

<sup>24</sup> In the chart, Figure 5.8, numbers displayed as negative show a reduction of herd size from what it was in 2010, while a positive number indicates an increase of herd size.

and watering requirements), and good market prices, also contribute to the attractiveness of keeping sheep. The most considerable change comes from the insured pastoralists in Dire (7.7) and Gomole (5.5). In Gomole, most pastoralists transitioned to farming in addition to the change of ownership to small ruminants.

Livestock ownership is an important indicator throughout the thesis and is linked to a number of different variables examined in this study. In the previous chapter, macro-level indicators reveal that livestock ownership decreases gradually despite several "boom and bust" cycles due to various factors (environmental, institutional, etc.), whereas this chapter provides an initial insight into micro-level dynamics. That is to say, per capita livestock holdings have decreased slightly over the past decade, but changes in species composition also speak to the wider context of uncertainties (drought, access to grazing and water) and livelihood transitions (to settled agro-pastoralism and mixing livestock with farming) in Borana. These developments are also crucial for understanding patterns of insurance uptake, which will be explored in greater depth in the following chapters.

### Asset Ownership

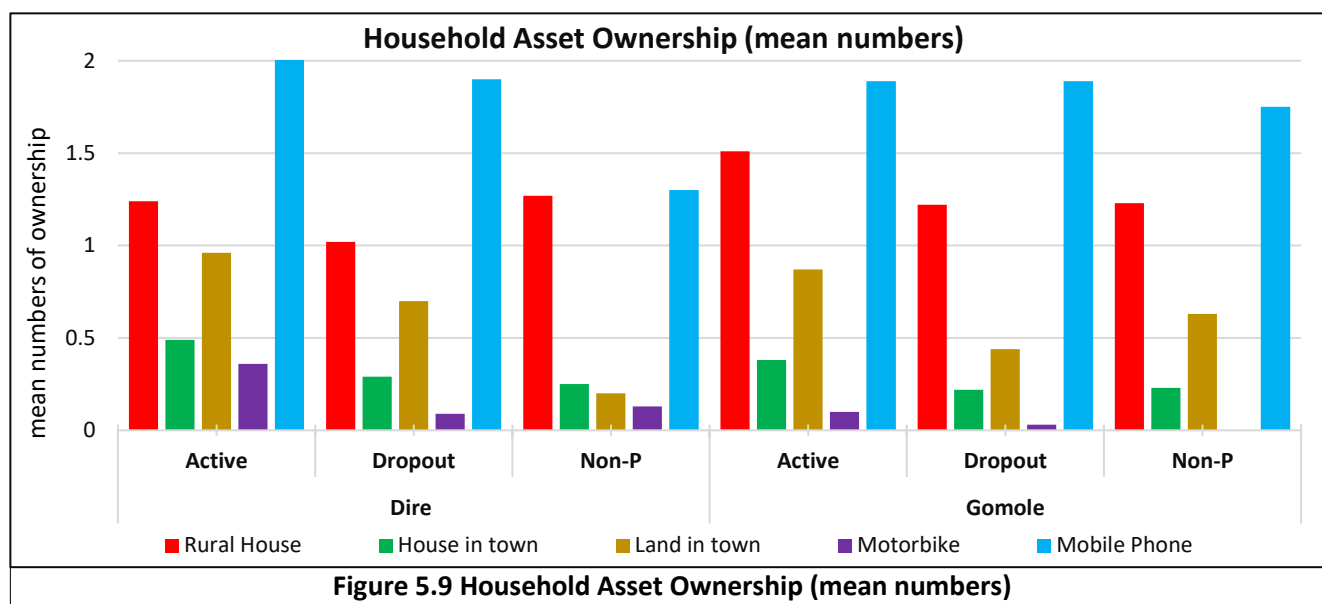
According to participants, pasture, land, water and people are key assets at the community level in Borana. At the household level, important assets are livestock, land (farmland or to construct a house in town), and different types of equipment, such as electronics or motorbikes, among some of the key household assets.

One remarkable feature in all households is mobile phone ownership. There is at least one mobile phone in each family. As shown below, the mean ownership is significant among active policyholders in Dire, where the mean ownership is two mobile phones per household. The lowest mobile ownership is also found in Dire, among non-policyholders, with a mean of 1.3 mobile phones per household.

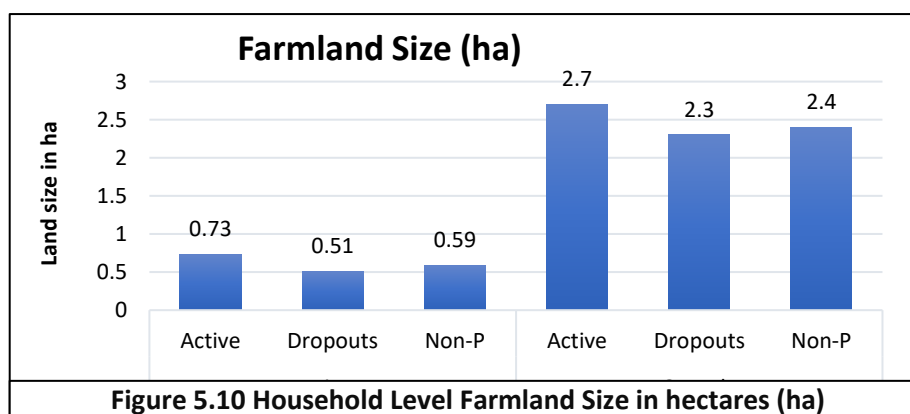
On average, 27.5 per cent of survey respondents in Dire and 22.8 per cent in Gomole report owning a house in town; however, the ownership is skewed towards insured households. Among those who reported owning a house in Dire, half of them are active policyholders; similarly, close to 40 per cent are insured households in Gomole.

The source of livelihood and income presented in Figures 5.5 and 5.6 indicate which resource type is dominant in the study sites. Overall, half (50.7%) of the households in Dire do not

own farmland, whereas, in Gomole, only 3.2 per cent reported that they do not have farmland. Among the households that own farmland in Dire, the largest proportion are active insurance policyholders (42.8%). In Gomole, those who do not own farmland are single (unmarried) respondents.



As depicted in Figure 5.10 below, there is a considerable difference in farmland ownership between Gomole and Dire. In Gomole, the mean landholding size is above 2 ha; in Dire, it is below 1 ha. In Gomole, active insurance policyholders have the largest per household mean land ownership at 2.7 ha. Non-policyholders stand in second place with 2.4 ha, and dropouts with 2.3 ha are third. Before it became a dominant source of livelihood in Gomole, pastoralists were encouraged by local administrators, led by Major Jatani, to fence off communal land and start farming. As a result, there were no rules that limited the size of communal land to be taken. This has led older households to own more farmland than other age groups.



Due to the continuous shift in land use towards farming, local administrators have had to intervene, particularly as land use-related conflicts have arisen. Key informants reported that everyone is prohibited from converting communal land to farms without securing the approval of indigenous institutions and kebele administrators; however, when these rules came into practice a decade ago, most households had already divided and shared the communal land. The young generation residing in the area will be granted a maximum of a hectare of communal land for farming if they establish a family.

Although there is a smaller mean per household farmland ownership in Dire, there is higher variability among households than in Gomole. The most considerable variation is among households who have never purchased livestock insurance (CV of 2.01), followed by active insurance policyholders (CV of 1.67). In Gomole, by contrast, the lowest variation of land ownership is found among households that are active insurance policyholders with a CV value of 0.58. These households also own the most farmland compared to any insured group in both sites.

Information concerning urban land ownership (in Borana) was also collected. On average, active insurance policyholders own a piece of land in one of the nearby towns where the study was conducted. The same insurance category also leads in Gomole with a 0.87 mean (average). In relative terms, most households with a plot of land in towns are active insurance policyholders in both sites, although there is a slightly higher proportion in Gomole. As presented in the table below (Table 5.2), these insurance groups lead, not only by a plot of urban land but also by more households owning two plots of land.

**Table 5.3 Household Land Ownership in Towns (per cent)**

No. urban lands (plots)	Dire			Gomole		
	Insured	Dropouts	Uninsured	Insured	Dropouts	Uninsured
0	43.2	63.4	72.5	38.5	66.1	51.6
1	32.6	24.4	25	41	25.4	35
2	14.4	4.9	2.5	15.4	6.8	11.7
3	3.2	4.9	0	5.1	1.7	1.7
4	6.5	2.4	0	0	0	0

Land ownership (farm and urban) is largely insurance- and location-disaggregated from the several asset ownership indicators studied. Gomole has a large proportion of farmland ownership, a result of the fact that agriculture is becoming an increasingly important source of support for livestock production and livelihood in general. In contrast, land and house investments in neighbouring towns/cities are trending in Dire as part of seeking alternative

livelihood patterns. Finally, active insurance policyholders possess significantly more farmland (Gomole) and urban land (Dire) than other groups.

## 5.6 Pastoral Resources (Assets): Water and Pasture

The presence of communal resources, particularly water and pasture, in many parts, characterises the Borana dryland system. Accordingly, this study asked what type of water and pasture are utilised among the different pastoral groups for their livelihood.

### Water

Water is a significant pastoral resource that influences pastoral production, settlements and mobility (Vetter, 2005; Coppock, 2016). In principle, unlike pasture, access to water is restricted. As a result, different pastoral groups have different strategies to access and utilise water. For practical purposes, the different sources of water for pastoral production that were identified during group discussions are listed below:

**Table 5.4 Sources of Water in Borana**

Source of water	English
<i>Ella</i>	Water-well (traditionally built)
<i>Haro</i>	Artificial pond
<i>Dambala</i>	Seasonal (rain) natural pond
<i>Laga</i>	River
<i>Motori</i>	Borehole (motorised or mechanical)
<i>Hadha</i>	Water collected after digging sand
<i>Madho</i>	Spring
<i>Dollolo</i>	Water collected during the rainy season by blocking the flow

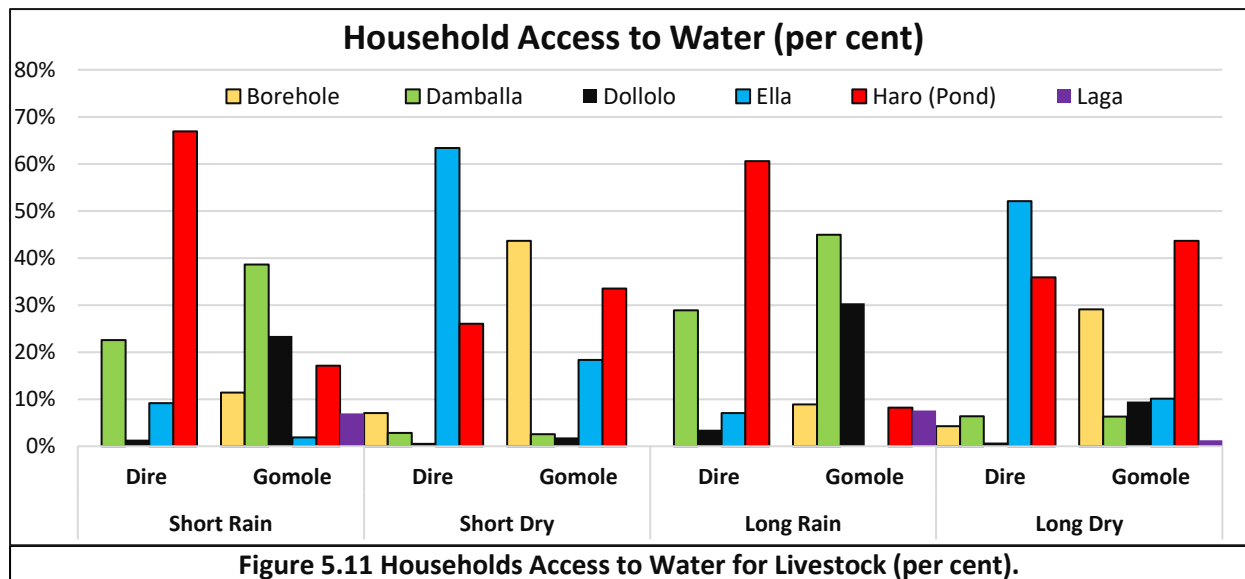
There are different rules or principles in place to manage these types of water resources. For example, access to surface water is governed by the same rules as to access to pasture. There are no exclusive rights to water from floods/rainstorms on an open surface. These types of resources are called *madho* or *damballa*. Exclusivity will come when such water is collected in a manmade pond (*haro*) constructed by an individual or group of people. The ponds are usually natural depressions, improved by scooping out mud, deepening shallow parts, or constructing simple earth bunds to retain water (see Picture 5.2). A locally appointed person often initiates these; the larger and more reliable a pond is, the more it is treated like a well, which is the most reliable water source in rural areas of Gomole in particular.



**Picture 5.2 Haro in Dire, Lafto kebele**

Wells (*Ella*) are familiar in Dire and require immense coordination efforts by larger groups of people to excavate, maintain and continue operating. The labour necessary must be provided by the well-users, who also form a water-well council, which decides on all matters relating to it. Access to these resources is only through the contribution of labour (by men constructing the wells, and women, providing inputs and cooking meals to those who are building them). Individuals who cannot offer either due to age or physical conditions will be granted access.

Access to these different water types follows seasonal availability; thus, the survey questions were designed as short rain, short dry, prolonged rain, and extended dry season water availability. As depicted in the chart below, the primary source of water during the short rain season is *haro* (artificial pond, 66.9%) and *damballa* (seasonal natural pond, 22.54%) in Dire and *damballa* (38.61%) and *dollolo* (water collected during the rainy season by blocking the flow) (23.42%) in Gomole.



There is a clear shift in water access and utilisation from rainy (short and long) to dry (short and long) seasons. As the above chart illustrates, in Dire *ella* emerges as the primary source of water during dry seasons – either long or short, with respectively 63.4 and 52.1 per cent of households reporting it as their principal source. *Ella* becomes the source during the dry seasons, followed by *haro* (artificial pond). In the short dry season, *haro* is used by 63.4 per cent of households, and 52.1 per cent during the long dry season. Unlike *ella*, use is not restricted to *haro*– as the construction is done by community and development actors (government and NGOs).

Finally, when the different water sources for livestock are considered concerning the insurance category, there is no significant deviation from the average within each study site. During the key informant interview, new water use was reported in Dire. Wealthy pastoralists are now constructing their borehole and a modified version of *dollolo* (collecting water during the rainy season and using it for the household when the dry season comes). These pastoral groups invest thousands of dollars (US\$5-10,000) per *dollolo* with a cover. Below is a picture of an individually-owned reservoir (*dollolo*) that can hydrate close to a hundred different animals for 2 – 3 months during dry/drought seasons, as confirmed by the owner.



Picture 5.3 A privately-owned *Dollo* construction in Dire

#### Pastureland (Livestock Feed)

As part of the livestock production, pastoralists employ different pasture-managing strategies (accessing, utilising and protecting) during different seasons of the year. As discussed in Chapter Four, the household (*warra*) reproduces and disposes of the requirements (labour and other key production elements) to access and use pasture. There are physical fences for nearby pasturelands, and 'agreed' demarcations are found far from the home-camp (*warra*), referred to as *forra* (satellite-camp) pasture.

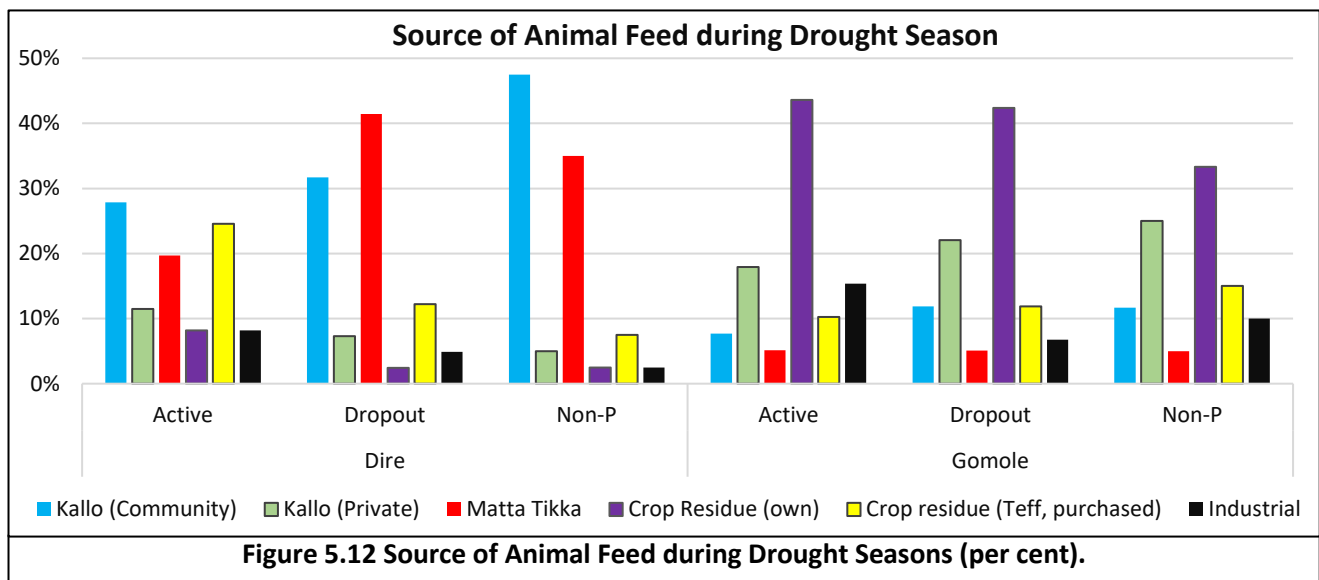
The different types of pasturelands are divided based on the type of animal grazing as follows:

Table 5.5 Sources and Types of Feed/Forage

Feed Source/Type	Means of acquiring and utilisation
<i>Seera yabiyee or jabillee</i>	Reserved for calves by the community
<i>Kallo dhunfa</i>	Private enclosure - some pastoralists change their farmlands to pasture depending on the availability of rain.
<i>Kallo</i>	A pasture closer to the home on a community plot for milking cows (primarily)
<i>Guessa</i>	A demarcated pasture found in remote areas; satellite camps for all types of livestock
<i>Matta tikka</i>	Communal open-grazing land: for most livestock species/types but recently communities have started fencing in some areas.
Crop residue	From privately-owned farmland or purchased (from nearby fields or big markets), mostly for fattening but during forage scarcity, for all types of livestock.
Industrial feed	Purchased from the market, for fattening during normal seasons but for all during resource stress.

Of the above different sources of animal feed, *kallo* has been the most popular in recent years. They are being privatised as pastoralists fence a portion of the range and claim sole ownership (Flintan et al., 2011). The average size of *kallo* ranges from 1 - 12 hectares in Gomole and up to 80 hectares in Dire.

There are stricter rules in place in Dire than in Gomole regarding the access and use of pasturelands. Whereas Dire has limited privately-controlled *kallo or matta tikka*, private pastureland is more prevalent in Gomole. The extensive presence of farmland has provided an opportunity to increase animal feed. Processed/industrial animal feed is becoming common in both sites, where there is better access to a road. This study has provided animal feed source options to understand differences among the insurance groups.



There is a similar trend among pastoralists when the feed source is looked at during the rainy and dry seasons. In Dire, most pastoralists rely on community pasture, whereas during rainy seasons, pasture sources in remote areas are used (*matta tikka*). Pastoralists take their herds close to the main camps during the dry season to use the community enclosures (*kallo*). In Gomole, due to the limited availability of *matta tika*, pastoralists feed their animals around nearby community *kallo*, private *kallo*, crop residue (*teff* straw is particularly dominant), and feed purchased from nearby areas or Modjo town (a town close to Addis, 500 km from Borana). There are insignificant differences among the different insurance groups during the 'normal' season.

As depicted in the chart above, the principal changes in livestock feed use can be noted during forage scarcity periods. In Dire, active insurance policyholders diversify their sources. They invest more in purchased feed - *teff* straw (24.6%) and industrial feed (8.2%) more than any other two groups. The most accessible feed that pastoralists combine with different feed types is *teff* straw, with only 12.2 per cent of households who dropped out of insurance and 7.5 per cent of non-policyholders having reported investing in it. These two insurance groups rely heavily on community pasture resources, *kallo* and *matta tika*.

In Gomole, crop residue (from own farm) plays a key role in supplying animal feed. Agro-pastoralists preserve crop residue for several years in anticipation of drought and utilise the available communal pasture during regular seasons. In this regard, those actively insured lead the chart by 43.6 per cent, followed by dropouts (42.4%) and non-policy holding households (33.3%). The active insurance policyholders also invest in industrial feed more than the other two categories, 15.38 per cent. Concerning the use of private enclosures (*kallo dhunfa*), a quarter of households do not purchase livestock insurance leads. These are followed by dropouts (22.03%) and active insurance policyholders (17.95%).

## 5.7 Summary of Features and Patterns from the Study Population

This chapter is an initial attempt to understand the features of the study population, from the data collected using a household survey. In particular, it provides a micro-level picture of heterogeneity in the Borana dryland system. It also aims to understand vital patterns emerging from gender, age, wealth status, livelihood and other key socio-economic factors when disaggregated by insurance category and research site (insurance cluster). The summary of these key indicators is presented in the table below (Table 5.5); however, there are several points that stand out.

First, most female-headed households are either dropouts or uninsured pastoralists. This correlates with their poor economic status and limited access to information (financial literacy). Similarly, most insured households are headed by males. Those who are dropouts tend to be under the age of 40, with a higher proportion being women.

Second, in both study sites, livestock is the predominant source of livelihood and income. Although farming plays an increasingly pivotal role in Gomole, livestock holdings in Gomole point to the continuing centrality of livestock-keeping in the make-up of people's livelihoods. In both sites, the largest livestock owners are also insured. In Dire, insured households' own

livestock (large stock) is twice that of uninsured households. Similarly, in Gomole, insured households own 1.4 more livestock (large stock) than those who are uninsured. Furthermore, as well as having larger herds, insurance policyholders are also more likely to have farmland plus houses in town, pointing to their wealthier status. Interestingly, diversifying livestock ownership to small stock (sheep and goats) follows a similar pattern, where insured households own more than the other two insurance categories in both study sites.

Third, a large herd and farmland size also reflect how a household has access to communal pasture and crop residues for animal feed. These are location- and insurance-disaggregated, where insured households rely more on community resources than other insurance groups due to their large herd size. The use of crop residue for animal feed is linked to the size of farmland, which is higher among the insured group and decreases towards dropouts and uninsured households. Finally, those who are dropouts are younger, and below those insured in terms of their wealth status. As discussed in the previous chapter- the extent of farmland, and the size of holdings is more significant in Gomole than in Dire. However, livestock-keeping is central in both locations – although there are important shifts to small stock, which are combined with farming in various ways.

**Table 5.6 Key Features of Studied Population – Dire and Gomole**

Selected indicators	Gomole			Dire		
	Active	Dropouts	Non	Active	Dropouts	Non
Female-headed hh (from total respondents in %)	2.6	11.9	8.3	8.2	17.1	20
Gender (0=Male & 1= Female)	.28	.42	.28	.29	.41	.47
Age of household head (years)	44	39.1	41.3	46.6	37.7	43.6
Large stock owned (cattle and camels) changed to TLU	19.9	13.2	14.2	30.3	16.7	14.6
Small stock owned (goats and sheep) (head count)	42.1	18	26	42.8	37.5	27.9
Crop farm area (ha)	2.7	2.3	2.4	0.7	0.51	0.6
Town house owned (count)	0.5	0.3	0.25	0.4	0.22	0.2
% source of livelihood from livestock	50.6	47.4	38.2	76	73.3	67.5
% income from livestock	53.9	35.6	38.3	86.9	95.12	90
% income from crops	41	54.2	51.7	0	0	2.5
% pasture from <i>kallo</i> (community)	7.7	11.9	11.7	27.9	31.8	47.5
% pasture from crop residue	43.6	42.4	33.3	8.2	2.4	2.5

Finally, pastoralists with many livestock have a limited (targeted) source of livelihood and income, yet multiple pathways to accumulate assets (farmland, houses in towns, etc.) and

secure livestock inputs (pasture and water). Adult males who invest heavily in insurance make up this type of household.

## **5.8 Conclusion**

This chapter profiles the households surveyed in Dire and Gomole. Differences and similarities across the two sites are presented, as well as trends with respect to the three insurance categories. Households in both study sites show heterogeneous demographic and socio-economic features, which influence differences in access to pasture. Such features are instrumental in influencing how drought risk and other uncertainties are experienced, as well as ways of responding to them.

The socio-demographic (gender and age) and economic (source of income and wealth) patterns to emerge from this chapter suggest that insured households are dominated by wealthy adult males. Younger and female pastoralists, on the other hand, are dropouts with a middle-level income. These patterns drawn from the household survey data have been pivotal in setting the initial landscape for the research. Subsequent chapters ask three interrelated questions: namely, what risks pastoralists are exposed to, experiencing, and conceptualising. Furthermore, they explore how responses to risks are combined with insurance by different pastoralists, disaggregated by wealth, age, gender, location, and insurance category.

## Chapter Six: Exposure to Risk - Index Insurance and Borana Pastoral Systems

## 6.1 Introduction

Livestock producers in Borana have a long history of facing recurrent risks and uncertainties: rain failures resulting in pasture and water shortages, market-based shocks, risks and uncertainties mainly arising from institutional/governance arrangements, mobility and conflicts, and others arising from the pastoral production system's structure to name but a few (Coppock, 1984, Scoones, 1995, Homewood, 2008, McPeak et al., 2012 and Lind et al., 2016). Although pastoralists face these multiple risks and uncertainties, there is a considerable heterogeneity within groups in Borana. Chapter Four laid out the variability of these risks within the Borana dryland system. By presenting the features of the study population, Chapter Five provides dynamics and heterogeneity within an insurance cluster.

This chapter focuses on exposure to drought risk in Borana. In particular, it will introduce and explain the mechanism that underpins index-based livestock insurance, as well as how it connects (or not) to differentiated exposure to drought.

There are four assumptions that underpin the development of the insurance model for exposure to drought risk. First, that rain failures lead to forage scarcity (Chantarat et al., 2012); hence, vegetation is monitored during rainy seasons to forecast the likelihood of drought for the dry season. Second, pastoralists in a sizeable geographical area (insurance unit/cluster) have relatively homogenous forage access; hence, exposure to a covariate risk (forage scarcity) is the same and can be ascertained objectively (Chantarat et al., 2012; Chantarat et al., 2017, Chelanga et al., 2017). Third, mobility is assumed to exist within an insurance cluster, and pastoralists living in the area have equal access to pasture. Finally, although pastoralists face various types of risks: idiosyncratic shocks (raiding, predation, accidents, and so on) or other types of covariate risks (disease outbreaks), covariate risk (drought) is the most common type of risk (Chantarat et al., 2012).

There are, however, limits to the ways in which the IBLI model seeks to measure drought exposure objectively. The distribution of forage/pasture over space and time is heterogeneous. Mobility has both temporal and spatial orientation (Huysentruyt et al., 2008; Mellisse, 2014), and cannot be restricted to a particular area for years. Moreover, pastoralists utilise various resource management/governance structures, such as *kallo*, *matta tika*, and others that are listed in the previous chapter. These are important for negotiating drought-induced scarcity of grazing resources because each has a different purpose and livestock features (species/type, condition and number) to accommodate.

Thus, forage scarcity is uneven at an insurance cluster level, and pastoralists are exposed to forage scarcity in different ways, yet these are not considered in index insurance design.

To demonstrate this argument empirically, this chapter examines the spatial and intertemporal vegetation/pasture distribution at macro-, meso- and micro-levels. In doing so, I explain how multiple factors condition forage availability in the study areas. Forage/pasture<sup>25</sup> and associated resource management practices at various levels are assessed primarily. The chapter will start by presenting the argument for whether macro-level pasture access/governance is homogenous and whether households' exposure to pasture shortage is the same. It moves on to discuss layers of pasture management – at meso- and micro-levels. The aim is to assess critically whether the risk-profiling under index insurance represents the population or not.

## **6.2 Whose Drought Counts? The Index Insurance and Localised Droughts**

There are no universal definitions of drought (West et al., 2019). Scholars, humanitarian organisations and pastoralists all have a different understanding of what drought is (Krätli, 2016). However, in this chapter, I discuss academic definitions of drought, and examine how such interpretations are linked with the practices of pastoralists. Chapter Seven focuses on how pastoralists conceptualise and experience drought.

The most basic definition of a drought is water deficiency relative to normal circumstances (Wilhite and Glantz, 1985; Lloyd-Hughes, 2014). As discussed in Chapter Two, index-based disaster risk financing programmes widely use agricultural drought from the different types of droughts. Agricultural droughts cover medium to long-term periods instead of hydrological droughts, which rely exclusively on precipitation and provide only short-term data (West et al., 2019). This- agricultural- sort of drought is likely to cause forage shortages and result in reductions/failures in pastoral and agro-pastoral settings. Various techniques have been used to monitor agricultural droughts, with NDVI<sup>26</sup> (an estimate of vegetation greenness) being the most widely used (Chantarat et al., 2012; Fava and Vrieling, 2021).

The IBLI programme in Borana uses NDVI to monitor pasture shortages. According to Lavender and Lavender (2016), NDVI has a correlation with the moisture content of the soil (which includes precipitation) and the health of the plant. As a result, when there is

---

<sup>25</sup> Pasture, vegetation, and forage are used interchangeably in this thesis.

<sup>26</sup> Normalized Differenced Vegetation Index

insufficient rain, the soil's moisture drops, resulting in deterioration of the leaf structure and a decrease in the quantity of chlorophyll (Lavender and Lavender, 2016; West et al., 2019). The healthiness of vegetation in a region is measured on a daily basis and progresses through many phases to generate an index cluster (homogenous insurance unit). The process of clustering areas into an insurance unit is dealt with in Chapter Two.

IBLI's risk-profiling technique, which considers a specific pastoral region to have a homogeneous risk of forage shortage, is referred to as an 'insurable unit/cluster'. It has been hypothesised that by developing a solid model, it is possible to create an insurance contract that covers the risk of forage scarcity (Chantarat and Mude, 2010; Chantarat et al., 2012). The rationale for geographical aggregation and risk-profiling in developing the insurance model is that all regions within an insurance cluster (for example, all places within Dire and Gomole), face the same risk of forage scarcity on average. Therefore, the covariate risk of drought is not connected to individual risk profiles; instead, on average, all pastoralists in an area experience the risk of drought equally.

Moreover, individualised (or idiosyncratic) risks and other covariate risks (like a disease or conflict) are assumed to be smaller than the covariate risk of drought in affecting livestock mortality (Chantarat et al., 2012). As a result, the insurance programme established a single premium rate for all pastoralists in a cluster. Moreover, the same amount of pay-out is distributed, assuming that the cost required per insured animal (calculated using TLU) is the same to all in an insurance cluster.

Yet these assumptions have certain flaws. To begin with, there is variability in rainfall distribution and forage levels within, and between, clusters. This implies that households in the same insurance cluster are exposed to varying levels of pasture shortage, and drought exposure varies over space. Secondly, some socio-economic characteristics, such as livestock ownership and composition (species, condition), are not considered in the spatial aggregation of forage status. According to a study performed in Ethiopia and Kenya, socio-economic dynamics are critical in responding to drought-related shocks (Jensen et al., 2018).

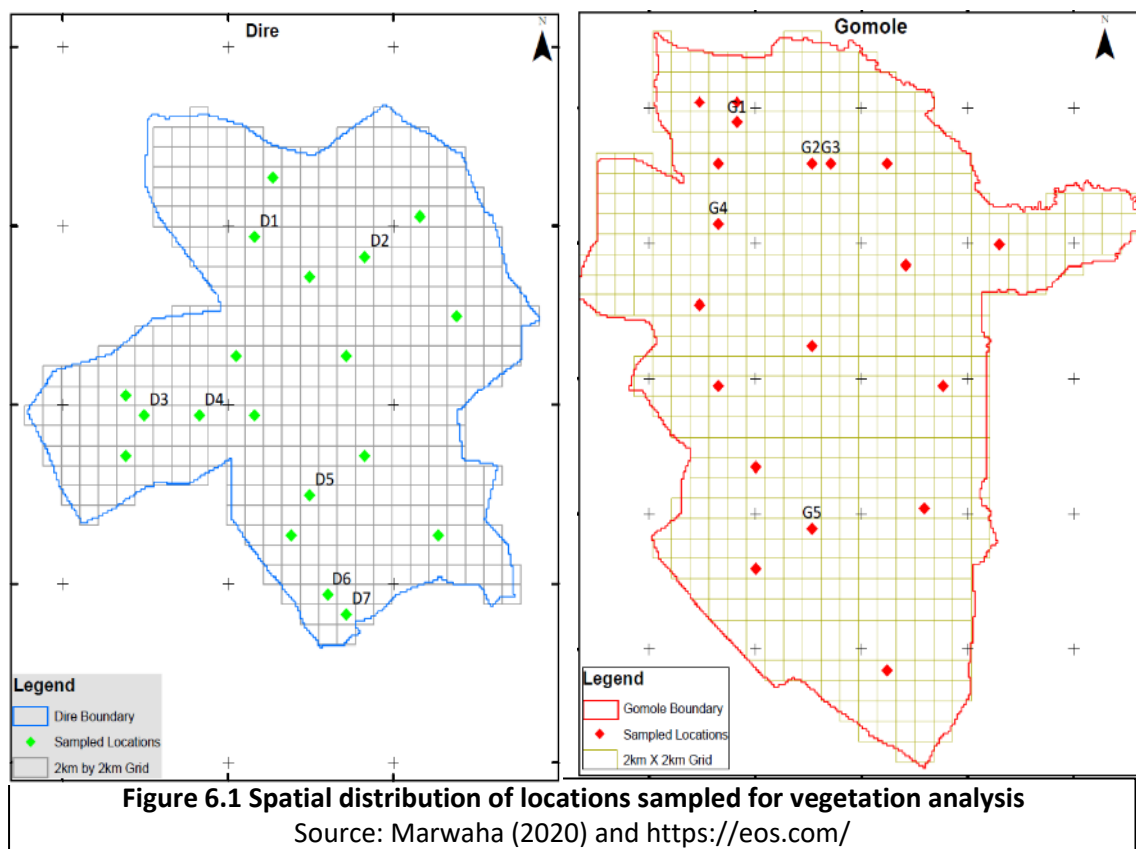
Finally, land cover and use vary due to differences in soil types, agroecology, rainfall distribution and economic factors, all of which influence pasture distribution (availability/scarcity) in a given location (McPeak, 2003; Desta and Coppock, 2004). As a result, land use and cover and localised regulations on pasture governance in East Africa

make grass available even when rain has failed (Homann et al., 2008; Flintan et al., 2011; Krätli, 2016; Lind et al., 2020).

### ***Exposure to Drought Risk: IBLI's Model and Practices of Pastoralists***

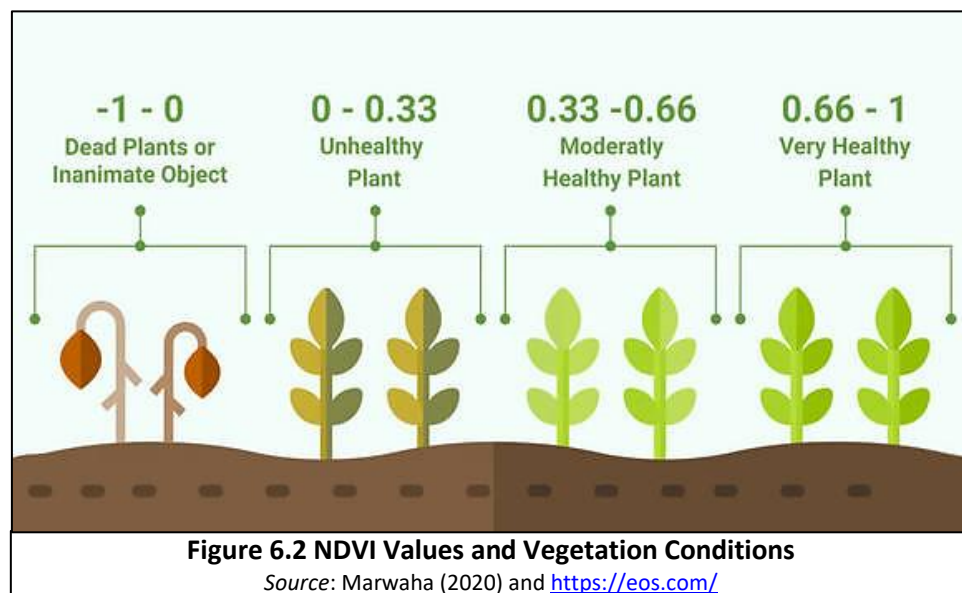
This section, by analysing NDVI, discusses the exposure to drought risk by linking it with pastoralists' practices. It asks how these shortcomings – discussed above - are manifested in the research areas. This section examines local level forage/vegetation variability, using a historical vegetation trend analysis from July 2002 to June 2020.

It utilises the same dataset as the IBLI product, known as NDVI eMODIS. The vegetation data has a high spatial resolution of 250m<sup>2</sup>, resulting in a high-quality NDVI every dekad<sup>27</sup>. The spatial resolution is aggregated into a 2km-by-2km (4km<sup>2</sup>) region to approximate micro-level vegetation coverage. The research sites were divided into several four-square-kilometre sections to sample representative locations for vegetation investigation, as shown in Figure 6.1. The sample sites selected for this analysis were 18 in Dire and 19 in Gomole.



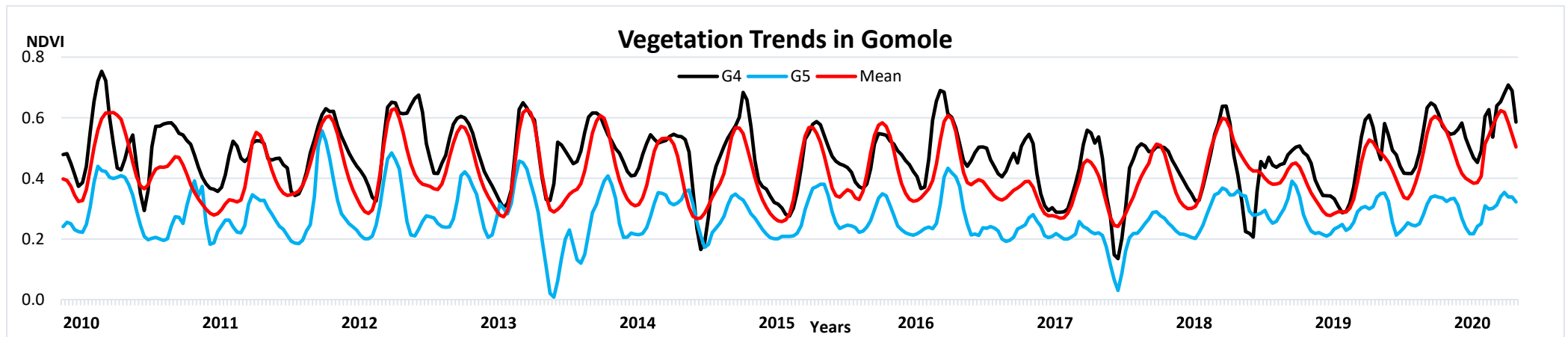
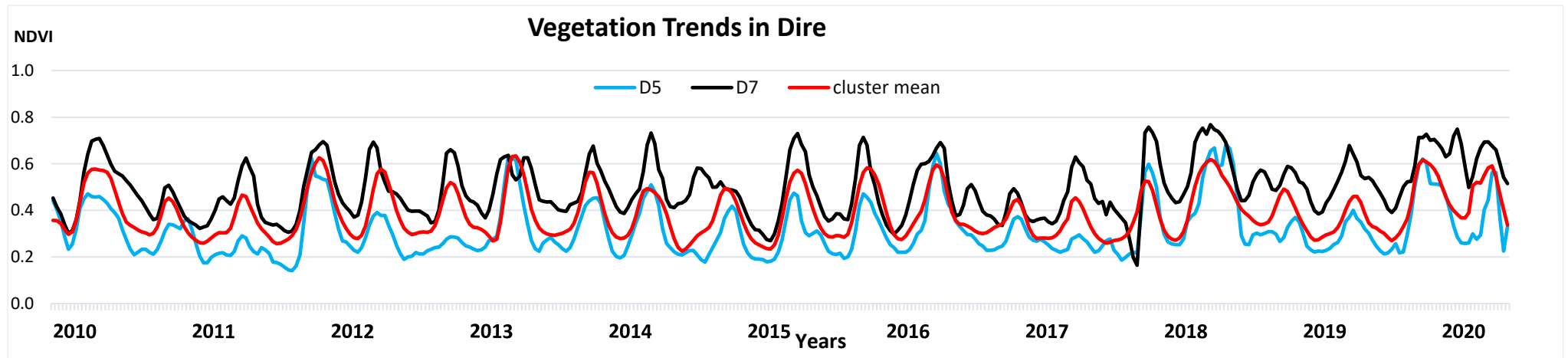
<sup>27</sup> The National Aeronautics and Space Administration's (NASA) Earth Observing System provides eMODIS (EOS).

Each cell in the figures in Figure 6.1 is equivalent to 400 ha (988.4 acres) of land. The IBLI cluster assumes that 434 cells (of 4 km<sup>2</sup>) or 173,600 hectares of land in Dire, and 544 cells or 217,600 ha in Gomole, display a relatively homogenous forage condition; consequently, each insurance unit faces the same level of risk. The light green-coloured points in Dire and the red-coloured points in Gomole are selected for analysis, covering the period 2002-2020<sup>28</sup>. These points are further linked to the experiences of households living within each cell. In Figure 6.1 above, the sampled cells are labelled as D1, D2, and so on in Dire, and G1, G2, etc., in Gomole. Households within each cell were interviewed as part of the mixed-method survey. The vegetation patterns, seen in Figure 6.2 below, are given a value between -1 and 1, with -1 representing inorganic objects or dead plants and 0 representing a barren ground. A tropical forest is represented by a value of 1. In a nutshell, the values quantify the greenness of vegetation, its density and its health. Figure 6.2 shows a graphical depiction of NDVI values and associated vegetation conditions.



The two charts in Figure 6.3 below illustrate the mean trend for both locations. They demonstrate temporal variability in vegetation distribution in Dire and Gomole. The red line in both figures represents the mean vegetation trend for respective study areas, and trends for the whole sample points are found in Annex III. For ease of visualisation, two trend lines are selected from each study location out of the total sampled and analysed.

<sup>28</sup> The analysis was done from 20002 to 2020, but for simplicity of presentation, the charts presented are from 2010. The remaining charts can be found in Annex III.



**Figure 6.3 eMODIS NDVI between 2010 and 2020 in Dire (top) and Gomole (bottom) clusters**

*Source (raw data): U.S. Geological Survey, by NASA; analysis by the author.*

As shown in the above chart (top), D5 or the nearby regions' mean forage level in Dire, represented by the blue trend line, is lower than the red cluster level trend. Furthermore, the forage conditions in D5 were “unhealthy” during the studied seasons, whereas the cluster average forage levels were “moderately healthy”. D7, on the contrary, is shown to have better pasture availability than the mean line. For example, during the 2018 short rainy season, a household in D5 and adjacent regions (including neighbouring communities within a 5 km radius) faced extreme forage shortages, whereas many of the adjoining areas (D7 and surrounding) were in better condition.

Similarly, in Gomole, Figure 6.3 illustrates heterogeneous vegetation trends between G4 and G5 from the mean cluster level. For example, in 2013, the vegetation level for G5 and its surrounding area was close to zero; this means that there was no vegetation cover. To the contrary, in areas within G4, it was more than the average (cluster-level mean). Therefore, pastoralists who experienced varied forage conditions in their location were treated under IBLI as if facing the same drought risk in the whole cluster. These geographical distributions are essential aspects of pasture management (access to fodder by a household is not at the cluster level; this will be expanded on later).

One could ask if soil fertility or land use issues are attributable to differences in the trends between G4 and G5 or D5 and D7. These are valid points; however, in designing IBLI, a “clear” change of vegetation (the peaks and troughs of vegetation in the above chart) during rainy and dry seasons, is one of the biophysical criteria considered. This is known as the 'seasonality' of vegetation, and the sampled sites G5 and D5 above qualify this criterion. Nevertheless, the mismatch is that cluster-level heterogeneity of vegetation distribution is averaged, with others having a different vegetation trend.

Pastoralists' experiences qualify the above argument and trend analysis. Obda Dido, 52, lives in the D5 neighbourhood. Following a year of drought in 2017, some areas of Borana had rain the following season, in 2018. Nevertheless, the pasture was insufficient due to the localised drought (Figure 6.3 above). Typically, more than one season of rain is required for the pasture to recover (McPeak et al., 2012). As a result, pastoralists like Obda were compelled to migrate to places with better pasture availability outside the IBLI-defined cluster. Although much of Gomole has been converted to farmland, he was told that the situation was better there.

Obda migrated to Gomole. He initially assessed fodder conditions in the most extensive pastoral regions along Kenya's borders, but herders informed him that the situation was no better there than in Dire. He asked a few households in Gomole if he could access their common or private pasture after explaining the circumstances (drought in areas of Dire). Because most common areas have been converted into farmland, there is barely sufficient pasture for grazing animals. Recognising the predicament, two families offered to let him camp, plough on one of their farmlands (*Oburu*) and graze animals.

Obda stayed in that area for approximately two months, and families supplied crop residue for his animals. He ploughed the land that he was offered temporarily and returned to Dire with his livestock when the situation improved. After three months, Obda planted maize, and the host community communicated with him to come and harvest. He returned to Gomole, harvested, and gave the crop residue to his hosts. Although he offered to share the harvest, the host household insisted he should take everything as they were in a better situation than where Obda lives (in Dire).

During his stay in Gomole, the host household had purchased livestock insurance and received a pay-out, as did all insured households (following the failure of the short rainy season of 2018). Considering the difficult situation in Dire, Obda expected that he would get higher pay-outs from the insurance he had purchased there. Unfortunately, he was informed by the insurance promoter in his locality that there would be no pay-out in Dire. Disappointed, Obda said, *"I migrated to Gomole searching for pasture for my livestock, and the situation is much better than Dire. How can I believe the areas I migrated to received a pay-out [livestock insurance] whereas my locality is considered normal? I feel this insurance business is like gambling and decided not to invest a cent."*

Under the IBLI model, it is assumed that pastoralists will migrate within the same insurance cluster. But this does not acknowledge the historical migration patterns and changes, human and livestock population changes, and other biophysical dynamics (particularly land cover and use) within each cluster and in other areas. Obda was not the only one to mention such issues for dropping out of livestock insurance. Migration in Borana is not confined to a given cluster<sup>29</sup>; instead, pasture availability, socio-cultural matters (for example, clan relationships and networks), and resource-based conflicts (re)define mobility patterns. An insurance

---

<sup>29</sup> When demarcating an insurance cluster, it is assumed that pastoralists have similar access to pasture and their mobility is frequent in that cluster.

clustering exercise with community representatives indicated that pastoralists in the northern part of Dire stopped freely accessing pasture in the southern part for more than ten years as the pasture governance changed following livestock and population increase. If there is a severe forage shortage in the northern part, they can move to where it is better, whereas the southern part of Dire is considered, as any part of Borana, not something they can freely access as an open pasture. Therefore, there is both temporal and spatial insecurity of mobility and no pasture is constantly controlled over the years (Huysentruyt et al., 2008; Krätli, 2016).

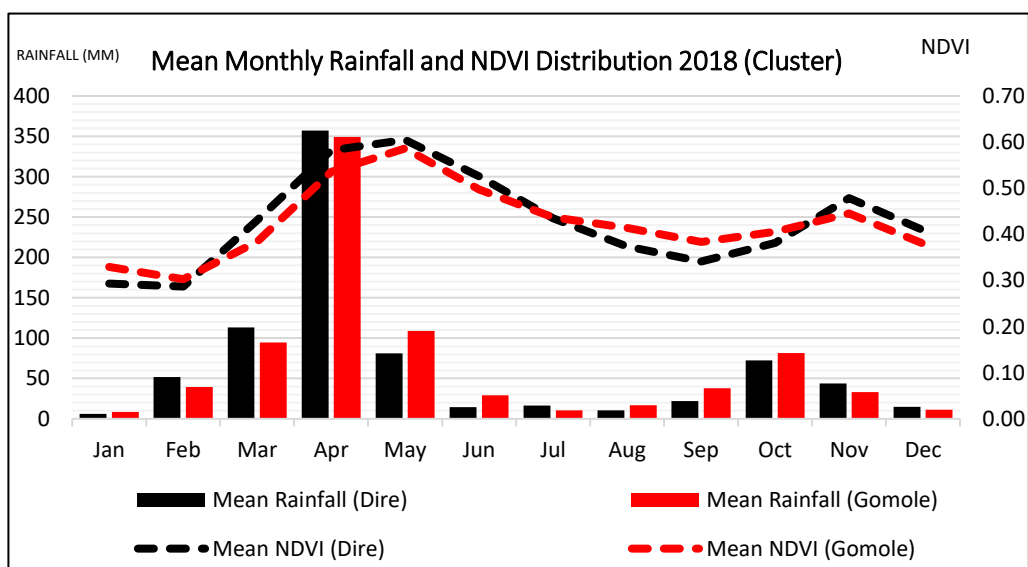
Despite this, each insurance cluster- Dire and Gomole in this case- is treated independently. The localised forage scarcity is averaged out, even though it affects individual households differently. In 2018, there were households in Dire that were not affected like Obda's by forage scarcity. As a result, they knew little about the challenges the likes of which Obda faced and did not make more effort to gather information. As long as the pasture conditions are "normal", pastoralists stay in their base camps and limit their mobility (Coppock, 1994 and 2016; Krätli, 2016).

Obda's experience corresponds with the quantitative forage analysis. Using the historical trend, the average index reading for Dire for the same season in 2018 was 37 percentiles, indicating "moderately healthy" forage conditions; however, where Obda resides and keeps his livestock, it was 16 percentiles, indicating "unhealthy" forage conditions. Because the IBLI's pay-out threshold is below the 20<sup>th</sup> percentile, pastoralists like Obda would have been eligible for an insurance payment. Nonetheless, the cluster level index fails to capture these intra-cluster differences, and no pay-out was provided.

Different pastoralists in the study sites have had very different experiences. In 2018, a female-headed agro-pastoralist in Gomole received a pay-out and was enthusiastic about livestock insurance. Qaballe, 41, obtained farmland in late 2017 after approaching community leaders and local government officials. *"My life has been filled with miracles, both good and bad. When they gave me the land, I was overjoyed. I wasted little time and began seeking someone with whom I might begin share-cropping. I don't know how to plough, and my oldest daughter is too young and untrained to push a pair of oxen beside me. Furthermore, I was worried that I'd lose the farmland if I didn't plant during the wet season. The person I agreed to share-crop (with) convinced me that the wind direction did not look natural and that I had to plant a short-growing crop, (maize), as soon as possible. In February,*

*we planted maize and covered the soil without seeing a single drop of rain. Despite the rain in late February and March being lower than it used to be, April had sufficient rain. Around mid-May, we harvested."*

As indicated in the chart below – Figure 6.4 - the rainfall and vegetation patterns at the cluster/Gomole level mirror Qaballe's personal experience. Although the aggregated seasonal vegetation level (March, April and May) was 0.5, it was considered lower than the historical average for the same season, resulting in a pay-out. Qaballe received a pay-out for the three cattle for which she bought livestock insurance. Although her region is known to have above-average forage conditions (Figure 6.1, second chart G5), most pastoralists and agro-pastoralists encounter drought there. For an agro-pastoral insurance cluster, where Qaballe lives, limited communal pastureland characterises the area, and households must rely on crop residue or other means of forage sources. Insurance is a good investment.



**Figure 6.4 Mean Monthly Rainfall and Vegetation distribution in 2018 in Dire and Gomole**

Drought conditions in pastoral areas take weeks or even months to develop (Coppock, 1994 and 2016). Nevertheless, the above discussions provide empirical evidence that localised droughts play a vital role in household-level risk exposure. IBLI's pay-out function is linked to an average, cluster level, and historical conditions. The assumption behind the model is that all areas within a cluster will be evenly exposed to covariate drought risk. Nevertheless, when disaggregating the cluster level, such covariate risks are seen to be highly uneven, and quite localised forage/vegetation availability dictates household-level exposure and

responses. Moreover, it is shown above that there is a heterogeneity of monthly and seasonal rainfall and NDVI levels. Therefore, reviewing the historical patterns of index calculation (vegetation analysis) under the IBLI model benefits some insured households but disadvantages others.

In failing to address such dynamics, hypothetically, households not severely affected by drought (forage scarcity) gain more when an insurance pay-out is made than those in the same cluster who have lost livestock due to such forage scarcity. These pastoralists face different risk portfolios despite living in the same insurance cluster, and so the insurance scheme protects the risk of forage scarcity for some but not others. This situation is known as spatial basis risk in the insurance industry.

Vrieling *et al.* (2016: 10) state, "It is unclear how effective an insurance scheme based on fixed seasonal definitions may be for such areas [arid agro-climatic zones]." The reason for this, as illustrated above, is that the IBLI model fails to recognise that each season has a distinct feature of rainfall and vegetation conditions, to which pastoralists adapt based on their cumulative experience. Furthermore, the intertemporal fluctuations of rainfall (start and end) are ignored.

Realistically speaking, the rains do not start on 1<sup>st</sup> March or 1<sup>st</sup> October, unlike IBLI, which monitors vegetation changes from these fixed dates. Contractually, fixing vegetation monitoring dates affects both pastoralists and the insurance company. Pastoralists consider IBLI a forage scarcity product that covers exposure to all drought risks occurring over an annual period, and all the training materials confirm that. Nevertheless, the monitoring occurs during specific months, such that early or late rainfall is not accounted for under the insurance policy.

In July 2021, while conducting fieldwork, I had an experience that demonstrated this. During the NDVI monitoring months, much of Borana seemed "densely" green due to good early rains in March and April. In contrast, the seasonal index results projected "no drought" for the dry season when seasonal aggregation was performed (details of this method are presented in Chapter Two). Because of the manner in which the model was constructed, misrepresenting the "greenness on the ground", insurance policyholders were told that there will be no payout. As a result, many insured pastoralists complained and were in the process of filing a charge against the insurance company. Although it was difficult to change the index readings, and further investigation into the features of the contract is necessary,

the insurance company made *ex-gratia*<sup>30</sup> payment (US\$ 55,000) to 1,053 policyholders. This might be considered a sound response from the insurance company, but it could not address the failure (design or contractual) of the model. Therefore, returning to the intrinsic meaning of insurance, “selection of risks” and “risk profiling” should be differentiated from “exclusion of risks” that have a direct relationship with the peril to be insured against.

Finally, inter-annual changes in pasture conditions are also noted in this analysis due to environmental and pastoral resource management activities. Pastoralists and agro-pastoralists control natural resources at both the individual and community levels, and their actions alter the dynamics of forage conditions. Such variations are known as ‘temporal basis risks’, and they are not covered by a cluster-based insurance design. The question here is which pastoralists’ practices, in relation to pastureland, are not considered in constructing the IBLI product, which I will discuss below.

### 6.3 Pastoral land Use Systems and Index Insurance

The above section presents the heterogeneity of pasture availability and access within an insurance cluster, and so the risk of drought differs across space. It also explains that IBLI amalgamates these varying profiles of forage distribution together in ways that do not represent the exposure to drought facing pastoralists within an insurance cluster. This is because pastoralists’ practices in resource management further deepen the complexity of pasture access with a changing dynamic at macro-, meso- and micro-levels.

#### Macro-Level Dynamics

*“Laftii Boranaa kutaa hin qabdu”*  
*“There is no boundary within Borana.”<sup>31</sup>*

The macro-level issues of pasture management are dealt with by the customary *Gada* councils and the regional government. The latest General Assembly (*Gumi Gayo*) in September 2020 deliberated various socio-cultural, economic and environmental issues for about two weeks. I participated in most discussions on resource management, conflict and other socio-economic and political matters. Two significant issues are relevant to list here.

---

<sup>30</sup> *ex-gratia* is a payment made by an insurer as a goodwill gesture to an insured. The company is not legally obliged to make such payments; rather it is done on a voluntary basis.

<sup>31</sup> Amendment of Law during the 2020 *Gumi Gayo* [https://www.youtube.com/watch?v=KDysl\\_i-kEo](https://www.youtube.com/watch?v=KDysl_i-kEo)

First, the banning of pasture enclosures, locally known as *kallo*, in agricultural lands. Pasture enclosures became legal in Borana during the 1973/74 *Gumi Gayo*; prior to that, they were sporadic and culturally unacceptable (Tache and Irwin, 2003; Tadesse, 2010). Although *kallos* are prime dry-season pasture sources, they have encountered some challenges in recent years. There is an increasing trend towards privatising *kallo*, which are community properties residing in one area. The General Assembly held in 2004 discouraged these practices, despite pastoralists' breaching of the rules by claiming the land they own is farmland. The latest assembly acknowledged the fragmentation of pasturelands and deplored their privatisation in the name of private farmland. Consequently, the conversion of *kallos* to farmland was outlawed, and anyone found violating this rule would be fined five cattle.

Second, despite the fact that indigenous institutions governing land and pasture have been up and running, external interventions in the name of development and state-led governance have disrupted a relatively equitable distribution of resources (Helland, 2002; Tache and Irwin, 2003). As discussed previously, after a cooperative was established by the government, a ranch in Dire was handed over to wealthy pastoralists. In the 1960s and '70s, the central government enclosed close to 50,000 ha of land, a prime dry season pasture and water source for many pastoralists (Tache, 2000).

Following the fall of the *Derg* regime in 1991, ownership was passed to mostly wealthy pastoralists who established pastoralists' cooperatives. Such large-sized lands are not delineated and cropped out despite they affect monitoring cluster-level forage distribution. There are five different ranches in Borana under different ownership statuses. The ranch in Dire controls an area close to eight per cent of the total land in the cluster. There are 170 members of the cooperative, but a little more than 20 are active and graze a few thousand cattle for commercial purposes. The current *Gada* leader and some council members favour the cooperatives, but some stand against them; therefore, nothing has changed. Those who oppose the current ownership by the wealthy request government and customary leaders facilitate the transfer of the ranch to those more than 1,000 households residing surrounding it. Failing to recognise such resource management dynamics has compromised the clustering and risk-profiling processes. In Gomole, close to 4,000 ha of land is fenced off and owned by the regional government of Oromia for its breeding activities (*ibid*).



**Picture 6.1 Gumi Gaayo, Day 9 of the General Assembly on September 06, 2020**

In recent years, despite the federal and regional governments showing hesitancy in their recognition of pastoralists' land use and resource management practices (Helland, 2002; Tadesse, 2010; Tefera et al., 2016), new initiatives have been underway. As part of a pilot project under Oromia rural land proclamation, Art-1 (1, A) of draft *dheeda* (rangelands) administration guidelines and Art-174 (ORG, 2016), three (Dire, Golbo, Malbe) of the five rangelands in Borana obtained certification. After a series of consultations, customary rangeland councillors and legislators from the regional government agreed to provide a certificate at the *dheeda* and *reera* (sub-*dheeda*) levels.

There are three central features worth noting here. First, the directive decreed that customary (traditional) law should govern the land in Borana and that the government should provide technical support. Second, it stated that all private holdings of pasture, after fair compensation, should be transferred to respective *dheeda* for communal management. Finally, and in contradiction to the first, the government should have the ultimate power over land administration (Kenennisa, 2020). Although it is too early to know the immediate effect of these interventions, evidence suggests that customary land-use and governance structures are better options for communal land certification than land certification using administrative boundaries (Sendaa et al., 2020).

IBLI's model, however, does not recognise any of these dynamics, whether led by customary or state institutions. Demarcations of large plots of land that can affect and change a given insurance cluster's risk profile are missed. While the insurance clusters try to accommodate

administrative boundaries and agroecological differences, these processes of land-use change are not accounted for.

### Meso-Level Dynamics

*"The management of pasture starts with adhering to the rules. The implementation is particular to a given community."*<sup>32</sup>

There are many pasture management practices in Borana (see, Tache, 2000; Helland, 2002; Tadesse, 2010; Tefera et al., 2016; Kenennisa, 2020; Sendaa et al., 2020). Despite the existence of localised governance styles, the most common practices are:

- *Seera yabiyee* or *jabillee* - reserved for calves.
- *Kallo* – a pasture closer to the home on a community plot and *kallo dhunfa* (private enclosure)
- *Matta tikka* - Communal open grazing land; communities have started fencing in some areas.
- *Seera hawicha* (home-based lactating animals' reserves) grazing area
- *Guessa* – pasture for dry herds found away from home

The rules (*aada'seera*) of these and other pasture resources are made at *Gumi Gayo*, but the practices are left to be adapted to local contexts and dynamics. As Tache (2000) and Tadesse (2010) point out, territorial units, such as *olla* (village), *arada* (cluster of *ollas*) or *reera* (cluster of *aradas*), are responsible for managing these pasture resources. This means that the governance of pasture resources is decentralised.

Figures 6.5 and 6.6 show a satellite image that illustrates such dynamics. The *aradas* and *reeras* in Gomole are near non-functional as much of the lands have changed to privately-owned farmlands (see Chapter Four on the transition of rangelands to farmlands). A few remaining *kallós* exist (bottom right, Figure 6.5) in areas where farming is less suitable or on hillsides. Moreover, the expansion of Yabello town and associated infrastructural amenities has hastened the transformation of lands to non-pastoral forms of use. In areas where farming persists, livestock production exists at the homestead level. Crop residue and purchased feed are the primary sources of feed. Pocket areas between villages and farms

---

<sup>32</sup> Gayo Qalla, 48, a medium-wealth category insured in Dire, who dropped out of insurance in August 2020.

serve as open grazing lands without rules similar to those mentioned above or restrictions on daily grazing (number and type). *"Most of these rules are now part of our history, not our daily practices"*, explains Nura Jilo<sup>33</sup> in Gomole. He continues, *"How many times have I met you in the last couple of days while wandering with my calves. There are no open places to graze animals, so I simply take them around the villages and return. I feel they are in an open jail"*. In other words, in Gomole, the land is a mosaic of different uses, with different access arrangements, and not the uniform pattern assumed by the IBLI model.

By contrast, the pattern in Dire is less affected by the growth of cropping due to the agro-climatic conditions and the persistence of community rules restricting farming. It is against the rules of the *Gumi Gayo* to change pasturelands into farmlands. If one wants to start farming, lands left for 'general' purposes are provided after approval from traditional resource managers and *kebele* administrators. Those who own farmlands keep it as a potential future 'asset' due to the insecurity around communal resources, but they do not farm on it unless they expect favourable rains. However, land access is affected in different ways. There are 13 *kebeles* (the lowest formal administrative structure) in Dire, and on average, each *kebele* has between 20 and 28 community *kallo*. *Matta tikka* and *forra* (remote) grazing areas exist at *reera* or *dheeda* levels. As shown in Figure 6.6, pasture enclosures for calves and lactating animals are found close to villages. This array of *kallo* areas, each with different access arrangements, therefore, challenges the assumption of the IBLI model that access is uniform inside the insurance cluster.

Qalla<sup>34</sup>, an insurance dropout, explains the localised pasture management as *'We have strict rules on enclosures. As of now [August 2020], the enclosures for lactating animals (hawicha) are open but not for calves (yabiyee); they are grazing with the lactating cows. We assessed the situation here and in the remote pasture areas, the number and diversity of livestock among community members. The situation looks good, so we decided to reserve most of the enclosures meant for calves.'* In the same cluster, Dire, where Obda<sup>35</sup> lives, the management is slightly different for the same period. There were good rains in late 2019 and early 2020, and a considerable community pasture enclosure was left untouched. Pastoralists in his locality discussed the issue and concluded that keeping it as it is might not help a new pasture grow. Therefore, they decided to open the enclosure for fourteen days. Unlike in

---

<sup>33</sup> Nura Jilo, 88, is an uninsured medium wealth category individual in Gomole.

<sup>34</sup> Qalla is a 44-year-old medium wealth group individual from Dire, who dropped out of the insurance scheme.

<sup>35</sup> Obda is a 54-year-old medium wealth group individual from Dire, who dropped out of the insurance scheme.

the past, members could not bring their animals; instead, they cut the grass and took it home – either to use as a reserve or for immediate consumption. Hiring daily labourers to cut the grass in those days was also allowed. Obda stated, *“If you do not fear God, you can hire as many daily labourers as you can, but pastoralists here are not that bad. Some hired four or five labourers because they have many livestock and cash to do so.”*

Meso-level pasture governance also considers spatial distribution of soil types, topography and availability of water. Certain areas are enclosed based on one of these criteria. For example, areas that provide sufficient pasture to different kinds of livestock simultaneously (browsers and grazers) are not frequently visited; instead, they are reserved for the dry season. Specific patches may be utilised 10 or 20 times, as patches of high production are most likely to be found alongside rivers or run-on areas (Swallow, 1994). Nevertheless, as shown in Figure 6.5 below (top right, green vegetation), such high production areas in Gomole have been entirely converted to farmlands, which in turn affects pasture governance and land-use features.

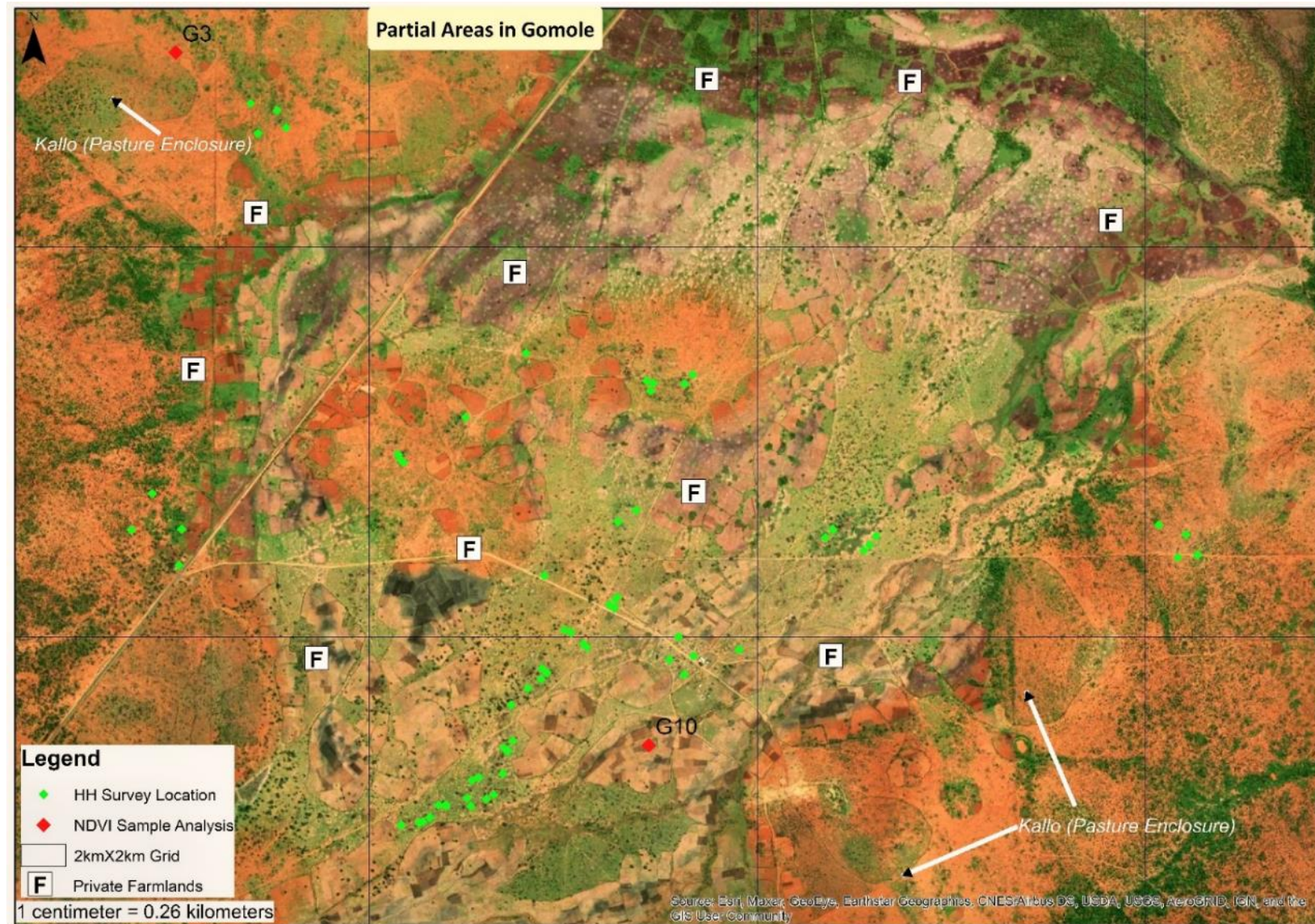
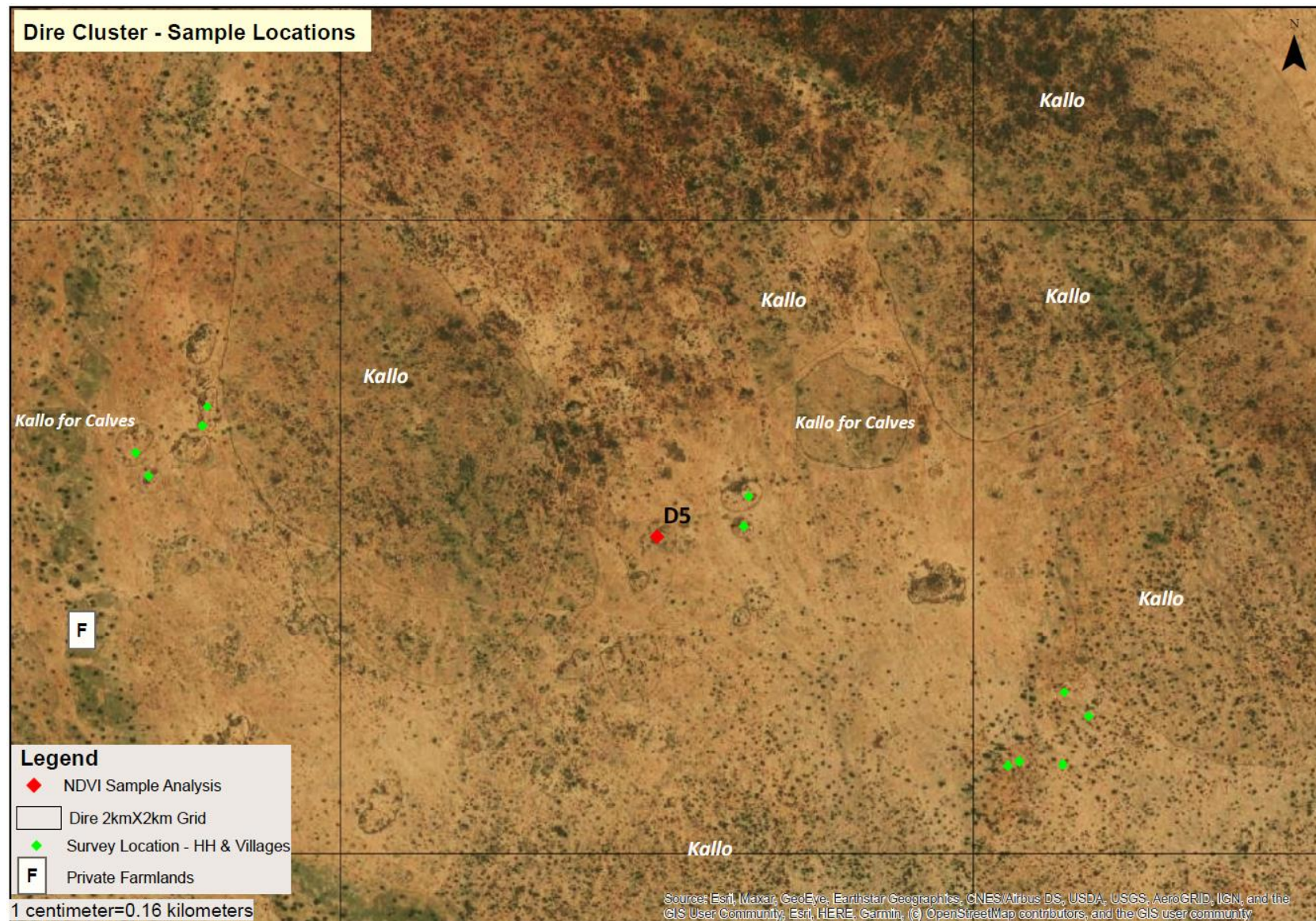


Figure 6.5 Partial Areas in Gomole, in 2019.



**Figure 6.6 Partial Areas in Dire, in 2019.**

Assumptions about uniform access are therefore challenged in both locations due to particular patterns of land use fragmentation and conversion affecting the rangelands. Pasture quality also varies over time, and across space in quite unpredictable ways. For example, the long rains of 2021 were poor. Despite the fact that there was a general shortage of pasture, it was not the same in all parts of Dire. The northern portion of Dire has several smaller pasture enclosures dedicated to calves and nursing animals, each with its own set of management features. The image below depicts a tense verbal exchange between six pastoralists. According to the local regulation, anyone bringing cattle older than one year, or outside the agreed-upon days of grazing animals, would be penalised. Animals owned by four pastoralists were spotted in the enclosure and arrested (the thorny fenced area is where they kept the animals). A poor older adult claimed he did not have access to pasture and could not afford to buy feed or migrate to remote places, so he refused to pay. A wealthy pastoralist paid for two of his cattle and bargained to be exempted for the other two. A woman who had paid the fine earlier stood nearby, watching the exchange and demanding a refund if any animal left the “prison” without a fine having been paid. Unlike in Gomole, the youth in Dire follow the local rules strictly – confining animals and fining owners.



**Picture 6.2 Verbal exchanges between livestock owners and youth who detained livestock found in communal property**

Hence, pasture governance and so access to rangeland resources vary based on location, season and the community managing the resources. These practices all result in high levels of heterogeneity of forage availability, both seasonally and spatially. This contrasts

dramatically with the assumptions of the IBLI model. The derivatives employed to cluster an insurance unit are uniform and static, but existing pastoral practices are complex and respond flexibly to the changing environment and variable conditions of the rangeland. A standard risk profiling of forage conditions will therefore misrepresent the features on the ground.

### Micro-Level Dynamics

The above sections set out the variability of pasture distribution and management at large (Borana) and semi-large (meso-/community) levels. The complexity increases from macro- to meso- and then to micro-levels. The misconception of most disaster risk financing schemes in the pastoral area lies in the interaction between individualised decisions (micro-insurance) and covariate risks (macro-/meso-level effects). Risks are presumed to be covariate, and so shocks are distributed to individuals equally (Chelanga et al., 2017). Therefore, through index insurance, the supposed 'same' risk of drought (as a form of forage scarcity) in an insurance cluster can be diversified (Chantarat and Mude, 2010; Chantarat et al., 2012).

The heterogeneity within insurance clusters where drought is assumed to have a uniform (covariate) impact becomes even greater if social differences such as age, wealth and gender are factored in. These factors determine how drought risks are perceived and responded to (see Chapter Seven). Wealth status is one key factor influencing micro-level adaptive capacity (Lybbert et al., 2004; Aklilu and Catley, 2010; Coppock et al., 2018) and influencing individualised decision-making, as illustrated by the following case.

In the area where Obda lives, pasture management in response to the 2018 forage scarcity differed among wealth classes, such that Obda migrated to Gomole (discussed at the start of this chapter). Wariyo, an insured pastoralist, secured 2 ha of land and planted improved grass. He confirms, *"It is normal to lose one or more cattle during a typical drought period, and I decided to sell those I believe are weak. I expected the feed reserved from the community and private kallo to be sufficient for all my livestock. If not, I have identified areas to which I can transport my livestock other than those lactating, using a lorry."* Another pastoralist, Roba, 30, lives in the same locality but opted for a different strategy. Despite his low wealth status<sup>36</sup>, he has two wives. The main reason for this is that he seeks to

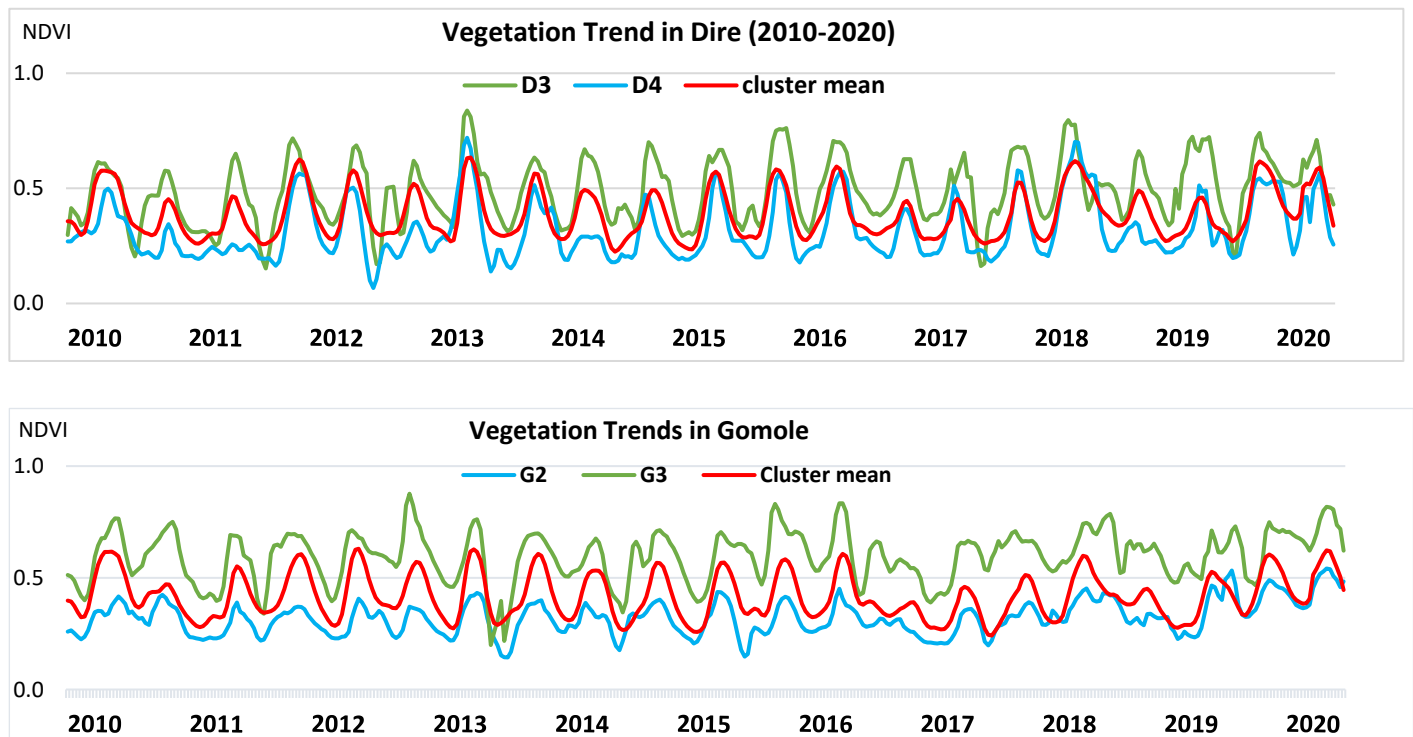
---

<sup>36</sup> Customarily in Borana, pastoralists tend to marry more wives when their wealth increases.

accumulate resources due to the uncertainty over his livelihood. *“I am not sure which area is convenient for pastoralism and farming; I want both and hence established a family at a young age in two areas that I believe have different land and vegetation types.”*

Obda is in a medium wealth category; Wariyo is rich, whereas Roba is poor. During the normal season, access and utilisation of resources rely heavily on communal pasturelands. Nevertheless, the dynamics become complex when resources are dwindling, and wealth-related responses become crucial. It is therefore impossible to condense the exposure to drought into a single risk.

Interestingly, the experiences of Obda, Wario and Roba are similar to those that the NDVI trend in some of the selected cells displays. Figure 6.7 displays the vegetation patterns of two cells located nearby in Dire (D3 and D4, top) and Gomole (G2 and G3, bottom). The analysis and data presentation are similar to the previous chart (Figure 6.3). By looking at the cells in the figures, indicating NDVI and so forage scarcity, we can see a highly variable pattern across space. Such variability is heightened at times when resources are limited during drought. Simply aggregating and assuming a mean for the purposes of the insurance model hides this variability. Yet making use of variability – facilitated by access to resources linked to wealth, networks and other relations - is essential for local responses, as the above cases show.



**Figure 6.7 eMODIS NDVI in Dire cluster between 2010 and 2020**

*Source (raw data):* U.S. Geological Survey, by NASA; analysis by the author.

Therefore, pastoralists pursue divergent pathways in response to drought in a particular area. Drought risk is multi-faceted and influenced by a variety of factors, including the amount of water and pasture required, as well as relationships and networks, pastoral backgrounds and other economic and social-environmental elements. Pastoralists respond adaptively to variations in resource availability over time and space and deploy different resources for this. Such variations are not predictable – one patch may have rainfall one week, then none the next. This requires continuous adaptation to uncertain conditions. Unlike the assumptions of the IBLI model, where a level of risk is predicted for a whole area, the exposure to drought is much more varied and complex in practice. Despite IBLI being widely heralded as one of the mechanisms protecting pastoralists during drought-related shocks, such factors are not considered in insurance. This, in turn, compromises the insurance product's purpose to protect the poor and most vulnerable groups.

Recent research on drought in Ethiopia highlights two key issues. Firstly, the drought in 2015 was the worst in five decades but had no apparent adverse effect on household welfare, including household consumption and child malnutrition (Hirvonen et al., 2020). Secondly, the impact of variations in rainfall was not identified in vegetation anomalies. The experiences detailed above in Dire and Gomole show that there are significant differences within clusters with respect to drought risk, and that wider institutional (governance) as well as individual factors (wealth, relationships, and ability to move livestock beyond the cluster) all influence drought exposure and responses. Extreme drought is not the only cause of famine; socio-political and institutional issues affect access and entitlements also play vital roles (e.g., Sen 1981; Devereux 2009). In Borana, a rain failure will not automatically lead to shocks among all households in the same cluster equally.

#### **6.4 Where does the risk of drought fall under IBLI?**

IBLI recognises these two clusters, Dire and Gomole, independently, and these insurance units have “well-defined risks”. The historical vegetation trends within a cluster and pastoralists' practices indicated that the “well-defined” risk of drought is much more diverse. Accordingly, it is assumed in designing IBLI that an insurance cluster displays a homogenous risk profile that the premium rates, effects of droughts, and thereby pay-out, are the same. This is, however, contested and begs the question: is the index-based insurance model a good fit with the lived experiences of drought by Borana pastoralists? Several points need to be considered to provide a clear answer.

First, when designing IBLI, macro-, meso- and micro-level dynamics are not explicitly identified and considered as to how they will affect a given insurance cluster over the years. This is because, in the study areas, there are both spatial and temporal basis risks. According to Fava and Vrieling (2021: 48), “basis risk remains a critical concern for index-based disaster risk financing schemes” to bring quality and sustainability. Since index insurance will not indemnify actual losses, there are some basis risk levels, which are “practically inevitable” (Jensen et al., 2018: 8). Nevertheless, the scale of such ‘basis risks’, which can be determined from a range of factors as discussed above, suggests that this is an important limitation of the IBLI design.

The distribution of vegetation varies, especially in locations where the NDVI values are lower than the average (cluster mean). These places are more vulnerable to forage scarcity than the rest. In technical terms, this scenario is spatial basis risk; it is the difference between the calculated drought level (forage scarcity) at the cluster level and the actual pasture condition at the micro-level (Johnson, 2020). Such average mean vegetation disregards heterogeneity of forage scarcity and, in this case, localised droughts. As a result, the index triggered might not trigger where insured households are losing livestock (Clarke, 2016; Carter et al., 2017).

Secondly, from the IBLI longitudinal study, only a third of livestock mortality accounted for the presumed covariate risk of drought (Jensen et al., 2016). As previously discussed, this illustrates how pastoralist practises play an essential role in vegetation governance that extends beyond rainfall distribution and thus understanding causes of livestock mortality (see also, Porter and White, 2016; Sohnesen, 2019; Hirvonen et al., 2020).

Third, as discussed above, rainfall distribution, vegetation conditions and risk-profiling in Borana and under the index insurance model, do not match. The relationship between seasonal rainfall distribution and vegetation status is positive but not strongly correlated in both study sites. Quantitatively speaking, annual rainfall is moderately correlated with vegetation trend. The Pearson correlation coefficient, for example, suggests a medium correlation of  $r=.32^*$  in Gomole and  $r=.42^*$  in Dire at a 95% confidence level<sup>37</sup>. The extensive privatised land-use practices in Gomole: cropping, increased heterogeneity, and individualised decisions on the plot of land a household owns, all influence cluster-based risk-profiling.

---

<sup>37</sup> 120 monthly rainfall and vegetation averages were analysed for both sites.

As discussed in Chapter Two, an insurance pay-out is triggered before the incidence of drought to enable pastoralists to protect their livestock by availing cash. This helps them to purchase the necessary supplements to keep their livestock alive. It means that the insurance model is designed to forecast the probability of forage scarcity based on the changes during the rainy season. As a result, IBLI is both a backward- and forward-looking probabilistic insurance model. It is backwards-looking as the current season's vegetation status of a cluster is compared with similar seasons over the last 20 years. It looks forward, as it predicts the likelihood of forage scarcity based on the current season's rainfall distribution and forage build-up. This is a linear presumption, whereas the above discussions illustrate that forage conditions/availability are non-linear and uncertain and conditioned by layers of governance.

Moreover, relying on a single indicator of further projection undermines the accurate 'risk profile' of an area. For one thing, the above practices of pastoralists at the macro-, meso- and micro-level are evolving (Section 6.2). The presence of variability of vegetation within each cluster (Section 6.1) illustrates that the assumed level of covariate risk at the cluster level is not representative of all areas. Secondly, the rainfall is too highly variable to predict vegetation trends accurately during rainy seasons. The third point mentioned above is a moderate correlation between rainfall and vegetation levels.

The figure below, 6.8, provides a good insight into the changes in rainfall and the trends of vegetation annually. All main rainy seasons have a moderately healthy vegetation distribution, but the rainfall is highly variable. If we compare the rainfall distribution of three consecutive years, either from 2010 to 2012 or 2015 to 2017, we see that the variability is very high, but the vegetation change was minimal. Consequently, the impact on livestock mortality due to drought (from rain failure) varies from season to season and year to year. From various studies conducted in northern Kenya (which borders Borana), the impact on cattle mortality from droughts regarded as 'extreme'<sup>38</sup> from 1952 to 2009 varies from 35 per cent to 80 per cent (Opiyo et al., 2015).

---

<sup>38</sup> In the study by Opiyo et al. (2015), Standardized Precipitation Index, SPI, is used as a drought indicator.

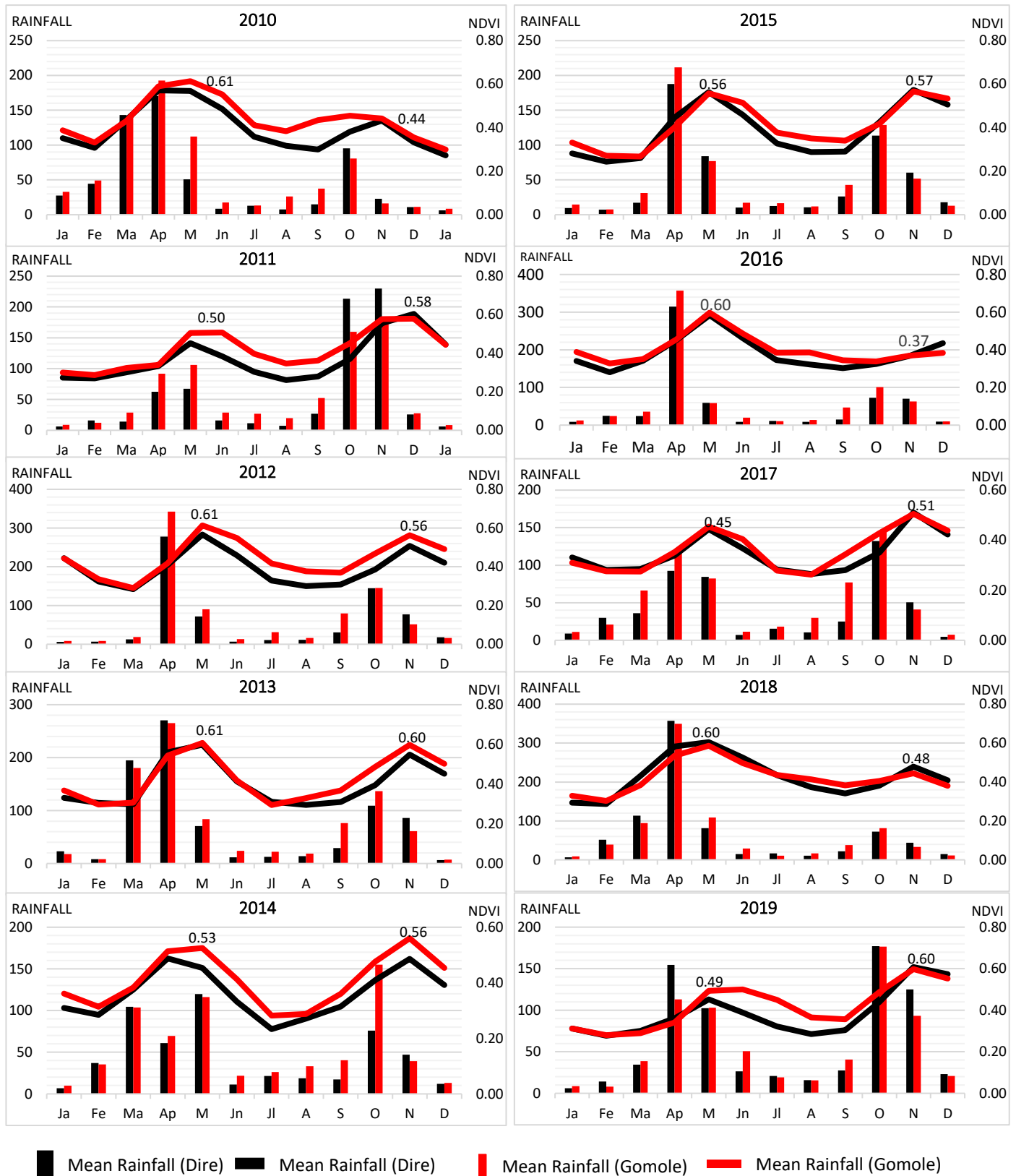


Figure 6.8 Annual Rainfall and Vegetation Trend from 2010 – 2019.

It should be recognised here that a pay-out is not a function of one rainy season/vegetation; rather it is how the current season is as compared to similar seasonal historical trends. Nevertheless, the limitation is that rainfall trends, and associated seasonal vegetation, are not strongly linked. Moreover, the broader practices of pastoralists – pasture management and cropping (in Gomole), and other livelihood activities, follow seasonal rainfall distribution, influencing pasture resources and governance at the meso- and micro-level. Such practices are not comprehensive but differentiated by location, wealth, gender and age. Therefore, the linear and “precise” model of “risk-profiling” and insurance contract design in IBLI does not represent all these complexities. Moreover, households in an insurance cluster will not benefit equally from pay-outs that are deemed to be derived from an identical “covariate risk” exposure within such a cluster.

All pastoralists in an insurance cluster are not equally exposed to drought risk. Their actual experience demonstrates unequivocally that there is another dimension to drought that does not conform to the “standard” drought assumption set out in an insurance model.

## 6.5 Conclusion

The discussion in this chapter aims to present the localised incidents of forage scarcity (drought). Index insurance reduces the variability of rainfall and forage distribution within insurance clusters to the mean. This, in turn, benefits some pastoralists, and others are disadvantaged. The chapter has highlighted how risk profiles constructed within index-based insurance models overlook some key aspects of pastoral practice. By assuming a predictable, uniform risk across an insurance cluster, the array of responses to real-life uncertainties that are central to diverse pastoral practices (varying across wealth, age, gender and location) are ignored.

First, in constructing the IBLI products, it is assumed that rain (of the short and long rainy seasons) starts and ends on a specific date. As discussed in Chapter Two, this is known as the “IBLI product cycle”. Accordingly, the distribution and trends of vegetation growth are considered to fit into the same months and dates rather than accommodating variability. The phenology of vegetation is therefore assumed to fall within a specific calendar, but this ignores the particular characteristics of plant quality/availability in extreme dry season forage situations. As depicted in the charts above, Figure 6.8, the distribution of rainfall and therefore growth of plants is not static; it changes through seasons and months, yet a rigid contract cycle that excludes such features characterises IBLI. Moreover, such mismatches

have forced the insurance product underwriter (discussed above and in Chapter Nine) to make an *ex-gratia* payment to all insured pastoralists as the index results of 2021 (long rain) failed to reflect the actual losses.

Second, the different resource governance practices and the changing dynamics of land-use at different levels (macro-, micro- and meso) are complex and vary inter-temporally and spatially. Moreover, decentralised vegetation management is distinctive and different from the average level pattern considered under IBLI. In addition, land-use patterns and migration are assumed to be static inter-temporally under IBLI, yet in practice great variability can be seen.

Third, mobility is highly influenced by the spatial and temporal factors of pasture and water resources and livestock conditions (type and number) (Coppock, 1994; Little et al., 2001; Coppock and Desta, 2004). Moreover, mobility is not the same for browsers and grazers, and foraging in an area also considers these dynamics and competition over resources (Liao et al., 2017). These aspects are not static as assumed by the IBLI model, and movement is always flexible, responding to uncertain events.

Furthermore, within IBLI both premiums and indemnity are assumed to be the same for all pastoralists within a cluster, as part of the risk profiles developed under the models. In other words, index-based insurance is designed as a “one-size-fits-all” product: all households are assumed to face the same risk level of drought, expressed through the same premium rate; and responses and effects of drought are the same. This assumption fails to recognise the fact that drought effects are not the same among all households. Pastoralists differ in their exposure to different risks, and their perception also varies across space, time and pastoral background.

In sum, this chapter sheds light on index insurance modelling by employing historical rainfall and vegetation analysis, and pastoralists' practices at macro-, meso- and micro-levels. The practices of pastoralists on the ground are flexible and pragmatic, responding to variable and uncertain conditions. In contrast, the IBLI approach requires a standardised approach, premised on predictable risk and uniform effects. These complexities are, in turn, reflected in the perceptions and experiences of drought as faced by pastoralists, which the next chapter (Chapter 7) will discuss.

## Chapter Seven: Perception and Conceptualisation of Risk

## 7.1 Introduction

The risk of drought is one of a range of overlapping risks and uncertainties with which pastoralists engage (Scoones, 1995; Coppock and Desta, 2004; McPeak et al., 2012; Catley et al., 2013). Different pastoralists also perceive the multiple forms of risks and uncertainties differently. In linking with livestock index insurance, this study's central argument is that diverse perceptions towards different sources of risk and uncertainty go beyond a singular concept of 'drought'. Notably, the thesis asks how different actors in an index insurance system perceive risk and uncertainty. How does this affect how they respond? This chapter contrasts the perspectives of those who design the insurance product, such as project implementers, modellers, actuaries, brokers and others, with those of pastoralists on the ground.

Among index insurance product-modellers, actuaries, underwriters and brokers, drought is constructed in a particular way, and so 'perceptions' of insurance units, premiums, pay-out triggers, index measures and purchasing clients are guided by this. The risk of drought expressed as pasture shortage is perceived as an objectively-measured probability event. This peril - pasture shortage due to rain failure - is defined, calculable, and can be associated with a particular trigger, in IBLI's case, using the NDVI. An area's drought status can be determined through NDVI reading linked to satellite imagery. Therefore, it is a notionally objective risk measure that allows the setting of premiums and pay-outs to individuals to protect privately-owned (and therefore insured) assets, namely livestock.

Furthermore, insurance advocates perceive drought in various ways. It is believed to have covariate incidence, which means that it impacts all households in an area roughly equally. As a result, all pastoralists in that area, in other words, the insurance unit (cluster), pay the same premium level and receive the same pay-out. The shock-absorbing capacity of households is perceived to be equal to that of the cost of keeping an animal alive during drought seasons. Such costs are presumed to be the same for all pastoralists in a cluster; therefore, pay-outs per insured animal type are distributed equally. Moreover, the average loss due to drought that all households in an area experience can be attributable to an objectively monitored indicator – NDVI, under the IBLI model.

However, while the failure of rains causes drought/forage shortage, poor rainfall exists alongside a myriad of other risks and uncertainties, including conflict, disease, locust plagues and family misfortunes, all of which are entwined and influence how drought is perceived

and experienced (McPeak et al., 2012; Catley et al., 2013). There are multiple and intersecting factors, but these are believed by insurance designers to have a minor impact on livestock mortality compared to a covariate drought risk (Chantarat et al., 2012 and 2017).

Risks and uncertainties are not simply felt individually; rather, they impinge on the family, wider kinfolk and clan groups. Accordingly, individual, household and wider-societal exposure and experience are important in the conceptualisation of drought risk. Drought is thus not only a solitary risk, but one with a broader scope and scale. Although drought risk is intended to be a covariate incidence in the IBLI model, it is distributed evenly among individuals as a sort of premium by excluding all other factors related with it. When a drought risk is financialised as a form of livestock insurance, the animal in question is not necessarily individually-owned, but rather linked to household, village, community, and clan dynamics of resource and asset sharing. Furthermore, as the previous chapter shows, drought does not necessarily affect an individual, a family, or communities in an area equally. Therefore, drought is perceived by an insurance promoter quite differently to how pastoralists perceive, experience and respond to it. Moreover, among pastoralists, too, the conception of drought varies.

Various studies (Tache, 2000; Flintan, Cullen, and Latosky, 2011; Anbacha and Kjosavik, 2019) indicate that aspects of social difference, including age, gender, wealth and location, are the core factors in understanding how risks and uncertainties are perceived. This chapter challenges how drought risk was conceptualised under the IBLI model and the uniformity of its effect on pastoralists. Multiple approaches are employed to strengthen the argument. First, pastoralists rank what they perceive to be as important sources of risk and uncertainty. Second, to statistically understand patterns of pastoralists' experiences following the catastrophic drought period in 2019, the Likert scale, disaggregated by insurance categories, is used. This will give a thorough examination of whether the drought impacts all pastoralists in an insurance cluster equally. Finally, this chapter will explain how, if, at all, pastoral backgrounds and different points of view affect understanding of where financialisation of risk, as a sort of livestock insurance, fits into these differing points of view.

## 7.2 Multiple Perceptions

### Free listings of risk perceptions

The temporal and spatial distribution of rainfall plays a crucial role in pasture availability (Smith et al., 2001; Anbacha and Kjosavik, 2019). However, as discussed in Chapter Six, different resource governance structures determine forage availability in an area, and vegetation condition goes beyond rainfall distribution. The assumption under index insurance is that forage scarcity is a covariate and affects all pastoralists in an insurance cluster equally, on average (Chelanga et al., 2017). Yet, do pastoralists perceive there to be a single source of forage scarcity in an area? And are the effects of drought the same among all pastoral groups in an insurance cluster?

To answer these questions, I employed a retrospective analysis, where pastoralists ranked the impact of the different risks they faced, from no impact to very high impact. But first, pastoralists were asked to free-list the three most important sources of risk and uncertainty faced in 2010/11 and 2018/19. This is then correlated with vegetation changes at the cluster level.

As shown by the table below (Table 7.1), in 2018/19, conflict was the most important source of risk in both study sites, selected by 64 per cent of households. Drought, at 18.7 per cent, took second place, followed by livestock disease, reported by 3.3 per cent of households as the top source of risk. In 2010/11, however, drought was ranked as the foremost source of risk by 70.7 per cent of households. Conflict and livestock disease followed, respectively, at 19 and three per cent. This is an initial indication of the temporality of the source of risk and uncertainty. Perceptions are also classed according to gender, whereby 67 and 15 per cent of males reported conflict and drought as the major risk, respectively, while for women it was 57 per cent and 21.5 per cent.

**Table 7.1 Foremost source of risk– Free list\* (per cent)**

Sources	Source of Risk and Uncertainty in 2018/19		Source of Risk and Uncertainty in 2010/11
	First	Second	First
Conflict	64	16	16
Drought	18.7	35	35
Livestock Disease	3.3	12.7	12.7
Water Shortage	2.3	2.7	2.7
Insecurity - National Politics	2	2.7	2.7
Others	9.7	13.7	13.7
Answered	-	17.3	17.3
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>

\* 14 different sources of risk were reported and aggregated here as others.

Cluster-level NDVI results show that a severe drought in late 2010 and early 2011 hit the entire Borana zone very hard. This incident was followed by a major conflict between Borana and Gari (Somali tribe) in the eastern part of the region and with Konso in the western part of the region. According to Feyissa (2014), during the war between Borana and Gari in 2012, more than 30,000 people were displaced on both sides. The cause of the conflict was not related to drought; rather, pockets of land around Moyale were occupied by pastoralists (*ibid*). During a further conflict between Borana and Gari in 2018, dozens of lives were lost, and close to 100,000 were displaced on both sides (UN-OCHA, 2018). In areas where severe violence was recorded, the vegetation situation was normal on both sides. Nevertheless, access to pasture in conflict-prone areas was almost non-existent. Consequently, forage scarcity was, in this case, related to access/governance. Although pastoralists in Dire wanted to migrate to areas bordering the Somali region following the long dry season in 2019 and 2021, they remained in nearby areas due to fear of conflict.

Moreover, drought and conflict are both covariate and individualised sources of risk and uncertainty. They are individualised, as not all pastoralists are exposed to conflict. The death of an individual directly affects their household, but a loss of a dry season pasture due to conflict affects the entire community, albeit disproportionately for some. Environmental and resource governance-related issues therefore can lead to 'drought'. A rain shortage might not necessarily lead to drought across all of that locality (as discussed in Chapter Six). Even during good rainy seasons, access to communal pasture can lead to 'man-made' drought, as community members decide to keep it as a reserve and access is restricted, despite some needing to graze their animals.

The causes of drought and conflict also take different forms, exacerbating uncertainty. For example, conflict in Borana is no longer a question of access to resources such as water and pasture. Indeed, conflict dynamics have acquired local, regional and national political dimensions (Temesgen, 2010; Odhiambo, 2012; Feyisa, 2014). The above table illustrates how risk and uncertainty change over time and interact. However, factors like conflict, which affect how pastoralists perceive and respond to drought, are not factored into index-based insurance risk profiles based on a single indicator (NDVI-measured forage availability).

### Drought Risk: Perception and Experiences

In 2019, following the severe drought season (failure of the long rainy season of March-May), OIC, the underwriter of IBLI products in Borana, made one of the largest indemnity

pay-outs to 3,000 pastoralists, totalling ETB 4.8 million (approximately US\$170,000). For the insurance promoter, pastoralists in Gomole and Dire were seen to be affected equally (within their cluster) and that the same amount of pay-out per animal should be made. But how did pastoralists perceive and experience drought conditions that year? Were the effects of drought for different pastoralists experienced the same way? Although it was a particularly severe drought, was the risk that pastoralists faced due solely to a shortage of pasture caused by the rain failure?

Table 7.2 below depicts the multiple causes of pasture shortage that pastoralists experienced in 2019. Pastoralists were asked to list and rank several sources of risk that they experienced that year and allocate weights<sup>39</sup> to each. This was then calculated to reflect the average effect of a given source of risk, disaggregated by insurance category and location. The closer the mean (average) result to five, the more significant the impact of a given source of risk on a household, with the opposite holding true for lower figures.

As illustrated in the table, three interrelated factors are mentioned and ranked as causes of forage scarcity - rain failure, conflict and land-use change. The leading cause of pasture shortage among all pastoralists in Dire was a conflict (with a mean impact of 4.2 out of 5), with some differences within each insurance category. This is followed by rain failure ( $\bar{x}=3.17$ )<sup>40</sup> and land-use change (1.6). By contrast, land-use change is the leading cause in Gomole (4.19), conflict takes second place (3.9) and rain failure as a cause of pasture shortage comes third (3.16).

Perceptions are therefore location-specific and not similar across the three insurance groups. The insured households experienced that the lack of rain had the biggest effect on the availability of pasture in Dire (4, or high impact). The second-highest perceived effect of rain failure was reported by the insured category in Gomole (3.9). The perceived impact of rain failure shifts from active policyholders to dropouts and non-policy holders in both sites. There is a strong perception that cattle are the most affected by drought, and active policyholders own the largest per capita amount of cattle in both locations.

---

<sup>39</sup> The weights are 0=no impact on the household; 1= very low; 2= low; 3=medium/average impact; 4= high impact; and 5=very high impact

<sup>40</sup> Unless stated otherwise, the figures/numbers in this chapter in brackets imply a mean value ( $\bar{x}$ ), which is the study population's average.

**Table 7.2 Impacts of different forms of risk and uncertainty (retrospective experience in 2019)**

Perceived impact of risk and uncertainty (retrospective)	Dire				Gomole			
	Active	Dropouts	Non	Cluster	Active	Dropouts	Non	Cluster
Mean TLU ownership (camel, cattle, donkey, goat, and sheep)	36.8	22.0	18.7	27.4	25.2	15.4	17.4	18.6
<b>Pasture Scarcity</b>								
Not enough pasture – rain failure	4	2.9	2.2	3.0	3.9	3.3	2.6	3.3
Not enough pasture – land-use change (privatised, changed to farmland)	1.5	1.9	1.6	1.7	3.9	4.1	4.5	4.2
Conflict over community resources (pasture, land, water)	4.2	4.1	4.5	4.3	4	3.8	4	3.9
<b>Livestock</b>								
Loss of animals – rain failure	3.2	2.1	2	2.4	3.1	2.8	2.6	2.8
Loss of animals – disease	2	1.5	1.4	1.6	2	1.7	1.6	1.8
Loss of animals – raiding/theft	0.75	0.46	0.3	0.5	1.2	0.9	1.2	1.1
Not enough water for animals – rain failure	3.1	2.8	2.5	2.8	1.8	2.4	2.2	2.1
<b>Market and others</b>								
High price for goods the household wants to buy	4.8	4.6	4.8	4.7	4.8	4.7	4.7	4.7
No buyer or low price to sell to the market	3	2.6	2.6	2.7	2.6	2.8	2.5	2.6
Limited food quantity/quality in the household	2.5	2.3	1.6	2.1	1.6	2.1	1.4	1.7
Absence/late timing of government/others' support - food, feed, water, medicine	2.9	3	3.3	3.1	2.8	2.5	2.3	2.5
Human sickness – a member of the household	0.56	0.54	1	0.7	0.77	0.76	0.6	0.7

*Note: Calculated using Likert scale 0–5 (0 = No impact on household, 1 = Very Low, 2 = Low, 3 = Medium/Average, 4 = High Impact, and 5 = Very High).*

*N = Active (100), Dropouts (100), and non-Policyholders (100).*

In 2019, pasture scarcity due to changes in land-use was seen as another important factor. In Dire, the impact of land-use change on pasture availability was not seen as a considerable problem. By contrast, in Gomole, non-policy holders (4.5) perceived land-use change to have had the greatest impact on their access to pasture. Dropouts (4.1) had a similar view, while insured pastoralists (3.9) appeared slightly less concerned. Such in-site difference is attributable to average farmland ownership, whereby households with insurance own, on average, more land (2.7 ha) than dropouts and non-policy holders, and so are less affected by the impact of land-use changes on common grazing areas.

Individualised experiences of drought are also vital. Gegna<sup>41</sup> explains how land-use changes affect pasture resources as *“much of the prime pasturelands here [Gomole] are now transformed into croplands. There is a belief that crop supports livestock production; hence people keep encroaching on open grazing land. This is banned under the community and local governance bylaws but there are always ways for people to violate the rules. Unmarried young men and some wealthy households are at the forefront. Not only has this diminished the limited pasture we have, but it is also a source of conflict among families.”* The district (woreda) administration adopted a localised regulation to protect the limited pasture resources of community members. Anyone grazing their animals in the protected area would be fined ETB 500, which increased by ETB 100 following the drought during the main rainy season of 2019.

Nevertheless, violators have the means to escape penalties. Sora<sup>42</sup>, who participated in the photovoice, took the picture below (Picture 7.1), showing livestock detained after being found grazing on the community kallo. He explains, *“the youth fight back, and the wealthy (can) afford to pay the fine after sending a large herd to graze. There have been a couple of violent encounters among individuals within our community on the use of kallo. The rule states that unless one establishes a family, land for farming will not be provided but the youth cannot afford to start a family, so they opt to engage in different economic activities, and farming is one”*. In Dire, however, the violators pay per animal, and the youth control monitoring, so confrontation is less likely. Still, determining which animal is entitled to graze in these

---

<sup>41</sup> Interview, Gegna, male, aged 38, in Gomole area, December 2019.

<sup>42</sup> Interview, Sora, male, aged 32, Gomole area, October 2019.

enclosures remains a source of conflict (see the discussion on pasture governance in Dire in the previous chapter).



**Picture 7.1 Fenced compound to detain livestock – Photo by Sora, 2<sup>nd</sup> October 2019, in Gomole.**

All pastoralists view macro-level conflict - between Borana and other pastoral groups - as a significant source of risk and uncertainty. Prime dry season community grazing areas are left untouched in conflict-prone regions, severely disrupting access to pasture. As Doss et al. (2008: 1466) explain, “The fear of insecurity (exists) rather than biophysical limits on rangeland productivity; even in a drought year, there is enough fodder for animals, but it goes unused for fear that anyone using it may be attacked”. In years like 2019, when the amount of rain was small in parts of Borana, pastoralists could not gain access to pasture in areas bordering the Somali region. Conflict also adversely influences migration patterns and routes.

Conflict was perceived as the leading source of pasture scarcity in 2019, as it limited access, particularly during stress periods in both clusters. Due to the location of Dire, its inhabitants are more likely to attach greater significance to conflict (4.2) than are those of Gomole (3.9).

Livestock mortality due to disease has also affected pastoralists. Causes of mortality may be covariate, such as a widespread disease outbreak, or they may be idiosyncratic (individual livestock production practices). Perceptions of risk associated with livestock disease are differentiated by insurance category, as Table 7.2 shows. Other important sources of risk are

related to markets and how much pastoralists purchase and supply at the market in response to risk (details in Chapter Eight).

In summary, pastoralists experienced drought risk significantly differently within an insurance cluster, and drought risk extends beyond rain failure, as various factors, most notably conflict and land-use change, affect pasture availability. Furthermore, these effects on forage availability do not have the same impact across all insurance clusters and households.

### **7.3 Differentiated Conception of Risk and Uncertainty: Wealth, Age, Gender and Location**

Perceptions are always subjective, deriving from an individual's knowledge, experience and background (Smith et al., 2001; Bammer and Smithson, 2008). As has been discussed in earlier chapters, pastoralists in Borana define and conceptualise risk and uncertainty quite differently from insurance providers. Perceptions amongst pastoralists are also heterogeneous. As a result, the experience, knowledge and view of drought do not emanate from a single, objectively calculable assessment, as assumed in the insurance design, but from diverse socio-economic, political and biophysical sources.

Conceptually, however, climate-induced shocks, particularly drought, are understood to be complex by both pastoralists and insurance promoters, albeit differently. For an index insurance, standardisation of key features of drought is vital; otherwise it is impossible to make a market-based risk transfer mechanism. On the basis of this drought risk-profiling, the same insurance premiums and pay-outs are set in an insurance cluster. Furthermore, the insurance model is based on the assumption that the vegetation distribution of an insurance cluster during the past two decades has been the same or somewhat comparable to what it is today.

How then do pastoralists conceptualise drought? This section shows that knowledge about the future is understood differently by pastoralists as compared to insurance promoters, even those pastoralists within the same insurance cluster. Factors like wealth, gender and age all shape the way in which pastoralists conceptualise and perceive drought.

## Wealth

*“Risk (diphu) is the condition of becoming short or scant, whereas uncertainty (Haala hinbanne) is the condition of being unaware of the time and extent. I believe the issue arises when you are unprepared, especially in terms of resources, to act on such incidents.”<sup>43</sup>*

When conceptualising risk and uncertainty, wealth comes strongly to the fore in the discussion. Among the wealthy pastoralists of both genders, risk and uncertainty pose both opportunities and challenges, which can be managed by mobilizing resources. For these households, the occurrence of a given level of risk and uncertainty is not the overriding concern; rather, it is their adaptive capacity and ability to respond. In Gomole, investing in modern agricultural tools and cropping *teff* (a cash crop for Borana in recent years) are ways of creating surplus resources, helpful to offset risks and uncertainties.



**Picture 7.2 Photovoice by Loko Doyo (52, wealthy female active insurance policyholder) in Gomole.**

In Dire, the accumulation of resources for adaptive responses may come in the form of livestock (commercialised) or non-agricultural investments, including building houses and starting other non-agricultural businesses (such as large or medium-sized shops) in nearby towns. For these wealthy pastoralists, the scale of investment is significant, as opposed to that for poorer pastoralists.

---

<sup>43</sup> Loko Doyo, 52, a wealthy, active insurance policyholder in Gomole (August 2020).

Malich, a wealthy photovoice participant, took the picture below and explained, *“In uncertainty, a person doesn't know when or how much something will happen. You have different ideas about how to make a living, keeping yourself healthy, or issues around food, market, school, etc. But none of these things can work well without enough resources. Large feed reserve is not enough on its own. Besides, you can't risk your livelihood by putting all your money in one livelihood type. I can't keep selling my animals to pay for my kids' schooling and other expenses.”*<sup>44</sup>



**Picture 7.3 Photovoice by Malich, 58, a wealthy, active insurance policyholder in Dire.**

Practices in Borana indicate that wealth differentiation is vital and that to cope with drought, wealthy pastoralists accumulate resources before the event. Hence, the response strategy to drought is a combination of *ex-post*, *ex-ante* and semi-*ex-ante* activity. For most economically weak pastoralists, uncertainty is an impediment, and at times is linked with bad luck. It is bound up with their daily struggle to eke out a living. Their adaptive capacity is weak, and these groups are poor or characterised by high vulnerability to different shocks that will deprive them of their livelihood.

*“I worry about risk. These problems and challenges hinder my family and me from leading a decent life. God will deal with uncertain events. My daily routines are dealing with problems, and I live in poverty.”*<sup>45</sup>

<sup>44</sup> Malich, 58, a wealthy male active insurance policyholder in Dire.

<sup>45</sup> Qaballe, a 72-year-old poor female from Dire, non-policyholder (5<sup>th</sup> May 2020).

Regarding the risk of drought, poorer women reflect on responses centred around the sporadic sale of milk (roadside) or the periodic sale of small ruminants. Poorer men and women sell goats and sheep to local markets, and the fasting season among Orthodox Christians disrupts their income severely. Therefore, there are multiple aspects affecting their income that extend beyond the incidence of drought. Milk sales among the wealthy are contractual; therefore, they are not affected by seasonal market prices. However, if there is an abundance of milk during fasting periods<sup>46</sup>, the milk is kept and used to produce butter, which can fetch high prices. Live animal sales stretch beyond local markets; in this way, pastoralists conceptualise it as competition with other traders beyond Borana. Distress livestock sales afflict the poor, but are not a problem for the wealthy.

In sum, richer and poorer pastoralists have very different perceptions of drought. Richer households are able to accumulate resources that provide a buffer against drought and other impacts, while poorer households with fewer assets have much less room for manoeuvre and constantly struggle with multiple challenges, creating worry and stress. In all cases, 'drought' is multifaceted but is experienced in quite different ways among different wealth classes.

### Gender

*"Men move with the strong livestock in search of pasture and water during drought seasons.*

*They do not know the struggle in the household with weak and unhealthy animals."*<sup>47</sup>

Gender is another essential element affecting perceptions of risk and uncertainty (Doss et al., 2008; Taylor, 2013). Due to men's role in moving with animals in search of pasture, their view of drought risk has a spatial element. The accumulated experience they possess with regard to vegetation conditions and livestock conditions influences how drought impacts are understood. Despite diminishing in number, satellite camps are dominated by men, enabling them to maintain better spatial orientation to pasture and drought.

On the other hand, women understand livestock production better at the household level. The impact of forage scarcity on milk production, and the physical condition (well-being) of livestock, are therefore at the forefront of their understanding of drought impacts. Furthermore, the uncertainty of forage availability at different levels is linked to women's dietary requirements, in a way that it is not for men. Hence, despite the limited spatial scope that women possess, drought still has multiple dimensions. Roles in livestock production are

---

<sup>46</sup> During fasting seasons, Ethiopian Orthodox Christians abstain from consuming meat or dairy products of any kind.

<sup>47</sup> Jatani Tatacha, female, 48, insurance dropout, March 2020.

primarily gendered, as Jatani (48), Qaballe (38) and many other women have indicated, and men understand these dynamics less. This makes it difficult for women to prioritise ways of responding to certain risks.

Hence, power relations among men and women at the household and community levels are crucial elements of risk and uncertainty. Although the husband consults his spouse on most activities that affect the household's well-being, he ultimately makes the final decision (Flintan et al., 2011). Qaballe, who believes her husband (an insurance dropout) is more moderate than most in her locality, confirmed that she misrepresented the insurance pay-out she received in 2017 for fear he might spend the money on something she did not want. She explains risk and uncertainty as:

*“Risk is something that poses a challenge to your daily livelihood. It is the dwindling of resources that are vital for your livelihood. Uncertainty is your limited knowledge of when and how these vital resources will diminish...in most cases, the availability of those resources is meaningless unless you have command over it.”<sup>48</sup>*

Men participate in meetings, mostly organised on an *ad hoc* basis, such as *kora eelaa* (meetings for water wells), *kora dheebuu* (meetings for watering or thirst), *kora dheeda* (meeting for grazing issues). In this way, they tend to have access to more information about the range and water conditions in their locality and remote areas. For example, the opening of *kallo* is decided by men taking their perspective of forage condition. There are, however, other community meetings that mostly happen in the background, known as *gaaddisa* – the ‘shade’, where pastoralists are classified by clan, age, gender or village; such as *gaaddisa eebbisa* (blessings in the shade) or *gaaddisa abbaa qa’ee* (meeting by village leader). Men and women separately assemble in the shade with their age groups or networks, like *marroo* for women. Such gendered discussions and deliberations contribute uniquely to how members conceptualise risks and uncertainties within insurance clusters or villages.

Knowledge and views of drought are evolving among both genders, necessitating (re)negotiation on resource allocation and management – particularly at times of crisis. Doyo<sup>49</sup>, explains “my wife decides on every single drop of milk produced in the house. Much of the income comes from contractual milk sold to Yabello town. Although I trade livestock and crops that we cultivate, milk sales provide a reliable source of income, so we negotiate how to

---

<sup>48</sup> Qaballe Malich, 38, a wealthy female active policyholder in Gomole - March 12, 2020.

<sup>49</sup> Doyo, a wealthy male insured agro-pastoralist in Gomole - October 2020.

*use our private land for crops or animal feed.*"<sup>50</sup> As cattle are most affected by drought, this results in limited milk production affecting a household's food security, income and social status. As a result, pastoralists with the largest cash and food source from milk renegotiate resource allocation to improve their adaptive capacity; and pastoralists like Doyo influence discussions in community meetings as to when and how *kallos* are enclosed or opened. Therefore, drought is a mix of environmental and households' personal views of the upcoming season, influenced by income, wealth status and other social facets.

The rationale among men and women for investing in livestock insurance is different. According to Bageant and Barrett (2017), demand for IBLI is not gender-differentiated, but the motivation for investment is not the same. One interesting example is of a married couple in Gomole - Loko (52) and Doyo (58), both independently investing in livestock insurance under their own names. They both claim their incomes are used for the well-being of the household; however, their income sources are different, and so too are their perceptions of drought. They believe the risk and uncertainty that emanate from drought affect their livestock differently. Each focuses on protecting its specific source of income. Loko sells milk; securing a continuous pasture source is a significant challenge. Therefore, livestock insurance is one means of protecting her lactating animals if the supply of pasture is disrupted. By contrast, Doyo focuses on fattening cattle and sells to medium and large markets. Therefore, there is no standardised definition of covariate risk among pastoralists: it is different among men and women, even those who are married and living in the same household. Drought risk is also subjectively perceived, located in particular circumstances and contexts; it necessarily goes beyond a single, calculable risk, and is embedded within one's ability to respond, alongside other socio-cultural, economic and environmental factors. The accumulated, constantly-evolving knowledge and experience one possesses shapes the perceptions of drought, with knock-on effects for the allocation of productive resources. This means that such dynamics greatly influence the investment in IBLI.

---

<sup>50</sup> Loko, Doyo's wife, exercises considerable power in a variety of socio-cultural and economic arenas compared to other women in her locality. Although men are culturally entitled to marry more women as their wealth develops, she refused to allow Doyo to do so.

## Age

*“Hariyyaa ilkaani koblaa, garanni kessii morka.”* People of the same *hariyya* (age class) laugh together, but there is a rivalry deep inside. *Lubbi lubbuu wal ulata.* Members of the same *lubba* (age-set) smell the same – think alike.<sup>51</sup>

In Borana, every socio-cultural, economic and political aspect is attributable to age, and each cycle of life is attributable to accumulated knowledge (Legesse, 1973; Oba-Smidt, 2016). The two age sets in Borana are *hariyyaa* and *luba* (*lubda* for females): the first being the recruitment of boys based on their age (physiological/developmental), and the second, based on the generational position of individuals (Legesse, 1973). “It can be said that the *hariyya* age-class system is more relevant than the *gadaa* system in conditioning daily behaviour and personal relationships” (Bassi, 2005:74).

The transition from one age set/class to the other leads to different socio-cultural and economic responsibilities every eight years. Within each age group, there are distinctive rituals and economic responsibilities. After performing a ceremony called *galma-kallachaa*, at the fourth age set (*raaba*, between 24- 32 years of age), a man is granted the right to marry and establish a family. He is permitted to participate in community discussions and decision-making. Despite not being well-structured for women, distinct tasks emerge with age, from childhood to after marriage, after having children, and so on. Therefore, risks and uncertainties are constructed differently within these different age sets and classes. Responsibilities and expectations that come at each age cycle add to the way in which various socio-economic and political issues manifest, which adds to an individual’s knowledge set.

Under *lubba*, which is divided into five groups and repeated every 40 years, men and women are celebrated separately. A person becomes a member of a specific group based on age and gender. Hence, siblings might join different *lubba* and, therefore, different classes of friends, who might be as old as her/his grandparent. Various discussions, information-sharing and support mechanisms depending on the age group and class dynamics. The internal rivalry within *hariyya* influences the kind of information to share and how to reorient productive and social resources to gain higher status. As a result, the temporality and position of an individual in conceptualising uncertainty becomes essential when age is considered.

---

<sup>51</sup> Both are Borana proverbs.

The complexity of conceptualising risk and uncertainty increases with age; however, it stagnates after the mid-seventies, particularly among those who reside in remote areas. They have limited access to information, and their participation in key livelihood issues is limited. Discussions are very limited, either in their frequency or with regard to matters discussed within their *hiriyya* (age-group) or *lubba*.

Malich<sup>52</sup> believes the future is strongly linked with the past and present. *“Your thoughts about drought are an accumulation of the past experiences and expectation of the future. Success and failures are vital in shaping some of your thoughts. When your engagement [livelihood sources] is wide, your level of understanding increases; at times, you might fail by adopting one strategy. However, you repeat when certain enabling factors exist.”*

Similarly, Dida, a photovoice participant who captured the image below (Picture 7.4), believes that forage scarcity is not a result of rain failure alone but rather a combination of factors. Multiple factors are mentioned during photovoice discussions and case studies, however, the combination of human, biophysical, and societal factors are seen as significant in influencing one's outlook on the future.



Population and livestock are increasing, and pasturelands are shrinking. Our traditional systems are not very strong as they used to be to harmonise these changes. The soil is not suitable for agriculture. It is hard to imagine what the future holds for a pastoralist.

**By Dida (male, 62, medium wealth status, insurance dropout)**

**Picture 7.4 Photovoice by Dida in Dire.**

<sup>52</sup> Malich, 58, wealthy insured male in Dire.

*“Risk is uncomplicated. It is part of pastoral life, and it is like a hurdle in that process. Sometimes you are successful, and at other times, you fail but you keep trying as it is embedded in your daily routines. Uncertainty, for me, is both complex and complicated. I sometimes lack the right way to express it.”<sup>53</sup>*

*“Uncertainty is a very complex term to explain. As a pastoralist, I can mention drought and conflict as the two major uncertainty features. However, every source of uncertainty is unique every time it happens. Conflict destroys humans and livestock, and land will be lost. In the past, the management of conflicts lay with the two fighting parties. There are some known causes, and it could be pasture or water, livestock-raiding or revenge. You do not predict the gravity of war and the level of preparation of your enemy, but you understand the dynamics. In the last two decades, it has become complicated. You do not simply take your gun and fight; many uncertainties revolve around it. Politicians from everywhere are now involved, and conflict-resolution is becoming complex as a result.”<sup>54</sup>*

The above quotes show the complexity of conceptualising risk and uncertainty by middle-aged pastoralists. For these well-experienced informants - Obda, 52, and Mohammed, 60, uncertainty is characterised by its complexity, and understood by an individual's previous experience and lessons learned. For example, drought is understood to result from a mix of factors, including rainfall distribution, temperature, wind directions, moisture in the soil, and livestock (type, number, and conditions).

Similarly, the conceptualisation of conflict is not limited to fighting; older pastoralists may view it as a broader interconnected issue whereby large pasture areas can be left unused, reducing access to prime pasture. Therefore, the so-called 'localised' conflict has a more complex feature and connections to the broader resource governance, development and political economy.

For such pastoralists with long experience in these areas, drought is more than the failure of seasonal rains; it is seen not as a one-off event but rather as an unfolding situation. Memories, experiences and imagination are vital in conceptualising risk and uncertainty. This contrasts with the perceptions of younger people, whose experiences are more limited and memories

---

<sup>53</sup> Obda Dido, 52, insurance dropout and middle economic status in Dire (August 31, 2020)

<sup>54</sup> Mohamed Ibro, 60, a wealthy active policyholder pastoralist in Gomole (21<sup>st</sup> August 2020).

shorter. Age therefore emerges as an essential element to conceptualise risk and uncertainty retrospectively and prospectively.

### Location

*“Lafa looni hin olinni, faltii hin fedhatani.”* In an area where cattle did not spend a day, cow dung is not expected.<sup>55</sup>

Drought has an inter-temporal and spatial orientation (Scoones, 1995, Coppock, 1994 and 2016, McPeak et al., 2012). Under IBLI, a historical (inter-temporal) analysis of vegetation trends for a given cluster (spatial) is the backbone of the contract design. Furthermore, it is believed that pastoralists commonly move via a specific route and towards a specific destination in search of pasture; hence, they move and can access resources equally in an insurance cluster. From the insurance marketing and selling perspective, and for practical purposes areas have to be clustered in a manageable way within the bio-physical spectrum of contract design. This is logical and necessary from the insurers’ viewpoint, but, as discussed in Chapter Six, in reality, pasture conditions and governance in an insurance cluster are not static.

In Dire, for example, mobility extends beyond its insurance cluster – both sporadically and during dry seasons. In this cluster, pastoralists own more livestock, and so multiple routes and stages of mobility are considered. Drought is perceived in relation to multiple scales: as localised – *kallo* level- and also at wider scales around base and satellite camps. It is also linked with conflict, as previously discussed. Furthermore, resource conditions and mobility within Dire are not the same. Pastoralists in the northern part of the cluster access pasture and move during stress periods within the area, but not in the southern part. Mobility between the two geographical areas within Dire is quite different during periods of stress.

As already discussed, changes in land use in Gomole have an impact on pasture quality and mobility. This insurance cluster has the highest area under crop production in all of Borana. More than rain failure, land-use change is perceived as the major contributing factor to pasture shortage in Gomole.

Thus, locational differences have a huge impact on perceptions of drought risk, with different constraints (whether land fragmentation, conflict or rainfall variation) affecting different sites in contrasting ways. Pastoralists construct responses to droughts – such as mobility – in

---

<sup>55</sup> Borana proverb.

relation to multiple spatial scales, from the very local to the wider region, and in ways that are not restricted to standardised movements within an insurance cluster area.

Yet insurance designers do not recognise this diversity of perceptions – across wealth, gender, age and location. For a simple product, they must assume that users are the same, have the same perceptions, and are keen to protect their livestock (wealth) against the risk of drought by offsetting future risks through insurance payments. As we have seen in previous chapters, this is not always the case. Many do not take up the insurance, while others drop out. Most persistent insurance holders are older, wealthier men with large herds, mostly of large stock. It is a different story for others, such as women with small stock or young people with fewer animals. They have different perceptions of risk because of contrasting livelihoods, different psychological and emotive factors, and different sources of knowledge to which they have access.

Therefore, perceptions of drought risk are shaped by a complexity of experience and knowledge that is not captured by index insurance risk profiles. An individual's economic status (source of income and wealth status), age (experience, outlook and social status), gender (physiological, social and economic roles) and location (residence and mobility) all influence how risks and uncertainties are conceptualised. The explanation by Jarso, 61, summarises the complex nature of rain and drought risk in Borana as below:

*“Rain is rain, and drought is a drought — no mystery about them. Uncertainty is the series of events around those [rain and drought]. The type of rain, distribution and amount, location and seasonality – short or long rain causes uncertainties for pastoralists. Is the failure of rain accompanied by strong sunlight, wind or humidity? If it is windy, there might be somba [livestock respiratory disease] and uncertainty about how hard it will be. If strong sunlight, dehydration might destroy livestock. On other occasions, we must fight to access pasture. Rain and drought are each single words, yet their meanings constantly evolve as new elements flow from them every time they happen.”<sup>56</sup>*

---

<sup>56</sup> Jarso Godana, a wealthy insurance dropout, male, 61 years old – March 2020.

## 7.4 How are Perceptions (Re-)Shaped?

*“The stress [livelihood] shapes my outlook on pastoral life.”<sup>57</sup>*

Pastoralists perceive and experience overlapping, not stand-alone, risks and uncertainties. By contrast, index insurance, based on a singular indicator and developed from a complex quantified approach, fails to capture the complex and evolving pastoral systems. One of the many complexities in the system is that pastoralists' perceptions are shaped by multiple factors; notably, how the knowledge set – accessing, acquiring and using - is vital in influencing their perceptions of the various risks and uncertainties, and thereby their responses. Social bonding and networks, personality and positionality of individuals in their household and community; where they live, their experience and practice, wealth and gender, and their priorities all influence perceptions (Whitfield, 2016; Tasker, 2020). Below are some of the vital factors contributing to how risks and uncertainties are perceived: they comprise sources of information, experience/knowledge, social groups, access and use of technology, and institutional connections and networks.

The perception of a specific risk or source of uncertainty starts with the search for information (November and Leanza, 2015; Müller-Mahn et al., 2020). Responding to risk and uncertainty begins with assessing and organising information (Neisser, 2014). This does not mean that all information is out there or can be accessed by all pastoral households equally. As in this case, the uncertainty of drought is not the absence of knowledge; instead, it is indeterminacy or lack of knowledge about the likelihood of the extent and timing of drought (Scoones and Stirling, 2020).

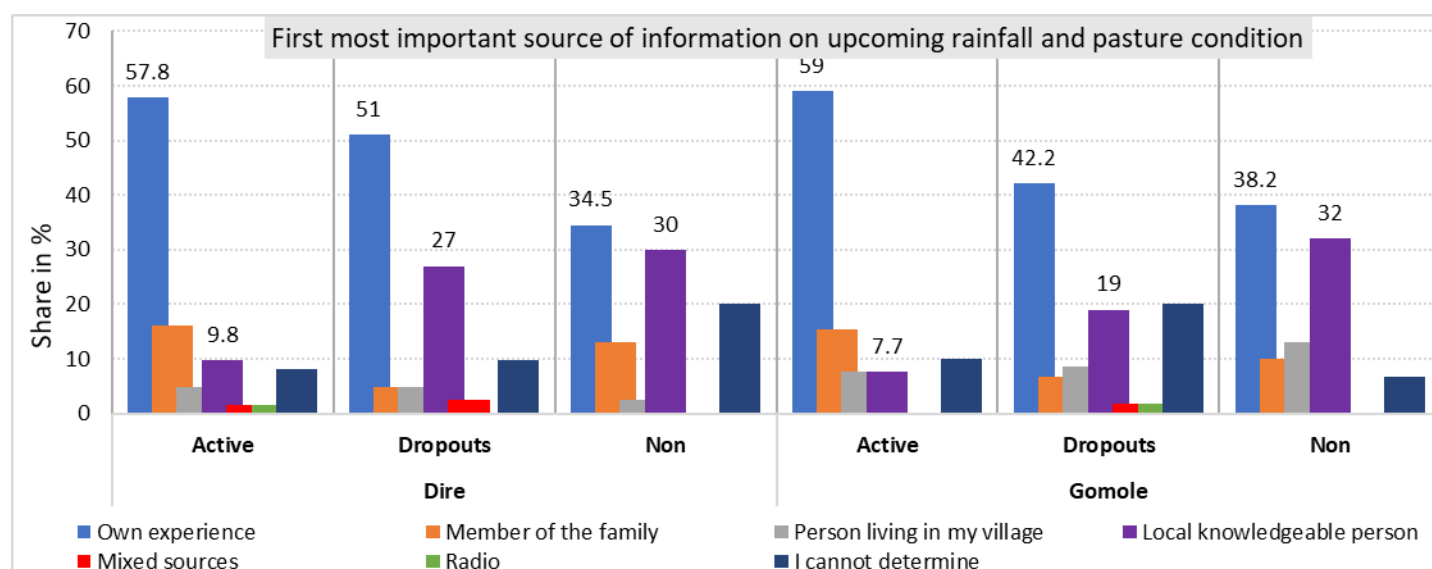
Pastoralists regularly try to find information on the likely occurrence of a particular risk/uncertainty and how it will influence their well-being. Moreover, they collect information on options (potential responses) that will reduce the adverse impact of these sources of uncertainty, in this case, drought. A famous historian, Borbor Bulle, 88, explains, *‘if you are a pastoralist, you should breathe in information with air [oxygen]’*. However, information gathering happens in a non-linear and heterogeneous way primarily due to the complex nature of uncertainty in pastoral systems. As discussed above, pastoralists face many overlapping sources of risk and uncertainty. Pastoralists search for information and knowledge

---

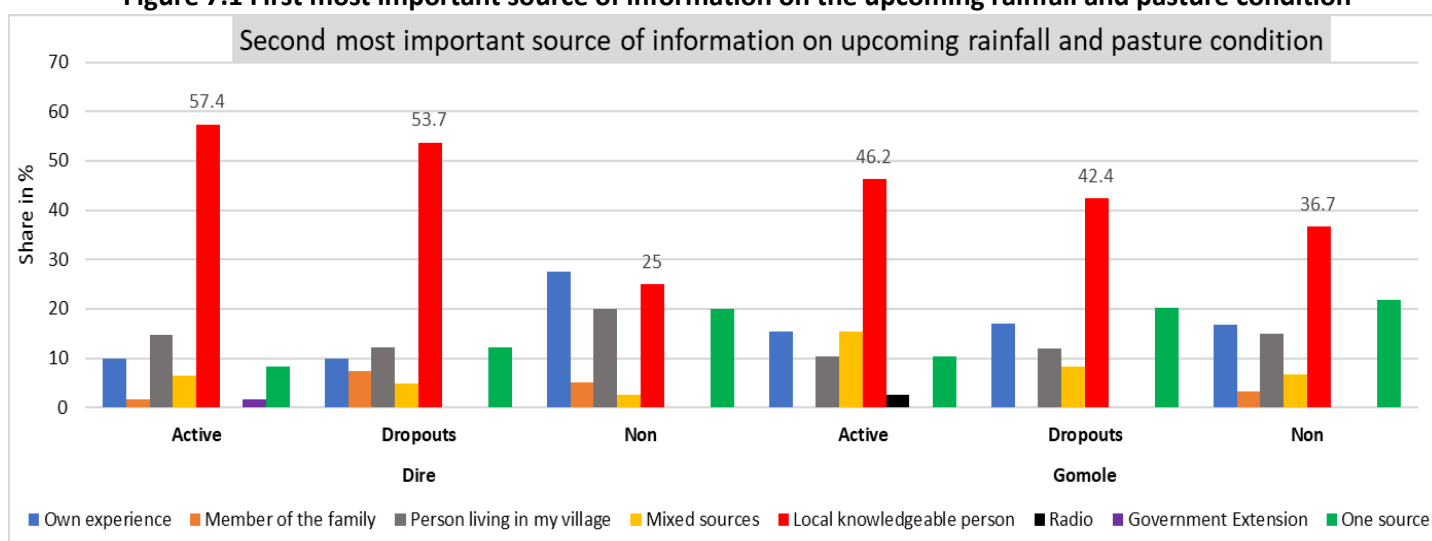
<sup>57</sup> Golicha Galgalo, 64, wealthy male agro-pastoralist in Gomole

on a daily basis from multiple sources of risk and uncertainty in order to respond to those that might affect them (Tasker and Scoones, 2021).

*Sources of Information:* Pastoralists listed multiple sources for the gathering of information on the upcoming rainfall and pasture conditions for the long rainy season of 2020, including market and conflict situations. There are seven different sources of information listed; see Figure 7.1. Interestingly, patterns emerge among different pastoralists categorised based on their insurance uptake. Insured households in both sites (59%) reported that their experience plays a significant role in predicting rainfall, and pasture condition status and distribution. This decreases for dropouts (51% in Dire and 42.2% in Gomole) and uninsured pastoralists (34.5% in Dire and 38.2% in Gomole). On the other hand, local, knowledgeable individuals are the second-ranked sources of information to households, but the trend increases from active policyholders to dropouts and non-policyholders (Figure 7.2).



**Figure 7.1 First most important source of information on the upcoming rainfall and pasture condition**



**Figure 7.2 Second most important source of information on the upcoming rainfall and pasture condition**

It is not surprising to observe that personal experience matters, for active insurance policyholders in both sites are characterised by their age (adult) and wealth (higher TLU) rather than the rest of the insurance groups. Clearly, demography – age - plays a role in the knowledge set of an individual; and the case below, Box 7.1, provides a good summary.

The contrast, particularly in understanding the layers of information, comes when the second most important source of information is considered. As depicted in the chart above, in figure 7.2, insured households ranked knowledgeable persons (local) as their major sources of information. The share declines among dropouts and is at its lowest among non-policy holding pastoralists. Finally, linking Figures 7.7 and 7.2, insured households have various sources of information, unlike other insurance groups. This is attributable to their wealth status (larger herd sizes) and age (older, so a wealth of experience in several aspects of risk and uncertainty) as opposed to the other two groups.

Here, it is important to note that the role of local knowledgeable individuals is instrumental in gathering, synthesising and distributing information on various forms of livelihood from the above two figures. Among others, they provide information on rainfall, pasture, disease (human and livestock), conflict and other socio-cultural and political aspects. Such individuals can be seen as “reliability professionals”, where their job is “to add knowledge at different scales and in keyways” to improve the reliability of outcomes in the face of high levels of variability and uncertainty (Roe, 2020: 14). These professionals follow events and stories unfolding in various domains, track them, translate depending on the local contexts and scenarios, and transmit them to their audience, adding their tacit knowledge (Tasker and Ian, 2021).

Knowledgeable community members, or reliability professionals, include *Raaga* (prophet), a person who is believed to possess a supernormal power to predict the future: “*Raaga* make prophecies to the Borana regarding natural disasters that have befallen them” (Oba-Smidt, 2016: 20). Other reliability professionals are clan officials, locally known as *hayyuu*, who are responsible for managing resources, particularly water wells (*ella*), and mediating disputes at communal and household levels. During disasters, they play an instrumental role in organising the community for rituals and social support mechanisms. *Uchuu* and *ayantu* are indigenous weather forecasters. The *uchuu* read the intestines of slaughtered cattle for this purpose, and the *ayantu* monitor the solar eclipse as it is strongly associated with wind direction, rainfall distribution and droughts. Some experts observe livestock behaviour and predict weather

conditions, locally referred to as ‘*waragu*’. Finally, a historian like Borbor Bulle is referred to as *arga-dhageti*. They observe (*arga*) and hear (*dhageti*) incidents and analyse the current conditions by linking with what they heard in the past, and from other areas, and predicting the future. These individuals are knowledge brokers insofar as they mediate the access to knowledge on uncertain events. Nevertheless, access to information, thereby influencing decisions or generating reliability, is selective (Tasker and Scoones, 2021).

*I have been considered as addaa duree/better off or wealthy/ three times but was impoverished on many occasions. I could list many issues: drought, government policy, conflict, cheating by brokers or friends, and confiscation by the border controls are common causes. In the past, I used to export live animals, skin and hides up to Isiolo town (in Kenya) and at times to Nairobi. When we returned, we used to purchase clothes and some industrial products from Nairobi. Sometimes the border controls on either side confiscated our goods for trading - livestock or clothes.*

*When the Derg regime was ousted in 1991, we lost everything. I was in Nairobi to sell livestock at that time; I lost around 38 cattle /young bulls, and enemies raided all my cattle back home. I was cheated by a friend with whom I left some money; I lost both my cattle and cash at the same time. I became impoverished. It was not easy to recover, especially when such events happen simultaneously. Drought and war had been our major problems, some families were completely destroyed, but we survived. On one occasion, we used to own more than 100 cattle and hundreds of goats; drought and conflict happened simultaneously, and I was left with 20 cows. We then decided to settle around this area/locally called kella or terminal [5 km from Yabello town]. Our cattle recovered, and after one year, we were in a better economic status. On the land we settled, the government took it. As a result, we were pushed up north from our prime pastureland. In fact, it used to be one of the best lands suitable for cattle, and the livestock were in good condition. I have seen so many things.*

*Currently, I am in a better position. I cannot read or write, but I am very experienced in many aspects: pastoralism, trading, farming, even fighting. At this age, I sniff out opportunities and grab them. I am not afraid of investing. My investment portfolio has expanded... To link to your area of interest, I had received livestock insurance payouts much higher than what others get. Despite the fact that I believe it helps during stress periods, it has been three years since I dropped out. This is like gambling, and I feel I took my share. I have other priorities that I am almost certain I will make a profit out of. I have feed reserves that can last for up to three years, and I have never seen a drought for three consecutive years.*

**Box 7.1 Golicha Galgalo, 64, wealthy male agro-pastoralist in Gomole.**

Individuals, local knowledgeable people, community/village leaders and early adopters of innovation are referred to as “high-reliability professionals” by Roe (2020). The local knowledgeable people are “professionals who have special institutional knowledge about the system they manage because of the distinct skills they have and on which they rely” (*ibid*: 11).

Others such as early adopters of insurance or community/village leaders are ‘different reliability professionals primarily showing up in various knowledge networks.’<sup>58</sup>

*Experience/Knowledge:* Furthermore, Borbor Bulle asserts that “reliability professionals” will not decide on your behalf; instead, they provide different perspectives. Nor do they discourage pastoralists from purchasing insurance. Instead, they provide insights into the upcoming season for which pastoralists should be prepared. Insurance, therefore, fits into such preparations. Notably, the networks of knowledge on the future are formed through associations with older male pastoralists (*ibid*). Consequently, insured households are usually wealthy adult males.

Dakise<sup>59</sup> invited two knowledgeable persons in September 2019, and they slaughtered a bull in a ritual known locally as ‘*korma korbessaa*’. He explains why he invited them and performed the rituals as *“these people understand nature more than we do. They predict the upcoming seasons in our area and other parts of Borana, which helps me think ahead of time. They told me the upcoming long-rain season [2020] would have good rains.”* Although the probability of the forecast occurring is one-third (Iticha and Husen, 2019), the perception one has and signs (environmental – like wind direction, vegetation condition) of the upcoming season add to the existing knowledge set of pastoralists. When I met Dakise in 2021, he mentioned that the local knowledgeable people predicted that the long rains of 2021 might not be enough.

Nevertheless, these local experts do not fully explain what will happen. Rather, using terms such as ‘sufficient’, ‘short’, ‘good’, and others, to predict the upcoming pasture and rain condition is subjective and leaves room for interpretation. The different information gathered complements an individual’s existing experience, knowledge, practices and social learnings. Notably, these various factors are associated with age (frequency of exposure to similar incidents) and come into play to link with the information gathered.

*Social Groups:* Rangeland/Pasture and water users’ associations are vital features of networks at different levels, shaping perceptions and knowledge base (Tache, 2008). Women participate in water-related networks and discussions while men participate in both water and pasture-related discussions. Women’s support groups, *maarro*, are a crucial network by which to exchange information and influence perceptions. Social bonding and learning within these groups have a wide range of benefits and can influence the way people perceive (Anbacha and

---

<sup>58</sup> Personal communication with Emery Roe, on 8<sup>th</sup> May 2021.

<sup>59</sup> An insured male from Dire, aged 56.

Kjosavik, 2019). During normal seasons, women invest in strengthening such networks, and relations to mutually gain from the information and at times of crises.

*Bussa gonofa* is another mutual support, clan-based network operating at different levels, whereby members contribute cash, material and livestock (Tache and Sjaastad, 2008). However, individuals' interactions within the different support groups are not the same. The older and wealthier (primarily insured) tend to establish a more robust network to their mutual advantage than do younger or poorer households. Females selling milk regularly to nearby towns, or active participants in community financial institutions, establish strong networks that enable them to accumulate knowledge about uncertainty. This gives them an advantage over other females in their surroundings, as well as their husbands, to reorient productive resources. Moreover, when expertise and age combine, a husband relies on his wife (Legesse, 1973).

Such social insurance systems have another dimension. Households, as individual units, and community members assess how such support networks shape resource-sharing during stress periods. They monitor not only pasture availability, but who to support or to get help from in that system. As the name indicates, *bussa* means spending, investing or taking out; hence members are required to share with those in need, mostly cows to be milked or calves. However, this has evolved into cash or other in-kind holdings in recent years.

*Technology:* In the last decade, cellular technology has contributed to the dynamics of accessing, collecting and disseminating information. The barriers of location/space are removed due to the expansion of the mobile network, which has enabled people to connect in new ways. Contents shared are vast in their range, and include production strategies, conflict, herding, market and social events. New networks are established within different information types/layers among interest groups. Wealthy adult males were early adopters of this technology and their financial capacity and multiple networks have given them a great advantage in this respect (Butt, 2015; Chelanga et al., 2022).

One study from northern Kenya found that the financial literacy and access to livestock market information for wealthier herd owners was more advanced than others with smaller herd sizes (Chelanga et al., 2020). In Borana, too, the majority of the insured households are wealthy male adults with higher per capita mobile phone ownership (Chapter Five).

These information-sharing mechanisms are also gender-divided. Women village insurance promoters (VIPs) in the study areas make up less than 5 per cent. Insured male pastoralists meet on market days to exchange information about insurance (in particular, informing new entrants about the product and its features), vegetation conditions in different areas, and potential pay-outs (during August–September and December–January), and other non-insurance related information. Although VIPs are the primary source of information about livestock insurance, the ‘informally’-created information-sharing during market days benefits males. Golicha, a VIP in Gomole, explains, *“when they call me to inform them about the index results or some clarification about the insurance, I tell them to come to one of the local bars/café’s during the market days. I make an appointment with many at the same time. This has become a tradition specifically after rainy seasons as information about pasture condition is critical”*.

*Institutional Connections and Networks:* Networks are important for getting information about potential/future aspects of pasture and water and their likelihoods – knowledge is social (and political). Moreover, networks are essential to source information on different aspects, and pastoralists at different levels strive to access them (Tasker, 2020). As mentioned above, perceptions as to the source of risk and uncertainty can change (Scoones, 1995; McCabe, 1997; November and Yvan, 2015), as do networks which pastoralists engage with at different levels and times.

Certain groups/individuals have easy access to local politicians to get first-hand information on upcoming government plans, such as early warning interventions; however, this layer of information networks is monopolised by wealthy men. They can be local leaders (like clan councillors), or other influential community members needed for political mobilisation. When local politicians organise meetings, such influential persons must attend in order for the broader community to accept the outcome of the meeting. In return, politicians provide first-hand information on relevant matters.

Finally, learning in various forms creates multiple change pathways through (re)shaping perceptions (Whitfield, 2016). Therefore, pastoralists rely on multiple sources of information to develop a complete understanding of the future. By comparison, insurance relies on one index and a singular source of information responding to an index “event”.

Knowledge about the future is uncertain; various risks are unknown, so information about different sources must be gathered from different sources. This is a social and political process

involving networks' access to crucial information brokers (local, institutional and political) and is differentiated by wealth, gender, age, and so on. The wealthier male insurance buyers have preferential access to diverse sources of information, which can offset the cost of buying insurance. People, therefore, engage with insurance differently, depending on their (social/political) access to information/knowledge. This is different from the central assumption inherent in the design of index-based insurance, which is that there is a uniform/universal access to knowledge about drought as a discrete type of risk.

## 7.5 Conclusion

This chapter gives an insight into the complexity of drought risk perceptions in pastoral areas. Unlike the way in which drought is regarded within the design of index-based insurance, pastoralists do not focus simply on vegetation cover – it depends on where and how you can move; what key resources are available (and so land tenure/access/conflict); what fodder can be bought in (so income/markets), and so on. Moreover, drought is not perceived as a single 'event' (peril) but is an unfolding situation and experienced very differently from that which satellite-derived data might indicate. Drought therefore emerges not just as an 'objective' trigger; rather, perceptions of drought and, hence, responses to it emerge from a range of practices, feelings and emotions that vary over time and space.

Firstly, there is more than one cause of drought risk, and hence, livestock mortality. There is no single peril that pastoralists strive to address. Forage scarcity has multiple sources, and perception and experiences are non-linear, complex matters. Therefore, drought risk is perceived as part of multiple, intersecting associated risks, referred to as "risky landscape" (Müller-Mahn and Everts, 2013), which contrasts starkly with the construction inherent in index insurance.

Secondly, perceptions of risk and uncertainty are conditioned by markers of social difference, such as age, gender, wealth and location. Most active insurance subscribers' perceptions are conditioned by the accumulation of resources, allowing buffers against uncertain events. By contrast, dropouts are opportunistic; situational factors (for example, seasonal pasture conditions or market) influence how they view drought. Such perceptions of drought influence how insurance is seen. For richer pastoralists, insurance is part of a wider investment portfolio, assisting accumulation. By contrast, for poorer pastoralists insurance may help offset the worst effects of opportunistic, chance events, if it can be afforded.

Thirdly, several aspects impact pastoralists' perceptions, most notably how the information set—accessing, getting, and using it—is crucial in influencing their views of various risks and uncertainties, and hence their behaviour. The key factors that influence how someone perceives a given risk or uncertainty are sources of information, experience/knowledge, social groups, access to and use of technology, and institutional linkages and networks.

There is therefore a mismatch between insurance promoters and different pastoralists on how drought is perceived and conceptualised. This chapter has provided an in-depth perspective on how the lived experiences of different pastoralists affect how drought is conceptualised and perceived. The chapter has shown how such perceptions are highly differentiated among different pastoralists and across sites. Such perceptions of drought, in turn, affect pastoralists' responses and how insurance is combined with an array of strategies to confront diverse risks and uncertainties. This is the focus of the next chapter.

## Chapter Eight - Responses to Risk

## 8.1 Introduction

The previous two chapters explored the exposure to drought risk and pastoralists' conceptualisation of risk and uncertainty. Contrary to what is typically assumed by insurance modellers, Chapter Six has shown that pasture shortage is not a random event that affects all households in an insurance cluster equally. Instead, several interconnected biophysical (rainfall, livestock illness, pests, so on) and socio-economic factors (wealth, gender, age, etc.) influence forage availability/scarcity. The conceptualisation of risk and uncertainty (Chapter Seven) expands on these exposure factors and explores how different pastoralists perceive and experience drought and uncertainty differently.

Building on the previous chapters' discussions of exposure and perception, this chapter seeks to address how various pastoralists combine insurance with other responses. Index insurance is intended to provide protection to pastoralists at risk of forage scarcity due to drought. As a result, protecting pastoralists' most important assets – their livestock – minimise their vulnerability to asset depletion and, ultimately, helps them avoid falling into a poverty trap (Chantararat et al., 2012 and 2017). Furthermore, it is claimed that the insurance product is less appealing to the wealthy because of their great capacity for self-insurance. It was primarily developed on the notion that everyone would participate, even on a commercial basis, when it was scaled out to other dryland systems (first in Ethiopia), and as a result, it was seen as an intervention in support of the vulnerable.

There is another key element of the insurance design, as discussed in detail in Chapters One and Two: namely, premium and pay-out calculations. The payouts are based on the resources required during dry seasons due to predicted forage scarcity, so that insured pastoralists can use the money to purchase animal inputs (feed, water, and veterinary services). Therefore, they all receive the same amount of pay-out per insured animal.

However, I argue that the practices of integrating livestock insurance with other forms of drought risk response differ (disaggregated by wealth, gender, and age) within an insurance cluster. Moreover, due to the fact that insurance is made available commercially to pastoralists in Borana, the tendency is for the poor not to take it up. This chapter provides empirical analysis to strengthen my argument. Firstly, I investigate if different pastoral backgrounds (economic position, age, gender, and location) have an impact on how individuals respond to risk and uncertainty. Secondly, I analyse how insurance is combined with various local strategies to mitigate drought risk and related uncertainty. In conclusion, I

examine whether livestock insurance will enhance or replace pastoralists' localised risk response efforts, exploring how insurance is seen as part of more varied responses by different groups of pastoralists (rich and poor, male and female). In so doing, I determine whether livestock insurance has succeeded in meeting the needs of the most vulnerable pastoralists, as intended by its providers. Finally, I will investigate local responses<sup>60</sup> to drought risk that pastoralists supplement or substitute when combined with insurance.

## 8.2 Factors contributing to drought responses

Responses refer to the potential combinations of activities deployed when a particular risk, such as drought, or multiple risks are encountered (Harwood et al., 1999). Responses in Borana are intended to manage (reduce, absorb or transfer) drought risk and its unpredictable impacts, alongside other interconnected risks. Drought risk affects multiple aspects of the livelihood of almost all pastoralists. The responses that are put in place to address it are varied, making it important to adopt a socially-differentiated analysis of risk responses.

A significant part of the discussion on responses in this chapter is for the drought that occurred in 2019. This was when a severe drought struck Borana; but further discussions are linked with previous drought incidents of 2011 and 2017. The second round of fieldwork in July 2021 was also instrumental in substantiating some critical aspects of the research through interviews and group discussions. It was marked by another period of drought in Borana.

During case studies and group discussions, pastoralists were asked about major response strategies they employ, including the changes in strategy from previous years. This was then cross-referenced with data from the household survey, which asked respondents to list various response strategies during stress periods (drought and dry seasons). They then ranked and gave weight to each strategy. A long list of responses was generated from this, but most of them aimed at addressing food, livestock, agriculture, market and social support risks and uncertainties. For ease of presentation and analysis, I divide pastoralists' responses into three categories.

*Consumption-smoothing* responses: these are actions employed at the household level to sustain, improve or manage family-level food demands during periods of stress or shock. *Productive responses* are the multiple dimensions of reorienting productive assets

---

<sup>60</sup> These are pastoralists' localised responses to risks and uncertainties such as herd management, migration, pasture enclosures, and so on that are not directly supported by external development players.

(individually or community-owned) to respond to the different risks and uncertainties faced. These assets can be accessed and used from an individual or community resource base or purchased from the market. Finally, *social insurance* (local support and moral economies) represents the third category. These responses are a combination of individual, household, extended family or clan-based actions and strategies.

As discussed in Chapter Seven, risk and uncertainty are experienced and conceptualised differently by pastoralists within an insurance cluster. Drought risk is shaped by a combination of factors, and pastoralists are not affected equally; instead, in addition to the biophysical features, economic status, gender, age level and location influence drought risk (forage scarcity). These attributes also shape how pastoralists respond to drought. The section below aims to present the role of these pastoral characteristics in shaping local responses. It also allows us to see how insurance may supplement or replace existing response strategies in the subsequent section.

### Economic Status

*'Boriini hin jirtu, boratiini hiyyessati'*, Borana proverb roughly translated as "A poor person has nothing to rely on, only his headrest".

The primary source of a pastoral household's economic status is livestock (Lybbert et al., 2004; McPeak and Little, 2006; Little et al., 2008; Aklilu and Catley, 2010; Coppock et al., 2018). It is also the primary asset base from which pastoralists source their food (Barrett et al., 2006; Coppock et al., 2018). Livestock and farmland ownership are equally significant in Gomole, an agro-pastoral region. In Dire on the other hand, farmland is small, owing to agro-climatic factors. As detailed in Chapter Five, livestock and their products provide a significant amount of a household's income in both sites. Furthermore, despite differences in herd numbers and income generated, livestock is important to all wealth categories in both locations.

Although Tache and Sjaastad (2010) define seven different wealth groups in Borana, pastoralists most commonly identify three classes<sup>61</sup>: rich, middle and poor. As explained in Chapters Four and Five (Table 5.2), wealthy pastoralists possess three times as many livestock as middle pastoralists and nearly nine times as many as the poor. While there is significant livestock ownership inequality between the affluent and the poor in both sites, the gap is higher in Dire (nine times) than in Gomole (seven times). In terms of private land ownership,

---

<sup>61</sup> Details of wealth categories are found in Chapters Four and Five.

Gomole households own four times more than Dire families. Unlike with livestock ownership, the disparity of farmland ownership between rich and poor is much less (see Chapter Five on farmland ownership).

Agro-pastoralists in Gomole rely on farming for grain supply – both for consumption and sales (source of income). Nevertheless, the sort of agronomic activity in Gomole is shaped by the wealth or cash derived from livestock. Households with significant herd numbers in Gomole employ modern agronomic practices, such as investment in tractors, improved seeds, fertiliser and hired labour. As a result, livestock ownership contributes significantly to drought response because it impacts not only the source of food and income, but also the level of investment in farming.

Richer pastoralists have more robust and advanced drought response mechanisms than the other two categories, allowing them to maintain food consumption and valuable asset (livestock). Gegna, a photovoice participant with livestock insurance, captured the image below (Picture 8.1, left) to demonstrate how better-off households accumulate resources to combat pasture shortage – either from their farms or other sources. *'We don't know what the future holds; we preserve food [grains]. We don't need to sell cattle during hard times. I don't have to worry about feeding my family,'*<sup>62</sup> explains a wealthy female photovoice participant who took the photo below in Gomole (right). Such a strategy by the wealthy aims at transforming the uncertainty around drought risk into a manageable feature – in other words, certainty.

On the other hand, the poor have few resources with which to deal with drought. As a result, they tend to compromise food consumption in response, either in terms of quantity or quality. While cows are the primary source of milk, poor households only own a small number of them and often face milk shortages. The scarcity becomes much more acute during drought seasons. Consequently, in times of hardship, milking goats becomes common, to enhance the supply. The majority of poorer households<sup>63</sup> also turn to grain consumption earlier than the wealthy households; grain that is either purchased (as in Dire) or stored (as in Gomole).

---

<sup>62</sup> Loko, 56, a wealthy female insured pastoralist from Gomole.

<sup>63</sup> Results from 24 case studies (poor households), supported by survey results that are presented later in this chapter.



**Picture 8.1 Feed Reserve (left) and Accumulating Grains (right)**

Photo (Left) by Gegna, 38, active insurance policyholder in Gomole.

Photo (Right) by Loko, 56, active insurance policyholder in Gomole

During droughts, income saved from livestock is crucial. Following the 2019 drought, most agro-pastoralists reported an overall reduction in grain (in Gomole) and animal products (at both locations). The majority of wealthy families often save the money earned from livestock sales. During times of crisis, they use the savings to compensate for a decrease in family milk supply (maintaining food consumption) and to purchase feed, water, and other inputs to protect their assets (livestock). This, however, was not the case for the impoverished who were forced to reduce household food consumption or sell their cattle ('distress sales').

Households in the medium wealth group use a broader range of response strategies such as livestock-crop production, livestock and grain trading, milk, and dairy product selling, brokering live animal trading, and so on. Although their income and wealth levels are important, some key attributes shape their response strategies, such as gender, age and family dynamics. For example, while a female-headed family is more likely to compromise asset bases than food consumption, the reverse is true in a male-dominated household of the same economic status.

Whether in the agro-pastoral site (Gomole) or the pastoral site (Dire), household response to drought risk is predominantly livestock-focused. However, the nature and extent of responses to drought risk and other forms of uncertainty are heavily influenced by livestock herd sizes and income, making responses differentiated by wealth status. Even during drought periods, the rich are more likely to maintain their asset base than the other two wealth categories — the poor compromise their food intake and financial base during drought periods more than

others. Medium-income people have more opportunistic responses, depending on their situations, with outcomes highly influenced by idiosyncratic factors.

Economic status shapes other responses too. Mobility to areas with better pasture has become determined by wealth and income, whereby those with large herds migrate to distant areas more than others. Although accessing and using water has been a communal response mechanism for a long time, wealthy pastoralists have started constructing their own water wells in recent years, particularly in Dire (see Picture 5.3, Chapter Five). Moreover, non-pastoral livelihood options are differentiated by wealth too. The richer own land in towns and can start a business, while poorer households engage in daily labour and petty trades. Such factors also influence how a household responds to drought risk. For the wealthy, with a strong presence in towns, securing animal feed is easier. They have networks already established to purchase animal feed from areas with better supplies, and leasing trucks is also easier,

## Gender

Gender plays a vital role in intra- and inter-household response mechanisms. Women generally have a smaller herd than men in Borana. Female-headed families own six TLU (six cattle or 60 small ruminants) fewer than male-headed households. This greatly affects their capacity to reorient multiple response strategies, particularly consumption-smoothing and productive responses. This limited capacity is translated into inadequate milk supply, smaller income generated from livestock, and less flexibility to invest in other aspects of livelihood. The absence or lack of support or companionship is another challenge that female-headed households face during stress periods. Qaballe, explains: *“there is a sense of insecurity when you are by yourself. It is not solely finance- or work-related but adjusting what you want to do during drought times also requires someone dear to you, whom you can consult.”*<sup>64</sup>

Regarding community-owned resources such as pasture and water, discussions and decisions regarding their use are dominated by men. Although women's role in managing livestock in satellite camps has grown in recent years (Doss et al., 2011), mobility is still considered men's business. These practices provide little room for women to reorient available community-owned resources to respond to drought risks and associated uncertainties. Moreover, the power dynamics between the two genders creates dependencies for women on men. Although multiple networks have been established to access information and enhance risk-

---

<sup>64</sup> Qaballe, an insured female-headed household in Gomole, aged 41.

response capacities, women from both male- and female-headed households are excluded from resource governance and similar networks.

During drought periods, men tend to focus on sustaining livestock by employing both community and individual-based responses. Migration, purchase of feed, and herd splitting are some of them. On the other hand, women diversify their income source base to sustain the food supply during stress periods. They engage in the selling of firewood or charcoal, and petty trades. During normal seasons poorer households engage in these types of trade, but during drought seasons wider layers rely on them as a coping strategy. Poultry has also become a source of food and income for many women across different marital statuses. All-female photovoice participants took similar pictures (below are two) to explain the positive aspects of poultry farming in response to risk. Their engagement in various income-generating activities has enabled them to improve food supply and to respond better to drought-related risks and uncertainties.



**Picture 8.2 Poultry as a response by Qaballe (left, 38, female headed) and Galmo (right, 18, single)**

In summary, gender plays a vital role in the patterns and scope of responses to drought-related uncertainty. During droughts, men maintain asset bases by participating in productive responses. On the other hand, women prioritise maintaining or smoothing consumption and diversifying income sources, intending to build assets afterwards.

### Age

Memories, experiences and imagination reshape how responses are selected and combined during drought periods. A person's age is strongly associated with their accumulated knowledge of the past. This includes understanding the patterns of rainfall and pasture

distribution, migratory routes and destination, and livestock, household and community dynamics. Moreover, most individualised or collective responses require strong working groups and networks; in this regard, adults (between 36–60 years old) are better positioned than younger (between 18–35 years old) pastoralists.

Adult and older male households influence governance and decisions linked to community resources. Below is a picture that Kusse<sup>65</sup> took in Dire to demonstrate the seating arrangement during a community discussion. While those at the centre, adult or older, are the core discussants, the others sitting in the second tier are the younger audience with limited influence on such decisions.



**Picture 8.3 Village-level discussion on pasture enclosures – by Kusse in Dire**

Adult pastoralists mix consumption-smoothing response strategies with productive responses better than their younger counterparts. Although they have large family sizes that require more food supply, more assets and labour are available to reorient productive activities. Adult pastoralists were found to have more assets (on average, five more cattle) and resources than younger households in both sites. For the young respondents in both locations, the main worry is sustaining daily food demand, while resource accumulation is secondary. *'How can I keep my cattle while my toddler is hungry?'* asks Bagaja<sup>66</sup>, explaining why most of his drought strategies focus on providing food for his young children. Here, family dynamics play a prominent role in determining the kind of response to be prioritised during drought seasons.

<sup>65</sup> Kuse, 36, medium-wealth group, insured male, Dire.

<sup>66</sup> Interview with couples in Dire, Bagaja (24) and Jireni (18).

In the early years after marriage, young couples struggle to sustain food supply, and drought is primarily viewed as the leading cause of household food shortages; the survival of their newborn babies or toddlers is their top priority.

Adult and older pastoralists engage in limited but high return livelihood activities – livestock and farming – compared to younger households. By contrast, younger pastoralists engage in various income-generating activities beyond livestock-keeping and farming. During stress periods, they reorient their strategies to secure more income by working as daily labourers (construction, shops, etc.) or in the transport sector. Renting out motorbikes is a booming business for the wealthy. However, the youths who hire motorbikes are now involved in smuggling goods from Kenya.<sup>67</sup> There are multiple checkpoints between Moyale (Ethio-Kenya) and Yabello (Borana zonal capital), and between major towns and Addis Ababa. The youth carry the goods off-road between areas before and after checkpoints.



**Picture 8.4 Smuggling Goods using motorbikes – on the road between Moyale to Addis. Motor bikers take the main road after they pass the checkpoints to offload the goods they carry.**

### Location

The spatial distribution of drought is a significant aspect of pastoralism, as discussed in Chapters Six and Seven. Across the two study sites, spatial patterns dictate both exposure and response to drought risk in relation to the resource base (pasture, water and land use) and pastoralists' economic status.

<sup>67</sup> A wealthy household purchases a motorbike and leases it to a young (male) driver in exchange for giving an agreed amount of cash to the owner on a daily or weekly basis.

In Dire, an extensive pastoral system and all response types— consumption-smoothing, productive responses and social insurance- focus on livestock. Consumption-smoothing, either decreasing or adjusting food intake, focuses on milk and meat-related inputs. Livestock slaughter is more common in Dire than in Gomole. Migration, a productive response, is less common in Gomole, whereas in Dire, it is one of the major response mechanisms. Farming is a source of food supply and a backup plan for livestock in Gomole but is insignificant in Dire. Therefore, grain-based consumption-smoothing responses to risk characterise households in Gomole.

Investment in surface or underground water sources in response to the risk of drought, either as a community or individually, is one of the most common strategies in Dire. There are few efforts in Gomole to invest in water — mainly due to the availability of a seasonal river and a large developed pond. Moreover, due to its proximity to the zonal capital, there are several water-development projects in Gomole, which have decreased uncertainty around drought-related water shortage.

Expanding the *kallo* community enclosures constitutes another response strategy, pursued more in Dire than in Gomole. By contrast, expanding private farmland is common in Gomole. Proximity to markets and social amenities also reshapes the kind of response strategies considered. Although both sites have big markets (for livestock, grain and other goods), the market in Gomole has a better supply of goods and services than that of Dire.

## Summary

Response to drought is influenced by multiple factors. An individual's or household's attributes- economic status, gender, age and location- affect the type and extent of responses employed following a drought. Table 8.1 summarises the findings.

These attributes are also combined differently at the household level. As shown in Table 8.1 below, an elderly, poor, female household who lives in Dire has a different response strategy to drought risk than the same wealth group living in Gomole, and younger. For example, consumption-smoothing by reducing daily intake by poor females differs between study sites. In Dire, consumption-smoothing is centred on milk and other dairy products; in Gomole, the focus is on a mix of grains and engaging in non-agricultural activities (due to age difference).

**Table 8.1 Household/Individual attributes that (re-)shape response strategies**

Attributes	Categories	Key characteristics of Responses (to drought)
<b>Economic Status</b>	Poor	Consumption-smoothing by reducing daily food intake (quantity or quality)
	Middle/Medium	Opportunistic – several low investment responses
	Rich	Focused (limited) and high return investments by sustaining food security to preserve an asset
<b>Gender</b>	Female	Sustaining food demand by compromising asset base
	Male	Sustaining asset base by destabilising consumption
<b>Age</b>	Young	Non-pastoral or non-agricultural income-generating activities to sustain household food demand
	Adult/Old	Maintaining food demand without depleting the asset base
<b>Location</b>	Dire (pastoral)	Livestock-focused response strategy – trade, migration, etc. and collective responses (enclosures, migration, water)
	Gomole (agro-pastoral)	Mixing crop with livestock and more individualised responses

Longitudinal studies (PARIMA and IBLI) corroborate these findings, highlighting the fact that livestock is the primary means of responding to drought and escaping poverty in Borana (Desta and Coppock, 2004; Barrett *et al.*, 2006; Doss *et al.*, 2008; and Jensen *et al.*, 2017; Kazushi *et al.*, 2018). However, pastoralists' response strategies are shaped by a variety of individual and household characteristic and social differences, in addition to wealth. The following section considers where and how the uptake of insurance fits with these differentiated responses.

### **8.3 Practices of combining responses with insurance: Trends, logic and decisions**

IBLI seeks to protect pastoralists' central asset – livestock - from weather-induced drought. As explained in Chapter Two, insurance involves providing cash as a pay-out, ahead of time, to supplement response mechanisms when a forage level falls below a certain threshold (Carter *et al.*, 2008; Chantarat *et al.*, 2012). This is assumed to enable pastoralists to spend on productive responses: feed, water and veterinary services for their animals. As such, their asset base will not have deteriorated, and they can avoid the poverty trap (Barrett *et al.*, 2008; Chantarat *et al.*, 2017).

Nevertheless, these assumptions raise two interrelated questions. Firstly, how are other responses combined with insurance by different pastoralists? And secondly, do these combinations supplement productive responses for vulnerable pastoralists? This section aims to compare assumptions with practices on the ground. Accordingly, pastoralists were asked about their responses to the 2019 drought.

i) Explaining the data presentation and discussion - How did I analyse and present the data?

In the previous chapters, Six and Seven, I discussed how the exposure to, and experience (and conceptualisation) of drought risk are influenced and shaped according to various signifiers of social difference, such as wealth status, gender, age and location. Furthermore, several responses to drought risk (see above) are conditioned by broader contexts, including the food security status of the household, the extent of assets (notably livestock), health conditions (human and livestock) and the level of security and conflict in an area. In the following analysis, responses are disaggregated by livestock-based wealth categories poor, medium and rich as well as by gender and age of the household head and location (see the discussion and Table 8.1 above).

I use two data sets to understand the responses to drought and how they relate to insurance. First, I analyse the difference in responses between insured and uninsured (dropouts and non-policyholders) households following the severe drought and pay-out (to insured households) in 2019. The second data set shows pay-out use among insured households in 2019. Following the drought, during the long rainy season of 2019 (March – June), the insurance underwriter distributed cash totalling US\$170,000 to 3,000 policyholders. In Dire and Gomole, 200 households received pay-outs, of which half were selected for this study. As the pay-out was made following the failure of the primary rainy season, the mix of responses between the insured and uninsured could be ascertained. Finally, by analysing the effect of wealth and location on pay-out use, I have identified the rate at which a household combines a given response strategy with insurance.

Information was first collected by asking pastoralists to list common responses to risk and uncertainty (through surveys and group discussions). Then, individual surveyed households were asked to rank all responses they implemented in 2019. Each ranked response strategy (using the Likert Scale)<sup>68</sup> was, in turn, disaggregated, based on wealth, location and insurance category. The rankings for each response strategy were standardised using proportions (in per cent). Insured and uninsured households of the same wealth category and location were then compared for each percentage. This step clearly shows how an insured household combines a given response strategy with insurance. To confirm the findings, I triangulated with pay-out

---

<sup>68</sup> For this study, all responses are ranked from 0 to 5 (0 = Not practiced/considered, 1 = Very Low, 2 = Low, 3 = Medium/Average, 4 = Highly considered/practiced, and 5 = Very Highly considered/practiced).

use and asked insured households to rank the likelihood of them combining a given response strategy with insurance.

Finally, as stated in Chapter Two, each insurance cluster has its own risk profile in terms of insurance pay-outs, which implies that various insurance premiums and pay-out rates are assigned to each one. The amount of insurance compensation is proportional to the predicted severity of the forage condition under the insurance model. The more severe the scarcity of forage, the higher the pay-out per TLU. Therefore, compensation is determined by the severity of the pasture shortage, the type of livestock and the number of animals insured in an insurance cluster.

Discussions on responses below are divided into two parts: consumption-smoothing and productive responses.

## ii) Combining Insurance with Consumption-Smoothing Responses

The survey results indicate that pastoralists deployed more than 22 different responses during the drought period of 2019 (details can be found under Annex II). Of these, 12 were combined with insurance in different ways. Among the different consumption-smoothing responses, three stand out: reducing daily food intake (quality or quantity), supplying food from the market (through cash or credit) and slaughtering livestock. These are combined differently depending on wealth and location, as discussed below.

*Daily food consumption (quantity/quality):* As shown in Table 8.2, uninsured pastoralists practised this response strategy more than insured households in both sites; however, the application of this strategy is greatly determined by wealth status. It is often used by low-income, uninsured families (65.6 per cent in Dire and 81.7 per cent in Gomole). The rate decreases for uninsured, medium-wealth groups at 61.3 per cent in Dire and 70 per cent in Gomole. Uninsured wealthy pastoralists are the least likely to practise consumption-smoothing (51.4% in Dire and 63.7% in Gomole). This can also be translated as insured families being less likely than uninsured households to reduce food consumption as a drought-response strategy. Furthermore, insured poor households employ this strategy in conjunction with insurance more frequently than do the wealthier insured.

*Food Purchase:* Although markets have historically served as a source of food supply, particularly grain, the expansion of infrastructure, notably roads and markets, has accelerated the trend (McPeak and Little, 2006). During drought periods, households secure their food

demand from local markets or shops. Grain purchases are common, to make up for the shortfall in milk supply (McPeak et al., 2012). Accordingly, all pastoralists reported purchasing food in the form of grain and complimentary food items from nearby markets; however, this practice is both insurance- and wealth-disaggregated.

In both sites, and across all wealth groups, insured pastoralists purchased more food than uninsured pastoralists. This strategy is combined with insurance more by medium-wealth groups in both localities (53.3% in Dire and 39.4% in Gomole). This picture is reflected in poor insured households, with 51.4 per cent and 33.3 per cent in Dire and Gomole, respectively. Surprisingly, wealthy insured households have the lowest combination rates: Dire at 42.5 per cent, while it is 29.4 per cent in Gomole.

**Table 8.2 Insurance with Consumption-Smoothing Responses in Dire and Gomole in 2019 (per cent)**

Location	Insurance Category	Wealth Category	Consuming less (daily) food – either quality or quantity	Purchasing food on credit	Slaughtering livestock
Dire	Insured	Poor	54.3	51.4	25.7
		Medium	53.3	53.3	38.7
		Rich	49.4	42.5	45.0
	Uninsured	Poor	65.6	38.9	33.3
		Medium	61.3	40.0	24.0
		Rich	51.4	37.1	57.1
Gomole	Insured	Poor	68.9	33.3	37.8
		Medium	56.8	39.4	23.1
		Rich	52.5	29.4	40.0
	Uninsured	Poor	81.7	24.2	25.0
		Medium	70.0	32.6	28.4
		Rich	63.7	20.0	32.9

The announcement of an insurance pay-out in August 2019 came as a welcome relief, particularly for low-income insured families. Because milk production was insufficient, it allowed them to protect their animals from distress sales and take food on loan. Bokayo from Gomole commented:

*"The local insurance promoter, Golich, informed us the situation was getting worse, and an insurance pay-out would likely be made. My firstborn was unwell, and we decided to leave our farmland fallow and grow natural grass for the livestock. I had expected average rainfall so that I would fatten two bulls and sell them to the local trader. However, I was left hopeless when the vegetation condition was worse than I expected. Since we did not cultivate, the situation worsened. I sold one bull to cover various expenses – food, medication, etc.*

*Nevertheless, the situation continued to deteriorate day by day. I had to make a difficult choice; I kept the bull and reduced our food intake. A day later I heard there would be a pay-out; I went to Bake [nearby market area in Gomole] and bought maize and rice."*<sup>69</sup>

Poorer insured pastoralists bought grains for food once the pay-out was made, with rice being the most common food item in most households. A family of ten can be fed with a kilogramme of rice, which costs US\$0.4. *"Rice is simple to prepare. You boil it, add salt, and serve it. You can save the milk you're selling by doing so. A litre of milk costs the same as a kilo of rice, yet serving 10 people requires nearly three litres,"* Negele<sup>70</sup> explains. Although the pay-outs to the poor and some middle-class pastoralists were modest, they went a long way toward acquiring food because they insured a limited number of their livestock. Qaballe Dida<sup>71</sup>, who received US\$15, was able to fulfil her food needs for over 17 days with the money she received.

For Boru<sup>72</sup>, the pay-out confirmed his observations of the changing state of vegetation. He was fattening ten bulls in the hope of getting a fair price for the Ethiopian New Year in September. *"I was in a deadlock when I saw the situation in Borana growing worse, and I had to choose between selling the bulls or jeopardising household food,"* he explains. From experience, pastoralists know that milk production drops when vegetation levels decline. Despite having close to ten cows, the amount of milk produced was insufficient to support Boru's extended family. He captured the photo below to show how milk production drops dramatically at the household level when cows' physical health deteriorates. This also indicates that the revenue earned from its sales is decreasing. *"I spoke with my wives and explained to them that keeping the bulls and later selling them has a beneficial impact on us and that they need to cook in one pot and share food, which means we eat poorer quality food at home",* Boru adds.

---

<sup>69</sup> Bokayo, a 45-year-old female-headed insured household, in Gomole.

<sup>70</sup> Negelle, young, an insured poor pastoralist, in Gomole.

<sup>71</sup> Qaballe Dida, from Gomole.

<sup>72</sup> Boru, a middle-aged man, from Dire.



**Picture 8.5 Photo by Boru, an insured pastoralist from Dire, to display the physical condition of cows during drought periods, October 2019**

Interestingly, the money from pay-outs received by medium and poor households was spent on food more than anything else in 2019. Those most likely to report this was the medium wealthy in Dire (27.7%) and poor households in Gomole (28.9%). Combining insurance pay-out with food purchase, however, follows a different rationale. Pastoralists in Dire rely on livestock for both food and income; thus, drought has an impact on both. To solve the problem, they must make a difficult choice: either reduce meals to maintain milk revenue or find another source of cash. The case of Boru, above, is a classic one in Dire. Poor households in Gomole, on the other hand, have a limited number of animals and typically small ruminants (see Chapter Five) and the drought affects farming more than livestock. Furthermore, they do not save grain, so pay-outs provide relief in helping overcome food shortages.

Finally, as mentioned in Chapter Seven and earlier in this chapter, wealthy pastoralists accumulate resources such as grain and animal feed (see Picture 8.1 A and B earlier in this chapter) as a response strategy during surplus seasons. As a result, they do not spend more insurance money on food than others, especially during the onset of a stress period.

*Slaughtering Livestock:* During times of stress, livestock become weaker and milk supply decreases (Degen, 2011). Some of the strategies used by pastoralists include reducing the quantity of weak livestock to boost food supply, relieving stress on limited resources (pasture/water), and increasing social responsibility. As seen in Table 8.2, slaughtering

livestock has two peculiar trends. Firstly, in an extensive pastoral system (Dire), uninsured poor (33.3%) and wealthy (57.1%) pastoralists slaughter more than insured households of the same wealth group. The reasons are that among the poor, there is a need to increase the supply of food at home as they have limited options for responding to drought risk. They also butcher small ruminants to reduce mortality owing to insufficient grazing availability and related risk (like livestock disease). This is a risk-aversion strategy, especially if households believe the drought will last longer. They also store grain for extended periods of stress.

Slaughtering animals among the wealthy is a herd-management practice that aims to increase food availability, as milk production is lower during such periods. To reduce competition for the limited pasture (feed), the weak and dry livestock are butchered. Nevertheless, the insurance pay-out alters their objective to reduce livestock. They change their plan to maintain the herd size by investing in feed and other inputs. The rich pastoralists also have a social responsibility to butcher animals and distribute them to the poor and needy. This is part of a common ritual known as "*foon walii kutuu*" (sharing meat).

Secondly, insured households in the agro-pastoral system in Gomole tend to slaughter animals more than those uninsured; however, it is practised more by both poor and wealthy insured. Therefore, slaughtering livestock is combined with insurance differently, and is highly wealth- and location-disaggregated. In an extensive pastoral system, insurance can result in increasing herd sizes for the poor and keeping large herds for the wealthy.

In conclusion, insurance is used in a variety of ways to respond to the consumption-related uncertainty that a household encounters during droughts. The findings show that limiting daily food consumption and purchasing food from nearby markets (cash or credit) are wealth- and location-disaggregated. Poor households combine insurance with food supply-related strategies to improve their daily food intake, more than the other two wealth groups. In contrast, those who are insured in the medium and better-off wealth categories increase their expenditure on grain purchases. Among the wealthy insured, less money is spent on consumption-smoothing responses, as they have large reserves of grain. Moreover, they slaughter weaker animals during stress times to supply food and revenue for their own households, as well as to support others through sharing networks. Pastoralists may be obliged to sell animals, particularly amongst the medium-income households, but a core of animals will be kept for milking. Insurance benefits might then be used to supplement the households' food supplies, with some weaker animals being slaughtered for meat. Poorer

households with insurance (a minority) have fewer animals and are more likely to spend their meagre insurance reimbursements on food. These trends are largely comparable across the two sites. However, there is a greater emphasis on animal purchase in Dire, whereas in Gomole the stress is on grain purchase across all wealth categories.

### iii) Combining Insurance with Productive Responses

The design and implementation of livestock insurance in Ethiopia and Kenya from the offset had as its objectives the transfer of drought risk through market-based mechanisms and the protection of pastoralists against weather-induced forage scarcity. As such, the model predicts the resources needed during stress periods to keep insured animals alive. So, payouts are given to households based on the number of livestock/TLU that are insured and how bad the drought risk is.

However, the practices of different pastoralists indicate that insurance is combined with local responses, and they extend beyond investing in animal feed, water and veterinary services. There are nine different response strategies that pastoralists combine with insurance. These are categorised under market-based and pastoral resource-based responses.

#### ***Market-based Responses***

Market-based responses that are combined with insurance focus on the use of the insurance pay-out to purchase various goods and services during a drought season. There are four strategies linked with this: selling livestock, purchasing feed/pasture (including pasture from private lands), buying water and purchasing veterinary services.

The per capita investment in livestock insurance directly reflects wealth status, particularly herd size, with the wealthy investing 61 per cent more than medium-wealthy pastoralists and 244 per cent more than poor insured households. Similarly, the per capita total sum insured (TSI) in Dire (US\$121.75) is more than double that of Gomole (US\$55.47).

*Livestock Sales:* As seen in Table 8.3, livestock sales are handled differently in both sites by the three wealth categories. Insurance is a good strategy for the rich to sustain productive stock by selling weak (dry or old) stock. The difference between insured and uninsured is greater in Gomole (9.4%) than in Dire (3.1%). There is no difference between insured and uninsured households in Dire's medium-wealth groupings. Uninsured households found in the medium wealth category in Gomole, on the other hand, sell animals more (55.8%) than insured

households (49.2%). Insurance helps insured poor households in Dire respond to drought risk by limiting livestock sales, which is not the case for wealthier households. However, the difference in both circumstances is small. Uninsured poor pastoralists (51.1% in Dire and 42.5% in Gomole) have a greater rate of distress sales than insured poor households.

Therefore, insurance pay-outs are substantially coupled with a reduction in distress livestock sales by poor households in Dire and by poor and middle-income households in Gomole. Richer households, on the other hand, continue to sell animals for regular herd management (disposing of the weak, dry and old livestock) in both locations.

**Table 8.3 Combining Insurance with Productive Paths – Market-based responses in 2019 (per cent)**

Location	Insurance Category	Wealth Category	Selling livestock	Increasing the purchase of feed/forage for animals	Buying water for animals
<b>Dire</b>	Insured	Poor	47.1	45.7	62.2
		Medium	60.1	46.7	62.7
		Rich	68.8	60.6	63.8
	Uninsured	Poor	51.1	42.2	61.4
		Medium	60.0	37.3	48.0
		Rich	65.7	40.0	57.1
<b>Gomole</b>	Insured	Poor	40.0	47.1	65.0
		Medium	49.2	59.6	73.7
		Rich	60.0	66.4	75.3
	Uninsured	Poor	42.5	40.7	44.4
		Medium	55.8	42.0	66.2
		Rich	50.6	50.6	57.6

*Purchase of Animal Feed:* A key rationale behind the introduction of insurance is to support livestock owners in purchasing feed for animals during pasture scarcity seasons/months. Insurance pay-outs are calculated by monetising the resources needed (animal feed, water and veterinary services) and animal feed takes the largest share. Indeed, the data show that insured families spend more, on average, than uninsured households; however, there are important differences across wealth categories and locations, as shown in Table 8.3.

While insured poor households spend more on animal feed than their counterparts in both research sites, the difference is smaller when compared to medium-wealth or wealthy households. The greatest disparity between insured and uninsured households was found in Dire's wealthiest households, where each insured person spent 20% more than an uninsured household in the same wealth level. The second-highest difference is between insured and

uninsured households in Gomole, where insured households spent 17.6 per cent more than uninsured households.

When it comes to combining insurance with this response strategy, location is crucial, especially among rich pastoralists. As demonstrated in the photographs below, pastoralists in Gomole preserve a sizable crop residue stockpile (either from their own land or purchased). Insurance benefits are used to finance alternative asset-building activities (such as livestock acquisition) or cash savings. Furthermore, among the wealthy, low rainfall perceptions do not discourage households from farming; rather, they change the type of crops they grow (from *teff* to short length of-growing crops, such as maize). Some have invested in equipment, such as tractors, and improved seeds that grow quickly. Conversion of private holdings to pastureland has become more popular in Borana's northern agro-pastoral zones. These are semi-humid zones with better availability of annual rainfall. As a result, wealthy pastoralists lease private pasturelands through established networks. This is not evident in Dire, where wealthier insured families spend a greater proportion of their reimbursement on livestock feed.

In summary, insurance is strongly combined with the purchase of feed during drought risk periods. However, it is more highly regarded by those who are relatively less vulnerable (wealthy and middle-class) than the poor.



**Picture 8.6 Crop residue (from own farm or purchased) accumulation in Gomole. Photo by Sora (left) and Qaballe (right), in October 2019 and March 2020 respectively.**

*Purchase of Water for Livestock:* Investment in water represents another vital strategy during periods of drought. How insurance is paired with this method comes down to herd size and type, location and access to water (community or private water wells). Due to the small size of the herd, communal reserves are sufficient to meet the watering requirements for poorer households. Moreover, water demand is limited for the small stock (mostly goats and sheep) that they own. Insurance is more commonly paired with this response strategy in Gomole than in Dire (Table 8.3, above). Agro-pastoralists buy water from local areas or hire labour to deliver it from far locations because community reserves are sparse and perennial areas have been converted to croplands.

*Veterinary Services:* Investments in veterinary services are another important factor in the assessment of insurance pay-outs. Interestingly, the difference between insured and uninsured households is minor (less than 1% on average); as such, it is not included in the figure above. It is, nonetheless, a priority for pastoralists. Furthermore, these services are inexpensive; in Borana, medication to treat common diseases costs an average of a birr per head cattle (US\$0.034)<sup>73</sup>. In Dire and Gomole, the average pay-outs spent on veterinary care is 13.7 per cent and 14.9 per cent, respectively.

In summary, livestock insurance is designed to support pastoralists in maintaining their livestock assets in the face of impending drought through facilitating expenditure on animal feed, water and veterinary services. For richer, insured pastoralists, the availability of cash—in the form of insurance pay-outs—has indeed aided them in their efforts to maintain core livestock by allowing investment in these vital resources. However, the pattern of pay-out expenditure differs across wealth groups amongst the insured. While richer pastoralists (by far the majority of insurance policyholders) follow the pattern expected by the IBLI designers, the relatively few poorer (and medium-wealth) households with insurance contracts instead tend to use pay-outs for more urgent expenditure, notably on food for human consumption. This does have a net effect of reducing distress sales during a drought, but, unlike richer insured households, they are unable to accumulate, replacing less productive animals (weak, dry or old) with new ones. In other words, insurance allows richer pastoralists to accumulate and reconfigure their herd, while for the few insurance holders amongst relatively poorer households, insurance pay-outs are used to offset extreme conditions. Insurance can therefore have positive effects, but these differ according to wealth group and across

---

<sup>73</sup> As per the exchange rate on 09/10/2019 by the National Bank of Ethiopia. It was also the time insurance payout was distributed to pastoralists.

locations. However, with the majority of insurance holders being richer, male pastoralists' insurance has not had the intended effect of being a 'pro-poor' intervention.

### ***Pastoral Resource-based Responses***

These are responses derived from an individual or community-owned pastoral resources. Pastoralists use five measures to respond to drought: migrating to communal regions, migrating to remote locations, increasing private enclosures, utilising communal enclosures and starting farming.

*Migration/Mobility*<sup>74</sup>: Migration as a response strategy, particularly during the time of pasture scarcity, is an important strategy for pastoralists in Borana (Coppock, 2016). Survey findings reveal that insurance is paired with two forms of migration: the move to local territories (usually within a 30-kilometre radius), or to more distant grazing sites as far away as Kenya (as far as 200km from base camps found in the study areas). Although longer-distance mobility is favourable for pastoral production (Hogg, 1992; Mellisse, 2014), the survey findings show that non-poor insured households are more likely to abandon this strategy. Furthermore, both types of migration (nearby and far) are location- and wealth-disaggregated.

As indicated in Table 8.4, pastoralists in Dire are more likely to migrate to common or nearby areas than pastoralists in Gomole. Moreover, migratory practices are not as structured in Gomole as they are in Dire. This is because most lands in Gomole have been converted to farming and therefore herders must move animals in search of grazing around any available open spaces.

When pastoralists perceive pasture conditions to be dwindling, responses start with migrating to common areas. More poor insured households (58.6%) migrate to common areas that are closer to their basecamp than uninsured households (43.3%). However, insured medium (57.3%) and wealthy (70.6%) pastoralists in Dire practise it less than uninsured households of the same wealth groups (respectively, 62.7% and 74.3%). The trends are similar in Gomole, as shown in the table below; however, when a comparison is made among the three wealth groups within each cluster, migrating to nearby areas is more highly practised by insured wealthy pastoralists in both sites (Gomole, 42.4% and Dire, 70.6%) than the rest.

---

<sup>74</sup> Migration and mobility are used interchangeably in this thesis. However, in Borana, this response strategy is termed as *godaana*, referring to 'to move'.

**Table 8.4 Combining insurance with Productive Response in 2019 (Pastoral Resources) – Migration (per cent)**

Location	Insurance Category	Wealth Category	Migrating to common areas	Migrating to distant areas
<b>Dire</b>	Insured	Poor	58.6	38.4
		Medium	57.3	36.7
		Rich	70.6	28.6
	Uninsured	Poor	43.3	40.6
		Medium	62.7	48.0
		Rich	74.3	53.1
<b>Gomole</b>	Insured	Poor	40.0	20.0
		Medium	38.5	27.7
		Rich	42.4	31.8
	Uninsured	Poor	34.2	27.5
		Medium	51.6	36.8
		Rich	48.2	48.2

Interestingly, when an insurance pay-out is announced, all insured households in both sites, regardless of wealth group, abandon their plans to migrate to remote areas in search of pasture. This is also a location-specific option, with pastoralists in Gomole considering it more than in Dire (see Table 8.4). In Gomole, the rate at which uninsured households employed this response strategy was 41.7 per cent higher than that of the insured households. Similarly, in Dire, the rate at which uninsured households practised this response strategy was 36 per cent more than the insured ones.

In recent years, migration to remote places has necessitated a large herd size, enhanced herding experience, and improved working groups/networks. Such mobility demands the acquisition of both technical and social skills (Roe et al., 1998). Furthermore, migration in Borana is diverse and unique to local conditions. Pooling of herds and duty-sharing is widespread among poor households, especially when mobility is unavoidable. A household or group of households residing in an *olla* (village) considers migration to remote places after sending a scout (family or hire labour, commonly referred to as '*aburru*') to examine the resources in the destination area(s).

Mobilising men with advanced herding skills in remote places is becoming an expensive and risky endeavour— both economically and socially. Firstly, livestock is not a single source of income, and in recent years, sending an adult household member has meant temporarily abandoning other socio-economic duties. As Dakisse states, "*In the past, we all were the same – both our activities and aspirations. Adult men moved together in search of pasture and*

*water. However, you might not find a single individual in the entire olla these days when you want to migrate because some have other priorities, such as livestock trading or farming, and others are poor".*<sup>75</sup>

Secondly, if pastoralists hire herders, they must pay a higher wage than other non-livestock enterprises such as construction or urban, unskilled employment. This requires a large sum of money, which only the wealthy can afford. However, those with smaller herd sizes have alternatives for collaborative migration (pooling herds); this requires strong social networks and contacts (Homann et al., 2008). Finally, migration decisions and routes are influenced by security (risk of war and livestock-raiding). When considering migration, factors such as sources of income, cash availability, wealth, gender, age, security and social relationships are taken into account.

Furthermore, pastoralists' mobility has been curtailed as rangelands have been converted to cropland and private enclosures (Lind et al., 2020). When pay-outs are made and pastoralists abandon plans to migrate with livestock, they instead invest in purchasing water and feed (as explained before), much of which is obtained from private sources. Thus, the receipt of insurance payments encourages pastoralists to invest more to acquire feed for their own herds rather than relying on collective risk responses. Nevertheless, when resources are pooled, rich pastoralists typically contribute more than those with lower economic status. However, when they opt-out of this type of response strategy, the wider collective risk-sharing mechanisms used by pastoralists of various wealth groups suffer. As a result, competition for grazing resources around base camps grows.

Accordingly, when one decides to abandon insurance, mobility is identified as a major response strategy. Surprisingly, migration is seen as a substitute for insurance among middle-income populations, such as Boru. He explains, "*I am the firstborn and started managing the household after my father died eight years ago. When I decide to leave insurance and the situation might not be good, I will migrate to Malbe [on the Kenyan border]. This means both of my young brothers will drop out of school; maybe they will continue next year. One will go with me, and the other will manage the herd in the base camp and other tasks.*" Consumption-smoothing and certain productive paths— such as "cut and carry" to feed cows and small ruminants— are adopted by those at the basecamp.

---

<sup>75</sup> Dakise, 56, male, from Dire.

*Land-use:* One of the fundamental developments in the Borana pastoral system, as addressed in Chapters Four and Five, is the conversion of land to non-pastoral uses. Furthermore, particularly in Gomole, the form of ownership has shifted dramatically from communal to private holdings. Insurance is combined with land-based activities before and after the incidence of drought risk (forage scarcity). Decisions are made before or around the time pastoralists expect rain (*ex-ante* and *semi-ex-ante*). Interestingly, some of the responses in this section are combined with the above migration responses.

As shown in the table below (Table 8.5), those who are insured deploy the three land-based strategies: expanding private enclosure, extensive use of community enclosures, and farming, more than uninsured households. These strategies differ across the study sites and the three wealth groups.

Poor, uninsured households in Dire (32.2%) and Gomole (22.2%) are the least likely to expand private enclosures compared to the other two wealth groups. The wealthy in Gomole violate local rules by incorporating community land into their private plots, as discussed in Chapter Seven (Section 7.2); and, because insurance investments are linked to the expectation of forage scarcity (drought risk), it incentivizes pastoralists to reposition their response strategy ahead of the rainy seasons by expanding private enclosures.

**Table 8.5 Combining Insurance with Productive Responses in 2019 – Pastoral Resources – Land-Use (per cent)**

Location	Insurance Category	Wealth Category	Expanding private enclosure	Utilising communal <i>kallos</i>	Starting farming
Dire	Insured	Poor	32.9	58.6	37.1
		Medium	34.5	69.7	50.0
		Rich	35.0	75.6	45.8
	Uninsured	Poor	32.2	56.0	32.2
		Medium	26.7	63.3	33.3
		Rich	28.6	60.0	40.0
Gomole	Insured	Poor	25.0	35.6	84.3
		Medium	32.6	39.4	90.8
		Rich	33.8	43.5	89.4
	Uninsured	Poor	22.2	30.8	73.3
		Medium	24.6	34.7	80.0
		Rich	23.5	35.8	70.6

The use of pooled resources is influenced by location, wealth and investment in insurance. This specific method of response finds greater traction in Dire (63.8%), an extensive pastoral system than in Gomole (36.6 %), an agro-pastoral system. Similarly, the wealthy participate in

it at a rate 20 per cent higher than that of the poor. The method is used by wealthy insured households at a rate of 29.1 per cent more than poor insured households and 26 per cent more than uninsured wealthy pastoralists. As a result, while location and wealth status influence the extent to which this response strategy is used, it is used more when combined with insurance.

Interestingly, despite the fact that farming is not common in Dire, with the average landholdings being less than a hectare (Chapter Five), the expectation of low rainfall increases the likelihood of cropping among insured households compared to the uninsured. Medium-wealth groups combine with insurance more than the other two groups, followed by poorer and wealthier households. In Gomole, wealthier households combine farming at a higher level than the other two, e.g., 89.4 per cent compared to the 70.6 per cent of uninsured households. Poorer and medium-wealth groups follow.

There is a similar trend of land-based responses by insured pastoralists relative to other response strategies discussed above. Unlike market-based responses that intend to supplement insurance suppliers' local response strategies, insurance increases the tendency to invest in individualised responses. Case studies further strengthen the findings from survey results, as below.

The expansion of communal enclosures as part of the response strategy to drought is widely practised in Dire. Members of a community gather and discuss their expectations of the upcoming rainy season and pasture conditions, herd dynamics (number and species) and related issues. If they expect below-normal pasture conditions, they will increase the enclosure and build fences. Although access to community enclosures is the same for everyone, social networks and power relationships (influencing the process and negotiating resource governance) within each paddock have played significant roles recently (Tache, 2009). When a household decides to invest in insurance, they influence discussion on the size of enclosures and when to open them. As discussed earlier, enclosures happen before the rainy season, as do insurance sales windows.

There are two interesting uses of communal pasture, which are location-specific. In most parts of northern Dire, insured pastoralists influenced the decision to open the enclosures. Although they had received insurance pay-outs, their first strategy was to use these resources. The opening of *kallo* depends on the physical condition of livestock, not the number. As they own large herds, per capita utilisation is higher among the wealthy than their counterparts.

Secondly, the “cut and carry” of pasture is a widespread practice in the southern side of Dire. The rule here is to take as much grass as possible in two weeks<sup>76</sup>. Pastoralists with cash can hire daily labourers to take as much as they can. Bonaya says, *“unless you have no fear of God, you can cut the grass and take it to your backyard.”*<sup>77</sup> Pay-outs arrive ahead of severe drought months, which gives insured pastoralists the advantage in garnering such resources. A portion of the pay-out is used to hire labour to cut grasses and take them home. With the cash, they can hire labour and make use of the resource. While such enclosures are notionally community-owned, influential pastoralists dominate the use, and this inequality is exacerbated indirectly through cash made available as an insurance pay-out.

Land-based responses with insurance also intersect. In both sites, the wealthy insured, as well as those in the middle wealth group, invest more in establishing private enclosures rather than in farming. This is especially true in Gomole, where there is less access to communal rangeland. By contrast, the poor are more likely to invest in farming in both sites, particularly in Dire.

Although the intentions and rationales are different among insured men and women pastoralists, the accumulation of crop residue is mixed with the purchase of insurance in Gomole (see Picture 8.6). Several considerations arise in combining insurance with farming in Gomole. First, the perception that there will be forage scarcity (drought), and its gravity, is essential. As covered in depth in Chapter Seven, the experience in pastoralism, network/working groups one has, wealth status, and family dynamics (labour, household expenses, health issues) shape the uncertainty about the severity of drought.

The source of income – grain or livestock, is the second consideration. For those who rely on the sale of grain, private lands are changed to farmlands, and livestock is sold (to buy crop residue/feed for the remaining animals, to buy small ruminants, or to save money in the bank for backup). Therefore, herd diversification also takes place – the shift from large herds to small ruminants. For the wealthy, the perception of the likelihood of forage scarcity, and thereby the purchase of insurance, is combined with intensified farming, including leasing tractors, acquiring plots of land, and improved varieties of seeds and other modern agricultural inputs.

---

<sup>76</sup> Participants in the case study and FGD revealed that pastoralists discuss and open community enclosures for only two weeks during a certain season.

<sup>77</sup> Bonaya, insurance dropout from Dire, aged 45.

There is also a significant difference between browsers and grazers. *“It is rare that you lose goats due to drought”*, Gegna states when explaining why he focuses on small ruminants in general, particularly during stress periods. Moreover, most lands that are left as uncropped areas are covered by shrubs and *Acacia* trees, which are suitable feed for browsers.

In summary, although mobility is an inherent part of drought response, insured households tend to minimise their movements if they are assured of insurance payment. Rather than investing in collective responses—pooling livestock and labour for longer distance movements—instead they seek to purchase water and feed, establish their own enclosures, or invest in farming through more individualised responses. In so doing they undermine the community-level responses to drought centred on mobility.

## 8.4 Conclusion

This chapter has examined the ways in which insurance is used alongside a range of other responses to drought conditions. From the various responses to drought by pastoralists (disaggregated by location, wealth and insurance category), 12 of them were found to be combined with insurance to varying extents. By disaggregating responses using the major variables of wealth, location and insurance uptake, I analysed the extent to which livestock insurance is combined with several response strategies. The analysis presented here highlights a number of key points.

First, drought occurrence does not always result in all households combining insurance payouts with specified responses (feed, water and veterinary services), as insurance modellers assume. Pastoralists in Borana devise many responses to drought. Multiple factors influence how the insured respond to drought, including economic status, gender, age and location, with the nature of responses multidimensional.

Second, wealthier pastoralists invest much more in insurance than do those in other wealth groups. Among the wealthy, insurance is invested in productive responses that protect the herd, even enhancing it by selling older animals and purchasing younger ones. Non-wealthy pastoralists invest pay-outs and combine with responses focused on food consumption and other productive responses that focus on market-based investments—purchase of feed and veterinary services. Therefore, there is a positive correlation between wealth and investment in livestock insurance. Herd size also influences the number of livestock insured. Wealthier pastoralists are most likely to use their pay-outs in ways that planners partially expected – by

purchasing water and feed or seeking veterinary services. However, insurance incentivises such individualised responses rather than investing in collective responses, such as moving herds longer distances in search of grazing and water. Overall, the pattern of uptake runs contrary to what IBLI planners assumed – that insurance would protect poorer and vulnerable pastoralists by making payments available during severe droughts, which could be used to purchase water, feed or veterinary services.

Third, those few poorer and medium-wealth households who do take out insurance (but to a much more limited degree than their richer counterparts) are able to reduce distress sales, and do not reduce meals as much as those who do not have insurance, as the cash pay-outs can be deployed to purchase food for human use. Most of such households do not have access to individualised enclosed pastures to the extent that richer households do, so they must move animals during drought as part of a collective response. However, increasingly medium-wealth (and some poorer) households with insurance are buying water and feed during extreme stress periods, and many have also diversified into farming, especially in Gomole.

Fourth, land-based responses are combined with insurance through individualised and opportunistic encroachment of community-owned resources. The introduction of insurance increases the rate at which insured households invest in expanding pasture and croplands. As a result, private ownership is increasing as insurance supplements most wealthy households, particularly during droughts.

In summary, insurance supports pastoralists' ability to respond to drought risk in different ways. However, the degree to which this protects or enhances productive livestock assets depends on wealth status. It is only the richer households that are able to follow the pattern that the IBLI designers envisaged through investing in the protection of the livestock asset. In contrast, the few poorer households who take up insurance use insurance to buy food and so smooth consumption. This undoubtedly has a positive effect as it reduces distress sales, but most poorer and medium wealth households use traditional strategies in the face of drought. However, the advent of insurance has unintended consequences. With richer pastoralists dominating insurance uptake, access to insurance incentivises more individual responses, allowing richer pastoralists the finance to accumulate and to avoid investment in collective responses; these may include group migration to more distant pastures, and communal resource management, with negative impacts on poorer pastoralists who do not have this option.

Finally, my study of how responses to drought are combined with insurance (or not) across different groups of pastoralists and locations shows how insurance is not the simple 'pro-poor' and 'pro-vulnerable' intervention as sometimes assumed by the designers. Instead, there are multiple outcomes, which are highly dependent on context and are not all as expected. Now, the thesis's last chapter delves into the broader significance of these findings for programmatic and policy issues, as well as academic discussions.

## Chapter Nine: Financialisation of Risk: The Hype, Realities and Challenges of IBLI

## 9.1 Introduction

This chapter summarises the key findings of the thesis and reflects on the way forward regarding index insurance and disaster risk-financing tools in general. I also present the contribution of this study to the academic debate (literature) on the financialisation of risk, and pastoral development.

I started this research immediately after resigning from a post that put me at the forefront of operationalising disaster-risk financing tools in African pastoral areas. The research is a response to some of the crucial questions that had been spinning around in my head for over six years while leading IBLI work in the field in southern Ethiopia. The formulation of a central research question, *'How do pastoralists combine livestock insurance with other ways of responding to risk and uncertainty?'* was the first step.

The PhD research work has been a hard process that involved unlearning some of the assumptions I had made while implementing IBLI. Interactions with Borana pastoralists enabled me to understand concepts of risk and uncertainty from their perspective. As a result, the significance of this research is manifold— programmatic (to practitioners who are implementing the insurance scheme), policy-relevant (to development actors envisioning scaling up similar tools), and scholarly (adding to the literature on the financialisation of risk from a pastoralist's standpoint).

By critically analysing the assumptions of designing and implementing index-based insurance in pastoral systems, my research sheds light on what happens on the ground. It does so by conveying the experiences of pastoralists in conceptualising and combining insurance with multiple forms of response to risk. I have thus illustrated the interconnection between exposure to, perceptions of, and responses to risk, and have differentiated the analysis based on wealth group, gender, location, and based on pastoralists' interaction with the insurance product. The (dis)connection between the conceptualisation of the index insurance model and the practices of pastoralists is set out in empirical and analytical discussions across the chapters. My findings provide further insight into who benefits from index-based insurance and how. Based on the findings, this chapter establishes a way forward centred on three main areas.

Firstly, I will summarise my core argument and the conclusions from Chapters Six, Seven and Eight. The second area discusses contributions to the critical literature on the financialisation

of risk, insurance and development interventions. The third section aims to answer the “So what?” type of question, highlighting what is missed in developing index-based disaster risk financing schemes in drylands. Therefore, this chapter seeks to contribute to disaster risk financing debates at different levels - programmatic, academic and policy-orientated.

## **9.2 Financialisation of Risk: A summary of assumptions vs practices**

This study interrogates the assumptions inherent in the index insurance model and explores what happens in practice. Unlike much of the literature on disaster risk financing and index-based livestock insurance in dryland systems, its focus is not on the impacts of these schemes. Instead, it tries to understand the financialisation of risk through livestock insurance from the pastoralists’ point of view. To do so, it investigates how the exposure to, perception of, and response to drought risk are conceptualised among insurance promoters, contrasting this with the pastoralists’ own perceptions and responses in Borana. Below is an overall summary of the arguments and findings in relation to the three sub-questions that have guided the thesis inquiry.

### Exposure to risk: *What risks and uncertainties have pastoralists in Borana faced over time?*

The IBLI model on risk exposure is based on four assumptions. First, pastoralists in an insurance cluster have similar access to pasture and their mobility patterns and areas they move to are generally the same. Second, they have a constant forage supply and, on average, face the same covariate risk of forage scarcity, which can be assessed objectively. Third, that access and mobility are the same throughout the years, so that comparison for benchmarking can be made. Finally, it is claimed in the insurance model’s construction that rain failure in an area is strongly correlated with pasture shortages, and that exposure to drought risk leads to animal mortality.

This study, however, concludes that these assumptions are problematic. It shows that forage scarcity is uneven at an insurance cluster level, and pastoralists are exposed to forage scarcity in different ways; as a result, objectively measuring the risk level that households face is more complicated than implied within the IBLI model. Moreover, due primarily to the unevenness of the distribution of forage/pasture over space and time, pastoralists put in place various resource management and governance structures to help manage variability. Yet these are not considered in the modelling of index insurance even though they are critical for pastoralists in addressing drought-related risk.

Rangelands are managed in a highly varied manner. There are more than one hundred independent pasture governance units linked to villages and groups of households within an insurance cluster. Forage management and use within these areas may be quite different depending on local rules and regulations. Access to forage is therefore not uniform, as assumed in developing the IBLI model. Moreover, mobility within an insurance cluster is not as static as implied under the insurance model; rather, it changes depending on resource availability and discussions among communities.

At the micro-level, a household or an individual exposure to risk is shaped by their socio-economic and personal background. Although panel household surveys under IBLI set out the heterogeneity of exposure to risk and the importance of socio-economic variables (Jensen et al., 2018), it is assumed in the insurance model that they are, on average, exposed in the same way. Moreover, such exposure is assumed to be the same over time. In practice, as the data in this thesis show, pastoralists are exposed quite differently across time and space, and their background (wealth, gender, age and location) dictates the type and extent of exposure to drought. Quantitatively, I analysed 20 years of rainfall and vegetation data to identify the correlation between the two, finding that they are not strongly correlated, as is assumed in the IBLI model. In short, my findings show how exposure to drought is not the same across an insurance cluster as is assumed by the IBLI designers.

Perceptions, Experiences and Conceptualisations of Risk: How are risks and uncertainties perceived by different pastoralists (richer/poorer, male/female, young/old)?

For an insurance modeller, the risk of drought expressed as pasture shortage in an insurance cluster is conceptualised as an objectively-measured probability event. This peril, (pasture shortage due to rain failure), is defined, calculable, and can be associated with a particular trigger– in IBLI’s case, the NDVI (Normalised Difference Vegetation Index), derived from satellite measurements. Since drought, due to rain failure, is assumed to affect households in an area equally, at least on average, the risk profile is constructed the same way within a cluster. Thus, insurance premiums and pay-outs are the same for all households within a cluster. Moreover, as the experience of pastoralists affected by forage scarcity is assumed to be the same (on average), they are assumed to be willing to pay the same premium amount for livestock insurance.

In reality, pastoralists face a myriad of risks and uncertainties, as the chapters in this thesis have shown, and so the risk of drought is linked with multiple issues. These various forms of

risk and uncertainty are perceived differently (Chapter Seven). Many overlaps through time and space— drought, conflict, flood, disease, locusts and family misfortunes- create pastoral “riskscapes” (Müller-Mahn and Everts, 2013). Moreover, the risk of forage scarcity is associated with rain failure, land use change, and conflict. Again, socioeconomic (such as wealth and gender) and institutional factors (pasture governance) influence how drought risk is viewed and experienced.

Risks and uncertainties are not simply felt individually, but rather impinge on the family, wider kinfolk and clan groups. Therefore, drought is not simply an individualised peril, as is assumed in the design of index insurance. As the empirical chapters have shown, there is a different conception of risk based on one’s gender, age, wealth, or location. A poor woman’s perspective and experience, for example, differ from those of a young woman. When a drought risk is financialized as a kind of livestock insurance, the animal in issue is not always owned by an individual, but rather has ties to household, village, community, and clan resource and asset sharing dynamics. Therefore, an incidence of drought also does not necessarily affect an individual, family or community in an area in the same way. Therefore, drought is perceived by an insurance promoter differently to pastoralists.

In an insurance cluster, drought risk for a poor older woman is an uncertain event of which one cannot understand the likelihood; rather it is given over to God. For a wealthy individual, drought risk is manageable through resource accumulation. Their greater availability of resources enables them to transform uncertainty into risk – a manageable feature. Finally, for the young, there is no difference between risk and uncertainty. By contrast, among the old, drought risk is a combination of several factors. Every new drought incident differs from those of the past; therefore, among pastoralists, the conception of drought is not the same. Age, gender, wealth, space/location and time all influence the way in which individuals perceive risk and uncertainty.

Combining Responses: *How is livestock insurance combined with other ways of responding to risks and uncertainties by different groups of pastoralists?*

As claimed by its promoters, livestock insurance aims to strengthen the resilience of the most vulnerable pastoralists against drought. The insurance pay-outs are intended to help keep core breeding livestock alive during climate-induced droughts. Even though it was said at first that poor and rich pastoralists are not the main targets because it doesn’t help the poor or

attract the rich, it was scaled up in Ethiopia with the idea that it would help pastoralists of all income levels.

However, responses extend beyond investments in livestock. Combining livestock insurance with other risk response strategies, mainly through pay-outs, has a diverse effect and, at times, unintended consequences by substituting collective responses. The study identified 12 different response strategies that pastoralists combine with insurance to differing extents. The insured households tend to be wealthy adult males, who invest pay-outs in the purchase of feed and water for livestock, as well as investment in veterinary services, and gaining private access to pasture and water for their animals. In so doing, insurance supports these wealthy groups in the protection of their livestock and accumulation of their assets, which in turn can be invested for multiple productive ends.

Middle-income insured households pursue opportunistic livelihood strategies, and insurance is combined with various livelihood activities. Although they are the key targets of a commercialised index insurance scheme, insurance has limited relevance to their drought response strategy. Nevertheless, insurance is useful to them when combined with consumption-smoothing responses, by stretching food demands and providing resources to purchase livestock feed. Nonetheless, insurance for this group has little impact on the likelihood of them making distress sales, one of the key objectives of safeguarding an asset by index insurance.

Insured poorer households have yet more strategies for responding to drought. They focus on consumption-smoothing responses by purchasing grain. They also relieve the stress on livestock through reducing milk consumption. Notably, due to their limited insurance investment, there is little evidence that they use insurance pay-outs to stabilise or enhance livestock production.

In summary, findings from the study sites indicate that uptake is heavily skewed towards adult men from wealthier households whose livelihood is dominated by livestock rearing. This is in sharp contrast to the assumption of planners and developers of IBLI that livestock insurance would be taken up by the non-wealthy but vulnerable, safeguarding them against the effects of drought. Based on these findings, I lay below some of the conceptual, programmatic and policy aspects that are vital in understanding livestock insurance and, broadly, disaster risk-financing schemes among smallholder farmers/pastoralists.

### 9.3 Self-Insurance, Social Insurance, and Market-based Insurance: Reflections on the Critical Literature

The financialisation of drought risk is a relatively new concept, especially for dryland systems. Insurance is a scalar technology because it predicts the future by looking at historical trends. The predictions are used to distribute risks uniformly among individuals (here, livestock owners) affected by a single, identified peril (in this case, drought) in a given, defined area (an insurance cluster). However, as the findings show, the basic assumptions made while developing the insurance model do not hold in practice. Drought exposure and responses are highly uneven and varied across locations and among the pastoral population in Borana. Pastoralists deploy a complex set of social, environmental, political, and economic responses spanning the individual, household, and broader society they live in and respond to risks and uncertainty. Such responses are flexible and adaptive, and not confined to a single area, hence the importance of mobility; nor do they relate just to an individual, hence the importance of collective responses. Responses are often combined in sequence over time and vary across social groups and locations, as the findings presented here have shown. The simple model underlying the insurance product does not match the complex reality.

Technocratic assumptions in insurance design are based on static derivatives, which are particularly problematic where land use, agricultural production and socio-institutional systems are continuously changing, making it difficult to predict the future. Rather than 'risk', 'uncertainty' where future outcomes are unknown is the norm. Responses to uncertainty, rather than predicted, calculated risk as in insurance, must involve flexibility and adaptiveness that adjust to unfolding circumstances instead of a single 'event'. This is how 'drought' is understood by pastoralists, making it very different to the way insurance promoters see it (as a cut off threshold in rainfall/forage growth). Pastoralists' responses to drought involve a range of strategies, as Chapter Eight has shown. These may be individual, kin-based or at a wider community/clan level, and necessarily involve mobilising relationships and forms of solidarity in order to keep livestock alive and keep families fed. Insurance instruments such as IBLI must become embedded in such a social, cultural and economic context (cf. Ewald 1991,2020). In the pastoral systems, insurance becomes embedded into wider social (like gender dynamics), institutional (pastoral resource governance), economic (livelihood), historical (views and experiences of individuals), political (insurance as governing risk, political technology) and environmental (resources) aspects and interactions. These are complex dynamics that combine structural and relational dimensions of risk and uncertainty, and

highlight the importance— as stressed in this thesis— of looking at insurance in combination with other response strategies, experiences and perceptions, rather than as an isolated intervention.

Too often, however, interventions by governments and development actors use a “top-down” technocratic approach, wrapped up in discourses of ‘progress’ and ‘modernity’ and aligned with neoliberal approaches to the ‘financialisation of risk’ (Christopher, 2015; Bracking, 2016).

Insurance is often cast in this way, with an individualised, market-based approach being seen as a step up from ‘traditional coping strategies.’ However, such arrangements run the risk of disrupting current systems by amplifying individual motives and undermining collective, communal forms of responses anchored in forms of local solidarity and ‘moral economy.’

Therefore, my thesis offers two contributions to the critical literature. First and foremost, I argue that drought risk insurance is not just a technical intervention; rather, it is inevitably linked to a combination of socio-political, economic and institutional practices. Drought risk is not just an environmental issue; it also has implications for other facets of life, such that insurance becomes embedded within a wider range of strategies, and is therefore socially and politically constructed in relation to wealth, age, gender and so on. This process of embedding with various response strategies (re-) shapes how an individual and community (co-) construct and respond to drought risks and uncertainties. As a result, insurance can be seen as a component of a holistic “riskscape” in dryland areas (cf. Müller-Mahn and Everts, 2013).

Secondly, the assumption that ‘drought’ can be reduced to a manageable insurance ‘risk’ (by predicting, calculating, estimating and monetising) narrows the focus of the response to the probability of the predicted loss and the amount of loss expected. However, drought cannot be separated from other risks and uncertainties, nor can it be tied to a single rainfall/forage threshold.

Current debates on insurance in developing country contexts are highly polarised. On one side there are various critiques of index insurance as being a neoliberal intervention that generates inequality through its focus on the individualisation of risk and ignoring of the collective (for example, Isakson, 2015; Taylor, 2016). On the other side, proponents emphasise how insurance can be central to early action, anticipation and the ability to protect assets (for example, Clarke and Hill, 2012; Clarke and Dercon, 2016; Jensen et al., 2015 and 2017; Janzen et al., 2015). My study takes a more nuanced stance. Insurance clearly has benefits— if seen as

working together with other responses– for some people in some places, but it is far from a panacea. Inevitably, a single contract or model will not be able to address the entire range of hazards that pastoralists face, and other responses must complement it. However, in designing interventions around insurance, much greater care is needed in examining the underlying assumptions and planning for reducing ‘basis risk’ and offsetting unintended negative consequences.

#### **9.4 Disaster Risk Financing Tools: Considerations for Programmatic and Policy Issues**

IBLI, as a top-down external intervention evolving from a perspective of social protection, presents many challenges. Uptake has been slow and patchy, despite the considerable hype that came with it, and plans for a massive expansion of this type of programme. The existing literature outlines some of the key challenges of introducing IBLI-type market-based programmes in Africa (Isakson, 2015; Carter et al., 2018; Fava et al., 2021; Johnson, 2021; ILRI, 2021), many of which have been highlighted by the findings presented in this thesis. These studies focus on the contract features (effectiveness) and demand (low uptake) as key factors of success or challenge of index insurance products (Miranda and Farrin, 2012; Jensen et al., 2016). However, as this thesis has shown, the challenges go way beyond the apparent low demand or the problem of scalability of the insurance products. Instead, the ways in which such insurance models conceive of, measure and profile drought risk within a pastoral system are fundamentally flawed, resulting in a set of outcomes that run counter to designers’ expectations, as shown throughout this thesis.

During my time as a practitioner, working to develop and introduce IBLI in Borana, I became familiar with the array of planning and pre-feasibility studies carried out during the piloting and scaling up of IBLI. However, these studies focused on biophysical, socio-economic and institutional features (e.g., Fava et al., 2017, Taye et al., 2016; ILRI, 2021), without delving into the pastoral context.

As this thesis has shown, pastoralists deal with a variety of risks and (crucially) uncertainties (which cannot be predicted), experienced in different ways by different people in different places. In other words, a conventional fixed insurance model, assuming calculable, covariate risks, will not work as planned as social, economic, and political factors impinge. Below, I summarise some of the issues that must be considered.

### i) Exposure to Drought Risk: Ensuring different pathways

Weather-induced drought is the largest source of forage scarcity (Lybbert et al., 2004; Barrett et al., 2006; Santos and Barrett, 2006; McPeak et al., 2012); nevertheless, it is spatially and intertemporally uneven (Chapter Six; see Flintan et al., 2011; CARE International, 2015; Abate and Angassa, 2016; Fenetahun et al., 2020). Exposure to drought risk (pasture scarcity) is highly correlated with the layering of risk (also known as 'risk profiling') in designing the insurance product. However, as discussed in this study, there are some practical challenges.

To begin with, the scale of pasture management is not part of risk profiling. The average impact of forage scarcity, distributed across households in an insurance unit or cluster, is undermined when multiple events are considered. These include changing the way land is used (turning it into towns or farms), locust swarms or infestations, water points or fences, and rangeland degradation, all of which make it harder for animals to find food over time. The extent and dynamics of conflict limit access to forage (pasture governance), and consequently, pastoralists individually and collectively reorient mobility and pasture use or protect certain areas. These issues necessitate revisiting the trends and changes in land use, institutional issues and their intersections with risk-layering when thinking about insurance "risk profiles."

Secondly, there is a difference in how space is conceptualised by pastoralists compared to insurance modellers. Mobility is a critical aspect of understanding space; however, mobility and migration patterns today are very different from what they were 20 or even ten years ago. The current insurance clusters in Borana do not reflect these dynamics. Therefore, while defining insurance clusters, migration patterns with access to resources must be considered and understood.

Thirdly, the intertemporal feature of forage scarcity is also understood differently by pastoralists compared to insurance modellers. The start of rain months (and, for that matter, the precise date) has been fixed in the insurance model since 2000. However, early build-up of forage due to a few days' heavy rains changes the predictive capacity of the model. The *ex-gratia* payment (Chapter Six) is a good example of where the model failed. The index insurance model also compares the current season's forage level by assuming (indirectly) that all other events have had a limited impact throughout the past 20 years. Therefore, the predictive model should be designed in a more adaptive and flexible manner to embrace changes and trends— spatial and intertemporal- by linking with pastoralists' practices.

The preceding three paragraphs raise the subject of how the insurance model may incorporate drought risk and uncertainties as experienced by pastoralists as part of the "risk profiling" process. The socioeconomic profile of a society should be understood first and foremost. This research shows that pastoral backgrounds – for example in relation to wealth, gender, and age - have a significant impact on how drought-risk is perceived. IBLI socioeconomic studies tend to ignore distinctions within groups, while reducing individuals to simple statistical representations. As a result, various intra- and inter-household socio-economic characteristics should be acknowledged and duly considered as part of any risk profiling of an area. In this thesis, I also have emphasised how depending exclusively on biophysical characteristics of drought ignores the 'actual' risk exposure, and thus experienced risk profile of an area. As a result, a risk profile method should consider both the biophysical and socioeconomic components of drought risk.

Second, the risk profiling process assumes that exposure to drought risk in a given location (insurance cluster) is consistent across the profiling years (20 years). Furthermore, migration patterns and resource distribution processes are believed to be constant. However, this thesis has revealed that this is not the case. As a result, a new insurance clustering method should be implemented. Furthermore, change detection—a method that compares present vegetation and land-use to that of the past—requires careful consideration.

Third, risk profiles for various types of vegetation, as well as premium rates, must be revised. One important component of cattle ownership (socioeconomic profile of pastoralists for risk profiling) is that browsers and grazers are affected differently. As a result, vegetation analysis should be performed separately for browsers and grazers; this will also influence the premium setting. It is superficial to standardise all sorts of livestock into a single TLU. Pasture management varies depending on the cattle species. As a result, risk profiling and premium setting should be altered based on species type, at least for browsers and grazers individually.

Finally, risk profiling should not be treated as a method of developing an insurance product as the sole intervention; rather, when the cost of insuring an animal exceeds the benefit, dropping IBLI should be considered as one possible outcome. Pre-feasibility studies are carried out prior to availing the IBLI product. As a former ILRI employee, I conducted various of such studies on biophysical, socioeconomic, and institutional components of a given pastoral system. Nonetheless, such investigations do not involve risk profiling in the ways suggested above nor did they offer a detailed cost-benefit analysis to inform the design of an insurance

model. As a result, before designing an insurance product, numerous scenarios should be explored to determine whether IBLI is suitable—technically, commercially, and economically.

## ii) Covariate Risk and Impacts: Acknowledging and embracing heterogeneous experiences and effects of drought

The notion of insurance is that all those insured against the same peril face an equal risk (cf. Ewald, 2019). However, drought risk due to rain failure in Borana contradicts this theory, as the assumed covariate risk is not equal among all in an insurance cluster. As a result, the risk-layering process addresses a specific aspect of the drought risk and simplifies the actual risk that pastoralists face. For example, in a contract cycle that covers a year, the short and long rainy seasons are calculated separately. In both cases, the delayed onset of short or long rain could be extremely punishing for pastoralists. The latest *ex-gratia* payment is one major result of the model's failure to capture the actual experiences of pastoralists and the complex vegetation dynamics in the drylands. Equally, vegetation change is not considered for browsers and grazers in the insurance model, while the standardisation of all animals into one unit, TLU, misses the actual experience of drought that pastoralists face, as different animals are managed in different ways. Consequently, the risk-layering process of designing index insurance should take these factors into account.

As this study has shown, the socio-economic aspects of a household are vital to understanding the drought exposure and experience. Vulnerability comprises a mix of factors— social, economic, environmental and political (Dercon and Krishnan, 2000; Catley, 2017; Gebreyes and Theodory, 2018). The framing of ‘covariate’ risk impact and protection through insurance does not accommodate the fact that there are multiple responses. Pay-outs should go beyond protecting livestock as the presumed objective of those who are insured, since there are very different strategies pursued by pastoralists, differentiated by wealth, gender and age. Wealth is a vital aspect of the response to drought and other risks. However, other aspects of identity (such as gender and age), as well as dynamics at the community and sub-national levels (social insurance, moral economies, politics, administrative boundaries, conflict and so forth) influence the mix of responses that households choose to make.

Insurance must inevitably combine with local responses. There is a general assumption that social insurance responses are on the decline (Lybbert et al., 2004; Santos and Barrett, 2011), and that a ‘modern’, market-based insurance product can replace these, assisting pastoralists in leaving “costly coping strategies” (Janzen and Carter, 2013. 2018), given the increasing

pressures of drought due to climate change. However, as this study has shown, local responses are still essential, and insurance is necessarily embedded in the wider response strategies among different pastoralists, but with varying outcomes; sometimes positive (mostly for richer, male pastoralists), sometimes negative. For example, collective risk-sharing mechanisms are vital, yet external interventions, such as insurance, may alter such social insurance by incentivising individualised risk-response mechanisms, and thus disadvantage poorer pastoralists who still rely on collective responses such as long-distance movements of herds. In this way, insurance may increase 'costs' for some. Looking at such trade-offs and the complex consequences of insurance interventions— rather than just looking through 'impact' metrics— is essential for future programming.

The IBLI is designed to aid pastoralists in their attempts to respond to drought risk. Yet, as this thesis has shown, there are many pre-existing approaches to drought risk response, attuned to the contexts and uncertainties of pastoral situations. Societal features like collective risk-sharing mechanisms or moral economy are vital in the pastoral system, for example. According to this study, individualised insurance plans may endanger fundamental parts of the social fabric if such collective and local risk-response and sharing mechanisms are ignored. As a result, thorough programmatic and policy evaluation is essential to establish whether individualised and commercialised risk-sharing strategies compromise components of a pastoral system and society. When the unfavourable effects of IBLI outweigh the benefits, the programme should be terminated. IBLI may not be appropriate in all dryland settings across diverse socio-cultural backgrounds because it is not a panacea, but simply a complement to existing responses.

Despite the hype about IBLI as a market-driven solution, independent of aid/state support, IBLI's underwriter in Ethiopia, Oromia Insurance SC (OIC), is far from 'breaking even'. IBLI remains a significant publicly-funded intervention, with livestock insurance not a profitable venture, due to the high administrative costs in remote, dryland settings (OIC, 2019). Most literature (Barnett et al., 2008; IFC, 2011; Da Costa, 2013) advocates a coordinated effort between public-private partners in scaling up and sustaining disaster risk-financing products. Barnett et al. (2008:1767) conclude that IBLI-like products in developing countries "will not materialise without the coordinated efforts of national governments and donors." Moreover, several studies on disaster risk-financing (for example, Barnett et al., 2008; Carter et al., 2008; Churchill, 2006; Churchill and Matul, 2012; Da Costa, 2013; Clarke, 2016) stress the importance of financial literacy (among the clientele), a conducive regulatory framework, and

a subsidy for the poor as three of the key success factors. Nevertheless, various policy questions arise. In particular, investments by multilateral organisations (the World Bank in Kenya and CTA, and CST in Ethiopia) and governments (notably in Kenya) raise questions about where limited public and ‘aid’ resources should be spent, given the evidence that, in practice, insurance largely supports richer, male pastoralists.

Regulatory frameworks are limited to administering contract-related issues. Both in Ethiopia and Kenya, there is no grading and standardisation of an index-insurance product. Such practices by the state will allow insurance companies and technical partners to re-engineer the technical difficulties (most of which are discussed in this thesis) that index-based insurance encounters. Finally, insurance subsidies as a social protection scheme for the ultra-poor have been devised as a means of narrowing inequality with other wealth classes. In reality, however, insurance pay-outs are spent mostly on food consumption by poor and vulnerable households. Hence, such social protection programmes, under the framework of index insurance, should be looked at differently rather than simply providing cash as a form of subsidy to insurance companies.

In conclusion, a more comprehensive insurance model that addresses the major features of drought exposure (biophysical and institutional components), experience (individual, household and community), and responses (wealth, gender, age and other backgrounds) are required; one that recognises that insurance must be embedded within local settings and be seen as part of a wider drylands “riskscape”. It should not be seen as just a technical, managerial solution that can be parachuted in without an understanding of the pastoral context.

## 9.5 Conclusion

Throughout this research, I have investigated how various pastoralists interact with a market-based, risk-management product – index-based insurance – as part of their broader set of risk and uncertainty responses. In challenging the assumptions made about drylands and the risks that pastoralists confront, I demonstrated the differences between the assumptions that insurance providers make and the practices of pastoralists. This has yielded important insights into programmatic, policy and scholarly dimensions.

Over the years, ‘drought crises’ have sparked various technocratic solutions among governments and development actors. Index insurance is the latest in a long line of such

'solutions', focused on financialising risk in the drylands through a novel market mechanism. However, its claims and expectations are found to be wanting and many of the assumptions are undermined by a closer look at the context on the ground. While insurance undoubtedly benefits some— mostly richer, male- pastoralists, its impacts are uneven and there are a range of unintended consequences. The simplification of a complex, social and political 'risky landscape' into a uniform, standardised intervention, with many underlying assumptions in the model, creates a number of problems, as outlined in this thesis. This is not an argument for abandoning insurance as part of the response to perennial drought in the drylands. Instead, it is an argument for taking account of local contexts more thoroughly and challenging the design assumptions of the approach, while examining how insurance becomes embedded in pastoralists' response strategies with varying outcomes.

## References

- Abate, T., & Angassa, A. (2016). Conversion of savanna rangelands to bush dominated landscape in Borana, Southern Ethiopia. *Ecological Processes*, 5(6), 1-18. doi:DOI 10.1186/s13717-016-0049-1
- Abshir, S. (2020). *Climate Change and Security in the Horn of Africa: Can Europe help to reduce the risks?* Berlin: Climate Security Expert Network.
- Adams, J. (2016). Risk and Culture. In A. Burgess, A. Alemanno, & J. O. Zinn, *Routledge Handbook of Risk Studies*. Routledge, New York, USA.
- Ahmed, A. G., & Teka, T. (1999). Livelihoods in the drylands of East Africa. *BASIS (Broadening Access and Strengthening Input Market Systems) and OSSREA (Organization for Social Science Research in Eastern and Southern Africa)*.
- Aklilu, Y., & Catley, A. (2010). *Mind the Gap: Commercialization, Livelihoods and Wealth Disparity in Pastoralists Areas of Ethiopia*. Feinstein International Center.
- Alderman, H., & Haque, T. (2007). *Insurance Against Covariate Shocks : The Role of Index-Based Insurance in Social Protection in Low-Income Countries of Africa*. The World Bank. Washington: The World Bank.
- Amare, A., Simane, B., Nyangaga, J., Defisa, A., Hamza, D., & Gurmessa, B. (2019). Index-based livestock insurance to manage climate risks in Borena zone of southern Oromia, Ethiopia. *Climate Risk Management*, 25, 1-16.
- Ambachew, A., Mamo, K., & Mohammed, J. (2017). Inclusive Financial Services in Pastoral Areas of Southern Oromia, Afar, and Ethiopian Somali Regions: Opportunities, Implementation Challenges, and Prospects. *Proceeding of Research for Enhancing Pastoralists Livelihood through Resilience and Market Expansion* (pp. 131-150). Harar: Haramaya University .
- Anbacha, A. E., & Kjosavik, D. J. (2019). Gendered perspectives of climatic and non-climatic stressors in Borana, southern Ethiopia. *Journal of Arid Environments*, 166, 28-36. doi:https://doi.org/10.1016/j.jaridenv.2019.02.012
- Anderson-Levitt, K. M. (2006). Ethnography. In J. L. Green, G. Camilli, P. B. Elmore, A. Skukauskaiti, & E. Grace, *Handbook of Complementary Methods in Education Research* (pp. 279-298). Washington : Lawrence Erlbaum Associates, Inc.
- Angassa, A., & Oba, G. (2007). Relating long-term rainfall variability to cattle population dynamics in communal rangelands and a government ranch in southern Ethiopia. *Agricultural Systems*, 715–725.
- Angassa, A., & Oba, G. (2008). Herder perceptions on impacts of range enclosures, crop farming, fire ban and bush encroachment on the rangelands of Borana, Southern Ethiopia. *Human Ecology*, 36 , 201–215.
- Audi, R. (2013). Epistemology: A contemporary introduction to the theory of knowledge. *Science and Education*, 22(3), 747-752.
- Ayal, D., Radeny, M., Desta, S., & and Gebru, G. (2017). Climate variability, perceptions of pastoralists and their adaptation strategies: Implications for livestock system and diseases in Borana

- zone", *International Journal of Climate Change Strategies and Management*, 10(4), 596-615.  
doi:<https://doi.org/10.1108/IJCCSM-06-2017-0143>
- Baalen, S. v., & Mobjork, M. (2017). Climate Change and Violent Conflict in East Africa Integrating Qualitative and Quantitative Research to Probe the Mechanisms. *International Studies Review*, 1-29. Retrieved from <https://academic.oup.com/isr/advance-article-abstract/doi/10.1093/isr/vix043/4616607>
- Bageant, E. R., & Barrett, C. B. (2017). Are There Gender Differences in Demand for Index-Based Livestock Insurance? *The Journal of Development Studies*, 53(6), 932–952.  
doi:<http://dx.doi.org/10.1080/00220388.2016.1214717>
- Bähre, E. (2011). Liberation and redistribution: social grants, commercial insurance and religious riches in South Africa. *Comparative Studies In Society And History*, 371-392.  
doi:10.1017/S0010417511000090
- Bähre, E. (2020). *Ironies of Solidarity: Insurance and Financialization of Kinship in South Africa*. Croydon: Zed Books Ltd.
- Bammer, G., & Smithson, M. (2008). *Uncertainty and Risk: Multidisciplinary Perspectives*. Trowbridge: Cromwell Press.
- Banerjee, R., Hall, A., Mude, A., Wandera, B., & Kelly, J. (2019). Emerging research practice for impact in the CGIAR: The case of Index-Based Livestock Insurance (IBLI). *Outlook on Agriculture*, 1-13.
- Banks, E. (2004). *Alternative Risk Transfer: Integrated Risk Management through Insurance, Reinsurance, and the Capital Markets*. John Wiley & Sons Ltd.
- Barnett, B. J., Barrett, C. B., & Skees, a. J. (2008). Poverty Traps and Index-Based Risk Transfer Products. *World Development*, 1766-1785.
- Barrett, C. B. (2008). Poverty Traps and Resource Dynamics in Smallholder Agrarian Systems. In A. Ruijs, R. Dellink, A. Ruijs, & R. Dellink (Eds.), *Economics of poverty, environment and natural resource use* (pp. 17-40). Springer.
- Barrett, C. B., Bellemare, M. F., & Osterloh, S. M. (2006). Household-level livestock marketing behaviour among northern Kenyan and southern Ethiopian pastoralists. In J. G. Little, *Pastoral Livestock Marketing in Eastern Africa: Research and Policy Challenges* (pp. 15-38). Rugby, UK: Intermediate Technology Publications Ltd.
- Barrett, C., Reardon, T., & Webb, P. (2001). Nonfarm income diversification and household livelihood strategies in rural Africa: concepts, dynamics, and policy implications. *Food Policy*, 26, 315-331.
- Bassi, M. (2005). *Decisions in the Shade*. (C. Salvadori, Trans.) Asmara: The Red Sea Press. Retrieved 2019
- Bassi, M. (2010). The politics of space in Borana Oromo, Ethiopia: demographics, elections, identity and customary institutions. *Journal of Eastern African Studies*, 4(2), 221-246.  
doi:10.1080/17531055.2010.487333
- Bassi, M., & Tache, B. (2011). The Community Conserved Landscape of the Borana Oromo, Ethiopia: Opportunities and Problems. *Management of Environmental Quality*, 22(2), 174-186.

- BBC. (2020, December 27). <https://www.bbc.com/amharic>. Retrieved from British Broadcasting Corporation : <https://www.bbc.com/amharic/news-55447034>
- Beard, R. E., Pentikainen, T., & Pesonen, E. (1984). *Risk Theory: The Stochastic Basis of Insurance*. London: Chapman and Hall.
- Beck, U. (1992). *Risk Society: Towards a New Modernity*. (M. Ritter, Trans.) London: SAGE Publications.
- Beck, U. (2009). *World at Risk*. (C. Cronin, Trans.) Cambridge: Polity Press.
- Behnke, R. H., & Mortimore, M. (2016). *The End of Desertification? Disputing Environmental Change in the Drylands*. London: Springer Earth System Sciences.
- Benson, C., & Clay, E. (1994). *The Impact of Drought on Sub-Saharan African Economies: A Preliminary Examination*. London: Overseas Development Institute.
- Berg, B. L. (2001). *Qualitative Research methods for the Social Sciences*. Neeham Heights: Allyn and Bacon.
- Berhanu, W., Colman, D., & Fayissa, B. (2007). Diversification and livelihood sustainability in a semi-arid environment: A case study from southern Ethiopia. *Journal of Development Studies*, 871-889. doi:10.1080/00220380701384554
- Berliner, B. (1985). Large Risks and Limits of Insurability. *The Geneva Papers on Risk and Insurance*, 313-329.
- Bhattacharjee, A. (2012). *Social Science Research: Principles, Methods, and Practices*. Florida: USF Tampa Library Open Access Collections. Retrieved from [http://scholarcommons.usf.edu/oa\\_textbooks/3](http://scholarcommons.usf.edu/oa_textbooks/3)
- Birhanu, Z., Berhanu, N., & Ambelu, A. (2015). *Rapid Appraisal of Resilience to the Effects of Droughts in Borana Zone, Southern Ethiopia*. Jimma: Horn of Africa Resilience Innovation Lab (HoA RILab).
- Blackburn, R. (2006). Finance and the fourth dimension. *New Left Review*, 39, 39-70. Retrieved from <https://newleftreview.org/issues/ii72/articles/robin-blackburn-crisis-2-0>
- Bonanno, A. (2016). The Financialization of Agriculture and Food in the Context of the Neoliberal Restructuring: Primary Characteristics and Basic Contradictions. *Estudios Rurales*, 1-17.
- Bonizzi, B. (2013). Financialization in Developing and Emerging Countries: A Survey. *International Journal of Political Economy*, 42(4), 83-107. doi:10.2753/IJP0891-1916420405
- Borana Zone Agriculture Office, BZAO. (2017). *Drought Assessment Report*. Yabello, Borana: Agriculture Office.
- Borana Zone, F. a. (2019). *Borana Zone Socioeconomy Profile 2019*. Annual Report., Yabello, Borana, Ethiopia. Retrieved 2020
- Bowles, S. (2016). *The Moral Economy: Why Good Incentives are No Substitute for Good Citizens*. Yale: Yale University Press.
- Bracking, S. (2016). *The Financialisation of Power: How financiers rule Africa*. Abingdon,: Routledge.
- Brand, U., & Wissen, M. (2014). The Financialisation of Nature as Crisis Strategy. *Journal für Entwicklungspolitik*, 16-45.

- Brewer, J. D. (2000). *Ethnography*. Philadelphia: Open University Press.
- Buckham, D., Wahl, J., & Rose, S. (2011). *Executive's Guide to Solvency II*. New Jersey: John Wiley & Sons, Inc.
- Burch, D., & Lawrence, G. (2009). Towards a third food regime: behind the transformation. *Agriculture and Human Values volume, 26*, 267-279.
- Bush, S. B. (2012). *Derivatives and Development: A Political Economy of Global Finance, Farming and Poverty*. New York: Palgrave Mac Millan.
- Butt, B. (2015). Herding by Mobile Phone: Technology, Social Networks and the "Transformation" of Pastoral Herding in East Africa. *Human Ecology, 43*, 1-14. doi:10.1007/s10745-014-9710-4
- CARE International . (2015). *Resilience in the rangeland: Changes and challenges for pastoral communities in Kenya and Ethiopia*. CARE International .
- Carter, M. R., & Barrett, C. B. (2006). The economics of poverty traps and persistent poverty: An asset-based approach. *The Journal of Development Studies, 42*(2), 178-199. Retrieved from <https://doi.org/10.1080/00220380500405261>
- Carter, M., D.Little, P., Mogues, T., & Negatu, W. (2007). Poverty Traps and Natural Disasters in Ethiopia and Honduras. *World Development, 35*(5), 835-856. Retrieved from <https://doi.org/10.1016/j.worlddev.2006.09.010>
- Carter, M. R., Barrett, C. B., Boucher, S., Chantarat, S., Galarza, F., McPeak, J., & Mude, A. G. (2008). *Insuring the Never Before Insured: Explaining Index Insurance through Financial Education Games*. Department of Agricultural and Applied Economics, University of Wisconsin.
- Carter, M., & Lybbert, T. (2012). Consumption versus asset smoothing: testing the implications of poverty trap theory in Burkina Faso. *Journal of Development Studies, 99*(2), 255-264. doi:<https://doi.org/10.1016/j.jdeveco.2012.02.003>
- Carter, M., Janvry, A. d., & Sadoulet, E. (2017). Index Insurance for Developing Country Agriculture: A Reassessment. *Annual Review of Resource Economics*. Retrieved from <https://doi.org/10.1146/annurev-resource->
- Carter, M. R., Janzen, S. A., & Stoeffler, Q. (2018). Can Insurance Help Manage Climate Risk and Food Insecurity? Evidence from the Pastoral Regions of East Africa. *Natural Resource Management and Policy, 52*. doi:10.1007/978-3-319-61194-5\_10
- Catley, A. (2017). *Pathways to Resilience in Pastoralist Areas: A Synthesis of Research in the Horn of Africa*. Somerville: A FEINSTEIN INTERNATIONAL CENTER PUBLICATION.
- Catley, A., & Iyasu, A. (2010). *Moving Up or Moving Out? A rapid livelihoods and conflict analysis in Mieso-Mulu Woreda, Shinile Zone, Somali Region, Ethiopia*. Addis Ababa: Feinstein International Center, Tufts University.
- Catley, A., Abebe, D., Admassu, B., Bekele, G., Abera, B., Gezahegn Eshete, T. R., & Haile, T. (2009). Impact of drought-related vaccination on livestock mortality in pastoralist areas of Ethiopia. *Disasters, 33*(4), 665-685. doi:doi:10.1111/j.0361-3666.2009.01103.x Catley, A., Jeremy, L., & Scoones, I. (2013). *Pastoralism and Development in Africa: Dynamic Change at the Margins*. London: Routledge and Earthscan.

- Catley, A., Admassu, B., Bekele, G., & Abebe, a. D. (2014). Livestock mortality in pastoralist herds in Ethiopia and implications for drought response. *Disasters*, 500-516.
- Catley, A., Admassu, B., Bekele, G., & Abebe, D. (2014). Livestock mortality in pastoralist herds in Ethiopia and implications for drought response. *Disasters*, 500-516.
- Cervantes-Godoy, D., Kimura, S., & Antón, J. (2013). Smallholder Risk Management in Developing Countries. *OECD Food, Agriculture and Fisheries*.
- Chadwick, A. (2019). *Law and the Political Economy of Hunger*. Oxford: Oxford University Press.
- Chantararat, S., & Mude, A. G. (2010). *Willingness to Pay for Index Based Livestock Insurance: Results from a Field Experiment in Northern Kenya*. Cornell University.
- Chantararat, S., Mude, A. G., Barrett, C. B., & Turvey, C. G. (2009). *The Performance of Index-Based Livestock Insurance: Ex ante Assessment in the Presence of a Poverty Trap*. Ithaca: Cornell University.
- Chantararat, S., Mude, A. G., Barrett, C. B., & Carter, M. R. (2012). Designing Index-based Livestock Insurance for Managing Asset Risk in Northern Kenya. *The Journal of Risk and Insurance*, 00(0), 1-33. doi:DOI: 10.1111/j.1539-6975.2012.01463.x
- Chantararat, S., Mude, A. G., Barrett, C. B., & Carter, M. R. (2013). Designing Index-based Livestock Insurance for Managing Asset Risk in Northern Kenya. *The Journal of Risk and Insurance*, 80(1), 205-237. doi:10.1111/j.1539-6975.2012.01463.x
- Chantararat, S., Mude, A. G., Barrett, C. B., & Turvey, C. G. (2017, June). Welfare Impacts of Index Insurance in the Presence of a Poverty Trap. *World Development*, 119-138.
- Check, J. W., & Schutt, R. K. (2012). *Research methods in education*. Thousand Oaks, Calif: Sage Publications.
- Chelanga, P., Khalai, D. C., Fava, F., & Mude, A. (2017, July). *Determining insurable units for index-based livestock insurance in northern Kenya and southern Ethiopia*. Nariobi: International Livestock Research Institute. Retrieved 2019
- Chelanga, P. K., Muendo, K., & Jensena, N. D. (2022). Duration of access to mobile phones and pastoralists' market participation in northern Kenya. *Forthcoming*.
- Christophers, B. (2015). The limits to financialization. *Dialogues in Human Geography*, 5(2), 183-200.
- Churchill, C. (2006). *Protecting the poor: A microinsurance compendium* (Vol. 1). Geneva: International Labour Office.
- Churchill, C., & Matul, M. (2012). *Protecting the poor: A microinsurance compendium* (First ed., Vol. II). Geneva: International Labour Office.
- Clapp, J., & Isakson, S. R. (2018). *Speculative Harvests: Financialization, Food, and Agriculture*. Rugby: Practical Action Publishing Ltd.
- Clarke, D., & Hill, R. V. (2012). *Cost-Benefit Analysis of the African Risk Capacity Facility*. International Food Policy Research Institute (IFPRI).
- Clarke, D. (2016). A theory of rational demand for index insurance. *American Journal of Microeconomics*, 8(1), 283–306.

- Clarke, D. J., & Dercon, S. (2016). *Dull Disasters? How Planning Ahead Will Make a Difference*. Oxford: Oxford University Press.
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research Methods in Education*. Oxon: Routledge.
- Coppock, D. L. (2016). Pastoral System Dynamics and Environmental Change on Ethiopia's North-Central Borana Plateau-Influences of Livestock Development and Policy. In R. H. Behnke, & M. Mortimore, *The End of Desertification? Disputing Environmental Change in the Drylands* (pp. 327-362). Berlin: Springer.
- Coppock, L. (1994). *The Borana Plateau of Southern Ethiopia: Synthesis of Pastoral Research Development, and Change. 1980–1991*. Addis Ababa, Ethiopia: International Livestock Center for Africa.
- Coppock, D. L., Bailey, D., Ibrahim, M., & SeyoumTezera. (2018). Diversified Investments of Wealthy Ethiopian Pastoralists Include Livestock and Urban Assets That Better Manage Risk. *Rangeland Ecology & Management*, 71(1), 138-148.
- Cossins, N. J., & Upton, M. (1988). The Impact of Climatic Variation on the Borana Pastoral System. *Agricultural Systems*, 27, 117-135.
- Costa, D. D. (2013). The 'rule of experts' in making a dynamic microinsurance industry in India. *Journal of Peasant Studies*, 40(5), 845-865.
- Crouch, C. (2011). *The Strange Non-Death of Neoliberalism*. Cambridge: Polity Press.
- Dahl, G. (1979). *Suffering Grass: Subsistence and Society of Waso Borana*. Stockholm: Stockholm Studies in Social Anthropology.
- Dandesa, T. (2015). *Assessment of climatic variability and development of localized climate prediction method for livestock production in Borana area, Southern Ethiopia*. Harar, Ethiopia: MA Thesis, School of Natural Resource Management and Environment Sciences, Haramaya University.
- Dandesa, T., Korecha, D., Nigatu, L., & and Cheneka, B. (2017). Assessment of Climatic Variability and Development of Localized Climate Prediction Method for Livestock Production in Borana Area, Southern Ethiopia. *Environment Science Journal of India*, 13(3), 137.
- De Haan, C. (2016). *Prospects for Livestock-Based Livelihoods in Africa's Drylands*. (D. H. Cees, Ed.) Washington, DC: The World Bank. doi:10.1596/978-1-4648-0836-4
- Dean, M. (1999). Risk, calculable and incalculable. In D. Lupton, *Risk and sociocultural theory: new directions and perspectives* (pp. 131-159). Cambridge: Cambridge University Press.
- Degen, A. A. (2011). Transformation of Borana from nomadic pastoralists to agropastoralists and shift of livestock from cattle to include more goats, camels and sheep in Southern Ethiopia. *International Journal of Business and Globalisation*, 6(3/4).
- Demissie, M., Addisu, A., & and Mezgebu, D. (2020). *ReCAP Impact Case Study on Ethiopia*,. DFID. Addis Ababa: ReCAP.
- Dercon, S. (2004). Growth and shocks: evidence from rural Ethiopia. *Journal of Development Economics*, 74(2), 309-329. Retrieved from <https://doi.org/10.1016/j.jdeveco.2004.01.001>

- Dercon, S. (2004). Risk, Insurance, and Poverty: A Review. In S. Dercon (Ed.), *Insurance Against Poverty* (pp. 9-37). Oxford: Oxford University Press.
- Desta, S., & Coppock, L. (2002, September ). Cattle population dynamics in the southern Ethiopian rangelands, 1980-97. *Journal of Range Management*, 55(5), 439-451. Retrieved 2020
- Desta, S., & Coppock, L. (2004). Pastoralism under Pressure: Tracking System Changes in Southern Ethiopia. *Human Ecology*, 32(4), 465–486.
- Desta, S. (2006). Pastoralism and Development in Ethiopia. *Economic Focus*.
- Devereux, S. (2009). *Seasonality and Social Protection in Africa*. Working Paper 011, Insitute of Development Studies , Future Agricultures.
- Dorfman, M. S. (1998). *Insurance and the Management of Risk*. New Jersey: Prentice-Hal.
- Doss, C., McPeak, J., & Barrett, C. (2006). Interpersonal, intertemporal and spatial variation in risk perceptions: evidence from East Africa. *Economic Growth Center Discussion Paper*.
- Doss, C., McPeak, J., & Barrett, C. B. (2008). Interpersonal, Intertemporal and Spatial Variation in Risk Perceptions: Evidence from East Africa. *World Development*, 36(8), 1453-1468.
- Drehsler, M., & Soer, W. (2016). *Early Warning, Early Action: The Sue of Predictive Tools in Drought Response through Ethiopia's Productive Safety net Programme*. The World Bank.
- Edao, B. M., Ameni, G., Assefa, Z., Berg, S., Whatmore, A. M., & Wood, J. L. (2020). Brucellosis in ruminants and pastoralists in Borena, Southern Ethiopia. *PLOS Neglected Tropical Diseases*, 14(7).
- Ellis, F. (2008). The Determinants of Rural Livelihood Diversification in Developing Countries. *Journal of Agricultural Economics*, 51(2). doi:<https://doi.org/10.1111/j.1477-9552.2000.tb01229.x>
- Engelen, E. (2008). The Case for Financialization. *Competition and Change*, 12(2), 111-119.
- Epstein, G. A. (2005). Introduction: Financialisation and the World Economy. In G. A. Epstein, & G. A. Epstein (Ed.), *Financialization and the World Economy* (pp. 3-16). Cheltenham: Edward Elgar.
- ERA, E. R. (2019). *Road Sector Development Program 22 Years Performance Assessment*. Addis Ababa: Ethiopian Roads Authority.
- Ewald, F. (1991). Insurance and Risk. In G. Burchell, C. Gordon, P. Miller, G. Burchell, C. Gordon, & P. Miller (Eds.), *The Foucault Effect* (pp. 197-210). Chicago: The University of Chicago Press.
- Ewald, F. (2019). The Values of Insurance. *Grey Room*, 74, 120–145. doi:[https://doi.org/10.1162/grey\\_a\\_00266](https://doi.org/10.1162/grey_a_00266)
- Fava, F., & Vrieling, A. (2021). Earth observation for drought risk financing in pastoral systems of sub-Saharan Africa. *Current Opinion in Environmental Sustainability*, 48, 44-52. doi:<https://doi.org/10.1016/j.cosust.2020.09.006>
- Fava, F., Jensen, N., Sina, J., Mude, A., & Maher, B. (2021). *Building financial resilience in pastoral communities in Africa*. Washington, D.C: World Bank.
- FDRE, C. S. (2013). *Population Projections for Ethiopia, 2007-2037*. Addis Ababa: CSA.
- FDRE, C. S. (2020). *Ethiopia Population Projection for 2020*. CSA.

- Fenetahun, Y., Yong-dong, W., You, Y., & Xinwen, X. (2020). Dynamics of forage and land cover changes in Teltele district of Borana rangelands, southern Ethiopia: using geospatial and field survey data. *BMC Ecology*, 20(55). doi:<https://doi.org/10.1186/s12898-020-00320-8>
- Feyissa, T. K. (2014). Conflicts among Pastoralists in the Borana Area of Southern Ethiopia: The case of Borana and Garri. *Master's Thesis in Peace and Conflict Transformation, Faculty of Humanities, Social Sciences and Education, University of Tromsø*. Unpublished MA Thesis.
- Fine, B. (2010). Locating Financialisation. *Historical Materialism*, 18(2), 97-116.
- Fisher, E., Hellin, J., Greatrex, H., & Jensen, N. (2018). Index insurance and climate risk management: Addressing social equity. *Development Policy Review*, 37(5), 581-602.
- Flintan, F. (2011). *Changing Nature of Gender Roles in the Drylands of the Horn and East Africa: Implications for DRR Programming*. REGLAP.
- Flintan, F., Cullen, B., & Latosky, S. (2011). Pastoral women's thoughts on 'change': voices from Ethiopia. *Future of Pastoralism* (pp. 1-36). Institute of Development Studies (IDS), University of Sussex and Feinstein International Center of Tufts University.
- Flintan, F., Tache, B., & Eid, A. (2011). *Rangeland fragmentation in traditional grazing areas and its impact on drought resilience of pastoral communities: Lessons from Borana, Oromia and Harshin, Somali Regional States, Ethiopia*. Nairobi : Regional Learning and Advocacy Programme.
- Francois, E. (2020). *The Birth of Solidarity: The History of the French Welfare State* . Duke University Press.
- Fratkin, E. (2001). East African Pastoralism in Transition: Maasai, Boran, and Rendille Cases. *African Studies Review*, 44(3), 1-25.
- French, S., Leyshon, A., & Wainwright, T. (2011). Financializing space, spacing financialization. *Progress in Human Geography*, 798-819. doi:10.1177/0309132510396749
- Galma, W., Menfese, T., & Angassa, a. A. (2017). Camel Management as an Adaptive Strategy to Climate Change by Pastoralists in southern Ethiopia. *Ecological Processes*, 6:26.
- Gebrekidan, T., Guo, Y., Bi, S., Wang, J., Zhang, C., Wang, J., & Lyu, K. (2019). Effect of index-based livestock insurance on herd offtake: Evidence from the Borena zone of southern Ethiopia. 23, 67-77. doi:<https://doi.org/10.1016/j.crm.2018.10.003>
- Giddens, A. (1984). *The Constitution of Society* . Cambridge: Polity Press.
- Gobu, W. (2021). *Index-Based Livestock Insurance, 2021 Long-Rain Long-Dry Ex-Gratia Payout Event Report*. ILRI.
- Gobu, W., Sambati, P., & Taye, M. (2018, August 13). IBLI eLearning course for village insurance promoters (VIPs) in Borana zone of Ethiopia. Addis Ababa, Ethiopia. Retrieved from <https://www.drylandinnovations.com/post/ibli-elearning-course-for-village-insurance-promoters-vips-in-borana-zone-of-ethiopia>
- Griffith, E. F., Pius, L., Manzano, P., & Jost, C. C. (2020). COVID-19 in pastoral contexts in the greater Horn of Africa: Implications and recommendations. *Pastoralism: Research, Policy and Practice*, 10-22. Retrieved from <https://doi.org/10.1186/s13570-020-00178-x>

- Halake, S. (2020, May 11). Ethiopia Steps Up Aerial Spraying To Stop New Desert Locust Invasion. *VoA Africa*. Addis Ababa, Ethiopia: Voice of America. Retrieved 2020, from nationalgeographic: <https://www.voanews.com/africa/ethiopia-steps-aerial-spraying-stop-new-desert-locust-invasion>
- Hansson. (2010). Risk: objective or subjective, facts, or values. *Journal of Risk Research*, 13(2), 231–238.
- Harvey, D. (2005). *A Brief History of Neoliberalism*. Oxford: Oxford University Press.
- Harper, D. (2012). *Visual Sociology*. Abingdon: Routledge.
- Harvey, W. (2011). Strategies for conducting elite interviews. *Qualitative Research*.
- Heaton, J. (2004). *Reworking Qualitative Data*. London: SAGE Publications Ltd.
- Helland, J. (1980). *Social Organization and Water Control Among the Borana of Southern Ethiopia*. Nairobi: International Livestock Center for Africa.
- Helland, J. (2001). Participation and Governance in the Development of Borana: Southern Ethiopia. In M. M. Salih, T. Dietz, & A. G. Admed, *African Pastoralism: Conflict, Institutions and Government* (pp. 56-80). London: Pluto Press.
- Helland, J. (2002). Land Alienation in Borana: Some land tenure issues in a pastoral context in Ethiopia. In M. Babiker, *Resource Alienation, Militarisation and Development: Case Studies from East African Drylands* (pp. 27-47). Addis Ababa: Organization for Social Science Research in Eastern and Southern Africa.
- Hickey, S. (2007). *Conceptualising the Politics of Social Protection in Africa*. University of Manchester.
- Hickey, S., Lavers, T., Niño-Zarazúa, M., & Seekings, J. (2019). *The Politics of Social Protection in Eastern and Southern Africa*. Oxford: Oxford University Press.
- Hirrfot, K., Barrett, C. B., Lentz, E., & Taddesse, B. (2014). The Subjective Well-being Effects of Imperfect Insurance that Doesn't Pay Out. *Agricultural & Applied Economics Association's 2014 AAEA Annual Meeting* (pp. 1-33). Minneapolis,: Cornell University.
- Hirrfot, K., Barrett, C., Lentz, E., & Taddesse, B. (2017). *Insuring Well-being? Buyer's Remorse and Peace of Mind Effects from Insurance*. World Bank Group, Development Research Group.
- Hirvonen, K., Sohnesen, T. P., & Bundervoet, T. (2020). Impact of Ethiopia's 2015 drought on child undernutrition. *World Development*, 131. Retrieved from <https://doi.org/10.1016/j.worlddev.2020.104964>
- Hitchcock, G., & Hughes, D. (1995). *Research and the Teacher : A Qualitative Introduction to School-Based Research* . London and New Yeork: Taylor & Francis Group.
- Hochrainer, S., Mechler, R., Pflug, G., & Lotsch, A. (2008). *Investigating the Impact of Climate Change on the Robustness of Index-Based Microinsurance in Malawi*. World Bank. Washington: World Bank.
- Hoddinott, J. (2006). Shocks and their consequences. *Shocks and their consequences across and within households in Rural Zimbabwe*, 42(2), 301-321. Retrieved from <http://dx.doi.org/10.1080/00220380500405501>

- Hogg, R. (1992). Should Pastoralism Continue as a Way of Life? *Disasters*, 16(2), 131-137.  
doi:<https://doi.org/10.1111/j.1467-7717.1992.tb00386.x>
- Hohl, R. M. (2019). *Agricultural Risk Transfer: From Insurance to Reinsurance to Capital Markets*. Chichester,: John Wiley & Sons Ltd.
- Homann, S., Rischkowsky, B., Steinbach, J., Kirk, M., & Mathias, E. (2008). Towards Endogenous Livestock Development: Borana Pastoralists' Responses to Environmental and Institutional Changes. *Human Ecology*, 503-520.
- Homann, S., Rischkowsky, B., Steinbach, J., Kirk, M., & Mathias, E. (2008). Towards Endogenous Livestock Development: Borana Pastoralists' Responses to Environmental and Institutional Changes. *Human Ecology*, 503-520. doi:DOI 10.1007/s10745-008-9180-7
- Homewood, K. (2008). *Ecology of African Pastoralist Societies*. Oxford: James Curry Ltd.
- Hulme, M., Doherty, R., Ngara, T., New, M., & Lister, D. (2001, August). African climate change: 1900–2100. *Climate Research*, 17, 145-168.
- Hurst, M., Jensen, N., Pedersen, S. H., Sharma, A., & Zambriski, J. A. (2012). *Changing Climate Adaptation Strategies of Boran Pastoralists in Southern Ethiopia*. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Retrieved from <https://core.ac.uk/download/pdf/211612215.pdf>
- Huysentruyt, M., Barrett, C. B., & McPeak, J. G. (2008). Understanding Declining Mobility and Interhousehold Transfers among East African Pastoralists. *Economics Faculty Scholarship*, 71. Retrieved from <http://surface.syr.edu/ecn/71>
- Ibrahim, M., Bailey, D., Coppock, D. L., & Tereza, S. (2015). *Investment Patterns of Wealthy Pastoralists on the Borana Plateau of Southern Ethiopia*. Fort Collins, CO: Feed the Future Innovation Lab for Collaborative Research on Adapting Livestock Systems to Climate Change.
- ILCA. (1985). *The Productivity and Potential of the Southern Rangelands of Ethiopia*. Addis Ababa: Joint ILCA/RDP Ethiopian Pastoral Systems Study Program (JEPSS).
- ILRI. (2021). *A regional approach to drought index-insurance in Intergovernmental Authority on Development (IGAD) countries*. International Livestock Research Institute. Nairobi: International Livestock Research Institute. Retrieved 2021
- ILRI, I. L. (2017, September 18). *Largest-ever micro-insurance payout made to Ethiopian pastoralists*. Retrieved from <https://news.ilri.org/>: <https://news.ilri.org/2017/09/18/largest-ever-micro-insurance-payout-made-to-ethiopian-pastoralists/>
- Insurance Development Forum. (2014). *Insurance Development Forum*. Retrieved from <https://www.insdevforum.org/>: <https://www.insdevforum.org/>
- IPCC. (2012). *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*. Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press.
- Isakson, S. R. (2014). Food and finance: The financial transformation of agro-food supply chains. *The Journal of Peasant Studies*, 41(5), 749-775.

- Isakson, S. R. (2015). Derivatives for Development? Small-Farmer Vulnerability and the Financialization of Climate Risk Management. *Journal of Agrarian Change*, 15(4), 569-580.
- Isakson, S. R. (2015). Small farmer vulnerability and climate risk: Index insurance as a financial fix. *Canadian Food Studies*, 267-277.
- Iticha, B., & Husen, A. (2019). Adaptation to climate change using indigenous weather forecasting systems in Borana pastoralists of southern Ethiopia. *Climate and Development*, 564-573.
- Janvry, A. d., Dequiedt, V., & Sadoulet, E. (2014). The demand for insurance against common shocks. *Journal of Development Economics*, 106, 227-238.
- Janzen, S. A., & Carter, M. R. (2018). After the Drought: The Impact of Microinsurance on Consumption Smoothing and Asset Protection. *American Journal of Agricultural Economics*, 101(3), 651-671. doi:<https://doi.org/10.1093/ajae/aay061>
- Janzen, S. A., Jensen, N. D., & Mude, A. G. (2016). Targeted social protection in a pastoralist economy: case study from Kenya. *Revue Scientifique ET Technique-Office International Des Epizooties*, 587-596. doi:<https://dx.doi.org/10.20506/rst.35.2.2543>
- Janzen, S., & Carter, M. (2013). The Impact of Microinsurance on Consumption Smoothing and Asset Protection: Evidence from a Drought in Kenya. *Annual meeting of Agricultural and Applied Economics Association*, 151141. doi:10.1016/j.agsy.2018.01.019
- Jasanoff, S. (2003). Technologies of Humility: Citizen Participation in Governing Science. *Minerva*, 223–244.
- Jenkerson, C., Maiersperger, T., & Schmidt, G. (2010). *eMODIS: A User-Friendly Data Source*. U.S. Geological Survey. Virginia : U.S. Geological Survey.
- Jensen, N., Barrett, C., & Mude, A. (2015). *The favourable impacts of Index-Based Livestock Insurance: Evaluation results from Ethiopia and Kenya*. Nairobi: ILRI. Retrieved from <https://hdl.handle.net/20.500.11766/4684>
- Jensen, N. D., Barrett, C. B., & Mude, A. (2016). Index Insurance Quality and Basis Risk: Evidence from Northern Kenya. *American Journal of Agricultural Economics*, 1450-1469.
- Jensen, N. D., Barrett, C. B., & Mude, A. G. (2017). Cash transfers and index insurance: A comparative impact analysis from northern Kenya. *Journal of Development Economics*, 129, 14-28.
- Jensen, N., & Barrett, C. (2017). Agricultural Index Insurance for Development. *Applied Economic Perspectives and Policy*, 39(2), 199-219.
- Jensen, N., G.Mude, A., & B.Barrett, C. (2018). How basis risk and spatiotemporal adverse selection influence demand for index insurance: Evidence from northern Kenya. *Food Policy*, 74, 172-198.
- Jensen, N., Stoeffler, Q., Fava, F., Vrieling, A., Atzberger, C., Meroni, M., . . . Carter, M. (2019). Does the design matter? Comparing satellite-based indices for insuring pastoralists against drought. *Ecological Economics*, 162, 59-73. doi:<https://doi.org/10.1016/j.ecolecon.2019.04.014>
- Johnsen, K. I., Benjaminsen, T. A., & Eira, I. M. (2015). Seeing like the state or like pastoralists? Conflicting narratives on the governance of Sámi reindeer husbandry in Finnmark, Norway. *Norwegian Journal of Geography*, 230-241.

- Johnson, L. (2013). Index insurance and the articulation of risk-bearing subjects. *Environment and Planning*, 2663-2681.
- Johnson, L. (2020). Sharing risks or proliferating uncertainties? Insurance, disaster and development. In I. Scoones, & A. Stirling, *The Politics of Uncertainty: Challenges of Transformation* (p. 196). Oxyron: Routledge. doi:<https://doi.org/10.4324/9781003023845>
- Johnson, L. (2021). Rescaling index insurance for climate and development in Africa. *Economy and Society*, 1-28. doi:10.1080/03085147.2020.1853364
- Johnson, L., Scoones, I., Taye, M., & Mohamed, T. (Forthcoming). Uncertainty in the drylands: Reimagining in/formal insurance from pastoral East Africa. *Environment and Planning: Economy and Space*, 1-26.
- Johnson, P., & Duberley, J. (2000). *Understanding Management Research: An Introduction to Epistemology*. London: SAGE.
- Jupp, V. (2006). *The Sage Dictionary of Social Research Methods*. London: SAGE Publications.
- Kamara, A., Kirk, M., & Swallow, B. (2005). *Property rights and land-use change: implications for sustainable resource management in Borana, Southern Ethiopia*. Journal of Sustainable Agriculture.
- Karwowski, E., Shabani, M., & Stockhammer, E. (2017). *Financialization: Dimensions and determinants. A cross-country study*. London: Kingston University London.
- Kenennisa, W. (2020). *Pastoral Land Tenure Security: A focus on Land Certification among the Borana, Ethiopia*. Unpublished MA Thesis, Addis Ababa University.
- Knight, F. H. (1933). *Risk, Uncertainty and Profit*. London: Longman.
- Komporozos-Athanasiou, A. (2022). *Speculative Communities: Living with Uncertainty in a Financialized World*. Chicago and London: The University of Chicago Press.
- Korf, B., Hagmann, T., & Emmenegger, R. (2015). Re-spacing African drylands: territorialization, sedentarization and indigenous commodification in the Ethiopian pastoral frontier. *The Journal of Peasant Studies*, 5(42), 881-901. doi:<https://doi.org/10.1080/03066150.2015.1006628>
- Krätli, S. (2016). Discontinuity in pastoral development: time to update the method. *Revue scientifique et technique (International Office of Epizootics)*, 485-497.
- Krippner, G. R. (2011). *Capitalizing on Crisis: The Political Origins of the Rise of Finance*. Cambridge: harvard University Press.
- Lancaster, C., & Walle, N. V. (2018). *The Oxford Handbook of the Politics of Development*. Oxford: Oxford University Press.
- Lapavitsas, C. (2011). Theorizing financialization. *Work, employment and society*, 25(4), 611-626. doi:10.1177/0950017011419708
- Lapavitsas, C. (2012). *Financialisation in Crisis*. Leiden and Boston: Koninklijke Brill.
- Lapavitsas, C. (2013). The financialization of capitalism: 'Profiting without producing'. *Analysis of urban trends, culture, theory, policy, action*, 726-805.

- Lavender, S., & Lavender, A. (2016). *Practical Handbook of Remote Sensing*. Taylor & Francis Group, LLC.
- Lavers, T. (2016). *Social protection in an aspiring 'developmental state': The political drivers of Ethiopia's PSNP*. Manchester: University of Manchester .
- Lavrakas, P. J. (2008). *Encyclopedia of Survey Research Methods* (Vol. 1 and 2). California: SAGE Publications, Inc.
- Lawrence, G. (2015). Defending financialization. *Dialogues in Human Geography*, 5(2), 2015-205. doi:DOI: 10.1177/2043820615588155
- Lawrence, G., Sippel, S. R., & Burch, D. (2015). The financialisation of food and farming. In G. M. Robinson, D. A. Carson, G. M. Robinson, & D. A. Carson (Eds.), *Handbook on the Globalisation of Agriculture* (pp. 309-327). Edward Elgar. doi:https://doi.org/10.4337/9780857939838.00023
- Leach, M., Scoones, I., & Stirling, A. (2010). *Dynamic Sustainabilities: Technology, Environment, Social Justice*. Oxon: Earthscan.
- Legesse, A. (1973). *Three Approaches to the Study of African Society*. New York: Free Press.
- Lentz, E., & Barret, C. B. (2005). *Food aid targeting, shocks and private transfers among East African pastoralists*. Cornell University.
- Li, J., & Zhu, X. (2019). *Conceptualizing and Contextualizing Higher Education with Chinese Characteristics*. Singapore: Springer.
- Liao, C., Clark, P. E., DeGloria, S. D., & Barrett, C. B. (2017). Complexity in the spatial utilization of rangelands: Pastoral mobility in the Horn of Africa. *Applied Geography*, 208-219.
- Liban, T. (2014). *Jatani Ali Tandhu: Life & Legacy of a Borana Statesman*. Fontaine Press.
- Lind, J., Sabates-Wheler, R., Kohnstamm, S., Caravani, M., Eid, A., Nightingale, D. M., & Oringa, a. C. (2016). Lind, J.; Sabates-Wheeler, R.; Kohnstamm, S.; Caravani, M.; Abdurehman Eid; Manzolillo Nightingale, D.; Oringa, C. Changes in the drylands of eastern Africa: case studies of pastoralist systems in the region. *IDS Publication*, 47.
- Lind, J., Okenwa, D., & Scoones, I. (2020b). The Politics of Land, Resources & Investment in Eastern Africa's Pastoral Drylands. In J. Lind, D. Okenwa, & I. Scoones (Eds.), *Land, investment & politics : reconfiguring East Africa's pastoral drylands* (pp. 1-32). Suffolk: James Currey.
- Lind, J., Sabates-Wheeler, R., Caravani, M., Kuol, L. B., & Nightingale, D. M. (2020). Newly evolving pastoral and post-pastoral rangelands of Eastern Africa. *Pastoralism: Research, Policy and Practice*. doi:https://doi.org/10.1186/s13570-020-00179-w
- Liniger, H., Studer, R. M., Hauert, C., & Gurtner, M. (2011). *Sustainable Land Management in Practice – Guidelines and Best Practices for Sub-Saharan Africa*. TerrAfrica, World Overview of Conservation Approaches and Technologies (WOCAT) and Food and Agriculture Organization of the United Nations (FAO).
- Little, P. D., Smith, K., Cellarius, B. A., Coppock, D. L., & Barrett, C. (2001, December). Avoiding Disaster: Diversification and Risk Management among East African Herders. *Development and Change*, 32(3), 401-433. doi:https://doi.org/10.1111/1467-7660.00211

- Little, P. D., McPeak, J. G., Barrett, C. B., & Kristjanson, P. (2008). Challenging Orthodoxies: Understanding Poverty in Pastoral Areas of East Africa. *development Change* , 587-611.
- Little, P. D., Mahmoud, H. A., Tiki, W., & Debsu, D. N. (2012). *Climate Variability, Pastoralism, and Commodity Chains in Climate Variability, Pastoralism, and Commodity Chains in Ethiopia and Kenya*. Adapting Livestock to Climate Change Collaborative Research Support Program, Colorado State University. .
- Little, P. D. (2013). Reflections on the future of pastoralism in the Horn of Africa. In A. Catley, J. Lind, & I. Scoones (Eds.), *Pastoralism and Development in Africa: Dynamic change at the margins* (pp. 241-249). Oxon: Routledge.
- Little, P. D., Debsu, D. N., & Tiki, W. (2014). How pastoralists perceive and respond to market opportunities: The case of the Horn of Africa. *Food Policy*, 49, 389-397. doi:<http://dx.doi.org/10.1016/j.foodpol.2014.10.004>
- Little, P. D., & McPeak, J. G. (2014). *Resilience and Pastoralism in Africa: South of the Sahara, with a particular focus on the Horn of Africa and the Sahel, West Africa*. Washington,: International Food Policy Research Institute.
- Livingstone, J., & Ruhindi, E. (2013). Women and economic diversification in pastoralist societies: a regional perspective. In A. Catley, J. Lind, & I. Scoones (Eds.), *Pastoralism and Development in Africa: Dynamic change at the margins* (pp. 231-240). Oxon: Routledge.
- Lloyd-Hughes, B. (2014). The impracticality of a universal drought definition. *Theoretical and Applied Climatology*, 117, 607-611. doi:<https://doi.org/10.1007/s00704-013-1025-7>
- Loftus, A. (2015). Financialising nature? *GEOFORUM*, 60, 172-175.
- Luhmann, N. (1993). *Risk: A Sociological Theory*. (R. Barrett, Trans.) Berlin and New York: Walter de Gruyter.
- Luhmann, N. (1993). *Risk: A Sociological Theory*. Berlin: Walter de Gruyter.
- Lune, H., & Berg, B. L. (2017). *Qualitative Research Methods for the Social Sciences*. Harlow: Pearson Education Limited.
- Lung, F. (2021, July 09). *International Livestock Research Institute*. Retrieved from [ilri.org: https://www.ilri.org/news/livestock-insurance-schemes-pastoralists-there-future-regional-approach-horn-africa](https://www.ilri.org/news/livestock-insurance-schemes-pastoralists-there-future-regional-approach-horn-africa)
- Lupton, D. (1999). Introduction: Risk and Sociocultural Theory. In D. Lupton, *Risk and sociocultural theory: new directions and perspectives* (pp. 1-11). Cambridge: Cambridge University Press.
- Lybbert, T. J., Barrett, C. B., Desta, S., & Coppock, D. L. (2004). Stochastic Wealth Dynamics and Risk Management among a Poor Population. *The Economic Journal*, 114(498), 750-777. Retrieved from <http://www.jstor.org/stable/3590237>
- Mader, P., Mertens, D., & Zwan, N. v. (2020). *The Routledge International handbook of Financialization*. (P. Mader, D. Mertens, & N. v. Zwan, Eds.) Oxon: Routledge.
- Mains, D. (2019). *Under Construction: Technologies of Development in Urban Ethiopia*. Durham and London: Duke University Press.

- Mannay, D. (2016). *Visual, Narrative and Creative Research methods: Application, reflection and ethics*. London and New York: Routledge.
- Markakis, J. (2011). *Ethiopia: The Last Two Frontiers*. Woodbridge,: James Currey.
- Marks, S. (2020, April 24). COVID-19 Restrictions Hurt East Africa's Fight Against Locusts. Addis Ababa, Ethiopia: Voice of America. Retrieved 2021, from <https://www.voanews.com/covid-19-pandemic/covid-19-restrictions-hurt-east-africas-fight-against-locusts>
- Marwaha, N. (2020, September 01). *5 Things To Know About NDVI (Normalized Difference Vegetation Index)*. Retrieved from up42.com: <https://up42.com/blog/tech/5-things-to-know-about-ndvi>
- McCabe, J. T. (1997). Risk and Uncertainty among the Maasai of the Ngorongoro Conservation Area in Tanzania: A Case Study in Economic Change. *Nomadic Peoples*, 1, 54-65. Retrieved from <https://www.jstor.org/stable/43123510>
- McPeak, J. G. (2003). Analyzing and Addressing Localized Degradation in the Commons. *Land Economics*, 79(04), 515-536. Retrieved from <http://www.jstor.org/stable/3147297>
- McPeak, J., & Little, P. (2006). *Pastoral Livestock Marketing in Eastern Africa: Research and Policy Challenges*. Practical Action Publishing.
- McPeak, J., & Little, P. D. (2006). *Pastoral Livestock Marketing in Eastern Africa: Research and Policy Challenges*. Warwickshire, UK: Intermediate Technology Publications.
- McPeak, J., Little, P. D., & Doss, C. R. (2012). *Risk and Social Change in an African Rural Economy: Livelihoods in Pastoralist Communities*. London, UK: Routledge ISS Studies in Rural Livelihoods.
- Mechler, R., Linnerooth-Bayer, J., & Peppiatt, D. (2006). *Disaster Insurance for the Poor? A ProVention/IIASA study A review of microinsurance for natural disaster risks in developing*. Geneva: Provention Consortium.
- Megersa, B., Markemann, A., Angassa, A., & Zárate, A. V. (2013, February 5). The role of livestock diversification in ensuring household food security under a changing climate in Borana, Ethiopia. *Food Security*, 15-28. doi:10.1007/s12571-013-0314-4
- Mellisse, B. T. (2014). *Implications of constrained mobility on livestock production and pastoral livelihoods of the Borana Plateau, southern Ethiopia*. Feed the Future—Adapting Livestock Systems to Climate Change, Colorado State University, Fort Collins, CO, USA. Retrieved from <http://www.vivo.colostate.edu/lccrsp/briefs/TIRI%20RB-02-2014.pdf>
- Middleton, N., & Thomas, D. (1997). *World atlas of desertification*. United Nations Environment Programme.
- Miranda, M. J., & Farrin, K. (2012). Index Insurance for Developing Countries. *Applied Economic Perspectives and Policy*, 391-427.
- Mitchell, L. E. (2011). Financialism: a (very) brief history. In C. A. Williams, & P. Zumbansen, *The Embedded Firm: Corporate Governance, Labor, and Finance Capitalism* (pp. 42-59). Cambridge: Cambridge University Press.
- Mobarak, A., & Rosenzweig, M. (2012). *Selling formal insurance to the informally insured*. Center for Microfinance.

- Morduch, J. (2004). Consumption Smoothing Across Space: Testing Theories of Risk-Sharing in the ICRISAT Study Region of South India. In S. Dercon (Ed.), *Insurance Against Poverty* (pp. 38-58). Oxford: Oxford University Press.
- Muller-Mahn, D. M., Rettberg, S., & Getachew, G. (2010). Pathways and Dead Ends of Pastoral Development among the Afar and Karrayu in Ethiopia. *European Journal of Development Research*, 22, 660-677.
- Müller-Mahn, D., & Everts, J. (2013). Risksapes: the spatial dimensions of risk. In D. Müller-Mahn, & D. Müller-Mahn (Ed.), *The spatial dimensions of risk* (pp. 22-36). Oxon: Routledge.
- Müller-Mahn, D., Everts, J., & Stephan, C. (2018). Risksapes Revisited-Exploring the Relationship between Risk, Space, and Practice. *Erdkunde*, 197-214.
- Müller-Mahn, D., Moure, M., & Gebreyes, M. (2020). Climate change, the politics of anticipation and future risksapes in Africa. *Cambridge Journal of Regions, Economy and Society*.
- Napier, A., & Desta, S. (2011). *Review of Pastoral Rangeland Enclosures in Ethiopia*. Pastoral Livelihoods Initiative (PLI) Project.
- National Government of Oromia, F. a. (2008). *Oromia Regional Atlas*.
- Ndegwa, M. K., Shee, A., Turvey, C., & You, L. (2021, September). Sequenced crop evapotranspiration and water requirement in developing a multi-trigger rainfall index insurance and risk-contingent credit. 13(4). doi:<https://doi.org/10.1175/WCAS-D-21-0071.1>
- Neisser, F. M. (2014). 'Risksapes' and risk management – Review and synthesis of an actor-network theory approach. *Risk Management*, 16(2), 88-120. doi:10.1057/rm.2014.5
- Niamir-Fuller, M. (1999). Managing Mobility in African Rangelands: The Legitimation of Transhumance. *Intermediate Technology Publications, London*.
- November, V. (2008). Spatiality of risk. *Environment and Planning*, 1523–1527.
- November, V., & Leanza, Y. (2015). *Risk, Disaster and Crisis Reduction: Mobilizing, Collecting and Sharing Information*. London: Springer. Retrieved February 2020
- Oba, G. (1998). *Assessment of Indigenous Range Management Knowledge of the Booran Pastoralists of Southern Ethiopia*. Consultancy Report for GIZ, German Corporation for International Cooperation.
- Oba-Smidt, C. (2016). *The Oral Chronicle of the Boorana in Southern Ethiopia : Modes of Construction and Preservation of History among People without Writing* (Vol. 4). (R. P. Watt, Trans.) Zürich: Northeast African history, orality and heritage.
- O'Brien, K., Eriksen, S., Nygaard, L. P., & Schjolden, A. (2013). Why different interpretations of vulnerability matter in climate change discourses. *Climate Policy*, 73-88. Retrieved from <http://dx.doi.org/10.1080/14693062.2007.9685639>
- Odhiambo, M. O. (2012). *Impact of Conflict on Pastoral Communities' Resilience in the Horn of Africa: Case Studies from Ethiopia, Kenya and Uganda*. RECONCILE/FAO.
- OECD. (2003). *Emerging Systemic Risks in the 21st Century: An Agenda for Action*. Organisation for Economic Co-operation and Development.

- Opiyo, F., Wasonga, O., Nyangito, M., Schilling, J., & Munang, R. (2015, September 16). Drought Adaptation and Coping Strategies Among the Turkana Pastoralists of Northern Kenya. *International Journal of Disaster Risk Science*, 295-309.
- Oromia, R. G. (2016). *Oromia Rural Land Proclamation, Dheeda Administrative Directive*. Oromia Rural Land Administration.
- Ouma, S., Johnson, L., & Bigger, P. (2018). Rethinking the financialization of 'nature'. *Environment and Planning*, 50(3), 500-511.
- Outreville, J. F. (1997). *Theory and Practice of Insurance*. New York: Springer Science+Business Media.
- Painceira, J. P. (2012). Developing Countries in the Era of Financialisation: From Deficit-Accumulation to Reserve-Accumulation. In C. Lapavistas, *Financialisation in Crisis* (pp. 185-216). Leiden: Koninklijke Brill.
- Painceira, J. P. (2021). *Financialisation in Emerging Economies: Changes in Central Banking*. London: Routledge.
- Pastoralist Forum Ethiopia, International Institute of Rural Reconstruction, The Development Fund. (2010). *Pastoralism and Land: Land tenure, Administration and use in pastoral areas of Ethiopia*. Addis Ababa: PFE, IIRR and DF.
- PCI, U. O. (2007). *The Future of Pastoralism in Ethiopia*. The UN OCHA Pastoralist Communication Initiative.
- Pelling, M., Müller-Mahn, D., & McCloskey, J. (2020). Disasters, Humanitarianism, and Emergencies. In I. Scoones, & A. Stirling, *The Politics of Uncertainty* (pp. 127-140). London: Routledge.
- PFE, IIRR, & DF. (2010). *Pastoralism and Land: Land tenure, administration and use in pastoral*. Addis Ababa: PFE; IIRR; DF.
- Pfeffer, I. (1956). *Insurance and economic theory*. Pennsylvania: Homewood.
- Popp, T. R., & Nowack, W. (2020). Resilience through the Financialisation of Risks? The Case of a Dairy System in Northwest Germany. *Sustainability*, 12. Retrieved from 6226; doi:10.3390/su12156226
- Porter, C., & White, E. (2016). *Potential for Application of a Probabilistic Catastrophe Risk Modelling Framework to Poverty Outcomes*. Finance and Markets Global Practice Group. The World Bank Group.
- Power, M. (2004). *The Risk Management of Everything: Rethinking the politics of uncertainty*. London: DEMOS.
- Presser, S. (1985). The use of survey data in basic research in the social sciences. In C. F. Turner, & E. H. Martin, *Surveying Subjective Phenomena Volume 2* (pp. 93-114). New York: SAGE.
- Qi, H. (2019). A New Literature on Financialisation. *Journal of Accounting, Business and Finance Research*, 7(2), 40-50.
- Rea, L. M., & Parker, R. A. (2014). *Designing and Conducting Survey Research: A Comprehensive Guide*. John Wiley & Sons, Inc.
- Rejda, G. E. (2008). *Principles of Risk Management and Insurance*. Pearson.

- Rejda, G. E., & McNamara, M. J. (2017). *Principles of Risk Management and Insurance*. Harlow: Pearson Education Limited.
- Renn, O., Klinke, A., & Asselt, M. v. (2011). Coping with Complexity, Uncertainty and Ambiguity in Risk Governance: A Synthesis. *Ambio*, 231-246.
- Roe, E., Huntsinger, L., & Labnow, K. (1998). High-Reliability Pastoralism Versus Risk-Averse Pastoralism. *The Journal of Environment and Development*, 7(4). doi:<https://doi.org/10.1177/107049659800700404>
- Roe, E. (2020). *A new policy narrative for pastoralism? Pastoralists as reliability professionals and pastoralist systems as infrastructure*. Brighton:: ESRC STEPS (Social, Technological and Environmental Pathways to Sustainability) Centre.
- Rose, G. (2016). *Visual Methodologies: An Introduction to Researching with Visual Methods*. SAGE.
- Ruby, J. (1991). Speaking For, Speaking About, Speaking With, or Speaking Alongside - An Antropological and Documentary Dilemma. *Visual Antropology Review*, 50-67.
- Salzman, P. C. (1994). Afterword: reflections on the pastoral land crisis. *Nomadic Peoples*, 34/35, 159-163. Retrieved 2021, from <https://www.jstor.org/stable/43124080>
- Santos, P., & Barrett, C. B. (2011). Persistent poverty and informal credit. *Journal of Development Economics*, 337-347.
- Santos, P., & Barrett, C. B. (2019). Heterogeneous Wealth Dynamics: On the Roles of Risk and Ability. In C. B. Barrett, M. R. Carter, & J.-P. Chavas (Eds.), *The Economics of Poverty Traps* (pp. 265-290). Chicago and London: The University of Chicago Press. doi:<https://doi.org/10.7208/chicago/9780226574448.001.0001>
- Saris, W. E., & Gallhofer, I. N. (2014). *Design, Evaluation, and Analysis of Questionnaires for Survey Research*. New Jersey: John Wiley & Sons, Inc.
- Scoones, I. (1995). *Living with Uncertainty: New Directions in Pastoral Dvelopment in Africa*. Practical Publishing.
- Scoones, I., & Graham, O. (1994, October). New Directions for Pastoral Development in Africa. *Development in Practice*, 4(3), 188-198.
- Scoones, I. (1998, January 01). Sustainable Rural Livelihoods: A Framework for Analysis. *IDS Working Papers*.
- Scoones, I. (2009, January). Livelihoods perspectives and rural development. *The Journal of Peasant Studies*, 36(1), 171-196. doi:<https://doi.org/10.1080/03066150902820503>
- Scoones, I. (2015). *Sustainable Livelihoods and Rural Development*. Rugby, UK: Practical Action Publishing. doi:<http://dx.doi.org/10.3362/9781780448749>
- Scoones, I. (2019). What is Uncertainty and Why Does it Matter? *STEPS Working Paper 105*, p. 56.
- Scoones, I., & Stirling, A. (2020). *The Politics of Uncertainty: Challenges of Transformation* (1st ed.). (I. Scoones, & A. Stirling, Eds.) Oxon: Routledge. doi:<https://doi.org/10.4324/9781003023845>
- Scoones, I., Shariff, T., & Taye, M. (Forthcoming). The Politics of anticipation in Africa's rangelands. In D. M. Mahn, & M. Bollig, *Future Rural Africa – Envisioning African Futures in Uncertain Times*.

- Scott, D. (2019). *Income Shocks and Poverty Traps: Asset Smoothing Rural Ethiopia*. Centre for Research in Economic Development and International Trade. Nottingham: University of Nottingham.
- Seekings, J., & Nattrass, N. (2005). *Class, Race, and Inequality in South Africa*. New Haven and London: Yale University Press.
- Semplici, G. (2019). Seeing like the herder: Climate change and pastoralists' knowledge – insights from Turkana herders in northern Kenya. In A. Ahearn, M. Oelz, & R. K. Dhir, *Indigenous Peoples and Climate Change: Emerging Research on Traditional Knowledge and Livelihoods* (pp. 65-82). ILO.
- Sen, A. (1981, August). Ingredients of Famine Analysis: Availability and Entitlements. *Journal of Economics*, 96(3), 433-464. Retrieved from <https://www.jstor.org/stable/1882681>
- Sendaa, T. S., Robinson, L. W., Gachene, C. K., Kironchi, G., & Doyo, J. (2020). An assessment of the implications of alternative scales of communal land tenure formalization in pastoral systems. *Land Use Policy*.
- Shaughnessy, J. J., Zechmeister, E. B., & Zechmeister, J. S. (2012). *Research Methods in Psychology*. New York: McGraw Hill.
- Sieff, D. F. (1999). The effects of wealth on livestock dynamics among the Datoga pastoralists of Tanzania'. *Agricultural Systems*, 59(1), 1-25.
- Simula, G., Bum, T., Farinella, D., Maru, N., Mohamed, T. S., Taye, M., & Tsering, P. (2020). COVID-19 and pastoralism: reflections from three continents. *The Journal of Peasant Studies*. doi:10.1080/03066150.2020.1808969
- Slovic, P. (2000). *The Perception of Risk*. Taylor & Francis Group.
- Smith, K., Barrett, C. B., & Box, P. W. (2000). Participatory Risk Mapping for Targeting Research and Assistance: With an Example from East African Pastoralists. *World Development*, 28(11), 1945-1959.
- Smith, K., Barrett, C. B., & Box, P. W. (2001, June). Not Necessarily in the Same Boat: Heterogeneous Risk Assessment Among East African Pastoralists. *Journal of Development Studies*, 37(5), 1-30.
- Sohnesen, T. P. (2019, November 04). Two Sides to Same Drought: Measurement and Impact of Ethiopia's 2015 Historical Drought. *Economics of Disasters and Climate Change*, 4, 83-101.
- Stapleton, J. (2017, September 18). *ILRI*. Retrieved from <https://news.ilri.org/>: <https://news.ilri.org/2017/09/18/largest-ever-micro-insurance-payout-made-to-ethiopian-pastoralists/>
- Stirling, A. (1999). Risk at a turning point? *Journal of Environmental Medicine*, 119-126.
- Stirling, A. (2003). Risk, uncertainty and precaution: some instrumental implications from the social sciences. In M. L. Frans Berkhout, *Negotiating Environmental Change: New Perspectives from Social Science* (pp. 33-76). Cheltenham: Edward Elgar.
- Stirling, A and Scoones, I. (2009). From Risk Assessment to Knowledge Mapping: Science, Precaution, and Participation in Disease Ecology. *Journal of Ecology and Society*, 14 (2).

- Stockhammer, E. (2004). Financialisation and the slowdown of accumulation. *Cambridge Journal of Economics*, 28(5), 719-741. doi:doi:10.1093/cje/beh032
- Sussman, S., Burton, D., Dent, C. W., Stacy, A. W., & Flay, B. R. (1991). Use of focus groups in developing adolescent tobacco use cessation program: Collective norm effects. *Applied Social Psychology*, 1772-1782.
- Sutherland, C., Dianne Scott, S. B., & Guy, H. (2012). Lay Knowledge of Risk: Exploring the 'Riskscapes' of Southern Durban Communities. In L. Blomertz, M. Doevenspeck, E. Macamo, & D. Muller-Mahn, *Risk and Africa: Multi-Disciplinary Empirical Approaches* (pp. 47-86). Berlin : LIT Verlag.
- Swallow, B. (1994). The role of wobility within the risk management strategies of pastoralists and agro-pastoralists. *Gatekeeper*, 47.
- Swift, J. (1988). *Major Issues in Pastoral Development with Special Emphasis on Selected African Countries*. Food and Agriculture Organization (FAO) of the United Nations and Institute of Development Studies (IDS).
- Tache, B. (2000). Changing Patterns of Resource Control among the Borana Pastoralists of Southern Ethiopia: A lesson for development agencies. In L. Manger, & A. G. Ahmed, *Pastoralists and Environment: Experience from the Greater Horn of Africa* (pp. 51-73). Addis Ababa.
- Tache, B., & Irwin, B. (2003). *Traditional institutions, multiple stakeholders and modern perspectives in common property: Accompanying change within Borana pastoral systems*. Securing the commons No.4.
- Tache, B. (2008). Pastoralism under Stress: Resources, Institutions and Poverty among the Borana Oromo in Southern Ethiopia. *PhD Thesis in Environment and Development Studies*. Norway. Retrieved March 24, 2019
- Tache, B., & Sjaastad, E. (2008). *Mutual assistance and poverty reduction among Borana Oromo: The Institution of Buusaa Gonofaa*. Norwegian University of Life Sciences.
- Tache, B. (2009). *Pastoral land use planning and resource management in Southern Oromia An integrated landscape approach*. Final report submitted to SOS Sahel Ethiopia, Addis Ababa.
- Tache, B., & Oba, G. (2010). Is Poverty Driving Borana Herders in Southern Ethiopia to Crop Cultivation? *Human Ecology*, 38, pp. 639-649. doi:DOI 10.1007/s10745-010-9349-8
- Tache, B., & Sjaastad, E. (2010). Pastoralists' Conceptions of Poverty: An Analysis of Traditional and Conventional Indicators from Borana, Ethiopia. *World Development*, 1168-1178.
- Tache, B. (2013). Rangeland Enclosures in Southern Oromia, Ethiopia: An innocative response or the erosion of common property resources? . In A. Catley, J. Lind, & I. Scoones, *Pastoralism and Development in Africa: Dynamic change at the margins* (pp. 37-46). New York: Routledge.
- Tadesse, T. (2010). *Borena land-use plan study project: Socio-economy Study Report*. Finfine: Oromia Water Works Design and Supervision Enterprise.
- Takahashi, K., Barrett, C. B., & Ikegami, M. (2018, July). Does Index Insurance Crowd In or Crowd Out Informal Risk Sharing? Evidence from Rural Ethiopia. *American Journal of Agricultural Economics*, 101(03), 672-691.

- Takahashi, K., Noritomob, Y., Ikegami, M., & Jensen, N. D. (2020). Understanding pastoralists' dynamic insurance uptake decisions: Evidence from four-year panel data in Ethiopia. *Food Policy*, 95. doi:<https://doi.org/10.1016/j.foodpol.2020.101910>
- Tasker, A. J. (2020). Exploring power and participation through informal livestock knowledge networks. *Preventive Veterinary Medicine*, 181. doi:<https://doi.org/10.1016/j.prevetmed.2020.105058>
- Tasker, A., & Scoones, I. (2021). High reliability knowledge networks: Responding to animal diseases in a pastoral area of northern Kenya. *Journal of Development Studies*. doi:10.31235/osf.io/5xbgh
- Taye, M., & Gobu, W. (2015). *First Index-Insurance Payout in 2014: Expectations and Reflections from Borana, Ethiopia*. Addis Ababa: Unpublished research report.
- Taye, M., & Francesco Fava, R. B. (2017). *IBLI Pre-feasibility Study in the Afar and Somali Regions of Ethiopia*. Addis Ababa: Unpublished Report.
- Taye, M., & Mude, A. (2018). *Strengthening resilience of pastoralists through Index Based Livestock Insurance (IBLI): Insights from Ethiopia*. Poster. Nairobi, Kenya: ILRI. Addis Ababa: ILRI. Retrieved from <https://hdl.handle.net/10568/96567>
- Taye, M., Alulu, V., Gobu, W., & Jensen, N. (2019). *Livestock insurance payouts and coping strategies of pastoralists during drought*. Nairobi: ILRI. Retrieved from <https://hdl.handle.net/10568/101632>
- Taye, M. (2020). Business Not As Usual: Five Problems For Pastoralists Caused By Ethiopia's New Currency Rules. *PASTRES Blog*. Addis Ababa, Ethiopia: PASTRES-IDS. Retrieved December 2020, from <https://pastres.org/2020/12/11/business-not-as-usual-five-problems-for-pastoralists-caused-by-ethiopias-new-currency-rules/>
- Taylor, M. (2011). Freedom from Poverty is Not for Free': Rural Development and the Microfinance Crisis in Andhra Pradesh, India. *Journal of Agrarian Change*, 11(4), 484-504.
- Taylor, M. (2013). Climate change, relational vulnerability and human security: rethinking sustainable adaptation in agrarian environments. *Climate and Development*, 5(4), 318-327. doi:<https://doi.org/10.1080/17565529.2013.830954>
- Taylor, M. (2016). Risky Ventures: Financial Inclusion, Risk Management and the Uncertain Rise of Index-Based Insurance. In S. Soederberg (Ed.), *Risking Capitalism* (Vol. 31, pp. 237-266). Bingley: Emerald Group Publishing Limited. doi:10.1108/S0161-723020160000031013
- Taylor-Gooby, P., & Zinn, J. (2006). Current Directions in Risk Research: New Developments in Psychology and Sociology. *Risk Analysis*, 26(2), 397-411.
- Tefera, S., Enawgaw, C., Tekle, D., Eid, A., Olibui, O., LaTosky, S., . . . Flintan, F. (2016). *Pastoralists do plan! Community-led land use planning in the pastoral areas of Ethiopia*. Rome: International Land Coalition.
- Temesgen, A. K. (2010). *Climate Change to Conflict? Lessons from Southern Ethiopia and Northern Kenya*. Fafo-report 2010:09.
- Tesfaye, A. (2017). *State and Economic Development in Africa: The Case of Ethiopia*. Wayne: Palgrave Macmillan.

- Tiki, W. (2014). *Livestock Marketing Value Chains: Dynamics and Challenges*. Addis Ababa and Atlanta: Emory Program in Development Studies .
- Tilahun, K. (2006, February). Analysis of rainfall climate and evapo-transpiration in arid and semi-arid regions of Ethiopia using data over the last half a century. *Journal of Arid Environments*, 64(3), 474-487. doi:10.1016/j.jaridenv.2005.06.013E
- Toth, R., Barrett, C., Bernstein, R., Clark, P. E., Gomes, C. P., Shibia, M., . . . Tadesse, B. (2014). Productive Spillovers of the Take-up of Index-Based Livestock Insurance. *2014 Annual Meeting, July 27-29, 2014*. Minneapolis: Agricultural and Applied Economics Association.
- Tsegaye, D., Vedeld, P., & Moe, S. (2013). Pastoralists and livelihoods: A case study from northern Afar, Ethiopia. *Journal of Arid Environments*, 138-146.
- Tsegaye, T., Taye, M., Gobu, W., Galgallo, D., & Banerjee, R. (2020). IBLI M-learning app. Software application. Addis Ababa, Ethiopia. doi:http://ibliapp.ilri.org/
- Turner, C. F., & Martin, E. (1985). *Surveying Subjective Phenomena* (Vol. 2). New York: Russell Sage Foundation.
- Tversky, A., & Kahneman, D. (1974). Judgment under Uncertainty: Heuristics and Biases. *Science*, 1124-1131.
- United Nations Framework Convention on Climate Change (UNFCCC) Secretariat. (2007). *Decision - /CP.13. Bali Action Plan*. Bonn: UNFCCC.
- University, C. (2022). *Cambridge International Dictionary of English*. Cambridge. Cambridge : Cambridge University Press.
- UN-OCHA. (2018). *Ethiopia: Oromia – Somali Conflict-Induced Displacement*. United Nation. Retrieved 2021, from Conflict-Induced Displacement
- UNOCHA-PCI. (2007). *The Future of Pastoralism in Ethiopia*. UNOCHA - Pastoralists Communication Initiative.
- Upton-Hansen, C. (2018). *The Financialization of Art*. London: London School of Economics and Political Science. Retrieved January 2022, from <http://etheses.lse.ac.uk/4012/>
- Vanderstoep, S. W., & Johnston, D. D. (2009). *Research Methods for Everyday Life: Blending Qualitative and Quantitative Approaches*. San Francisco: John Wiley & Sons.
- Vetter, S. (2005). Rangelands at equilibrium and non-equilibrium: recent developments in the debate. *Journal of Arid Environments*, 62, 321-341.
- Villa, K. M., Barrett, C. B., & Just, D. R. (2011, August 08). Whose Fast and Whose Feast? Intrahousehold Asymmetries in Dietary Diversity Response Among East African Pastoralists. *American Journal of Agricultural Economics*, 93(4), 1062-1081. doi:https://doi.org/10.1093/ajae/aar038
- Vrieling, A., Meroni, M., Mude, A. G., Chantarat, S., Ummenhofer, C. C., & Bie, K. (. (2016). Early assessment of seasonal forage availability for mitigating the impact of drought on East African pastoralists. *Remote Sensing of Environment*, 174, 44-55. doi:http://dx.doi.org/10.1016/j.rse.2015.12.003

- Wandera, B., Wyburn, D., Galgallo, D., Khalai, D., Gobu, W., Taye, M., & Mude, A. (2015). Index-Based Livestock Insurance (IBLI) index calculator app for Ethiopia. Nairobi and Addis Ababa, Kenya and Ethiopia. Retrieved from <https://www.drylandinnovations.com/post/index-based-livestock-insurance-ibli-index-calculator-app-for-ethiopia>
- Wandera, B., Wyburn, D., Taye, M., Galgallo, D., Khalai, D., Gobu, W., & Mude, A. (2018). IBLI training for sales agents. Nairobi and Addis Ababa, Kenya and Ethiopia. Retrieved from <https://www.drylandinnovations.com/post/ibli-training-for-sales-agents>
- Wang, C., & Burris, M. A. (1997, June). Photovoice: Concept, Methodology, and Use for Participatory Needs Assessment. *Health Education Behavior*, 24(3), 369-387.
- West, H., Quinn, N., & Horswell, M. (2019). Remote sensing for drought monitoring and impact assessment: Progress, past challenges and future opportunities. *Remote Sensing of Environment*, 232, 111291. doi:<https://doi.org/10.1016/j.rse.2019.111291>
- WFP, W. F. (2017). *Pasture-Drought Satellite Index Insurance for Pastoralists in Ethiopia (SIPE): Feasibility Study*. Addis Ababa: WFP.
- Whitfield, S. (2016). *Adapting Climate Uncertainty in African Agriculture: Narratives and knowledge politics*. London: Routledge. Retrieved 2019
- Wigan, D. (2009). Financialisation and Derivatives: Constructing an Artifice of Indifference. *Competition and Change*, 13(2), 157-172. doi:10.1179/102452909X417033
- Wilhite, D. A., & Glantz, M. H. (1985). *Understanding the Drought Phenomenon: The Role of Definitions*. Drought Mitigation Center Faculty Publications.
- Willett, A. H. (1951). *In The Economic Theory of Risk and Insurance*. Pennsylvania : University of Pennsylvania Press. Retrieved from <http://www.jstor.org/stable/j.ctv4s7kgm.12>
- Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2004). *At Risk: Natural hazards, people's vulnerability and disasters* (Second ed.). London: Routledge.
- Worku, I. (2011). Road Sector Development and Economic Growth in Ethiopia. *Ethiopian Development Research Institute* .
- Worku, M. A., Feyisa, G. L., & Beketie, K. T. (2022). Climate trend analysis for a semi-arid Borana zone in southern Ethiopia during 1981–2018. *Environmental Systems Research*. doi:<https://doi.org/10.1186/s40068-022-00247-7>
- World Bank. (2004). *Project Information Document: Ethiopia Productive Safety Nets*. The World Bank.
- World Bank. (2011). *Weather Index Insurance for Agriculture : Guidance for Development Practitioners*. Agriculture and Rural Development Discussion Paper. Washington: World bank.
- Wyburn, D., Taye, M., & Gobu, W. (n.d.). IBLI Game V 1.0. 1. Addis Ababa, Ethiopia. Retrieved from <https://www.drylandinnovations.com/post/ibli-game>
- Yin, R. K. (1984). *Case Study Research: Design and Methods*. Beverly Hills: Sage.
- Zewdie, Y., Taye, M., & Fava, F. (2020). Livestock insurance for pastoralists in Ethiopia: Exploring opportunities for scaling. *ILRI Policy Brief*. Retrieved 2020, from <https://hdl.handle.net/10568/108964>

- Zinn, J. O. (2008). *Social Theories of Risk and Uncertainty: An Introduction*. Blackwell Publishing Ltd.
- Zuev, D., & Bratchford, G. (2020). *Visual Sociology: Practices and Politics in Contested Spaces*. Palgrave.
- Zwan, N. v. (2014). Making sense of financialization. *Socio-Economic Review*, 12, 99-129.  
doi:10.1093/ser/mwt020
- Zweifel, P., Eisen, R., & Eckles, D. L. (2021). *Insurance Economics* (2 ed.). Cham: Springer.

## Appendices

### **Annex I Primary Data Collection Instrument**

Module I	Household Survey
Module II	Focus Group Discussion (FGD) Guideline on Risk and Uncertainty: Timeline, Perceptions and Responses
Module III	Focus Group Discussion (FGD) Guideline on Land Use and Changes
Module IV	Focus Group Discussion (FGD) Guideline on Risk and Uncertainty
Module V	Case Study – Phase I
Module VI	Case Study – Phase II - <u>Discussion Questions for extended case studies</u>
Module VII	Case Study Phase III – Extended Version
Module VIII	Elite interview – Reflection Interview

## Consent Form

### PARTICIPANT INFORMATION SHEET TEMPLATE

Dear Research Participant, thank you for your time. My name is Masresha Taye, I am a Doctoral Researcher at the Institute of Development Studies, University of Sussex. My research project is entitled as 'Financialization of Risk in the Ethiopian Drylands: Pastoralists' Practices of Integrating Livestock Insurance to Respond to Uncertainty'. Borana zone is selected to conduct this research. As member of the Borana pastoral community, *you are being invited to take part in this study. Before you decide whether or not to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully or request that it be read to you in full.*

**What is the purpose of the study?** This project is part of a greater research study called Pastoralism, Uncertainty and Resilience: Global Lessons from the Margins (PASTRES) which aims to explore the livelihoods of pastoralists in three regions – in Southern Europe, Eastern Africa and Western China. The project hopes to learn from pastoralists to inform policy, not only in pastoral areas but more broadly across the world. My research is interested in understanding how pastoralists in Borana pastoral zone of Ethiopia combine livestock insurance with other ways for responding to risk and uncertainty.

**Why have I been invited to participate?** You have been invited to be involved in the research, because you are part of this community where the research is being carried out or are a practising pastoralist.

**Do I have to take part?** *It is up to you to decide whether or not to take part. You will not be obliged to answer all the questions I ask, and you will be free to decide what questions you answer and which you do not. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part, you are still free to withdraw at any time and without giving us a reason.*

**What will happen to me if I take part?** During the research, we would like to interview you individually or involve you in group discussions or ask you to answer questions as part of a questionnaire or involve you take photographs of the interview. We will be primarily collecting information relevant to livestock management practices and social relations within the community.

**What are the possible disadvantages and risks of taking part?** We envisage no disadvantages or risks of taking part in this research. Giving consent allows for complete confidentiality and anonymity. If you have any concerns, please raise them. You can withdraw at any time.

**What are the possible benefits of taking part?** Our research will contribute to an improved understanding of pastoral livelihoods through setting out how pastoralists respond to risk and uncertainties in Ethiopia thereby understand where does livestock insurance fits in. Though there are no direct benefits to you, we will feedback results of our study both to you and your community, as well as policymakers.

**Will my information in this study be kept confidential?** All information collected will be kept strictly confidential in line with the General Data Protection Regulation (GDPR), May 2018, which is an EU law on data protection, where the research is hosted.

We have strict systems in place to ensure confidentiality, privacy and anonymity during the collection, storage and publication of research material. Any data that is stored from this project will be completely anonymous, such that no individual can be identified. Data will be stored for a year after completion of

the thesis (December 2022), after which confidential data will be destroyed. Any third party that may have to access such information (translators, interpreters) will also have to sign a confidentiality agreement.

In line with the GDPR, your data rights include the right to information, to access, to rectification, to erasure, to restrict processing and to object the processing of your personal data up until December 2020.

We will always ask permission before recording videos or taking photos and explain the conditions of sharing such recording.

**What should I do if I want to take part?** If you would like to take part, you will be asked to sign a consent form.

**What will happen to the results of the research study?** The results will be used for producing research papers and reports as well as my dissertation. These may be published online, in journals, books and photos/videos. Some videos and photos may be used in publications if you give the permission for use.

**Who is organising and funding the research?** This research is funded by the Economic Social Research Council. As a doctoral student at the Institute of Development Studies, at the University of Sussex, in the United Kingdom, I am organizing the research project. In addition, I am a graduate fellow at the International Livestock Research Institute, where all field research costs are covered by.

**Who has approved this study?** This study has been approved by the Research Ethics Committee of the Institute of Development Studies at the University of Sussex, UK. In addition, Institutional Research Ethics Committee (IREC) of ILRI approved this research.

In addition, Institutional Research Ethic Committee at the International Livestock Research Institute (ILRI) has approved to conduct this study.

Contact for Further Information - You can get in touch with the Principal Investigator of the research, Professor Ian Scoones, using these contact details: [i.scoones@ids.ac.uk](mailto:i.scoones@ids.ac.uk) (number: +44 01273 915679) or ILRI Nairobi based supervisor Dr. Francesco Fave using [f.fava@cgiar.org](mailto:f.fava@cgiar.org).

The UK-based Institute of Development Studies has insurance in place to cover its legal liabilities in respect of this study.

Thank you

Many thanks for reading/listening to someone reading out the information sheet

Date: June 05, 2019

## CONSENT FORM FOR PROJECT PARTICIPANTS

### Financialization of Risk in the Ethiopian Drylands: Pastoralists' Practices of Integrating Livestock Insurance to Respond to Uncertainty

I agree to take part in the above research project. I have had the project explained to me and I have understood the Information Sheet, which I may keep for records. I understand that agreeing to take part means that I am willing to (tick, as applicable):

- ☐ Be interviewed by the researcher
- ☐ Allow the interview to be photographed / videotaped / audio taped
- ☐ Make myself available for a further interview should that be required

Consent options (tick, as applicable)

- ☐ I understand that any information that I provide is confidential, and that no information that I disclose will lead to the identification of any individual in the reports on the project, either by the researcher or by any other party.
- ☐ I consent to the digital still/video being shown to others, with some content being used in publications.
- ☐ In case a follow-up interview is needed, I will provide information.
- ☐ I agree that the information provided can be used up to one year after the publication of the dissertation, after which data will be destroyed (December 2022).
- ☐ I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage of the project without being penalised or disadvantaged in any way up until December 2020. After December 2020 I cannot withdraw anymore.
- ☐ I consent to the processing of my personal information and data for the purposes of this research study. I understand that such information will be treated as strictly confidential and handled in accordance with the General Data Protection Regulation (GDPR), May 2018.

Name: \_\_\_\_\_

Signature \_\_\_\_\_

Date: \_\_\_\_\_

- ☐ I understand that I have given my approval for my name and/or the name of my village/community, and/or the name of my workplace to be used in the final report of the project, and in further publications.
- ☐ I consent to be identified in the material that will be published, as outlined in the information sheet, identification will only be for the purposes of the research and anonymity will still be guaranteed throughout the data collection period.

Signature: \_\_\_\_\_

## Module 1 Household Survey Data Collection Instrument

## General Information

No.	Question	Response
1	Date of Interview (E.C.)	
2	Name of Interviewer	
3	Code given to the Household	

## Section I Household Identification

No.	Question	Response
1.1	Name of the person interviewed	
1.2	Gender of the respondent	<b>A)</b> Male <b>B)</b> Female
1.3	Relationship to the household head	<b>A)</b> Head <b>B)</b> Spouse <b>C)</b> Child <b>D)</b> Other
1.4	Name of the Kebele	
1.5	Name of the <i>Reera</i>	
1.6	Name of the <i>Olla</i>	
1.7	Number of years the household lived in this <i>Olla</i> (you can use Number of Gaddas you lived here)	
1.8	Phone number you can be reached	09 _ _ _ _ _ _ _ _
1.9	Geographical Coordinate of the household survey	
	Latitude	
	Longitude	
	Altitude (meters above sea level)	

## Section II Household Characteristics

### Household Composition

A **household** in Borana is referred to as *Warra*, is an extended family of the head of the household, spouse and their children and relatives who are living with them for more than six months in a year.

No.	Question			Write Age or year of birth (E.C.)	
2.1	Age of the person interviewed				
2.2	Marital Status <b>A)</b> Single <b>B)</b> Married <b>C)</b> Divorced/Separated <b>D)</b> Married with more than one wife <b>E)</b> Widowed <b>F)</b> Don't want to answer				
2.3	Age of spouse of the household head				
			Number below 16 years of age	Number of children above 16 years of age	
2.4	Number of Children	Biological			
		Adopted			
2.5	How many relatives live with the household?				

## Educational Status

No.	Question	Educational attainment	Options
2.5	Head of the household		a) Never attended school b) Can read and write
2.6	Spouse(s) of the household		c) Adult/Alternative Basic Education d) Primary 1 <sup>st</sup> Cycle – Grades 1 -4 e) Primary 2 <sup>nd</sup> Cycle – Grades 5 – 8 f) Highschool - Grades 9 & 10 g) Preparatory – Grades 11 & 12 h) TVET – Levels I, II, III and IV

### Source of Livelihood and Asset Ownership

**2.7** What is the primary source of the household's livelihood (means of living)? (Write the share in percentage from the total). Here, provide ten pebbles/grains/small stones and clarify proportion as a share from the total for each means of livelihood. Readout the options and ask for share (percentages).

No.	Means	Now (2019)	Gadamoji Liban Jaldessa (2010)
1	Livestock rearing		
2	Crop production		
3	Trade (petty or any type of trading)		
4	Daily labourer		
5	Government/private sector employee		
6	Brokering		
7	Remittance		
8	Other		

**2.8** What are your top five major sources of cash? Write as 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> for the below options.

No.	Means	Now (2019)	Gadamoji Liban Jaldessa (2010)
1	Livestock and livestock products		
2	Crop produce sell/resale		
3	Trade – other than crop/livestock		
4	Wage (daily labour)		
5	Salary from formal work – gov't/private		
6	Brokering		
7	Remittance		
8	Other		

**2.9** Relative to other households in your *olla* in general, how do you characterize your household? Pick one of the options.

Abba Gadda Periods	Better, Same as, or Worse off than others	Rank as the 1 <sup>st</sup> , 2 <sup>nd</sup> and 3 <sup>rd</sup> among the past three Abba Gaddas
Now – Abba Gadda Kura		
Abba Gada Guyo Goba		
Abba Gada Liban Jaldessa		

### Settlement, House and Asset

<b>2.10</b>	Did your household come to this place from another location ( <i>Reera</i> )? a) Yes b) No
<b>2.11</b>	How do you describe your current residence type? (READ OUT THE OPTIONS) Kura Jarso (2019) ____ Gadamoji Guyo Goba (2010) ____ Gadamoji Liban Jaldessa (2003) ____ <b>A)</b> Fully sedentarized ( <i>Olla</i> or a nearby town) <b>B)</b> Live in a basecamp and satellite camp (seasonal mobility) <b>C)</b> Live in a satellite camp (full mobility)

**2.11** Which one of the following assets do you own in the household currently and during the year 2010 (during *Gadamoji Abba Gada Guyo Goba*)? For each property/asset, write the total number as 0, 1, 2, 3...

Asset name	Number		Asset Name	Number	
	2019	2010		2019	2010
House in a rural area (not the one in the satellite camp)			Cropping tools	<i>Qambera</i>	
House in a nearby town				<i>Giuda</i>	
Wooden/Metal/traditional bed				<i>Marasha/Wagala</i>	
				Other	
Radio			Bicycle		
Solar light			Motorbike		
<i>Oburuu</i> (Private land)			Mobile phone		
Private land in a nearby town			Other (list)		

### Section III Livestock Stock and Pastoral Resource

Now, we will ask you about pastoralism and pastoral resources. Kindly, provide us with accurate information.

<b>3.1</b>	What are the number of livestock you currently own? Kindly provide different numbers based on ownership and management type.																																											
	<table border="1"> <tr> <th rowspan="3">Type of animal</th> <th colspan="2">Now</th> <th colspan="2">Gadamoji Guyo Goba (2010)</th> </tr> <tr> <th colspan="2">Owned and Managed by you</th> <th colspan="2">Owned and Managed by you</th> </tr> <tr> <th>Mature</th> <th>Young</th> <th>Mature</th> <th>Young</th> </tr> <tr> <td>Camel</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Cattle</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Goat</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Sheep</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Donkey</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Poultry – write total number</td> <td colspan="2"></td> <td colspan="2"></td> </tr> </table>	Type of animal	Now		Gadamoji Guyo Goba (2010)		Owned and Managed by you		Owned and Managed by you		Mature	Young	Mature	Young	Camel					Cattle					Goat					Sheep					Donkey					Poultry – write total number				
Type of animal	Now		Gadamoji Guyo Goba (2010)																																									
	Owned and Managed by you		Owned and Managed by you																																									
	Mature	Young	Mature	Young																																								
Camel																																												
Cattle																																												
Goat																																												
Sheep																																												
Donkey																																												
Poultry – write total number																																												
<b>3.2</b>	<p>Where is/are your primary source of pasture during normal/regular seasons? (Current)</p> <table border="1"> <tr> <th>Season</th> <th>Source of Pasture/feed (Normal Seasons)</th> <th>Source of Pasture/feed (Drought Seasons)</th> </tr> <tr> <td>Short Rain</td> <td></td> <td>Short Rain-</td> </tr> <tr> <td>Short Dry</td> <td></td> <td>Short Dry</td> </tr> <tr> <td>Long Rain</td> <td></td> <td>Long Rain-</td> </tr> <tr> <td>Long Dry</td> <td></td> <td>Long Dry</td> </tr> </table> <p>Write major sources only!</p> <div style="display: flex; justify-content: space-between;"> <div> <p>1) Own plot (<i>Duhnfa</i>)</p> <p>3) Nearby community plot – <i>Matta tikka</i></p> <p>5) Crop field - <i>Obuuru</i></p> <p>7) Other (Specify) _____</p> </div> <div> <p>2) Community plot – <i>Kallo</i> - Nearby</p> <p>4) Communal open grazing land (free access) - <i>Foora</i></p> <p>6) Purchased from market.</p> </div> </div>	Season	Source of Pasture/feed (Normal Seasons)	Source of Pasture/feed (Drought Seasons)	Short Rain		Short Rain-	Short Dry		Short Dry	Long Rain		Long Rain-	Long Dry		Long Dry																												
Season	Source of Pasture/feed (Normal Seasons)	Source of Pasture/feed (Drought Seasons)																																										
Short Rain		Short Rain-																																										
Short Dry		Short Dry																																										
Long Rain		Long Rain-																																										
Long Dry		Long Dry																																										
<b>3.3</b>	<table border="1"> <tr> <th rowspan="2">Season</th> <th colspan="2">Source of water normal seasons</th> <th colspan="3">Source of water drought seasons</th> </tr> <tr> <th>Source</th> <th>Distance from home</th> <th>Season</th> <th>Source</th> <th>Distance from home</th> </tr> <tr> <td rowspan="3">Short Rain</td> <td>1<sup>st</sup></td> <td></td> <td rowspan="3">Short Rain- Short Dry</td> <td>1<sup>st</sup></td> <td></td> </tr> <tr> <td>2<sup>nd</sup></td> <td></td> <td>2<sup>nd</sup></td> <td></td> </tr> <tr> <td>3<sup>rd</sup></td> <td></td> <td>3<sup>rd</sup></td> <td></td> </tr> <tr> <td rowspan="3">Short Dry</td> <td>1<sup>st</sup></td> <td></td> <td rowspan="3">Long Rain- Long Dry</td> <td>1<sup>st</sup></td> <td></td> </tr> <tr> <td>2<sup>nd</sup></td> <td></td> <td>2<sup>nd</sup></td> <td></td> </tr> <tr> <td>3<sup>rd</sup></td> <td></td> <td>3<sup>rd</sup></td> <td></td> </tr> </table>	Season	Source of water normal seasons		Source of water drought seasons			Source	Distance from home	Season	Source	Distance from home	Short Rain	1 <sup>st</sup>		Short Rain- Short Dry	1 <sup>st</sup>		2 <sup>nd</sup>		2 <sup>nd</sup>		3 <sup>rd</sup>		3 <sup>rd</sup>		Short Dry	1 <sup>st</sup>		Long Rain- Long Dry	1 <sup>st</sup>		2 <sup>nd</sup>		2 <sup>nd</sup>		3 <sup>rd</sup>		3 <sup>rd</sup>					
Season	Source of water normal seasons		Source of water drought seasons																																									
	Source	Distance from home	Season	Source	Distance from home																																							
Short Rain	1 <sup>st</sup>		Short Rain- Short Dry	1 <sup>st</sup>																																								
	2 <sup>nd</sup>			2 <sup>nd</sup>																																								
	3 <sup>rd</sup>			3 <sup>rd</sup>																																								
Short Dry	1 <sup>st</sup>		Long Rain- Long Dry	1 <sup>st</sup>																																								
	2 <sup>nd</sup>			2 <sup>nd</sup>																																								
	3 <sup>rd</sup>			3 <sup>rd</sup>																																								

	Long Rain	1 <sup>st</sup>		a) <i>Ella</i> b) <i>Dollolo</i> c) <i>Haro</i> – Pond d) <i>Laga</i> – river e) <i>Damballa</i> f) Borehole ( <i>Motori</i> ) g) <i>Hadha</i> – after digging sand b) <i>Madho</i> - Spring	a) less than 1 hour b) b/n 1-2 hrs c) b/n 2-3 hrs d) b/n 3-5 hrs e) b/n 5-10 hrs f) b/n 10-20 hrs g) more than 20hrs
		2 <sup>nd</sup>			
		3 <sup>rd</sup>			
	Long Dry	1 <sup>st</sup>			
		2 <sup>nd</sup>			
		3 <sup>rd</sup>			

#### Section IV Risk and Uncertainty: Exposure, Perception, and Response

##### Exposure and Perception

**Dhiphu or Risk** is a situation where the likelihood of potential challenges to livelihood are known and can be manageable. **Hinbanne or Uncertainty** is a situation where the risk factor is known but likelihood and extent of outcomes cannot be predicted.

- 4.1** A household faces different types of risks and uncertainties. Risks such as livelihood related, market, peace and security and risks in relation to government policies. Can you list the major risk exposures your household encountered in the following periods? Explain to the research participant to start with the topmost risk/uncertainty they face to the lowest for each period.

Ranking	Gadamoji Liban Jaldessa (2003)	Gadamoji Guyo Goba (2010)	Now/ this year (2019)
1 <sup>st</sup>			
2 <sup>nd</sup>			
3 <sup>rd</sup>			
4 <sup>th</sup>			
5 <sup>th</sup>			

- 4.2** Now you have told us the different risks and uncertainties you faced in the past years, could you tell us if one of the following risks/uncertainties happened in different years and how much they affected your (household's) livelihood? Write the answer from 0 to 5. Provide '0' if the respondent thinks the specified risk factor didn't affect the household. However, put '5' if it severely impacts the household's livelihood. Explain the three reference periods that are associated with the last three Abba Gadas of Borana, and all issues are related to Long Rain – Long Dry seasons.

Major Risk/Uncertainty Factor	Gadamoji Liban Jaldessa (2003)	Gadamoji Guyo Goba (2010)	Now/ this year (2019)
Not enough pasture for animals – drought			
Not enough pasture – land-use change (privatized, changed to farmland)			
Not enough water for animals - drought			
Conflict over pasture resources (household level impact)			
Conflict over boundary (community-level impact)			
<b>Reminder: refer the question and scaling options</b>			
Loss of animals – raiding/theft			
Loss of animals – disease			
Human sickness – a member of the HH			
Limited food quantity/quality in the HH			
No buyer or low price to sell to the market			
High price for goods I want to buy			

Government Policy	Villagization			
	Expense (different types of payment for the gov't)			
Absence/late timing of government/others intervention -food, feed, water, medicine				

**4.3** Below are risks/uncertainties perception questions. Kindly respond if you were worried about accessing one of the below pasture resources during the different Abba Gada periods. READOUT all the major risks first and ask them to score. Write from '0' to '5' depending on the level of worry, where '0' is 'not worried' at all and '5' is 'highly worried'.

Major risks	Gadamoji Liban Jaldessa (2003)	Gadamoji Guyo Goba (2010)	Now/ this year (2019)
Normal rain but <i>finna</i> was bad			
Below normal rain			
No rain			
Information about upcoming long rainy season			
Information about upcoming short rainy season			
Major risks	Gadamoji Liban Jaldessa (2003)	Gadamoji Guyo Goba (2010)	Now/ this year (2019)
Information about livestock market price			
Information about consumable goods' market price			
Information about humanitarian intervention			
Information about clan/boundary conflict			
Information about migratory routes			
Other			

**4.4** What response strategies did you use to overcome the different livelihood related risks and uncertainties you faced? For each period, write put from '0' to '5' depending on its level of importance.

Major response strategies	Gadamoji Liban Jaldessa (2003)	Gadamoji Guyo Goba (2010)	Now/ this year (2019)
Consuming less (daily) food – either quality or quantity			
Purchasing food on credit			
Relying on others' assistances			
Selling livestock – weak or old			
Selling livestock – young or strong			
Buying livestock – young			
Buying livestock – weak or old			
Slaughtering livestock			
Participating in other informal cash generation schemes such as daily labour			
Pulling children out of school			
Migrating to common areas			
Migrating to distant areas - not the usual migration routes/areas			

Expanding private enclosure			
Splitting herds			
Expanding communal <i>kallos</i>			
Asking neighbours/relatives for help			
Reducing the purchase of feed/forage for animals			
Increasing the purchase of feed/forage for animals			
Cropping			
Purchasing livestock insurance			
Buying water for animals			
Praying and hoping for the best			

**4.5** What do you expect regarding pasture and related conditions in the upcoming Long Rain – Long Dry season (2020) and potential responses you are planning.

Status	Expectation A) Very Good B) Good C) Bad D) Very Bad E) I can't determine)	Source of Information A) member of the family      B) person living in my <i>olla</i> C) local knowledgeable people    D) government officials – announcements, during public meetings, etc. E) Radio – weather forecast, market forecast, etc F) Other (Specify)
Rain condition		
Pasture Condition		
Livestock Condition		
Livestock Price		
The market price for consumable items		
Security – within different sub-clans in Borana		
Security – with neighbouring zones (outside Borana)		

**4.6 Respondent's risk attitude:** Below are lists of actions that characterize the risk attitude/characteristics of a person. For each activity, kindly respond if you agree or not. The level of agreement is from '0' to '5'. If you totally disagree with the statement write '0' and if you strongly agree, write '5'.

Risk attitude	Level of agreement
I avoid decisions which bring forth either severe losses or high returns	
To sustain my livelihood, I am willing to take more risks than others	
I am concerned with an existing profit more than several predicted and non-guaranteed profit, (bird on hand is better than ten on a tree)	
I am more willing to diversify my livelihood (cropping or other Income Generating Activities) than others	
I am reluctant to leave pastoralism until I see its advantages and disadvantages from pastoralists in my <i>Olla</i> or <i>Reera</i>	
I take my decisions without hesitation regardless of their probable risks	
Before I take high-risk probability decisions, I prefer to discuss with my family and the community I live with	
I am willing to invest in diversifying risk to overcome climate-related shocks	
I am willing to purchase insurance to protect my livestock from drought	

I am at the mercy of climate-related risk	
I am at the mercy of market risk	
I am at God's mercy	
I have a production risk entirely under control	

### Response: Land Use Changes

<b>4.9</b>	For the different land use types and changes listed below, kindly select their availability and sizes? 0= non-existence, 1= available but with smaller size/share, 2= available with normal size, and 3= available with larger size *			
	<b>Land use types</b>	<b>Gadamoji Liban Jaldessa (2003)</b>	<b>Gadamoji Guyo Goba (2010)</b>	<b>Now/ this year (2019)</b>
	Seera/Kallo Yabbii (private grazing for calves)			
	Oburru			
	Cooperative enclosures (Weldaa)			
	Open grazing land			
	Cooperative land for crop production			
* size of different land uses is in relative to the village/olla the respondent lives in.				
<b>4.10</b>	Have you practised crop production in the past five years? <b>a)</b> Yes <b>b)</b> No <b>c)</b> I had started but not anymore			
<b>4.11</b>	If your answer for the above question is 'A' or 'C', what are the TOP FOUR reasons for starting crop production? 1 <sup>st</sup> _____ 2 <sup>nd</sup> _____ 3 <sup>rd</sup> _____ 4 <sup>th</sup> _____			
<b>4.12</b>	Do you have title deed on the land you are currently using for crop production? <b>A)</b> Yes <b>B)</b> No			
<b>4.13</b>	What is the size of Oburru? In timad/ha? _____ timad/ha			
<b>4.14</b>	Which land-use type you prefer? <b>A)</b> Livestock production dominated land use type <b>B)</b> Equally pursuing livestock and crop production <b>C)</b> Crop production dominated land use type			

### Section V Finance and Insurance: Knowledge, Perception, and Practices

<b>5.1</b>	Where do you keep your cash? <b>A)</b> I don't usually keep cash <b>B)</b> in my house <b>C)</b> with a nearby shop-owner/keeper <b>D)</b> with an elder in my community <b>E)</b> at the bank <b>F)</b> with a local/nearby credit and saving association <b>G)</b> Other (Specify) _____	
<b>5.2</b>	Have you heard about livestock insurance before? <b>A)</b> Yes <b>B)</b> No	
<b>Knowledge about IBLI:</b> If the respondent hasn't heard about livestock insurance before, proceed to question <b>5.11</b>		
<b>5.3</b>	Which animals are insured under livestock insurance? Write all that apply <b>A)</b> Camel <b>B)</b> Cattle <b>C)</b> Goats <b>D)</b> Sheep <b>E)</b> Poultry <b>F)</b> Donkey <b>G)</b> Horse <b>H)</b> I don't know	
<b>5.4</b>	Is the premium paid refundable if there is no payout? <b>A)</b> Yes <b>B)</b> No <b>C)</b> I don't know	
<b>5.5</b>	For how long does IBLI cover? <b>A)</b> Rainy Season <b>B)</b> One year/annual <b>C)</b> One dry season <b>D)</b> No idea	
<b>5.6</b>	Who is the major source of information to buy IBLI? <b>A)</b> A local government official <b>B)</b> Local Insurance Promoter/ Prime Cooperatives (Village Insurance Promoter) <b>C)</b> Radio <b>D)</b> Banners/Leaflets <b>E)</b> Staffs working at ILRI	
<b>5.7</b>	IBLI's Asset Protection contract has one of the following features? If triggers, it <b>A)</b> pays after the dry season <b>B)</b> pays before the dry season for estimated resource requirement during dry/stressed seasons <b>C)</b> pays during the rainy season <b>D)</b> I don't know	
<b>5.8</b>	What is the risk covered in IBLI? <b>A)</b> Death of Livestock <b>B)</b> Forage scarcity <b>C)</b> Predation <b>D)</b> I don't know	
<b>5.9</b>	The payout for policyholders in one IBLI unit(cluster) has no bearing on the payouts for neighbouring IBLI units. <b>A)</b> True <b>B)</b> False <b>C)</b> I cannot tell	
<b>5.10</b>	Which months are open to purchasing IBLI product? (Ask them to use local calendar)	

	<b>A)</b> January-February and March-April <b>B)</b> January – February, and August – September <b>C)</b> March-April and August-September <b>D)</b> I don't know																																	
<b>5.11</b>	Have you ever had an IBLI/livestock insurance coverage? <b>A)</b> Yes <b>B)</b> No																																	
<b>5.12</b>	What are the primary reasons for purchasing/not purchasing livestock Insurance? a) _____ b) _____ c) _____ d) _____																																	
<b>5.13</b>	Were there seasons that you discontinued purchasing livestock insurance? <b>A)</b> Yes <b>B)</b> No <b>C)</b> I have never purchased livestock insurance																																	
<b>5.14</b>	Will you buy livestock insurance in 2020? <b>A)</b> Yes <b>B)</b> No <b>C)</b> I haven't yet decided																																	
<b>5.15</b>	If your answer is Yes or No for question 5.16, list the major reasons? <b>A)</b> _____ <b>B)</b> _____ c) _____ d) _____																																	
<b>5.16</b>	Whom do you consult about purchasing or not purchasing livestock insurance? (Highly influential) a) myself, no one    b) with my spouse    c) with members of the household    d) with people in my <i>Olla</i> f) Other (Specify)																																	
Below are questions associated with IBLI/Livestock Insurance, if you never had a coverage, the interview ends here.																																		
<b>5.17</b>	How many times have you purchased IBLI? (write number of times and '0' if they haven't purchased)																																	
<b>5.18</b>	Could you please tell us the total amount of Birr you paid during the first IBLI purchase?																																	
<b>5.19</b>	How much was paid during your last IBLI purchase?																																	
<b>5.20</b>	Have you ever received a payout? <b>A)</b> Yes <b>B)</b> No																																	
<b>5.21</b>	If you have received a payout, was the money/cash received as you expected? <b>A)</b> Yes, it was what I expected <b>B)</b> Below what I expected <b>C)</b> Very Disappointed																																	
<b>5.22</b>	From the payouts you received, how have you utilized the money received? <b>Write numbers from '0' to '5' to show the extent of funds invested.</b> <table border="1"> <thead> <tr> <th>Payout Expenses</th> <th>Scale</th> <th>Payout Expenses</th> <th>Scale</th> </tr> </thead> <tbody> <tr> <td>Payout invested in</td> <td></td> <td>Health services for humans</td> <td></td> </tr> <tr> <td>Purchase of food for humans</td> <td></td> <td>Vet/drug for animals</td> <td></td> </tr> <tr> <td>Purchase of feed/forage for animals</td> <td></td> <td>Repaid debt</td> <td></td> </tr> <tr> <td>Water for animals</td> <td></td> <td>Saved</td> <td></td> </tr> <tr> <td>Purchased livestock</td> <td></td> <td>Purchased livestock insurance</td> <td></td> </tr> <tr> <td>School fee</td> <td></td> <td>Other _____</td> <td></td> </tr> <tr> <td>Sold livestock</td> <td></td> <td>Other expenses</td> <td></td> </tr> </tbody> </table>	Payout Expenses	Scale	Payout Expenses	Scale	Payout invested in		Health services for humans		Purchase of food for humans		Vet/drug for animals		Purchase of feed/forage for animals		Repaid debt		Water for animals		Saved		Purchased livestock		Purchased livestock insurance		School fee		Other _____		Sold livestock		Other expenses		
Payout Expenses	Scale	Payout Expenses	Scale																															
Payout invested in		Health services for humans																																
Purchase of food for humans		Vet/drug for animals																																
Purchase of feed/forage for animals		Repaid debt																																
Water for animals		Saved																																
Purchased livestock		Purchased livestock insurance																																
School fee		Other _____																																
Sold livestock		Other expenses																																
<b>5.23</b>	Which major risks increase your likelihood of purchasing livestock insurance?																																	
<table border="1"> <thead> <tr> <th>Major risks</th> <th>Likelihood you will buy insurance - '0' no likelihood and '5' Very High Likelihood</th> </tr> </thead> <tbody> <tr><td>Expected the upcoming long rainy season will be poor</td><td></td></tr> <tr><td>Expected the upcoming long rainy season will be normal</td><td></td></tr> <tr><td>Expected the upcoming short rainy season will be poor</td><td></td></tr> <tr><td>Expected the upcoming short rainy season will be normal</td><td></td></tr> <tr><td>Expected bad livestock condition during LRLD</td><td></td></tr> <tr><td>Expected normal livestock condition during LRLD</td><td></td></tr> <tr><td>Expected bad livestock condition during SRSD</td><td></td></tr> <tr><td>Expected normal livestock condition during SRSD</td><td></td></tr> <tr><td>Information about livestock market price will be high</td><td></td></tr> <tr><td>Information about livestock market price will be low</td><td></td></tr> <tr><td>Information about consumable goods' market price will be high</td><td></td></tr> </tbody> </table>		Major risks	Likelihood you will buy insurance - '0' no likelihood and '5' Very High Likelihood	Expected the upcoming long rainy season will be poor		Expected the upcoming long rainy season will be normal		Expected the upcoming short rainy season will be poor		Expected the upcoming short rainy season will be normal		Expected bad livestock condition during LRLD		Expected normal livestock condition during LRLD		Expected bad livestock condition during SRSD		Expected normal livestock condition during SRSD		Information about livestock market price will be high		Information about livestock market price will be low		Information about consumable goods' market price will be high										
Major risks	Likelihood you will buy insurance - '0' no likelihood and '5' Very High Likelihood																																	
Expected the upcoming long rainy season will be poor																																		
Expected the upcoming long rainy season will be normal																																		
Expected the upcoming short rainy season will be poor																																		
Expected the upcoming short rainy season will be normal																																		
Expected bad livestock condition during LRLD																																		
Expected normal livestock condition during LRLD																																		
Expected bad livestock condition during SRSD																																		
Expected normal livestock condition during SRSD																																		
Information about livestock market price will be high																																		
Information about livestock market price will be low																																		
Information about consumable goods' market price will be high																																		

Information about a potential clan/boundary conflict		
Information about there won't be direct food aid (PSNP)		
Information about there will be direct food aid (PSNP)		
<b>For the below question, writer from '0' to '5' to show the extent</b>		<b>Write from '0' to '5'</b>
<b>5.24</b>	Do you believe livestock insurance contributes to response with livelihood related risk and uncertainty?	
<b>5.25</b>	Has the information about the index announcement influenced perception regarding the vegetation condition in an insured area?	
<b>5.26</b>	Has the information about the index announcement helped pastoralists with livestock insurance to strategize risk response strategies?	
<b>5.27</b>	Do you believe pastoralists with livestock insurance have better information regarding pasture condition?	
<b>5.28</b> Which of the following response strategies you mostly combine livestock insurance? Write from '0' for strategies with no likelihood of combining with IBLI and '5' to show very high likelihood. On the other hand, in seasons when you don't invest on IBLI, write which strategies you will substitute IBLI with other response strategies.		
<b>Major response strategies</b>	<b>From '0' – '5'</b>	<b>From '0' –'5'</b>
Consume less (daily) food –quality or quantity		Migrate to distant areas - not the usual migration routes/areas
Purchase food on credit		Migrate to common migration areas
Rely on others' assistances (relatives)		Reduce the purchase of feed/forage for animals
Rely on food aid (e.g. PSNP)		Increase the purchase of feed/forage for animals
Sale of livestock		Start cropping – preparing the land
Purchase of livestock		Buy water for animals
Slaughter of livestock		Reduce expenses on ceremonies
Participate in other informal cash generation schemes such as daily labour		Vaccinate animals or use veterinary services
Pull children out of school.		Purchase guns/bullets or other tools

## Module II Focus Group Discussion (FGD) Guideline on Risk and Uncertainty

Name of the facilitator: \_\_\_\_\_

Date: \_\_\_\_\_

Woreda/District: \_\_\_\_\_

Kebele: \_\_\_\_\_

**Introduction:** My name is Masresha Taye, a doctoral researcher at the Institute of Development Studies (IDS), University of Sussex in the UK. My study is part of a greater research project called Pastoralism, Uncertainty and Resilience: Global Lessons from the Margins (PASTRES) which aims to explore the livelihoods of pastoralists in three regions – in Southern Europe, Eastern Africa and Western China. The project hopes to learn from pastoralists to inform policy, not only in pastoral areas but more broadly across the world. My research focuses on understanding how pastoralists in Borana pastoral zone of Ethiopia perceive and respond to the different risks and uncertainties they face. In addition, the research will explore the practices of combining livestock insurance with other ways of responding to risk and uncertainty. Though this community discussion is part of a PhD project, the final results aim at creating an in-depth understanding of risk and uncertainty faced by the Borana pastoralists among policymakers, decision-makers, development practitioners, academicians and all those who are working on pastoral issues.

Before we start our discussion, tell us your name, name of the olla you came from and your role in the community (local elder, member of the community, etc.)

S/N	Name of Participant	Name of <i>Olla</i> (Village)	Role in community
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

### Composition of FGD participants

- Male and female
- Young and old
- IBLI Policy – active, dropouts and never purchased

## Personnel requirements for all exercises

1. Facilitator -1
2. Dedicated Note-taker – needs to be comfortable taking exhaustive notes quickly – 1

### Exercise 1 - Defining Risk and Uncertainty

Planned Time – **45 minutes**

- **Exercise objective:** To come up with local definitions and concepts of risk and uncertainty. In so doing, this exercise also aims at understanding the different risks and uncertainties pastoralists face in different Gada periods.
- **Materials required**
  - Markers (Colors: One colour for listing definitions, another colour to list major risks/uncertainties pastoralists in Borana face)
  - Pebbles to rank different types of risk and uncertainty.
  - Flip chart – A0 flip chart for writing land use definitions, types, concepts and major use types.
  - Camera (ask permission before taking any pictures), audio recorder (inform participants the discussion will be recorded only for the purpose of recalling points discussed during the analysis/write-up part of the study), notebooks, paper and pen to make a copy of the timeline and to make notes of the discussions that follow.

#### **Activity description:**

**Step 1** – as a general definition, **Risk** is a situation where the likelihood of potential challenges to livelihood are known and can be manageable. **Uncertainty** is a situation where the risk factor is known but likelihood and extent of outcomes cannot be predicted.

Hence, taking these very generic definitions, how do the community here define risk and uncertainty?  
What major issues or concepts are embedded when we think about risk and uncertainty?

On the flip chart list those major concepts associated with risk and uncertainty in Borana.

**Step 2** - Now we have comprehensive definition of risk and uncertainty in the local context, let's list the major R&U people in Borana face – now and in the past. This is a free-listing exercise of different R&U in Borana. On the flip chart, write all sorts of R&U forwarded by the group discussants. Try to probe participants by reading out some general risk types in dryland systems – such as not enough pasture for animals – drought, not enough pasture – land-use change (privatized, changed to farmland), conflict over pasture resources (household level impact), loss of animals because of disease, no buyer or low price to sell to the market, etc.

**Step 3** – the third step in this exercise is ranking the different risks and uncertainties faced by different groups in Borana. These risks are not associated a given period/year rather general to Borana pastoralists.

Risks and Uncertainties	1	2	3	4	5	6	7	Score	Ranking
1									
2									
3									
4									
5									
6									
7									

Below are steps to follow while implementing pair-wise ranking

- List different risks provided by participants as presented above.
- For each risk, type compare with other risk types, e.g., R&U#1 with R&U#2 as in the above table.
- Count and write the totals on the 'Scores' column
- Finally, rank risk types listed based on the scores.
- Confirm with participants the scores and ask if they have suggestions/comments on the rankings.

**Step 4** – this step aims to identify which risk types of impact (positively or negatively) which specific pastoral groups most than others and why?

- To implement this step, first list all the risks identified by participants. Then, ask different pastoral groups existing in Borana. To give a generic grouping - male-young-poor pastoralists, female – old – poor pastoralists, or young pastoralists in general, old pastoralists, etc.
- Finally, ask which risk type highly impacts a certain pastoral group/s and why? Here, it should be noted that risks and uncertainties are not always something 'bad' rather they also create opportunities. As an example, establishment of towns of centres has a risk of overtaking pastoral lands and other resources. At the same time, however, it creates opportunities (jobs, livelihoods, and cash) through marketing and trading activities to the pastoral communities.

**Step 5** – this final step asks which of the risks and uncertainties perceived predominantly in which Gada period. After listing the different risks that were provided by participants, ask them to rank each at different Gada periods. Start by asking the last three Abba Gada (Leaders of Borana), their names, years they administration, and major events (specifically Gami Gayo – General Assembly and Gadamoji – retirement ceremony).

Provide 20 pebbles so that they will put proportions to different risk types.

Risk Types	Now (Kura Jarso) Rank as 1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> ...	Gadamoji Guyo Goba Rank as 1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> ...	Gadamoji Liban Jaldess Rank as 1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> ...

## **Exercise 2 – Risk Responses**

Planned Time – **45 minutes**

- **Exercise objective:** To understand the major risk responses among Borana pastoralists.

- **Materials required**

- Markers (Colors: One colour for listing definitions, another colour to list major risks/uncertainties pastoralists in Borana face)
- Pebbles to rank different types of risk and uncertainty.
- Flip chart – A0 flip chart for writing land use definitions, types, concepts and major use types.
- Camera (ask permission before taking any pictures), audio recorder (inform participants the discussion will be recorded only for the purpose of recalling points discussed during the analysis/write-up part of the study), notebooks, paper and pen to make a copy of the timeline and to make notes of the discussions that follow.

**Activity description:**

**Step 1** – This exercise starts by asking different risk/uncertainty responses that have been implemented by pastoralists in Borana.

Hence, by referring the above exercise, ask participants to list all the risk responses they implemented any point in time or someone in Borana using. As to ease the discussion, you can mention some response strategies Purchasing food on credit, selling livestock – young or strong, expanding private enclosure, migrating to common areas, reducing the purchase of feed/forage for animals, etc.

**Step 2** – now, we have different types of responses adopted by different pastoral groups. Are there differences of employing one strategy over the other based on seasons? If so, which strategies are most likely implemented during SRSD and LRLD? Next to the above list, ask if they mostly practised for SRSD or LRLD and check if there are reasons for that.

**Step 3** – some response strategies could be distinctive to a certain pastoral group. Hence, ask here if there are differences of adopting risk responses by different pastoral groups. As an example, selling animal could be practised frequently/more by young pastoralists or male pastoralists than their counterparts. Check if this type of difference holds true for all listed responses and if there are reasons/justifications in doing so.

**Step 4** – depending on the risks pastoralists are facing, there are responses that evolve over time. Are there changes of response strategies that are in place that were not considered in the past and vice versa? Here, list response strategies as

- New to Borana and Non-existent (Not practised anymore) and list under each column.
- Ask what are the causes for such change on risk responses?

**Closing:**

Ask participants if they have questions or feedback.

We appreciate you all for sharing your valuable time and experiences with us. This will be extremely useful information to help me understand issues in relation to land use and associated changes in pastoral areas of Borana. Once I finish collecting data from similar discussions across *Dheda Gomole*, I will analyse and present major findings to representatives of Borana.

### Module III Focus Group Discussion (FGD) Guideline on Land Use and Changes

Name of the facilitator: \_\_\_\_\_

Date: \_\_\_\_\_

Woreda/District: \_\_\_\_\_

Kebele: \_\_\_\_\_

#### Composition of FGD participants

- Male and female
- Young and old
- IBLI Policy – active, dropouts and never purchased

**Introduction:** My name is Masresha Taye, a doctoral researcher at the Institute of Development Studies (IDS), University of Sussex in the UK. My study is part of a greater research project called Pastoralism, Uncertainty and Resilience: Global Lessons from the Margins (PASTRES) which aims to explore the livelihoods of pastoralists in three regions – in Southern Europe, Eastern Africa and Western China. The project hopes to learn from pastoralists to inform policy, not only in pastoral areas but more broadly across the world. My research focuses on understanding how pastoralists in Borana pastoral zone of Ethiopia perceive and respond to the different risks and uncertainties they face. In addition, the research will explore the practices of combining livestock insurance with other ways of responding to risk and uncertainty. This specific group discussion I am planning to have with you focuses on land-use changes in this locality. By displaying a land-use map of *Dheda Gomole* in 2008 (2000 Ethiopian Calendar), we will discuss current land-use practices and changes. Though this community discussion is part of a PhD project, the final results aim at creating an in-depth understanding of risk and uncertainty faced by the Borana pastoralists among policymakers, decision-makers, development practitioners, academicians and all those who are working on pastoral issues.

Before we start our discussion, tell us your name, name of the *olla* you came from and your role in the community (local elder, member of the community, etc.)

S/N	Name of Participant	Name of <i>Olla</i> (Village)	Role in community
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

#### Personnel requirements for all exercises

1. Facilitator -1
2. Dedicated Note-taker – needs to be comfortable taking exhaustive notes quickly – 1

#### Exercise 1 - Defining and Understanding Land Use – Land Cover (LU-LC) Practices in Borana

### Planned Time – 30 minutes

- **Exercise objective:** To come up with local definitions and practices of land use – land cover in the context of Borana. This serves two purposes: first, to get participants’ understanding of land use and land cover types in their locality. Second, to list the dominant land use – land cover types in Borana and how these different use types have changed over time.
- **Materials required**
  - Markers (Colors: One colour for listing LU-LC definitions, another colour to list the dominant LU-LC types)
  - Pebbles to rank the dominant LU-LC types
  - Flip chart – A0 flip chart for writing land use definitions, types, concepts and major use types.
  - Camera (ask permission before taking any pictures), audio recorder (inform participants the discussion will be recorded only for the purpose of recalling points discussed during the analysis/write-up part of the study), notebooks, paper and pen to make a copy of the timeline and to make notes of the discussions that follow.

### Activity description:

**Step 1** - The first part of this activity is to explain about the global definitions of LU and LC. In general, LC is the different physical entities covering a land in a given area. These are rangeland, forest, water bodies, urban centres etc. On the other hand, land use can be defined as any form of use – economic or related, on a piece of land by humans.

Hence, taking these very generic definitions, how do the community here define land use? What major issues or concepts are embedded when we think about land use?

On the flip chart list those major concepts associated with land use definitions in Borana.

**Step 2** - Now we have comprehensive definition of land use in the local context, let’s list the major land-use types that currently exist in Borana. This is a free-listing exercise of different land-use types/practices by pastoralists in their locality. On the flip chart, write existing land use types by asking participants to list them.

**Step 3** – the last step from this exercise is ranking the different land-use types forwarded by members of the community (participants of this FGD). Have a pre-designed matrix table (as below) that you will rank major land-use types in the community.

Land Use Types	1	2	3	4	5	6	7	Score	Ranking
1									
2									
3									
4									
5									
6									
7									

Below are steps to follow while implementing pair-wise ranking of land use types.

- List land-use types provided by participants as presented above.
- For each LU type compare with other LU types, e.g. LU #1 with LU#2 as in the above table.
- Count and write the totals on the 'Scores' column
- Finally, rank LU types listed based on the scores.
- Confirm with participants the scores and ask if they have suggestions/comments on the rankings.

### **Exercise 2 - Land Use – Land Cover (LU-LC) Changes in Borana**

Planned Time – **45 minutes**

- **Exercise objective:** To understand the major land-use changes in Borana in the past three Gada periods (*Gadamoji Liban Jaldessa, Gadamoji Guyo Goba and Now*). This exercise specifically envisions to identify the major features of land-use changes thereby set out driving factors associated with the changes.
- **Materials required**
  - Markers (Colors: One colour for listing LU-LC definitions, another colour to list the dominant LU-LC types)
  - Pebbles to rank the dominant LU-LC types
  - A coloured LU-LC Map from 2008 (A0 size)
  - Flip chart – A0 flip chart for writing land use definitions, types, concepts and major use types.
  - Camera (ask permission before taking any pictures), audio recorder (inform participants the discussion will be recorded only for the purpose of recalling points discussed during the analysis/write-up part of the study), notebooks, paper and pen to make a copy of the timeline and to make notes of the discussions that follow.

### **Activity description:**

**Step 1** – This exercise starts by asking the major land use types in the past three Gada periods.

Hence, by referring the above exercise, ask if all the LU types participants mentioned existed during the three Abba Gada periods. On a pre-designed table on a flip chart, ask participants to allocate proportions (average) LU types in their locality. Refer the table below.

Use pebbles (20 pieces) to put the proportion of LU types.

<b>Land Use Types</b>	<b>Now (Kura Jarso) – Copy from the above exercise</b>	<b>Gadamoji Guyo Goba</b>	<b>Gadamoji Liban Jaldess</b>
1			
2			
3			
4			
5			
6			
7			

**Step 2** – Display LU Map from 2008 and explain major features; among others Yabello town, roads, major locality (Did Hara, Mana Agga), cultivated areas around Did Hara, etc. Ask participants if they can recognize what is displayed.

**Step 3** – ask participants to locate (in their locality and surroundings) on the map major LU changes they have experienced/witnessed since 2008. Then, ask when did such changes happened (as a major change).

**Step 4** – after discussing LU changes, ask participants what major driving forces are linked to those changes they listed. First, ask participants list (free) driving factors attributable to the LU changes then, ask to rank using the same step followed at Exercise 1. You can probe this question by mentioning major driving forces (factors) identified from the literature. They are drought/rainfall, policy, increase of livestock and human population, bush encroachment, settlement, change of livelihood, etc. These are however generic examples compiled from the literature. Hence, ask specific driving forces or factors of land-use change.

- Start this step with free listing of the factors
- Using the format below, pair-wise ranking, ask participants to compare each driving force with others in the list.
- Here, it's important to note that more than the comparison itself, justifications provided for preferring one factor over the other is important. In so doing, ask questions why a given factor is important over the other. Is it because of its importance to livelihood (pastoral resource)? If it can be a source of conflict with other sub-clans in Borana? If it is a ritual site?

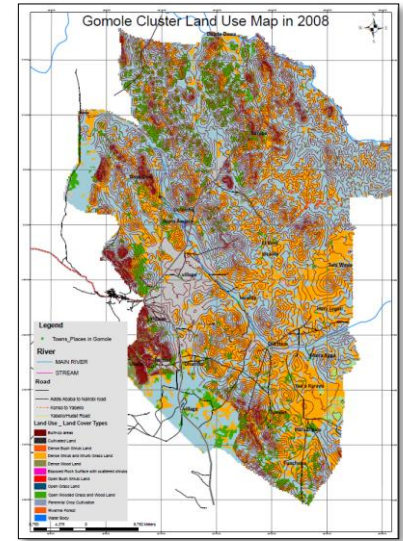
**Table Driving Forces of Land Use Changes in Gomole Cluster, Borana**

Factors - Land Use Changes	1	2	3	4	5	6	7	Score	Ranking
1									
2									
3									
4									
5									
6									
7									

**Step 5** - Readout the top-ranked driving forces for land-use changes. Finally, ask what roles do indigenous and government (at different levels) played in promoting sustainable land use to the pastoral community?

**Step 6** – Crop production – through direct field observation, it is possible to witness most pastoralists in Borana have started to engage themselves in crop production that it used to be. Will you list the major reasons for the increasing trend of crop production?

- Which crops are mostly produced and for what purposes? Where do they get different agronomic and agricultural production practices? If there is an increasing trend of people being involved in agricultural production, will this threaten the communal rangeland and pastoral



production system? If so, how? What should be done (by the government, community leaders, and individual pastoralists) land-use changes regarding crop production? (create a column as government, community leader, pastoralists).

**Closing:**

Ask participants if they have questions or feedback.

We appreciate you all for sharing your valuable time and experiences with us. This will be extremely useful information to help me understand issues in relation to land use and associated changes in pastoral areas of Borana. Once I finish collecting data from similar discussions across *Dheda Gomole*, I will analyse and present major findings to representatives of Borana.

## Module IV Focus Group Discussion (FGD) Guideline on Risk and Uncertainty: Timeline, Perceptions and Responses

Name of the facilitator: \_\_\_\_\_

Date: \_\_\_\_\_

Woreda/District: \_\_\_\_\_

Kebele: \_\_\_\_\_

Location of the discussion place: Northing \_\_\_\_\_ Easting \_\_\_\_\_ Alt \_\_\_\_\_ ms

**Introduction:** My name is Masresha or Gayo Taye, a doctoral researcher at the Institute of Development Studies (IDS), the University of Sussex in the UK. My study is part of a greater research project called Pastoralism, Uncertainty and Resilience: Global Lessons from the Margins (PASTRES) which aims to explore the livelihoods of pastoralists in three regions – in Southern Europe, North and Eastern Africa, Western China and Western India. The project hopes to learn from pastoralists to inform policy, not only in pastoral areas but more broadly across the world. My research focuses on understanding how pastoralists in Borana pastoral zone of Ethiopia perceive and respond to the different risks and uncertainties they face. Besides, the research will explore the practices of combining livestock insurance with other ways of responding to risk and uncertainty. Though this community discussion is part of a PhD project, the final results aim at creating an in-depth understanding of risk and uncertainty faced by the Borana pastoralists among policymakers, decision-makers, development practitioners, academicians and all those who are working on pastoral issues. **This exercise is for research purpose only, kindly feel free to reflect all questions honestly.**

Before we start our discussion, tell us your name, name of the olla you came from and your role in the community (local elder, member of the community, etc.) **Write their names, age, olla, etc. here.**

S/N	Name of Participant	Name of Olla (Village)	Age	Role in community
1				
2				
3				
4				
5				
6				
7				

### Exercise 1 – Icebreaker (15 minutes)

**Objective** – This exercise aims at understanding the similarities and difference between Gomole and Diree Clusters.

**Activity Description** - Below are major discussion points to ask participants about the difference or similarity of the two clusters. Ask them to reflect if each of the below issues is the same or different and what makes them similar or different? **Why?**

- Livelihood (for example, livestock-dominated in Diree and crop dominated in Gomole)
- Resource Type – quantity and quality (pasture, water, and other resources)
- Land-use type and pattern

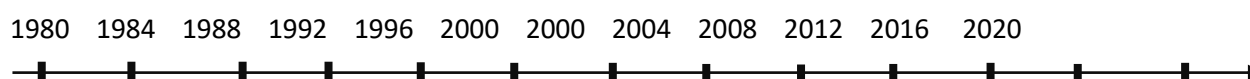
- Settlement pattern
- Traditional/local customs and regulation
- Risk types
- Risk responses

### Exercise 2 – Historical Mapping of Risks and Responses (20 minutes)

**Objective** – This exercise aims at understanding the historical risk occurrences in the area and what risk response mechanisms were implemented. **This is only about the locality – not comparison.**

**Activity Description** – below are the different periods that you will ask them to recall major risk/problem happened and what strategies followed. Focus on the older people of the group to recall the even happened. Ask them to exhaustively list the problems that had happened at the community level and major response (coping) strategies implemented at each period. **To help you understand the timelines of Gada periods, refer to the table below.**

Gada Period	Period	Power taking Year	Gadamoji (retirement) Year
Jilo Aga	1976-1984	1976	1980
Boru Guyo	1984-1992	1984	1988
Boru Madha	1992-2000	1992	1996
Liban Jaldess	2000-2008	2000	2004
Guyo Goba	2008-2016	2008	2012
Kura Jarso	2016-2024	2016	2020



### Exercise 3 – Livestock Insurance (15 minutes)

**Objective** – This exercise aims at getting how participants understand Livestock Insurance

**Activity Description** – this is an open discussion, ask participants the following questions step-by-step.

- What is livestock insurance?
- What features (components) of IBLI that are appealing (interesting to you) and why?
- What issues/features of IBLI should be clarified or considered for improvement and **Why?**

### Exercise 4 – Investing in IBLI (15 minutes)

**Objective** – This exercise asks participants to list the reason they purchase IBLI and associated issues.

**Activity Description** – this is a free-listing exercise and the idea is to understand why the reasons they keep investing in IBLI. Hence, ask the questions below one by one. Start with the phrase '**we were told that you all are active policyholders and we would like to ask you questions concerning that**'.

- What factors influence you to purchase IBLI?

- Which pastoral group (rich/poor, male/female, young/old) invest more on IBLI than others? Are there economic reasons to invest in IBLI?

#### **Exercise 5 – Combining IBLI with other forms of risk response (coping strategies) (15 minutes)**

**Objective** – This exercise aims at understanding how IBLI is combined with other forms of risk response strategies?

**Activity Description** – this is a free-listing exercise, and the idea is to understand how livestock insurance can be combined with other forms of risk responses (coping) strategies.

- When do you think of IBLI as a risk response mechanism what comes to your mind first that it can be combined to respond to a certain livelihood risk? Why that specific strategy can be combined with IBLI?
- Which risk response strategies cannot be combined with IBLI? **Why?**
- What factors can be listed for the reason to reduce or stop investing IBLI? This could be different issues hence ask them to list any reason that comes to their mind as a reason to drop out of IBLI?

#### **Exercise 6 – Photovoice validation discussion (15 minutes)**

**Objective** – This exercise aims at understanding how pastoralists perceive a certain picture taken by other pastoralists.

**Activity Description** – inform them that pastoralists were given digital camera so that they will take pictures they believe are risks and response strategies. Selected pictures will be distributed, one-by-one. Then, ask each of the participants what they see from the picture in their own words.

## Module V - Case Study – Phase I

### Livelihood

1. Tell us your main livelihood sources, rank from the top to the least. Has your livelihood means changed from what it was in the past? List the factors that force you to change (make it explicit not a generic one like 'poverty').
2. Who are the early adopters (their characteristics – age, gender, economic status etc.) of livelihood change? What do you think the reason for being the first mover? Who are the late adopters and what do you think the reason to be the last? Where do you put yourself – early adopter/first mover or last (tell us your experience)?
3. How has trading evolved? Tell us the types of trading activities you are involved in? (tell us from the most important one, such as petty trade, livestock brokering, exporting to Modjo or Kenya, grain selling, milk or dairy product selling, non-agricultural products). Which other types of trading do you want to get involved? Why you are not involved in this trading activity you aspire now?

### Resource ownership

1. What are the main resources in Borana? Which one among the listed you own (tell us what you have more and less)? What resources you inherit? Which one you created? What key factors are important for your resource ownership?
2. Tell us how the *foora* system now and in the past in your area? Which pastureland management by Borana you appreciate most? Why? Which (where) one is a bad management type?
3. Are there deviants in community resource management? If yes, why they break the law? Has such an issue increased from the past? If so, why? Who breaks the rule most? (rich/poor, male/female, young/old). Were there any moment you have to brake any community/social rule in the past? Why? What aspect of social/community or local/regional gov't rule you want to change and why?
4. Do you own a piece of land or a house in a nearby town/centre? If so, tell us how the idea came to your mind, how you investigated the situation, whom did you talk with, how much you invested, and all related stories in the process (decision, challenges you face, and solutions you came up with) of acquisition of land? Which type of people mostly invest on urban land/house (male/female, rich/poor, livestock owners/crop producers, young/old)?
5. Do you have land for crop production? If yes, like the above tell us the detail stories – processes, decisions, challenges and solutions you came up with? If you don't have land for the crop, tell us also the stories about how you came up with not having land for the crop? In your experience, what kind of people mostly start crop production?
6. Do you see new risks/uncertainties because of the changing dynamics of resource use and ownership? Tell us how? What will be the future risk/uncertainty for Borana?
7. Which networks (economic, social, political) are important for you and why? Which one you would like to avoid and why? Which one you want to be part of and why?

### Risk responses

1. What risks (problems) are involved in livestock production? Crop production? Trade/marketing? Community resource management?
2. What is a drought for you? Are all droughts the same? If not, how do you differentiate them? Tell me the big droughts your experience in the past (mention season & years)? What makes them big for you?
3. Can you tell us the risk responses you put in place before the risk happens? What about during the challenge? Tell us also the response after the risk passes?
4. What type of people is successful in responding to risk? Could you tell us their personal attributes? Who failed and what do you think the reasons?

5. Which risk response strategies (now or in the past) you are/were successful? Which ones you failed? What are the factors/reasons for your success or failure?

General

1. What is livestock insurance for you? Is it your major livelihood portfolio? If not, why? Where do you put livestock insurance (as risk management, investment portfolio, or something else)?
2. What risk and opportunity you experience from the following (tell us both and link with your own experience)
  - Land use and land use change
  - Trade
  - Road infrastructure
  - Education and health
  - Other (specify)
3. Other than God and government, what are you scared of most and why?

## **Module VI - Case Study – Phase II - Discussion Questions for extended case studies**

1. **Introduction:** Start with introduction. Who I am and what I would like to do. I came here to learn about the different livelihood issues of Borana and your thoughts concerning livestock insurance. We have four discussion points, livelihood, risk and uncertainty, responses and livestock insurance. We want your thoughts and experiences (as a household), hence provide us with extended experiences you have – so for each question we ask you, tell us your stories. When needed you can mention other people's experiences. To help me understand you and your household, tell me about yourself, your name, age (Gada Period), number of children, livestock you own and size of cropland you have? This is purely for research purpose so tell us the exact assets you own.
2. **Livelihood** - Tell me about your livelihood now and in the past?
  - What has changed and what remained as it is?
  - Tell me the entire process of transitioning (both wholly or partially) to a different livelihood source? Tell me the moments of recognizing, deliberating and deciding to change or adopt new ways of pursuing livelihood? Provide with experiences of yours.
3. **Risk and Uncertainty** –
  - What is the risk for you? What about uncertainty?
  - Do these two issues change, both the actual features and concepts for you?
  - Tell me first the practical features and changes over time then the perception you have?
4. **Responses** - Among different pastoral groups of Borana, responding to risk and uncertainty had both common and very localized (at the village or household level) features. Tell me those responses you feel are very common with others and those you think are peculiar to the people like you? What factors contribute to localized responses? Which risk responses are changing for you and why? Does the cycle of events impact your response strategies?
  - Tell me about the coping strategies you were successful, failed, or so-so? What are the reasons for the success and failures?
  - Do you keep looking for new strategies to support your livelihood? Why? If the new strategy is very good for you and your household, will you totally leave pastoralism? Why?
5. **Livestock Insurance** - We were told that you are an active (dropout, never purchased) of a livestock insurance scheme? What is livestock insurance for you? Why you purchased insurance?
  - What difference does insurance make to you?
  - Does the cycle of events (Dhaaccii) impact your decision to invest in insurance?
  - What issues you consider investing in insurance (dropout/not purchase investing)?
  - Could you explain how you combine insurance with other forms of risk response? Here, tell me as
    - i) a combination of responses because you feel that you are insured,
    - ii) a combination of responses after you received a payout, and
    - iii) a combination of responses after you heard about the index status (if it is there is a payout and no payout?
  - What behavioural change does insurance has concerning risk perception and responses?
  - Why do you keep investing on (dropped out of) insurance?
  - What advantage you have over others due to livestock insurance?
  - If you decide not to purchase insurance, which strategies to cope with draught you will take in substitute for insurance? Why these strategies?
  - Where do you put livestock insurance (as risk management, investment portfolio, or something else)? Why?

- Do you have fate in livestock insurance in the long run? How and why?

**Never purchased**

- What issues you consider when you decide investing in insurance?
- Will you consider buying livestock insurance?
- If you decide to purchase insurance, which coping strategies you will consider combining with insurance? Which strategies you will stop using because of insurance?

## Module VII - Case Study Phase III – Extended Version

### Theme 1 - Introduction and issues about Risk and Uncertainty

- Start your discussion with the objective of the research. Before that, try to give a background about the theme of the research – risk and uncertainty as below: -
  - **Dhiphu/Raako or Risk** is a situation where the likelihood of potential challenges to livelihood are known and can be manageable. **Hinbanne or Uncertainty** is a situation where the risk factor is known but the likelihood and extent of outcomes cannot be predicted.
- What risks/uncertainties (as defined above) are most important for you?
- How have these changed over time? (Link with his/her age and ask the difference in the *Derg* regime with that of the current one?)
- What do you think the future (for your children?) risks/uncertainties will be?

### Theme 2 – Livelihood (20 Minutes)

- What is the mainstay of your household now and in the past (three decades ago)?
- How have your (as a household) livelihoods changed, between now (EPRDF, after 2015) what it was in the past (*Derg*)? Why have these changes occurred? What do you foresee the mainstay for your children?
- How do these changes affect your household's abilities to respond to the risks/uncertainties defined above?
- What are the most important responses to the risks/uncertainties (identified earlier), now/in the past (as defined)/in the future? Why changes?
- What motivates people to shift (diverse) to different forms of livelihood production (say to crop production)?
- What types of risk-sharing (helping each other in difficult times as an example *Busa Gonofa*) are used – now, in the past? Do you see changes in community support system? If yes, what are the reasons?

### Theme 3 – Risk and Uncertainty, Perception and Response

#### Perception and Response

- **Pastoral Resources/Production (System)** – How do you see pastoral resources now and in the past (3 to 4 decades ago)? What are the major changes in pastoral production systems for you? What were the factors for such changes? Do you prefer such changes to continue? Why (if yes/no)? Could you tell us different risks and uncertainties that emanate from pastoral production? Which of these risks changed over time (increasing or decreasing)?
- **Land Use** - How has the use of land changed? What are the problems you are facing concerning land use and land-use changes if any? How do you respond with land-use changes? (in the last few decades and now)? Has your strategy changed? Why?
- **Market** - How have markets changed? How do you define market-based risk for you? What is the significant market-based risk responses you as a household use?
- **Conflict** - How has conflict changed (past and now)? How are you impacted by these different types of conflicts over time?

**Climate** - How has the climate changed? Do you perceive yourself as vulnerable to environment/climate-induced risks? How does it impact your household? Does the risk of this

particular factor evolve overtime? Could you tell us the type of response mechanisms put in place in the past and now?

#### **Theme 4 – Financialization**

Thank you for the detailed information regarding risk and uncertainty in your household and locality. As you are aware, different initiatives aiming at improving the livelihood of the pastoral community are underway in Borana. One of these that aims at increasing pastoralists' access to finance is credit and saving and insurance. I will be asking you how these financial institutions work in your area.

- What are the different financial institutions available in your locality? Which one of those you use/engage? How do you perceive the role of these institutions in helping/assisting a household's livelihood?
- Have you heard about livestock insurance? If so, which pastoral group invests on livestock insurance than others? Why do you think the reason?

#### **About Livestock Insurance**

Let me ask you a few questions about livestock insurance.

#### **For Active Policyholders**

- Why do you buy insurance?
- Have you had a pay-out? What did it help you do? Which expenses (payout spent on) did you consider only because of the payout? Which response strategies did you consider because of the payout? Why? Which ones did you drop out because of the payout?
- During a drought, what would you combine insurance with?
- What are the problems with livestock insurance?
- Are there response strategies you employed because of livestock insurance than other pastoralists without it?
- If you want to discontinue investing in IBLI, which strategies you would likely consider most? Why?

#### **For Dropouts**

- Why do you buy insurance?
- Have you had a pay-out? What did it help you do?
- During a drought, what would you combine insurance with?
- Why dropped out of insurance? When did you decide to stop buying insurance, which response strategies you substituted by insurance?

#### **For Non-Policyholders**

- Have you heard about insurance? Why didn't you buy insurance?
- What benefits do you think policyholders get from insurance? Do you feel you are disadvantaged by that (not having insurance)?
- What do you do to get through a drought instead?

## Module VIII – Elite interview – Reflection Interview

**Question 1** - In designing IBLI in the Horn of Africa, key evidence and assumptions were put forward. Could you please reflect on the below?

- Drought caused by rain failure is the leading cause of livestock mortality. In other words, there is a single peril that can be insured. In this way, the risk of drought from rain failure in a given pastoral area can be captured objectively by employing innovative (remote) technology.
- Livestock is held individually and can be insured through individualized insurance protection. Insuring the loss of the key household assets of pastoralists – livestock - thereby reduces their household's vulnerability, food insecurity, asset depletion, and eventually can avoid putting them into a poverty trap.
- The index insurance model considers rainfall distribution is highly correlated with pasture availability. Hence, by monitoring rainfall distribution during rainy seasons, possible forage scarcity can be predicted for dry seasons.
- Pastoralists in an area have similar access to pasture, and their mobility is contained and can be demarcated and calculated during the monitoring periods - index insurance units.
- The risk of forage scarcity/drought is a covariate in an area; hence pastoralists on average are affected by it equally. As a result, vegetation in an area can be monitored objectively, calculated, and premiums/payouts can be associated with individual pastoralists' exposure to drought.
- By standardizing different species of livestock into TLU, premium rates and payouts are developed. As a result, vegetation scarcity for browsers and grazers is assumed to be the same.

**Question 2** - Do you think/believe the drought is conceptualized similarly among pastoralists in IBLI areas? What would be a mismatch of such conceptualization of drought?

**Question 3** - Apart from a good contract design, '*willingness and ability to pay among the clientele*' is instrumental for scaling IBLI. This is one of the major assumptions for scaling disaster risk financing tools in dryland systems. In other words, despite such major assumptions being achieved, pastoralists might not invest in IBLI. In your experience what key features are missed?

**Question 4** - Reviewing IBLI longitudinal studies in Borana and findings from my survey indicate that insured households tend to be wealthier than uninsured pastoralists. What would this mean to disaster risk financing programs?

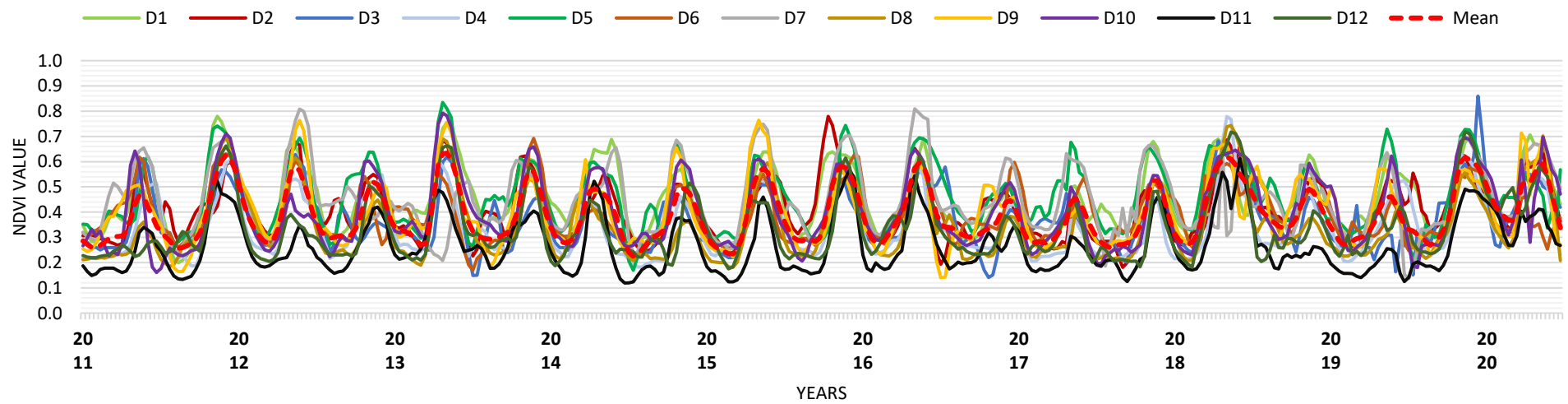
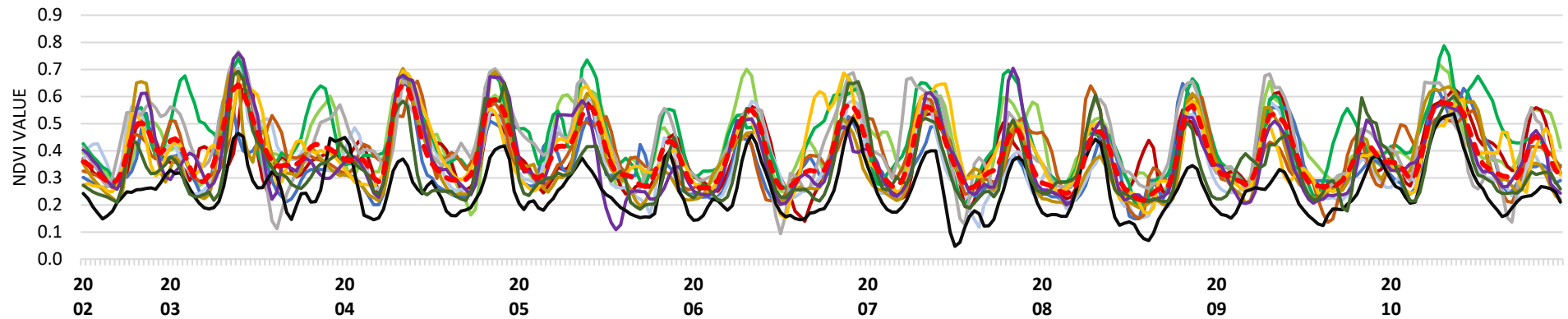
**Question 5** - What key issues can be considered in designing the insurance product? (Bulleted points).

**Annex II List of Major Risk Response Strategies**

1. Consuming less (daily) food – either quality or quantity
2. Purchasing food on credit
3. Relying on others' assistances
4. Selling livestock – weak or old
5. Selling livestock – young or strong
6. Buying livestock – young
7. Buying livestock – weak or old
8. Slaughtering livestock
9. Participating in other informal cash generation schemes such as daily labour
10. Pulling children out of school
11. Migrating to common areas
12. Migrating to distant areas - not the usual migration routes/areas
13. Expanding private enclosure
14. Splitting herds
15. Expanding communal *kallos*
16. Asking neighbours/relatives for help
17. Reducing the purchase of feed/forage for animals
18. Increasing the purchase of feed/forage for animals
19. Cropping – Start Farming
20. Purchasing livestock insurance
21. Buying water for animals
22. Praying and hoping for the best

## Annex III Vegetation Trends for Sampled (Studied) Areas in Dire and Gomole

Vegetation Trend in Dire (NDVI values)



## Vegetation Trend in Gomole (NDVI values)

