

*Full Length Research Paper*

# **Herd mobility, markets and informal insurance practices among herders in Ethiopia**

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**This paper examines portfolio of livelihood strategies that households employ in semi-arid and risky production environment. Results show that there are multiple choices available for pastoral and agropastoral herders to adapt to or cope with the changing conditions. These include herd mobility, relying on traditional early warning, informal asset transfer, livestock fattening (emergence of markets) and in some cases a complete shift from pastoralism. Moreover, the development of institutional arrangements to assist various forms of economic transaction that supported the flow of productive assets from less efficient to more efficient users emerged as herders tend to mix their strategies. The results imply the need to revise development strategies that erroneously perceive herding communities as homogenous groups. Interventions supporting sustainable livelihoods in pastoral areas emphasize supply of diverse packages in order to meet different demands.**

**Key words:** Mobility, markets, informal insurance, traditional institutions.

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## **INTRODUCTION**

Pastoral herders occupy the marginal lands of Ethiopia and are mainly involved in livestock production. Their production system is increasingly challenged by frequent droughts and conflicts resulting from natural resource scarcity. As a result, their economy is unstable and heavily falling under the influence of natural and made-made problems. Consequently, they are deriving global and national attention to respond to such growing challenges in which Ethiopia spent hundreds of millions of dollars to support development activities in the pastoral inhabited regions. To make this successful, a precondition could be to understand how pastoral herders do survive and adapt in a risky livestock production environment, which has been a long-standing and insufficiently answered question. In the past, external interventions involving restocking that involves the distribution of animals to destitute households to support their stock rebuilding capacity were proved to be useful.

But evidence shows that the coverage was small and the impact was short-term as recurring droughts and epidemics influence the smooth recovery process. Although, the more powerful ones having strong social network are able to move out their livestock to graze elsewhere during drought, those relatively poor who fail to benefit from informal system do not benefit even from the restocking programs (Anderson, 1999).

Nevertheless, others who have relatively a good network with relatives, friends and marriage relationships with wealthy family manage to restock after crises. Such informal networks strongly support the coping efforts much more than the restocking interventions of outsiders as it also allows acquisition of breeding stock by species. This is not always the case. Moris (1988) observes the continuation of restocking intervention in some parts of Kenya and Ethiopia for destitute households. This shows that there is a variety of practices and experiences across

the region and have proved a mixed strategy available to suppress chronic vulnerability of pastoral households. In any case, one of the weaknesses of restocking interventions was that development agencies have undermined the significance of traditional institutions in enhancing grazing resource management and arranging wealth redistribution.

Moreover, it is essential to assess the outcome of settlement and restocking interventions on well-being. The major problem seen today in the semi-arid lands of eastern Africa is huge number of displaced people. Since they remain disconnected from their relatives and friends who can otherwise be a reliable source of breeding stock, farming has in general been considered as an immediate way to respond to the problem of stockless pastoralists to rebuild their herds. From a development perspective, settling pastoralists permanently into exclusive farming or fishing pursuits has not been successful (Unruh, 1993).

However, it has been proven to be most effective in restocking pastoralists who have reached a 'stockless' status. This might require casual involvement in crop production and reducing livestock number to enable them to cope after drought and permit resource regeneration (Belay et al., 2005).

In any case, such change of land use depending on climatic conditions could make the local institutional environment more complex. Restocking stockless pastoralists means adding more demand for fodder and more competition on common grazing area. This has a negative influence on the coping efforts of others who manage to survive and do not enter refugee. In some districts of the Somali region, drought being a prime causal factor for resource scarcity and conflict has led many to depend on food aid. The traditional restocking mechanisms, involving assurance of reciprocity, seems to have broken down with the continuous supply of food aid (Devereux, 2006). The recovery rates and access to grazing resources in trying to re-enter the pastoral life is now under constraint. Evidence on how and why such informal institutions have a limited role is urgently needed to support state intervention efforts. In order to understand the poverty reduction role of traditional institutions through facilitating exchanges at the time of stress, one needs to assess the local capacity based on the existing options and preferences of pastoral herders in times of environmental stress (Unruh, 1995).

The purpose of this paper is to examine the diverse practices pastoral and agropastoral herders consider and adopt to respond to and adapt to ecologically-induced stresses.

## METHODOLOGY

Data were collected from three purposely selected districts in eastern Ethiopia (Mieso, Kebribeyah and Harshin) between 2009 and 2010. The region was selected due to the presence of challenges to the survival of pastoral commons, alternative market

outlets and possibility to draw on social insurance mechanisms among pastoral societies. Data collection involved some steps and mixed methods. In this case, the first few days of contacts with the villagers were spent on other matters rather than the main subjects of the study. This was essential in such seemingly marginalized society to establish friendly relationship with the key informants and to develop trust and make subsequent contacts easier and to prevent the key informants from constraining further contacts with the rests of village community members. The next step was discussion with these key informants on the major themes of the study with the intention of generating basic information that helps refine questions for the household survey. Key informant interviews were helpful in revising and adjusting the content of the questionnaire to fit into the realities on ground and used to formulate relevant hypotheses. One of the critical challenges in data collection was that those available were hopeless due to striking level of poverty and failed to show enthusiasm. In effect, enumerators were advised to begin with questions pertinent to respondent's situation in a more flexible way so that he would be at ease. The household survey covered 159 households from eight lowest administrative units (called 'kebeles') with the help of four enumerators. And the issues included in the survey included mobility patterns, participation in different kinds of markets, the role of informal livestock exchange and contribution to poor herders restocking efforts, livelihood sources, land use and access to land for private use and the constraints undermining the possibility to conserve the pastoral communal grazing land and the interaction between private land use and water-points and the link between property rights and livelihoods.

As processes of institutional change and factors associated with change in land use, property rights and shift in livelihood strategies can be captured using a more qualitative approach, data from focus group discussions and expert key informants were used to write this paper. Based on the existing literature and insights from the focus-group discussions, a hypothesis has been formulated for variables that could affect contribution of livestock as:

### Age

In the pastoral setting, older people tend to be richer than younger ones as herd accumulation is possible even in the context of unpredictable weather. Thus, age was hypothesized to affect contribution positively.

### Loss of livestock due to diseases

The more the number of livestock a household loses due to diseases and other reasons, the greater lesser would be the probability of contribution of livestock as informal insurance for the poor. This variable was hypothesized to have a negative effect on contribution.

### Livestock owned

Pastoral communities expect that wealthy herders, influenced by embedded norms, are expected to share their wealth with others. Such an expectation encourages rich pastoral households to contribute more than others. As a result, it was anticipated that holding larger herd influences contribution positively.

### Using improved seed

This is measured as a dummy variable. Investment in farming activities undermines the labor available for herding where less

emphasis could be given to livestock production. This has been a recent phenomenon as many herders lost their herd due to frequent drought occurring in the area. Therefore, those using improved seed for cultivation can contribute less livestock. And the effect was hypothesized to be negative.

#### **Frequency of mobility**

This has been a traditional livestock production strategy in the pastoral environment. Those who have a chance to move frequently from their settlement are expected to save their stock from epidemics and have access to better grazing resource. Hence, practicing mobility frequently was hypothesized to have a positive effect on contribution.

#### **Use of crop residue (dummy)**

More reliance on crops and crop residue is usually among small-herders than large herders. Feeding crop residue is often practiced among those herders engaged in fattening; they produce for markets, rather than for subsistence. This was anticipated to have a negative effect on the decision to contribute.

#### **Private grazing land (ha)**

Herders establish enclosure as a livestock feed bank at times of feed stress, which in turn enable them to keep more herd than others. It was hypothesized to have a positive effect on contribution.

#### **Size of landholding (ha)**

Earnings from crops increase as herders invest in crop farming. The proportion of income from livestock would be less when compared to large herders. Thus, larger landholding reduces the chance to contribute herd as social insurance for the poor.

#### **Renting oxen**

This is a practice in which herders are characterized by agropastoralism and are engaged in such economic transaction. As they keep limited herd size, they do have a few or none to contribute. Hence, it was expected to have a negative effect on contribution.

#### **Hosting relatives**

This is a reciprocal sharing of grazing resources. It serves as a strategy to minimize risk of livestock loss and is common among pastoralists on the basis of close kin. Thus, involvement in hosting relatives was hypothesized to have a positive effect on contribution. Finally, to identify those factors determining households' contribution of livestock for the poor as a social insurance, a binary logistic regression was used.

## **RESULTS AND DISCUSSION**

The main livelihood source for (agro) pastoral households is livestock production and parallel engagement in other

activities including crop farming, petty trade, charcoal burning (which is thought to be destructive to the resource base while it is being recognized as an immediate source of cash income) and remittances from distant relatives involved in businesses in the urban areas and abroad. Survey data show that 32.1% of the sample households were engaged in wage employment and 13.8% in petty trade. The study has shown that the highest income was earned from petty trade, whereas sale of grains becomes the lowest. Sale of fuel wood mainly charcoal is another income sources ranking next to petty trade. It is practiced by half of the sample households. Another form of sustaining livelihoods is dependence on inter-household assistance, which is believed to be an informal insurance. It is characterized by mutuality as current contribution produces an expectation on future reciprocation. The fluctuating nature of poverty in uncertain rangeland environment increases the need to understand the importance of cooperation for asset mobilization. Cooperation provides a means for various members of indigenous community to rely on their own people supporting them from falling into chronic poverty. It is a system where households share resources with other marginal households and extend such norms to assist distant relatives. This is believed to be one alternative to overcome vulnerability and collapse of families due to deprivation of productive assets that can be recognized as forms of risk-sharing.

In this context, village chiefs and elders organize pooling of assets required for the survival of the poor. For instance, among agropastoralists, those households having no oxen but own land obtain group support for traction power and other necessary inputs. Across the case study sites, it is common to contribute female animals, grain or milk. This is usually a voluntary action enabling households to remain in the system. Those having strong social capital (good networks) manage to restock after drought-induced crises.

This indicates that informal networks strongly support the recovery process. Therefore, the risk of losing livelihoods and ending in destitution is not a straightforward step but it may be a circumstance coming after failing to recover through informal insurance, which needs to be considered as another benefit from building social capital. Local actions in the rangelands are not restricted to recovery practices. They involve precautionary activities to manage the likely effects of risks (such as violent attacks, environmental change, policy changes and market failure). Without providing detail accounts of risk assessment, the results indicate that the way resource users assess and perceive risk provides evidence as to whether informal institutions are able to create options for access to grazing resources in a changing rangeland environment.

Understanding how informal insurances, markets and pastoral mobility jointly enable a pastoral household to deal with risk related factors is critical to designing projects and programs that fit into diverse priorities based

**Table 1.** Average herd ownership and landholding size among herders using crop residue.

| Asset possession | Districts |      |            |      |         |      |
|------------------|-----------|------|------------|------|---------|------|
|                  | Mieso     |      | Kebribeyah |      | Harshin |      |
|                  | No        | Yes  | No         | Yes  | No      | Yes  |
| Livestock (TLU)  | 2.65      | 3.22 | 7.23       | 7.11 | 5.86    | 7.10 |
| Landholding (ha) | 1.91      | 1.81 | 3.73       | 3.52 | 3.64    | 2.45 |

on location, production system, wealth and exposure to various kinds of hazards (Smith et al., 2001).

### **Mobility and markets**

The ways herders perceive and assess risk determine the mechanism through which they secure their livelihoods from the production system by deploying private or communal resources even in the face of greater inequality. These mechanisms are explained as follows:

#### ***Mixing diverse strategies during drought***

Households manage stress using different strategies: food purchase, casual employment and support from relatives. These strategies are affected by exogenous factors such as the market prices. Some households purchase food grains through selling livestock. However, a decline in livestock prices and a rise in food prices during drought period is a challenge for households pursuing this coping strategy. Poor market conditions, poor infrastructure and low capacity to bargain for better prices increases their vulnerability to drought shocks since they are forced to sell more livestock to purchase grains than under a normal condition. Wage employment, though rare, is another drought time livelihood option that poor herders consider – an opportunity which is rare in places far away from agropastoral areas or towns. Paid wage labour has been observed in Mieso than in Kebribeyah district due to access to main transport line and road-construction activities. Such employment is not dependable and intermittent in nature.

A third mechanism of survival under stress is direct dependence on relatives. Large family herders usually depend on income from their relatives who have not been equally affected because of variability in rainfall conditions since they live on other clan territory. These are groups with high network density. They reciprocate for their relatives when they encounter similar environmental problems. This livelihood strategy is effective when the scale of drought is low and affects certain part of the region.

#### ***Fattening animals***

Herding families which are better-off and have a few

livestock are engaged in fattening animals through supply of fodder from purchase or contract grazing. Many households in Mieso practice it – entering a commercialization phase. Access to infrastructure, especially roads and railway connected to the capital Addis, is a unique opportunity to earn better and reasonable prices for the fattened animals. Among animal resources owned, poultry and goat are preferred compared to others when market is considered; whereas, goat and camel easily adapt to the changing feed resources since they browse on leaves. This encouraged more and more agropastoralists to change their production strategy similar to Harshin pastoralists. Reasonable price level, availability of feed, non-susceptibility and fast reproducibility of goats together with access to market created more incentive to produce these species. This has an implication for the focus of agricultural extension services and technological support to improve availability of feed where herders tend to rely on crop residue to feed the animals. Knowledge of indigenous practices and technological preferences should be an entry point to respond to local need. This strategy seems to be adapted, as more households tend to permanently cultivate small plots of land.

Table 1 shows that in Mieso and Harshin, households practicing the use of crop residue as animal feed tend to have large livestock holding compared to others in Kebribeyah.

#### ***More labour for herding***

There has been an increasing trend in allocating herding labour due to declining feed sources and increasing conflict threats. Consequently, agropastoralists have two options, either to limit herd size and provide feed from surrounding or to reduce time spent on farming and maintain herd size through searching feed elsewhere; although, the drought condition is more or less equally affecting farming and herding. A household's choice in this particular case is determined by the functioning capacity of institutions of herding defined by groups in terms of protecting the herd. If herding institutions are effective, a household can focus on farming and maintain herd size simultaneously.

#### ***Reliance on traditional early warning***

Traditional ways of drought forecasting exist where

pastoral herders experience long-existing tradition of self-reliance though there is a difference among households in terms of access to information. Such indigenous knowledge is embedded in and central to their belief system compared to the scientific early warning practices of the National Disaster Prevention and Preparedness Commission that often pledges for food aid than saving livelihoods. The traditional practices include looking at the condition of the star, the sun and the moon as well as observing animal behaviour. These are simply shared ideologies and results of repeated observation by individuals gifted with such power. Although, scientifically unexplainable in terms of cause and effect, such belief system influences the behaviour of the community. It is a practice based on indigenous knowledge. Results from the focus group discussion reveal that households with low level of network density have lower chance of access to information on such traditional early warning, which makes them mitigate the undesired effects of shocks in a very poor manner. The number of relatives living in other villages determines this showing that sharing information is again segregated on the basis of social capital. This is consistent with the evidence from other studies where exposure to risk and its perception are influenced by a number of socioeconomic factors, one of which is individual's network (Smith et al., 2001).

The costliness of information, simply because of not being part of the informal network, causes differences in the way households mitigate the effects of disaster. In general, those which are part of the network take some measures subsequent to such forecast. These are isolating calves from cows, interruption of milking and searching for alternative feed for the calf. But they are often reserved from selling their animals during drought contrary to evidence from the literature on drought induced distress sale. De-stocking and restocking following drought period, as an adaptive strategy practiced elsewhere, is not common in this study area. Selling decisions are mostly related to household cash requirements, which take place during normal rainfall years. This strategy has been followed for a long time and is remaining stable.

### ***Share-cropping contract***

The last and peculiar survival strategy for the poor agropastoral household is share-cropping contract solely practiced among 66.7% of the sample households from Mieso. This is a newly emerging institutional arrangement between oxen owners and those who only possess farmland or only labour. Discussions reveal that there are two types of contracts: unequal sharecropping and labour contribution and equal sharecropping and labour contribution – both having different property rights arrangements. Interesting here is examining differences in rules of sharing benefits- ex ante agreement and ex-post implementation of contractual agreements – in which

the latter is influenced by change in state of nature. The emergence of contractual market transaction indicates the gradual transformation of herders into market economy. There were two forms of share-cropping common in the district:

**Unequal sharecropping:** This is an arrangement between those possessing land and oxen and others who are poor and contribute only labour – owner employees someone on his farm. The hired labour contributes only his labour and finally shares the crop – obtaining one-third of the total harvest, whereas, two-third remains for the land right holder. Village leaders also indicate that poor people who do not have oxen but possess land do not prefer such contractual arrangement since it leads to overexploitation of labour. Working alone on the farm in such harsh environment is tiresome. The bargaining power of the poor is also limited, as they do not have options other than accepting these rules. In circumstances where the hired individual and the employer are close relatives, he can have a chance to informally mobilize family labour from the land right holder.

**Equal sharecropping:** This is a land lease contractual arrangement where the landowner<sup>1</sup> contracts out his land to someone who has oxen and needs additional land. The landowner does not have oxen unlike the previous case. It is an agreement involving pooling of physical assets from both parties. The agreement involves equal contribution of labour and sharing of outputs. A written contract is made in the presence of village elders and a copy of contract is kept with the village leader. Failure to commit to the agreement in the contract will cause interference of the elders and the village leader who mediated the contractual process. This is a typical case of externally enforced contract demanding the action of the third party, which is the elders' group. What will happen if nature disturbs the contract and crops fail to yield? This has been often the case in the district consequent to recurring droughts and erratic nature of rainfall. Agropastoralists of Mieso do not rely much on crop production as livelihood source compared to livestock. In cases of crop failure, a household which owns a farm but few or no livestock will be compensated with cash payment (100 to 200 Birr). The contracting person who has been cultivating the land accomplishes the payment mainly because there is still a chance to graze livestock on the farm, where biomass from the failed crop serves as an alternative feed source.

Such compensatory arrangement is not based on initial contract but practiced simply to assist the landowner having no livestock to cope or survive during abnormal rainfall years. The landowner deprived of oxen prefers receiving compensation from his partner to selling the

<sup>1</sup> Landowner throughout the text is to mean land right holders without having the right to sell as land constitutionally falls under state ownership.

crop biomass to other members of the village even if he can obtain better prices than he is compensated. The property rights arrangement is then mutually beneficial and is done to develop trust with his partner and to ensure sustaining contracts with the same partner. Change in the state of nature brings about adjustment in the initial contract and new arrangement is established. Such contracts are internally enforceable between contracting agents and explicit in nature involving deliberate action. In this contracting process, the distribution of costs and benefits and the bargaining capacity of the parties look symmetrical. Access to key production resources has become decisive in ensuring fair distribution of benefits.

Comparing both situations of contracts, the second one seems more sustainable than the first for two reasons: 1) the landless and oxen-less households rarely exist unless a person migrates in from distant villages due to conflict or other reasons making the first type of contractual arrangement non-typical, and 2) increasing poverty, livestock raids and drought problems have in some cases brought a few households to become oxen-less while some others still have oxen.

### **Mobility**

Knowledge on how both pastoral and agropastoral households have been mitigating drought through their individual action provides a clue as to the type of policy interventions demanded to assist local action. To examine whether mobility with the herd or selling part of the herd is preferred, respondents have been requested to provide reasons why they: 1) opt for an action but do not pursue it, or 2) opt and pursue it. Analysis of the reasons is useful to check whether their actions are constrained by the existing property rights system or market infrastructure. There are cultural and economic criteria causing dilemma in individual decisions to reduce vulnerability to drought effects. Herders might have different reasons. This sub-section compares the situations in the case study districts.

**Mieso District:** Three categories of households can be distinguished with respect to their individual selling and mobility decisions.

**i) Long mobility with herds:** This option has been preferred for several reasons. Saving cash during time of drought is difficult as immediate need of spending on food items is given a priority. This brings a question 'whether or not the establishment of saving facilities will encourage selling of animals' and the kind of marketing policy and intervention strategy required. There is a general feeling that when costs of mobility (for example, possible loss of animals due to *Isaa* raids) is compared to the possibility of investing cash on direct food items,

mobility is preferred to selling since villagers can protect themselves. Some households feel that weight loss during drought period artificially reduces the prices of livestock, making selling difficult, whereas keeping the animals until after drought period to allow the animal to regain weight may be useful. For instance, if two animals out of four die, the remaining two after drought period can compensate for the lost animals since market prices rise due to two reasons: 1) an increase in weight and general status of survived animals, 2) a relative lower level of supply to markets close to marginal areas. Therefore, development interventions that reduce the transaction costs of searching for a reasonable market would support pastoral decisions to reduce livestock production risk.

Households which may expect to succeed in maintaining more than 50% of their herd from drought prefer this choice. This is a good reason for most herders to move around looking for better pasture to ensure the survival of their animals during drought other than immediately selling – a situation which leads to a need for government policy to adjust market structure in a way it supports herd rebuilding strategy of pastoralists and agropastoralists as an effort to reduce vulnerability and poverty. All sorts of collective action that pastoralists organize within their vicinity or through forming strong networks among their distant relatives and kinships reflect their interest to save herd loss. To enable coping local level collective action demands the complementary role of market. Integration of market mechanisms with traditional institutions is indispensable. Post drought coping is only possible if at least a few animals survived, which makes recovering successful since it is hard to obtain a single animal from other members of the community. This makes putting greater energy in search for feed and water under drought condition extremely essential. Most believe that the risk of entire herd loss should be left for chance. In this context, mobility is preferred mitigation strategy. In doing so, livestock could be saved in its live form, which undermines the market risk associated with immediate price rise after drought. Many of the households pursue a 'moving' to 'selling' strategy. If most members of the various villages pursue this strategy, what will happen to the grazing and browsing resource base? This question is pertinent because drought conditions force herders from use of grass to vegetations and leaves, even for cattle, yielding undesirable effect on the natural ecology.

Responses so far reaffirm this phenomenon marking already a threshold for continued degradation of the rangelands.

**ii) Selling part of the herd:** This option has been preferred for entirely different reason. Some prefer selling animals entirely and opening up small businesses to sustain life and generate reliable income (end pastoral life) other than losing the whole animals in cases where risk of 100% loss occurs in long drought period. Others

think in terms of immediate household needs and prefer selling to moving the herd to buy food for the household consumption since saving cash for post-drought herd rebuilding is far from being possible (end pastoral life). This implies the need to give emphasis to provision of emergency food aid before those drought-affected groups sell most of their herd. It is clear to see that costs of recovery can be much higher than early drought intervention in terms of building the capacity of herders to avoid distressed sale. Poverty reduction strategies should address the diverse needs and intentions of pastoralists and agropastoralists as some of the mitigation strategies that some choose end up in incapacity to recover after drought. Old people prefer to sell their herd and stay in their own village by saving cash for post-drought purchase.

**iii) Conditioned mobility or selling:** Households involved largely in petty trade prefer selling their livestock to mobility. Why? In fact, the choice for mobility among very strategic village members depends usually on the availability of information where to move that is, information about better pasture area, which means their decision is not random; rather, it is based on information obtained through their informal social networks. Some households adjust their mitigation efforts based on past experiences. Those which consumed all their cash due to extreme food shortage in the previous drought did not sell the core herd during drought. They make a distinction among species and sexes of animals as 'core' and dry herd. The core refers to those essential for herd rebuilding, and the dry ones are required mainly for immediate consumption through slaughtering or sales. The tradition of giving priority of access to better pasture for core herd and selling for non-core herd is typical in both pastoral and agropastoral systems to cope with vulnerability. All institutions creating access options for pasture and water in the rangeland during the period of environmental stress is to save at least the core herd.

Pastoral herders have experienced that keeping the livestock for prolonged period could lead to weight-loss in times of feed stress in which they prefer selling. In preferring for either strategy, households consider the opportunity cost of maintaining and selling herd based on the reliability of information they have at the time of decision-making. Personal network of a household and the resource conditions within the safely movable area also affects the decision. Although, price level is an important determinant of herders' selling decisions immediately before drought, the social cost of mobility during drought in terms of causing family disintegration influences the decision.

**Kebribeyah District:** The decisions and actions of households are determined by certain factors. Weight loss long before realizing drought shock discourages selling. Absence of alternative income sources or

livelihood always brings a dilemma to sell or not that will eventually produce an influence to keep animals under risky condition. Above all, selling decisions are mainly based on availability of pasture in accessible areas. For poor herders, selling the livestock entirely (in spite of unfavourable terms of trade) does not ensure survival in drought years and yet selling is preferred. An interesting observation here is that individual level decisions are influenced by group level capacity to arrange access to better grazing area. Other studies reveal that an increase in costs of veterinary services and access to water points are the two main reasons for the poor to prefer selling. Restocking through savings, markets and social insurance are extremely limited for the poor and even more readily accessible for the ex-ante wealthy (McPeak and Barrett, 2001). In fact, mobility is mainly the choice of large herders. Poor and small herd owners prefer selling to mobility. Large herders make use of their strong informational power to migrate more easily compared to small or poor herders. While relatively wealthy households pursue herd mobility, poor herders practice partial selling and purchase of feed from crop growers for the remaining herd. The justification for the poor members is that once sold it is hard to replace the herd. This implies that ex-post coping is a challenge to some households when they have poor personal networks and poor relatives. Other groups sell part of the herd to cover food expenditure even if livestock feed is available elsewhere. This implies the need to provide food aid to such marginal groups to avoid the risk of selling their animals at cheaper price whenever the group can move its herd to a specific place for grazing.

Those who would decide to sell consider sensitivity to feed scarcity as species selection criterion. For example, sheep is sold earlier than other species. Herd size, feed availability, market prices, and household's food expenditure are the four crucial factors influencing herders' strategic decision to mitigate the effect of drought. These factors tend to affect the decision of poor and relatively better-off households differently.

**Harshin District:** In this district, households that are afraid of conflict between different clans limit mobility and prefer selling. Animal strength also determines the decisions for either option. Weak animals expected to die during mobility to distant pasture will be sold and strong ones maintained. Mobility remains crucial as an asset-saving mechanism other than maintaining or improving livestock productivity. Traditional institutions supporting mobility help overcome household vulnerability. Those having a few livestock can still try to escape the drought effects through moving within the clan territory. This differs from Kebribeyah, where small herders tend to sell instead of searching feed. So herd size does not determine selling decisions in this situation. Still important difference exists between large and small herders in terms of distance of mobility. While small herders are

limited to clan's territory, large herders move either across the border towards Somaliland or other clans' grazing area. The latter group arranges such mobility together with non-clan members who live in their clan's grazing area but have a plan to migrate to their clan's grazing land. Hence, difference in wealth among herders determines the extent of mobility.

Other observed important feature for those choosing mobility is preference for species of animals. For instance, supply of draft power and milk for a household brought a shift in production strategy of herders. Categories of animals required for both purposes are retained in the herd. This is contrary to a few decades back when crop-farming did not make a livelihood source and herders focused on keeping female animals. Such a change in preference is largely related to uncertainty, livelihood diversification, grazing scarcity and institutional change (that is, property rights to land). Insights from the group discussion indicate that there are herding families which prefer mobility within clan's land until they are left with a single animal other than selling. A question arises whether this is because of low opportunity cost of keeping compared to selling. Further probing proves that this is mainly influenced by a household's capacity to save money and the drive to maintain herd size for reasons of prestige having symbolic value. Such norms having less economic significance influence decisions at household level.

### ***Market development and strategic shift***

Access to market makes intensive livestock production more profitable. This depends on geographical location. Focus group discussions conducted in Mieso District show that there is a regular consultation among community members to reduce livestock number to increase animal productivity. This is in contradiction with the argument dominant in the literature that risk-buffering mechanisms can only be successful if herders concentrate on increasing livestock size. Intensive feeding other than extensive grazing is considered not only because mobility is difficult but also due to a reduction in feed availability in communal grazing land. None of the villagers believe in increasing livestock size and are more inclined towards commercialization. Relatively, better access to veterinary services than that of Kebribeyah and Harshin motivates herders to prefer quality to quantity since the risk of loss due to diseases incidence can be controlled. This does not mean that opportunistic stocking is not practiced to manage risk in changing resource conditions. Number of livestock does not count in achieving food security at household level, but the purpose it serves. For instance, an attempt to increase livestock number means reduced productivity (milk per cow and inadequate traction power). However, there is preference among species of livestock in increasing herd size. For instance, goat and camel are

preferred to cattle because they can easily adapt to changes in feed conditions and rely on perennial trees. This has an implication on programs and policies for livestock development in the area.

In addition, male camel is rented as means of transporting goods to market as these areas are far from the modern means of transport. The rate of rent depends on how far the animal travels; minimum cash obtained being 10 Birr per day. Keeping male camel in the herd, as an asset base of a household, serves as a recovery strategy after prolonged drought. Camel milk has a medicinal value for treating different diseases including stomach aches caused by drinking polluted water from cisterns. This saves the medical cost, which otherwise a poor household has to cover through selling whatever it owns. As a survival strategy in the marginal rangelands, different aspects of benefits derived from each livestock species is a determining factor in retaining the minimum required number from each species. This has an implication for intervention strategies to improve household well-being in terms of recognizing local preferences.

### **Asset transfer as informal insurance**

An important informal insurance in the pastoral and agropastoral production systems is self-reliance where internal resource mobilization and asset transfers help the poor cushion against the impacts of shocks. In eastern Ethiopia, it is recognized as a "charitable obligation intrinsic to the Islamic religion" (Devereaux, 2006:57). This inter-household assistance is characterized by mutuality as current contribution produces an expectation on future reciprocation. Hence, the fluctuating<sup>2</sup> nature of poverty in uncertain rangeland environment necessitates understanding the norms fostering cooperation for asset mobilization. Cooperation provides a means for various members of indigenous community to rely on their own people supporting them from falling into chronic poverty. It is a system where households share resources (livestock, grain and others) with other marginal households and extend such norms to assist distant relatives. This is believed to be one alternative to overcome vulnerability and collapse of families due to deprivation of productive assets. The result reported in Table 2 requires careful interpretation. It is important to note that the amount contributed and received do not necessarily much in all cases since some of those households which contributed and/or received might fall out of the overall sample households. In terms of contributions, it is likely that households which contributed livestock might have contributed grain as well. The last row in Table 2 provides the sample

<sup>2</sup> This is referring to a situation where those wealthy households in the past have become poor while the rests with less livestock earlier have improved their livestock possession through time.

**Table 2.** Average amount of informal assistance in the last three years period (in Birr).

| Districts          | Received  |       |        | Contributed |       |        |
|--------------------|-----------|-------|--------|-------------|-------|--------|
|                    | Livestock | Grain | Others | Livestock   | Grain | Others |
| Mieso              | 136       | 27    | 25     | 89          | 41    | 20     |
| Kebribeyah         | 54        | 37    | 56     | 104         | 48    | 34     |
| Harshin            | 91        | 30    | 194    | 219         | 63    | 93     |
| Overall sample (N) | 105       | 30    | 73     | 121         | 48    | 40     |

**Table 3.** Sample households who contributed and/or received assistance over three years.

| Events      | Responses | Districts |            |         | Total |
|-------------|-----------|-----------|------------|---------|-------|
|             |           | Mieso     | Kebribeyah | Harshin |       |
| Contributed | No        | 14        | 23         | 11      | 48    |
|             | Yes       | 66        | 17         | 28      | 111   |
| Received    | No        | 37        | 25         | 18      | 80    |
|             | Yes       | 43        | 15         | 21      | 79    |
| Total (N)   |           | 80        | 40         | 39      | 159   |

households which have either contributed or received in the three case study districts. As a result, the overall sample in each category (received and contributed) does not add up to 159. In this context, village chiefs and elders organize pooling of assets required for the survival of the poor.

For instance, among agropastoralists, those households having no oxen but own land obtain group support for traction power and other necessary inputs. Across the case study sites, it is common to contribute female animals, grain or milk. This is usually a voluntary action enabling households to remain in the system. Those having relatively good network with different members of the community are often successful in managing to rebuild their livestock subsequent to drought-induced crises. This indicates that informal networks hold up the recovery process. In reality, small portion of the pastoral population benefited from this because those with poor informal networks often fail to gain from such system. There is also divergence between those who received and contributed since there is variation in time between contribution and reciprocation (Table 3). Interestingly, the result shows that we should not be pessimistic on the role of the informal insurance as 69.8% of the sample households have made contributions over the three years period. On the other hand, the fact that nearly 50% have received benefited from insurance means self-reliance at household level could remain critical.

As the frequency of drought increases, the reliability of informal insurance is reducing. Others provide evidence where such informal mechanisms are unable to shield households from large-scale and long-lasting shocks

(Fafchamps et al., 1998). This is because shocks produce persistent effects where temporary events carry over chronic impacts to the future welfare of households. This will reduce households' capacity to rebuild the assets lost that undermines their ability to contribute to economic growth (Dercon, 2003). Hence, those social relationships among community members that could have served as means of regaining assets can be weakened in the event of large-scale shocks developing persistent effects.

Informal asset transfer can occur at community as well as household levels. Transfer of resource is another economic link among pastoral households. Transfer refers to change of entitlement as resource or an asset flows from one to other person due to cultural or legislative influence. The forms of transfer identified include a gift on occasions of marriage and birth, support during time of disaster and a dowry system. A community with close interaction with the other provides gift during marriage and at birth. They also help each other at time of crises such as drought sharing food grains or contribute animals to enable the destitute to revive. The third form of asset transfer occurs most frequently and involves a large amount of livestock. The amount of asset transferred in a dowry system varies based on the status of a household. Arbitrarily, households in pastoral or agropastoral groups are categorized into rich, poor and middle wealth groups. The rich households invest on dowry up to 100 small ruminants, 5 camels and 5 cattle; whereas the poor does up to 20, 2 and 0, respectively. This pattern changes with situations of drought and good rain years.

The dowry system, being an incentive, encourages

**Table 4.** Determinants of households contribution of livestock for the poor (Y=1).

| Variables                      | Coefficient | Standard error | Marginal effect | Mean of X |
|--------------------------------|-------------|----------------|-----------------|-----------|
| Age                            | 0.006       | 0.017          | 0.001           | 41.9      |
| Livestock owned (TLU)          | 0.100**     | 0.052          | 0.019           | 4.99      |
| Livestock died due to diseases | -0.110**    | 0.051          | -0.020          | 3.81      |
| Use improved seed (yes = 1)    | -0.165      | 0.429          | 0.039           | 0.52      |
| Frequency of mobility          | 0.285***    | 0.011          | 0.053           | 2.87      |
| Use of crop residue (yes = 1)  | -0.615      | 0.529          | 0.125           | 0.78      |
| Private grazing land (ha)      | 0.946***    | 0.378          | 0.184           | 0.88      |
| Landholding (ha)               | -0.750**    | 0.263          | -0.142          | 2.53      |
| Rent oxen (yes = 1)            | -0.240      | 0.446          | 0.048           | 0.36      |
| Host relatives (y = 1)         | -0.375      | 0.418          | -0.004          | 0.30      |
| Constant                       | -0.555      | 0.857          | -               | -         |

Log likelihood: -83.90; Restricted log likelihood: -95.64; Chi-squared: 23.48 ( $p < 0.001$ ). \*\*\* $p < 1$ , \*\* $p < 5$ , \* $p < 10$ .

adolescence groups to get married at early age, which contributes to over population of pastoralists. This will be an immediate cause for environmental degradation apart from natural factors. It uncovers that an economically beneficial and socially desirable system might have a deleterious effect on the natural environment. A household level asset transfer is a second form of asset transfer taking place from parents to children in the form of succession when they pass away. In all districts surveyed sons within a household take two-third of the entire assets owned by parents and the remaining one-third is left for female adolescence. This is not considered as a bias against female since religious rules advocate. In some cases, daughters are totally ignored in sharing parent's wealth. This has an implication on the management responsibility of female children towards the herd and the care they take even at the time of disaster. However, sons give great care with the expectation that they are going to own later. In other words, female children cannot be a good source of information for early warning and monitoring system. Although, changing such bias is difficult in the short run, giving more focus to male adolescence for data collection helps in getting reliable information. From the entire sample, 76% (121 out of 159 households) have contributed livestock to assist their poor community members (Table 2). The results in Table 4 provide the determinants for contribution of livestock to the poor to enable them to cope. Consistent with the qualitative data, livestock holding, frequency of mobility during drought period and possession of private grazing are likely influencing households to contribute livestock. On the other hand, loss of livestock due to diseases and engagement in farming are negatively influencing contributions. A direct interpretation of the coefficients is a bit tricky in such a logistic regression and a more appealing interpretation comes from looking at the marginal effects for binary and continuous predictor variables.

In the case of livestock death from diseases, an

increase in animal death by 10 units reduces the capacity of a household to contribute by 20% keeping all other variables at their mean values. Alternatively, efforts made to save 10 animals through better veterinary service intervention will likely increase the capacity to contribute by 20% so long as informal insurance norm persists. The model predicts that an increase in livestock size by one unit increases the likelihood of contribution by 1.9%. The use of enclosure as private grazing becomes vital since the likelihood of contribution increases by 18.4% when area enclosed increases by a hectare. A related study indicates that the feed reserved on enclosed land for dry season grazing enables a household to cope with feed scarcity (Beyene, 2010). An increase in land under private holding does not favour contribution as crop-production has become important for certain agropastoral herders – where an increase in landholding by a hectare reduces the likelihood of contribution of livestock by 14.2%. The model also predicts the positive influence of mobility in enhancing contribution in which a unit increase in the frequency of mobility increases the probability of contribution by 5.3%. Results from the group discussion also suggest that those with high network density are able to move their herd to mitigate the negative effects of drought.

Overall, where formal insurance and credit markets fail, as in many pastoral areas of Africa, studies confirm that inheritance of livestock within the close family members, multiple-ownership claims to livestock and croplands, livestock tenancy arrangements at birth, and bride-wealth at the stage of adolescence are some of the common forms of embedded informal insurance schemes (Swallow, 1993). At a wider scale, an extensive review of African economic performance shows that informal institutions facilitate adaptation in risky environment mainly in traditional societies where “liquid” assets (cash-based transactions) are limited. It is emphasized that establishing social connections assist livestock spread over a larger geographical area as risk management

activities (Collier and Gunning, 1999). A recent study on the informal social protection among east African herders reveals that mobilization of assistance for the poor households is determined on the basis of social networks and kinship structure. A poor household with wealthy relative can easily secure temporary assistance (such as livestock products) and insurance (livestock) than the poor without wealthy relatives (HPG, 2009). Likewise, a game theoretic approach to analyzing reciprocal informal insurance arrangements among Kenyan herders shows that herders create supplementary mechanisms such as the use of intermarriage to ensure the prospect of cooperation. This is expected to be essential in reducing the temptation to renege (Dixit et al., 2013).

Such evidence generates the question whether or not informal insurance has a role in accommodating households which are most vulnerable but characterized by very poor social capital. However, neither the focus group discussions nor the survey result gave an indication that such disaggregation in organizing informal insurance exists.

## Conclusions

The study has shown the important role of informal insurance where state support and formal institutions of asset saving are either missing or inefficient due to a number of factors. The results from a simple logistic regression clearly support the qualitative evidence in that although some level of discrimination is observed among herders in planning mobility, the tradition of livestock asset transfer serves as informal insurance to enable destitute households to rebuild their herd in the aftermath of drought. There are two important lessons derived from this study. First, there needs to be revisions of development strategies that have erroneously perceive herding communities as homogenous groups. Development interventions that support sustainable livelihoods in semi-arid pastoral areas should consist of diverse packages that assist the success of various mitigation and coping strategies. Second, there is still a potential for traditional institutions to provide social protection in a risky environment. As sources of risk become diverse and internal capacities decline with the frequency and length of droughts, asset protection tasks to save livelihoods cannot be left to the traditional leaders and local chiefs.

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