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Comparative resilience of Somali grain and livestock market systems

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Abstract: *Livestock and grain market systems in Somalia's South West State, while vital to food security and household income, are affected by recurrent shocks, including insecurity, climate shocks, pests and livestock disease, desert locusts, and the COVID-19 pandemic. The fact that markets continue to function indicates a substantial degree of resilience. Findings from a mixed-method assessment across eight domains of system resilience indicate that the grain market system is more resilient than the livestock market system in three key domains: business strategy, diversity, and connectivity. Results show that grain businesses recover more quickly and are more likely to take action to achieve recovery than livestock businesses. When confronted by thin markets, practitioners have tended to respond by strengthening existing market actors, with the goal of filling critical gaps in the market. However, our findings provide new types of information to address systemic issues and strengthen market system resilience.*

Keywords: market system resilience, Somalia, agri-food systems, conflict-affected environments, gender

Introduction

Livestock and grain market systems in South West State in Somalia are vital to food security and household income but are affected by recurrent shocks, including insecurity, climate-related events, pests and livestock diseases, desert locusts, and the COVID-19 pandemic. The fact that markets continue to function indicates a substantial degree of resilience. Resilient market systems have the potential to buffer exposure to shocks and stresses while helping households to recover more quickly after a shock, through increased income and improved access to affordable food. For this study, we took a systems-level approach to measuring resilience to illuminate key differences in the resilience of grain and livestock market systems in the Bay and Bakool regions of Somalia. Comparing their strengths and weaknesses points practitioners towards multiple pathways to strengthen market systems in

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a region of Somalia characterized by a high humanitarian case load and systemic challenges to the smooth functioning of markets.

Applying a resilience lens to market systems

During recent years, the US Agency for International Development (USAID) has placed resources behind an effort bringing together decades of programming and research around the resilience of vulnerable households and communities with lessons learned from its established portfolio of market system strengthening programmes. Market development actors may inadvertently contribute to the growing vulnerability of large portions of the rural population by supporting the commercialization of market activities where only the wealthier subset of the target population have the resource base to tap into those remunerative activities. In other words, market development on its own is not adequate for enabling pathways out of poverty for households lacking the resilience capacities (such as insurance, social safety net programmes, reliable roads, cold chain infrastructure) needed to prepare for and recover from climate and conflict-related shocks, as well as long-term stresses, such as demographic pressures. One solution is to ensure that the market system itself is resilient, in order to respond to shocks in ways that support rather than hinder inclusive growth. USAID commissioned the development of a conceptual framework and guidance for measurement of market system resilience (MSR), which we have applied in this study. In doing so, we leveraged the expertise of staff from the USAID Somalia Growth, Enterprise, Employment and Livelihoods (GEEL) Project.

The GEEL Project's activities in South West State are predominantly focused on iterative learning, as they are among the first USAID-funded market system strengthening interventions in regions characterized by insecurity, recurrent shocks, and a high humanitarian case load. The GEEL Project has worked through the private sector, regulatory bodies, and other market actors to expand the adoption of improved technologies and practices and increase access to finance and markets for smallholder farmers. RTI International funded an independent study in 2020 to operationalize the MSR framework and use it to assess market systems in the context where USAID funded GEEL to pilot market system strengthening activities. GEEL activities had been predominantly located in less conflict-affected regions of Somalia, Somaliland and Puntland; the iterative learning activities introduced in South West State in 2019 focused on the grain sector.

We define a market system as a 'dynamic space – incorporating resources, roles, relationships, rules, and results – in which private and public actors collaborate, coordinate, and compete for the production, distribution, and consumption of goods and services' (Downing et al., 2018: 2). For USAID, MSR is the 'ability of the system to draw on system-level resources – such as social safety nets, early-warning systems, emergency relief systems – in the face of shocks and stresses' (Downing et al., 2018: 1). The purpose of strengthening MSR is to protect or enhance the well-being of vulnerable people (Vroegindewey, 2019).

We adapted and applied USAID's MSR framework to collect new data to assess differences and similarities in levels of resilience in the grain and livestock market systems in the Bay and Bakool regions. The study focuses on two research questions:

First, what are the comparative strengths and weaknesses of the Bay and Bakool livestock and grain market systems in terms of resilience? Second, what resilience domains are most important for business recovery from shocks and what adaptive strategies enable that recovery? We first situate the MSR framework within recent trends in market system strengthening research, before applying it to the contextual features of the market systems discussed in this study; we then share the findings from qualitative and quantitative interviews carried out with business owners and market stakeholders in Baidoa and Hudur and discuss implications for effective MSR programming in vulnerable contexts.

Market-oriented approaches to economic growth

Although building the resilience of households is a long-range development goal, doing so in a sustainable way recognizes the importance of individual agency, social networks, the enabling environment, and market systems. The conclusions of Nigel Poole's (2017) meta-analysis of the body of research on smallholder agricultural and market participation provide a cogent argument for the importance of market system strengthening despite the lack of empirical research showing direct links to poverty reduction on a large scale (Poole, 2017). Further, applying a systems lens to the Sustainable Development Goals requires multiple integrated approaches, including direct farmer-level interventions alongside large-scale transformative change (Poole, 2017). In turn, improvements in agricultural market systems are necessary for improving the condition of the rural and urban poor.

An extensive body of empirical evidence regarding value chain strengthening reveals consistent gains in terms of income growth and improved food security across contexts and programmes for smallholder producers (Seville et al., 2011). Critical advantages in terms of assets, farmer organization, and access to better infrastructure are key determinants in who benefits from improvements in the value chain, presenting a challenge for integrating the most vulnerable producers (Seville et al., 2011). Research indicates that the labour pathway may be a more reliable avenue to income growth for producers unable to compete in stronger markets (Seville et al., 2011). A market system approach effectively incorporates labour by defining four key market functions, including provision of wages, alongside consumer goods and services, productive assets and inputs, and sales revenues (Vroegindewey, 2019).

The current shift to the system rather than value chain also provides a more holistic framework for investigating gender-specific and environmental aspects of market development (Poole, 2017). All of these considerations should encourage researchers and implementers to continue efforts to define and measure pathways whereby market system strengthening leads to resilient outcomes for vulnerable groups.

Domains of market system resilience

The **MSR framework** (Downing et al., 2018) provides guidance for assessing the resilience of market systems in specific contexts and moments in time. A market system achieves resilience through proactive exchanges and agreements among market actors (supported by enabling norms, networks, and regulatory systems), that channel resources from points of concentration to points of need (Downing et al., 2018).

The MSR framework defines eight domains of MSR, four structural and four behavioural; behavioural domains relate primarily to the practices, attitudes and norms of market actors, while structural domains address the enabling environment and institutional framework. We developed tailored definitions of each domain specifically for this study (Table 1). Each domain encompasses a

Table 1 MSR domain definitions adapted for South West State

	Behavioural domains
Evidence-based decision making	Businesses seek first-hand information from more than one source to inform decisions and check in with these sources regularly, including during shocks. Businesses use information to make innovations that increase revenue or adapt to shocks; keep written records; and invest in technology to improve business management and record keeping.
Business strategy	Businesses plan their activities in advance and maximize profit through the volume of transactions versus margin per transaction. Businesses have strategies in place to retain customers by providing them with additional services. Businesses collect information about customer satisfaction and seek customer input regarding new types of products/services they need.
Cooperation	Businesses work together collectively in response to disturbances. Businesses work jointly with suppliers and service providers to proactively address issues and resist negative forms of collaboration. Businesses are served by business or professional groups that have inclusive membership and respond to all members, regardless of status or identity.
Competition	Businesses do not take advantage of market strength or disturbances to collude. Businesses adhere to agreements and are held accountable by other market actors. A favourable environment for entrepreneurship results in new market entrants across value chain segments, including start-ups by members of marginalized groups.
	Structural domains
Power dynamics	There is a balance of power between various actors in the market system. Government, private sector, and civil society groups have resources to fulfil mandates. Marginalized groups have representation through groups and networks to advocate for their interests. Business owners across value chain segments believe they can influence issues affecting their markets.
Rule of law	Formal and informal rules are widely known and adhered to. Disputes among market actors are handled fairly, regardless of business owners' influence or identity, reinforcing the value of being a good actor. Taxation is fair and not unduly burdensome. Security is maintained within and between market centres to minimize risks for business owners.
Diversity	Members of marginalized sub-clans, women, and youth are represented in business ownership across value chain segments and businesses of various sizes. Open and inclusive platforms for business linkages ensure that success is not determined by influence or identity.
Connectivity	Flexible and dynamic supply and sales chains enable businesses to access different markets, buyers or suppliers in case of a shock. Businesses are able to negotiate credit from buyers or suppliers to manage risk and adapt to shocks. Business owners from marginalized groups possess linking social capital to larger businesses.

Source: RTI International

continuum of possible market system behaviours and characteristics, ranging from proactive to reactive in the face of shocks and stresses.

We apply the MSR framework to markets in Somalia's South West State to generate empirical findings from a systems lens regarding the strengths and vulnerabilities of highly shock-affected market systems. The study focuses on grain and livestock market systems due to their importance for local livelihoods and meeting the food needs of the Somali population. The MSR framework allows us to tackle the political economy constraints and opportunities related to the contested nature of power in the region, the outsized role of humanitarian actors, and a robust private sector that has flourished despite numerous obstacles and ongoing conflict.

Somali market systems and food security

The importance of livestock to the Somalia economy has expanded significantly in the last few decades, helping to drive the agricultural sector's contribution to an estimated 75 per cent of GDP (World Bank and FAO, 2018). Livestock is a major export for Somalia and has overshadowed the crop subsector, which remains critical for food security, leading to a substantial reliance on imports of cereals and other food products (World Bank and FAO, 2018). The crop subsector holds potential for growth despite the growing pressures of climate change.

The Bay and Bakool regions of South West State have fertile soils and are part of Somalia's sorghum belt. Members of the Rahanweyn clan, which forms a majority in the region, traditionally practise agro-pastoralism, ranging from sedentary households to those practising a more nomadic lifestyle (Maxwell et al., 2016). In Somalia, pastoralists and agro-pastoralists describe resilience as the ability to maintain or rapidly restore livelihood assets, especially those that are essential to health and well-being (SomReP, 2018). Wage labour, especially farm labour, is a critical source of income for agro-pastoral households, as are self-owned micro-enterprises run primarily by women.

Imported inputs flow through Mogadishu, which also serves as an end market for agricultural products from South West State or a gateway for exports. Baidoa and Hudur, the capital cities of the Bay and Bakool regions, form regional market centres. However, for perishable products such as milk or stored grains, local markets play a larger role, in part because of poor road infrastructure and insecurity. Furthermore, an estimated 80 per cent of the agricultural land in the region is controlled by al-Shabaab, the powerful militant group, making rural–urban market linkages challenging and costly.

Petty traders, micro- and small enterprises make up most of the livestock and grain market actors in the Bay and Bakool regions, with larger businesses oriented toward neighbouring Ethiopia, Mogadishu, and export markets. Women tend to dominate petty trade, especially milk selling and grain retail, where low revenues have discouraged men's participation. Nevertheless, women are increasingly represented as owners of relatively higher influence enterprises that have greater social and financial capital, particularly in Baidoa's vibrant local market (see Figure 1).

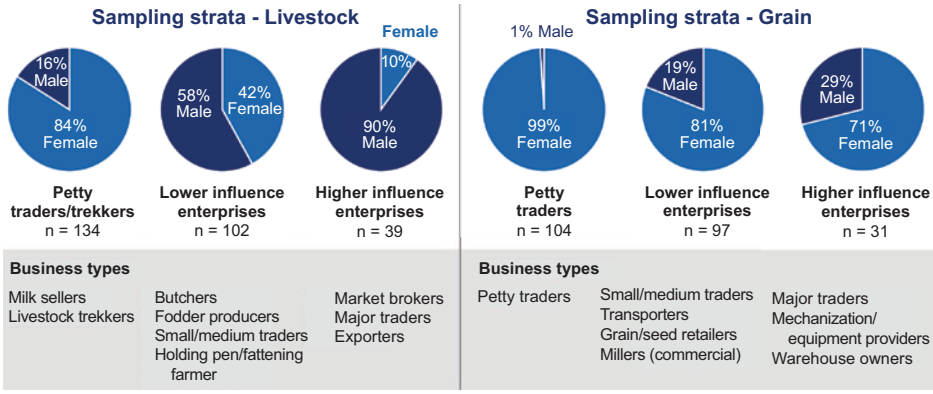

Figure 1 Sampling strata by gender of owner, business type, and level of influence

Local and regional governments play a minor role in supporting markets, and are tasked with providing basic services, such as sanitation, infrastructure repair, and security. In response to slow and ineffective formal dispute resolution, the business community often turns to traditional law, known as *xeer* (Abdile, 2012). However, *xeer* law relies on clan networks for paying fines, resulting in uneven application across different clan and sub-clan groups and often disadvantaging women who lack independent legal status (Austrian Red Cross ACCORD, 2009; Stremlau and Osman, 2015). Finally, members of marginalized sub-clans may prefer *shari'a* law, although it is often administered in al-Shabaab-held areas in opposition to government courts in Baidoa and Hudur.

Most market activities in South West State are impacted by shocks related to climate change, specifically recurrent severe droughts and the locust-infestation of 2020 and 2021. Insecurity is another persistent shock; the unpredictability of active conflict between the government and al-Shabaab, clan groups, and militias that set up roadblocks lead to significant costs and delays in the flow of trade. Cash transfers provided for humanitarian assistance are critical to supporting market demand, thereby helping markets to withstand covariate shocks affecting the population of the region. The most direct impact of COVID-19 on grain and livestock markets during the study period (July and August 2020) was the closure of export markets and decline of international remittances, resulting in reduced demand for livestock (IOM Somalia, 2020). Movement restrictions interfered with transporting livestock and grain between markets, pushing up costs and incurring losses to pests and disease.

Methods

The study used a cross-sectional approach to address the research questions previously mentioned by comparing the livestock and grain market systems centred in Baidoa and Hudur with each other. The study was framed to assess the non-producer portion of the market to provide insights regarding the way that markets work for smallholder producer well-being outcomes. The team collected

quantitative and qualitative data to develop a set of defined indicators, adapted for the South West Somalia context outside of Mogadishu. Indicators of MSR were distributed between the quantitative and qualitative data collection instruments to provide complementary data.

Limited data are available about businesses outside of Mogadishu, especially micro, small, and medium enterprises (MSMEs); therefore, the team began by preparing a census of grain and livestock businesses in Baidoa and Hudur. A stratified sampling frame was developed that was proportionally distributed based on the total number of businesses of each type.

Local enumerators conducted in-person interviews with a stratified sample of 507 MSME business owners. One of the co-authors of this study, a Somali researcher with expertise in Somalia political economy, conducted in-depth interviews via phone with business owners, local authorities, and civil society leaders in Baidoa, Hudur, and counterparts in Mogadishu and Afgooye.

Sample characteristics

Our total sample consisted of 507 business owners or managers across the two regions. Regarding the grain market system, 88 per cent of the businesses were owned by women. In contrast, women owned 58 per cent of businesses across the livestock market system. Of the respondents, 47 per cent reported that they did not attend school at any point. An additional 45 per cent of respondents reported that they had completed Qur'anic school.

We used a broad interpretation of the term 'employees' to include family members who help out part-time with the business. Even with this interpretation, 59 per cent of grain and 37 per cent of livestock businesses did not have any employees. Of the business owners with employees, most had fewer than five people helping out or working in the business.

The gender makeup of business owners varied significantly between the grain and livestock market systems, with women constituting most of the grain business owners (see Figure 1). Analysing our sample breakdown by level of influence, petty traders and livestock trekkers had the least social and financial capital, whereas exporters, fattening farm owners, warehouse owners, and major traders had the most influence. We also found that women were dominating in the less-influential market segments.

Findings

Study results for eight domains of resilience

Addressing our first research question, results of the study revealed a moderate level of resilience across the grain and livestock market systems in the Bay and Bakool regions (Table 2). Moderate resilience was determined using a four-point ranking system, with very little resilience as the first category, and a strong level of resilience as the fourth and highest; workshop participants placed both market systems second in that ranking for most domains, as 'somewhat resilient'. However, grain and livestock market systems also varied on several qualitative and quantitative indicators

Table 2 Comparative grain and livestock MSR

Quantitative and qualitative findings per resilience domain
Domain #1: Evidence-based decision making
Approximately half of livestock (57%) and grain (47%) actors innovated to grow their business, but livestock businesses are more likely to increase revenue as a result (69% versus 41%).
Most businesses (97% livestock and 84% grain) rely on first-hand market information but only occasionally or rarely seek out new information.
Businesses in both market systems for the most part rely on friend and family networks rather than peer groups for business advice.
Livestock actors (51%) are more likely to use paper-based recordkeeping than grain actors (31%).
Most businesses (91% of livestock businesses and 91% of grain businesses) agree that investing in technology could earn them more money but believe it would be too expensive.
Domain #2: Business strategy
Businesses lose customers only rarely or occasionally, primarily because of price competition. Livestock actors also struggle to provide consistent supply (38%).
Most actors in both market systems occasionally reduce their profit margin to ensure good value to customers.
Grain actors (43%) are more likely than livestock actors (22%) to plan a week ahead; most businesses plan only a day ahead.
Although both value chains believe customer feedback is important, grain businesses (43%) are more likely to seek customer feedback than livestock businesses (28%).
Grain (79%) and livestock (95%) businesses gathered customer feedback personally, but 33% of grain businesses also told staff to request feedback.
Domain #3: Cooperation
Grain actors are more likely to cooperate in diverse ways (driven by women).
Grain actors are more likely to want to help their suppliers/providers (i.e. producers; 73% of grain actors versus 61% of livestock actors).
Livestock businesses are more active in community meetings, but only grain businesses are active in trade or business associations (18%).
Collusion is rare in both market systems because of local capacity to resist.
Business committees effectively fill some functions of industry groups but exclude petty traders.
Market actors regularly activate networks to tackle shared problems but with inconsistent outcomes.
Domain #4: Competition
Al-Shabaab has significant ability to control products and traders entering markets; taxation and security substantially impact trade between cities.
Adherence to agreements is similar (66% of grain businesses versus 58% of livestock businesses), and businesses leverage reputation risks to hold actors accountable.
Formidable risks involved in starting a business are offset by readily available supply, yet high-value activities require strong clan networks.
Women are entering market activities in significant numbers but are at a disadvantage because of a lack of collateral and networks.
Most businesses report an increase in new market entrants, but 36% of grain businesses also report a decrease compared with 9% of livestock businesses.

(Continued)

Table 2 Continued

Quantitative and qualitative findings per resilience domain
Domain #5: Power dynamics
Al-Shabaab is the most powerful market stakeholder, followed by clans (more so for livestock businesses) and local government (more so for Baidoa).
Leadership of business committees excludes marginalized sub-clans, youth, and women; women are filling some leadership roles in grain businesses.
Perceptions of ability to influence community decisions and local authorities are weak in Hudur but stronger in Baidoa. On average, influence is weak across market systems, especially for women in grain businesses.
Domain #6: Rule of law
Most businesses are aware of laws and regulations.
Impartial enforcement of laws and regulations is weak in both market systems but especially for the grain market system.
Disputes are more frequent among grain businesses, but perceptions of fair dispute resolution are more common among grain businesses compared to livestock businesses.
Taxation is viewed as excessive and burdensome, with triple-taxation occurring because of government, al-Shabaab, and illegal roadblocks.
Livestock actors are more vulnerable to roadblocks and interruptions in market access, which raise costs and threaten livestock and trekker safety.
Domain #7: Diversity
More grain actors (40%) use more than one supply channel compared with livestock actors (17%).
76% of livestock and 60% of grain actors reported only one supply channel.
Social perspectives regarding women participating in business activities are improving in both market systems.
Women in the grain market system are in higher opportunity segments.
Clans have an all-important role in the market, including access to finance, business linkages, and dispute settlement, leading to the exclusion of marginalized sub-clans.
Domain #8: Connectivity
Access to and use of finance were low in both market systems, but more grain actors (32%) did not know how to apply for a loan compared with livestock actors (12%).
Actors in both market systems, but especially grain, were confident in their ability to find new suppliers in case of a new shock (62% of livestock actors versus 81% of grain actors).
Linking social capital between market actors and influential individuals was present in both market systems, but linkages to clans and external businesses (such as exporters) were stronger in the livestock market system.
Clans are both an enabler for trusted relationships and a barrier to forming them; this is especially critical for the livestock market system, which depends upon linkages to other cities.

of resilience; differences in resilience in three domains, business strategy, diversity, and connectivity, were validated and further elaborated during the participatory workshop with GEEL Project staff and stakeholders representing the private sector and research institutes. The grain market system is noticeably more resilient in each of these domains. Regarding business strategy, grain business owners planned in advance, used multiple branding and advertising strategies, and emphasized customer

satisfaction. Qualitative data revealed that livestock actors tend to rely on friend and family networks for day-to-day business functions, and minimize investment in planning, advertising, and attracting customers and clients.

The grain market system also showed greater resilience in the diversity and connectivity domains, with women drawing on friend circles to access finance, albeit at a small scale. Grain actors were also more confident in finding alternate suppliers because of the high level of production and the fact that producers are essentially price takers. However, the livestock market system had strong connectivity through effective clan networks that support more widespread and higher value business linkages and ensure access to finance and insurance. Thus, although the livestock market system had greater capacity to leverage high-value activities, it was exclusive and therefore tended toward a reactionary response to shocks, rather than one that channels resources toward those who most need them.

Grain and livestock business owners showed similar levels of resourcefulness in tackling shared problems, leveraging networks, and forging alliances with varied actors, albeit with mixed outcomes. Although businesses generally described an open and competitive market system, differences in opportunities to access clan resources such as insurance and finance interfered with the ability of women and marginalized groups to advance into higher value activities. Al-Shabaab was reported to have a strong capacity to regulate the market and to exclude products and entire sub-clan groups, limiting free competition. The impacts were felt regionally and fell with greater weight on the livestock market system, which is higher in value.

Business recovery and adaptive strategies

To respond to our second research question, regarding the resilience domains and adaptive strategies that are most important for business recovery, we begin by assessing the shocks that occurred prior to the study period, before looking at recovery and the way adaptive strategies across different resilience domains facilitated adaptation. Businesses in the Bay and Bakool region were affected by a broad array of shocks during the period from July 2019 through June 2020. The most significant shock by far for grain was insecurity and conflict, which affected 47 per cent of grain businesses and 28 per cent of livestock businesses. Road closures because of insecurity affected 31 per cent of livestock businesses – more than any other type of shock – and 24 per cent of grain businesses. More grain businesses reported a greater variety of shocks; in particular, the locust invasion affected the supply base of 30 per cent of grain businesses, and the COVID-19 pandemic affected customers and suppliers for 27 per cent of livestock businesses. Overall, the non-producer market actors included in this study were more affected by security-related market interruptions than by supply-side shocks (Figure 2).

Remarkably, despite the broad range of shocks affecting grain businesses, grain actors recovered to a greater degree than livestock actors in a given time frame. Twenty-seven per cent of grain actors reported recovering and being better off than before the shock, compared with only 12 per cent of livestock actors (Figure 3).

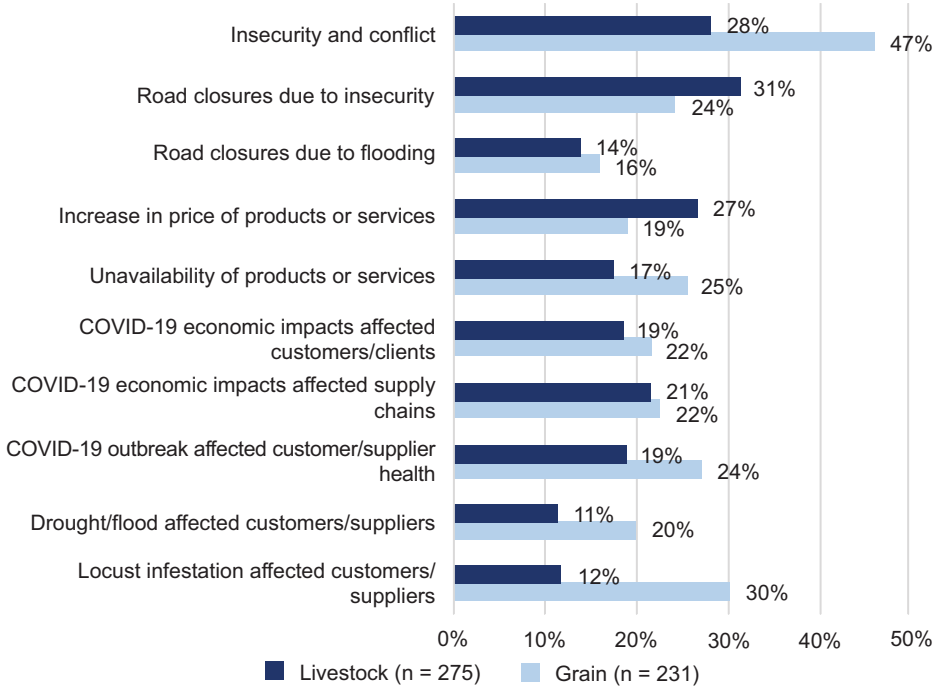

Figure 2 Shocks affecting at least 10% of businesses

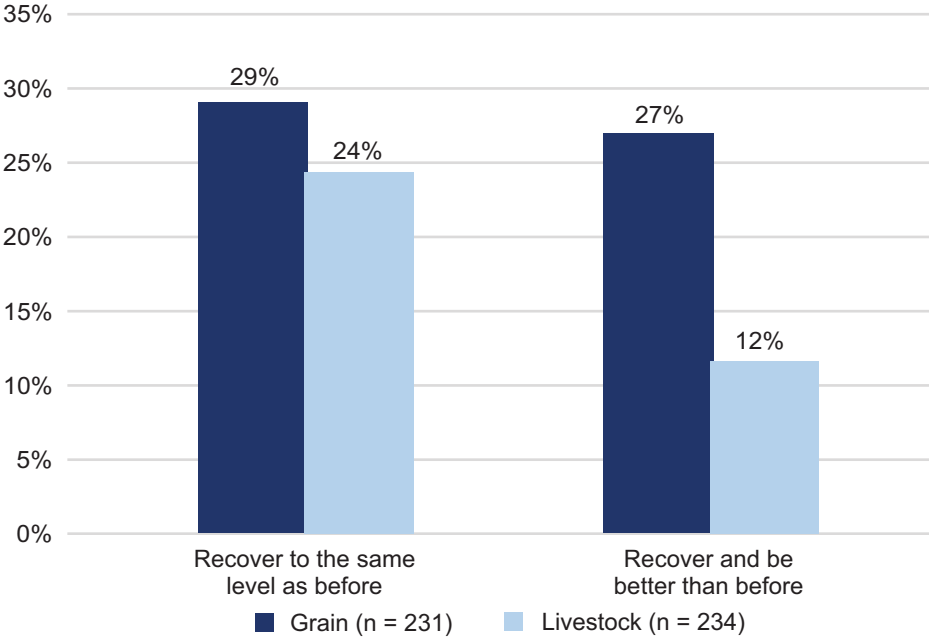

Figure 3 Percentage of businesses already recovered

Table 3 Results for the ordered logit regression model with marginal effects

Derivative of the marginal effects	*dy/dx*	*Std Err.*	*z*	*P>|z|*	*[95% confidence interval]*	
#1 No recovery	0.054	0.023	2.35	0.019	0.009	0.099
#2 Somewhat, but worse off	0.045	0.020	2.22	0.027	0.005	0.084
#3 Same as before	–0.037	0.016	–2.27	0.023	–0.069	–0.005
#4 Better than before	–0.062	0.027	–2.30	0.021	–0.114	–0.009
ologit model						
Obs.	463					
Prob > chi2	0.02					
P > |z|	0.020					

Another 29 per cent of grain businesses and 24 per cent of livestock businesses had recovered to the same level as before the shock. These results indicate that the greater resilience capacities noted across multiple domains for grain actors effectively enabled them to recover more quickly.

Given that the recovery options can be ordered from worst to best, we used an ordered logistic regression model (ologit) in Stata to compare recovery rates between the two market systems (Table 3). We found that livestock businesses were more likely to report lower recovery levels than grain businesses. Livestock actors, on average, were 6.2 per cent less likely than grain actors to say that their business had recovered and was doing better than before. Similarly, livestock actors were 5.4 per cent more likely to indicate that their business did not recover at all. Based on the model, the livestock market system appeared to have a harder time recovering from the shocks than the grain market system.

Although grain businesses implemented a wide variety of measures to adapt to shocks, 47 per cent of livestock businesses did not implement any at all (Figure 4). The most common adaptive strategy for grain businesses (36 per cent) was seeking out a new supplier/customer base, corresponding to strengths in the connectivity domain. In contrast, the most common adaptive strategy for livestock businesses was a family member migrating with the goal of sending remittances (19 per cent). Grain businesses were also likely to make new investments in their business (28 per cent), offer discounts on products and services (26 per cent), access markets in new locations (22 per cent), or make changes to products/services to grow their customer base (18 per cent), reflecting greater capacity for business strategy than livestock actors. These findings illustrate that greater resilience capacities are a key pathway to better uptake of adaptive strategies, an indicator of the resilience of businesses across the grain market system. For implementers, these results suggest that incentives in the livestock market system may not align with desired resilience outcomes. Together, findings related to shock exposure and the use of adaptive strategies can help to inform the key vulnerabilities and leverage points for targeted interventions.

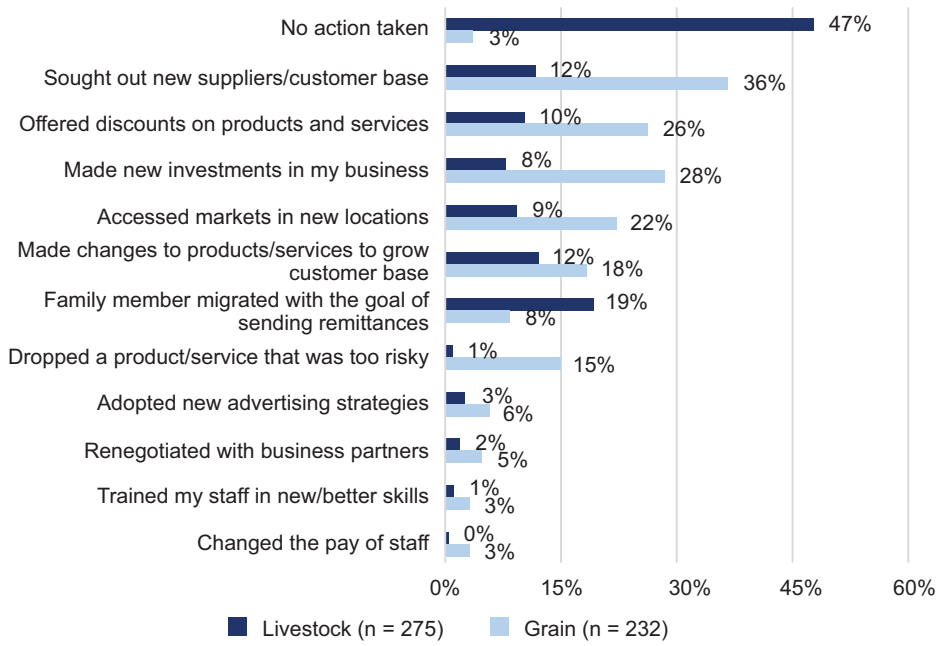

Figure 4 Livestock versus grain adaptive strategies (multi-select)

Discussion and recommendations

The MSR framework enabled us to compare the grain and livestock market systems in a more holistic way by looking at a broader set of characteristics than traditional value chain studies. For example, in programming, we often focus on increasing sales and market linkages; however, while livestock is unmistakably stronger on each of those dimensions, resilience is weak. Livestock actors' dependence on networks for growing their businesses rather than a customer orientation has resulted in a system that is ill-adapted to proactively managing the shocks and stresses prevalent in the operating environment. In contrast, results indicate that grain businesses recover more quickly and are more likely to take action to achieve recovery than livestock businesses. Although structural features of the livestock sector – such as the capital and length of time to breed and raise cattle – determine the length of time needed for recovery, the resilience domains shed light on multiple market characteristics that facilitate a faster recovery, which is critical for the shock-affected Somali markets. In this context, diversifying into petty trade in the grain market may present a viable pathway out of poverty for some grain producers.

The MSR framework also enabled us to generate contextualized learning applicable to USAID's resilience programming in the region. Key takeaways are as follows.

- Programming to support the availability of climate, security, and price-related information to an inclusive set of market actors is critical to the increased resilience of the two market systems. Platforms will need to consider low literacy

and the demographics of mobile phone ownership to strengthen the ability of small-scale and marginalized actors to readily prepare, adapt, and respond to major shocks.

- Roadblocks are a major shock to livestock market systems that require traders to make frequent adjustments to where they purchase or sell livestock. Future programming can support market information platforms that help traders, including those from marginalized groups, to know the price information in accessible markets.
- Veterinary products and services are dominated by a single professional association, which often blocks new market entrants and restricts competition. This is compounded by international donors' control of vaccination activities and NGOs providing free services or products – both of which are disincentives to new market entrants. Future programming needs to scale nascent agrovet services, while also supporting the Ministry of Livestock, Forestry, and Range to help re-align incentives.
- The ability of local traders to aggregate and sell grain in regional markets to offset supply and price shocks is limited. The burden of low prices gets passed to producers, the most vulnerable actors in the market system, who are increasingly affected by climate-related shocks. Future programming can increase the capacity of trader associations to negotiate better prices and access credit through a warehouse receipts programme and advocate for policy solutions to tax and infrastructure issues.
- There is a critical need for storage facilities and strong and inclusive producer cooperatives to manage storage during supply shocks, negotiate fair prices, and improve access to credit despite frequent shocks. However, to incentivize women's participation and ensure benefits flow to woman-headed households (often the most vulnerable), accountability systems must be put in place so that women members can give feedback, hold leadership positions, and influence outcomes.
- Both market systems, but especially the livestock market system, rely heavily on the clan system to solve problems, regulate the system, and support market actors during shocks. Business committees and other industry groups need to be strengthened to play a larger role. To further increase inclusion within these groups, petty traders and other low-capital businesses should be supported to participate.

Conclusion

The results of our study revealed key sources of resilience in two market systems that continue to function despite repeated shocks in South West Somalia. Numerous market constraints and dependence on an inherently exclusive clan system of justice, finance, insurance, and business network management severely undermine the resilience of both market systems, particularly women and marginalized clan groups. Nevertheless, sources of resilience can be found across the structural and behavioural domains of the market system.

Comparative strengths in the grain market system correspond to stronger recovery from shocks within the period of research. The results of our study showed that the grain market system, in which women play a more prominent role, is more resilient than the livestock market system. The grain market system has less discriminatory opportunities for forming networks and accessing informal finance, and greater diversity with respect to women's involvement. We find evidence of grain businesses' adaptive capacity in terms of the type and number of adaptive strategies used to recover from shocks. Producers of grain, however, are price takers, suggesting that the burden of risk mitigation falls to the most vulnerable actors who are also directly affected by climate change. Resilience-oriented practitioners must look for ways to rebalance risk across the market system by addressing unequal power dynamics, including institutionalized obstacles to women's economic empowerment, and promoting inclusive and effective forms of cooperation. Market functions serving smallholder producers will need to be emphasized, including storage capacity, access to finance, and access to inputs, particularly in support of climate smart practices.

Finally, increasing the value proposition of participation in the grain market is a key avenue to economic growth and assisting vulnerable groups. However, greater revenue could pose a risk to the currently diverse mix of business owners, unless mitigating measures are found, emphasizing the importance of working at the structural level in tandem with behaviour-focused interventions. Although more conceptual and empirical work is needed to lay the groundwork for evaluating the impact of market system strengthening on producer well-being, we believe the results of our study help illustrate the relevance and valuable insights to be generated by measuring MSR.

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