



Livestock wealth and social capital as insurance against climate risk: A case study of Samburu County in Kenya



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ABSTRACT

We use data from 500 households in Samburu County (Kenya) to explore how natural environment and market accessibility affect coping and adaptation strategies of pastoralists. In particular, we ask whether households accumulate livestock wealth and invest in structural and cognitive social capital to protect themselves against climate risks. We find weak evidence that households accumulate livestock wealth in response to living in a drier environment, and no evidence that households invest in either structural or cognitive social capital as insurance against climate risks. However, coping strategies vary across social groups. For example, while rainfall does not robustly affect cognitive social capital (trust)—we find that the “poor” and “financially-integrated” households (i.e., those who have relatively good access to credit and capacity to save money) show greater mutual trust in drier environments. The results from this study can be used for priority setting by policy makers and development agencies for programs aimed at safeguarding household livelihoods in arid and semi-arid lands (ASALs).

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1. Introduction

Households, communities and nations have to cope with a changing climate and increased climate variability. Predictions from climate research suggest that negative effects in terms of increased frequency and intensity of droughts are likely to be felt strongly in Sub-Saharan Africa (SSA), where most households are poor and rely on rain fed agriculture (Davies et al., 2009). Agriculture accounts for a large share of SSA gross domestic product (GDP), and is susceptible to climate shocks. This is particularly true for agriculture in so-called Arid and Semi-Arid Lands (ASALs). Approximately 41% of ASALs in SSA are situated in East and Southern Africa, and they are mainly inhabited by pastoralists and agro-pastoralists (Tessema, 2012). Pastoralists are households whose way of life, socio-cultural norms, values and indigenous knowledge revolve around livestock keeping and transhumance to use natural pastures (Ayantunde et al., 2011). Agro-pastoralists incorporate some crop farming alongside livestock keeping and transhumance.

In Kenya, ASALs occupy 87% of the land area and support more than 30% of the human population. ASALs are also home to the entire camel population, 50% of the cattle, and some 70% of all sheep and goats. Pastoral and agro-pastoral households in ASALs are exposed to the risk of losing part of their asset base because of climate shocks (Mude et al., 2007). Other potential shocks include livestock diseases and price fluctuations (Mude et al., 2007; Ouma et al., 2008), but climate shocks (droughts and floods) are considered the most constraining factors for agro-pastoralism. Some households respond to climate change by changing the intensity of exploiting own and common resources, and incorporating crop farming in their livelihood (Bryan et al., 2011; Davies et al., 2009; Lang, 2007; Speranza, 2010).

The way households and communities respond to increased climate shocks are of interest for policy makers seeking to improve the resilience of (agro) pastoral livelihoods (Fratkin et al., 1999; Schlenker and Roberts, 2009). Because of the temporal nature of climate change it is difficult to study household responses in real-time, and a dynamic setting. This paper proposes a “short cut” approach, and considers the relation between climate shocks and responses in a cross-sectional setting, exploiting spatial variation in climate patterns. Specifically, we ask whether households change their investment in livestock and social capital to protect themselves along an ecological gradient from “relatively wet” to “relatively dry.” While not denying that alternative protective measures may be equally important for (agro) pastoral households – including altering the crop mix (if any) or engaging in migration – we

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believe a focus on these complementary dimensions are of interest for policy making. Informal sharing, facilitated by high levels of intra-community trust and altruism, is a well-known strategy enabling communities to cope with (idiosyncratic) risk (Binswanger and McIntire, 1987). We regard this as a group response to shocks. In contrast, accumulation of livestock wealth reflects choices by individual households and, while “herd building” or “herd reconstituting” may entail collective action via lending out of heifers and cows (Sutter, 1987), to a large extent this is a private activity (albeit one with external effects). We analysed whether different types of households respond differently to exposure to climate shocks by selectively investing in two forms of capital – social capital and natural capital. We also ask whether access to (road) infrastructure and markets is a relevant mediating factor.

As mentioned above, we use cross sectional data to understand how households protect themselves against climate risks. We translate the findings of our static approach to progressive climate change, and to explore how households and communities may respond to a changing climate over time. This not only requires that climate patterns change over time in a similar fashion as they do when moving along the ecological gradient in our study, it also requires that the nature of alternative adaptation strategies does not change over time, or that these strategies are stable. Both conditions are unlikely to hold, so the findings of this paper are not intended to “predict” how pastoral households will respond to climate shocks in the future. Instead, they represent a modest step towards the understanding about climate shocks and self-protection in ASALs.

We find there is a weak association between rainfall and livestock wealth as we move from wet to drier environments, and households in drier settings tend to accumulate more livestock. In addition, we find no relationship between average investment in social capital and rainfall. Social networks do not become more tight or dense in response to climate shocks. However, coping strategies vary across social groups. Poor households, wealthier households and financially-integrated households have to some extent different coping strategies. These insights may potentially inform policies particularly those targeting intervention and designing of institutions that support self-protection measures to climate shocks related risks.

2. Coping and adaptation strategies in ASALs

In East Africa, (agro) pastoral households are exposed to many risks, including price risk, but also diseases, ethno-political violence, crime and corruption. While it is not evident that climate shocks are necessarily the most debilitating factor for rural livelihoods, it has been documented that exposure to droughts and floods has significant adverse effects on the lives of these poor. From a research perspective, focusing on climate shocks has the advantage that such shocks – gauged by low rainfall in what follows – are plausibly exogenous to household choices and to most other socioeconomic variables including the other risk factors mentioned above. This facilitates the interpretation of correlations between rainfall and self-protection as causal relationships – even if attribution concerns obviously remain in a cross-sectional setting.

Households in ASALs have devised various strategies for coping and adapting to the risks associated with climate shocks. Coping strategies refers to the use of endowments and entitlements by households to ensure survival after a shock has occurred (Ouma et al., 2011), while adaptation strategies, though crafted in part by coping strategies, are a long-term set of actions taken to maintain the ability to deal with, and recover from, stress and shocks, while maintaining assets and capabilities (ibid). Common coping and adaptation responses to climate risks used by (agro) pastoralist involve introduction of breeds, reduced consumption, new approaches to farming, diversification, livestock accumulation, livestock sharing, migration to urban areas and exit from livestock husbandry (Binswanger and McIntire, 1987; Little, 2001; Little et al., 2001; Mude et al., 2007; Ouma et al., 2008; Silvestri et al., 2012). While some coping and adaptation strategies

are slowly becoming less effective (e.g., livestock migration due to privatization of rangelands, see Ouma et al. (2008)), investing in livestock and social capital are still ranked as some of the most effective coping strategies (e.g., Mude et al., 2007). They are at the heart of strategies that most households use to respond to shocks.

In ASALs two main types of risks are identified: covariant and idiosyncratic risks. Covariant risks affect all farmers of a particular area, and could arise due to government policy, economic forces (price volatility), or large-scale acts of nature such as drought. Idiosyncratic risks, in contrast, affect individual households – such as individual health shocks (Binswanger and McIntire, 1987). Livestock accumulation may be effective when confronted with covariant risks, such as drought because accumulating livestock implies improved odds that some animals will survive a drought (*ceteris paribus*). Hence, families with more livestock are expected to recover more quickly, and claim a larger share of communal pasture resources. Instead, investing in social capital and networks is particularly effective in the presence of idiosyncratic shocks – affecting some members of the network but not others. If so, households within socially-knit networks can informally insure one another via sharing arrangements based on altruism or well-understood expected reciprocity (e.g., Coate and Ravallion, 1993; Ligon and Thomas, 2003; Townsend, 1994; Van Rijn et al., 2012). Investing in social capital and livestock wealth may provide complementary mechanisms to protect households against shocks, and theory suggests that especially livestock accumulation will be effective in the context of covariant climate shocks.

Households do not invest in livestock and social capital exclusively for insurance purposes – in fact, the need for insurance may not even be the major consideration for such investments. There are various other uses for livestock (Livestock in Development., 1998). They are a source of income; one of the few assets available to the poor to save (especially women); and livestock manure and draught power are important for soil fertility and the sustainable intensification of farming systems. Moreover, livestock allow poor households to exploit common property resources and diversify and stabilize incomes. Livestock are also used to pay bride wealth (Herskovits, 1926), and the accumulation of livestock helps households to accrue social status (Kaye-Zwiebel and King, 2014). Similarly, alternative benefits or uses of social capital, other than mutual insurance, include economizing on transaction cost by speeding up search, increasing trust and facilitating information circulation (Fukuyama, 2001), facilitating coordination and cooperation (Putnam, 1993), and increasing loan repayment rates in rotating savings and credit societies. However, even in situations where households may decide to invest in accumulating livestock wealth for several reasons, it is still possible to identify the impact of rainfall on insurance component. This is particularly so in situation where this other seasons are not systematically different along the two gradient in our sample. But if other reasons for investing in social capital and livestock also evolve along the gradients, then the demand for insurance cannot be identified because it will be confounded.

The literature shows that pastoralists consider access to markets as an important factor that might mediate (climate) risks (Smith et al., 2014). The reason is that market access (captured using distance to markets in this study) affects decision-making related to marketing of livestock (Bailey et al., 1999). The explanation is the transaction costs associated with buying and selling animals. Ease of market access reduces the tendency to hold on to livestock wealth (Barnett et al., 2008). Interventions and policies intended to help people manage climate related risks may need to account for variation in strategies undertaken by households over space to prove effective. The main objective of this study is to explore how changing socio-economic and ecological conditions affect coping and adaptations strategies among (agro) pastoral households. Specifically, we ask whether households accumulate livestock wealth and invest in social capital to protect themselves against climate shocks.

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