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Effect of COVID-19 on livestock value chain actors and food systems in northern Kenya



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Feed the Future Accelerated Value Chain Development (AVCD) Program

Effect of COVID-19 on livestock value chain actors and food systems in northern Kenya

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The Feed the Future Kenya Accelerated Value Chain Development (AVCD) program seeks to widely apply technologies and innovations for livestock, dairy and staple crop (root crops and drought-tolerant crops) value chains in order to competitively and sustainably increase productivity, contributing to inclusive agricultural growth, nutrition and food security in 23 counties in the country. Supported by the United States Agency for International Development as part of the US government's Feed the Future initiative, its main goal is to sustainably reduce poverty and hunger in the Feed the Future zones of influence in Kenya.

In partnership with the International Crops for Research Institute for Semi-Arid Arid Tropics (ICRISAT) and the International Potato Center (CIP), International Livestock Research Institute (ILRI) will lead the implementation of AVCD. The three CGIAR centres will work closely with partners—county governments, NGOs, CBOs, private sector actors and other USAID-funded projects/programs, as well as leverage knowledge and best practices from academic institutions and foundations.

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Abbreviations and acronyms

ASALs	Arid and semi-arid lands
AVCD	Accelerated Value Chain Development
CAHWs	Community animal health workers
CDRs	Community disease reporters
CHVS	Community health volunteers
CHWs	Community health workers
FtF	Feed the Future
KES	Kenyan shillings
Kg	Kilogram
LMAs	Livestock market associations
LVC	Livestock value chain
MT	Metric tones
PPEs	Personal protective equipment
PREG	Partnership for Resilience and Economic Growth
SMEs	Small and medium-sized enterprises
WFP	World Food Programme
WHO	World Health Organization
ZOI	Resilience Zone of Influence

Executive summary

The Novel Corona virus disease (COVID-19) caused by SARS-Cov-2 was first reported in Wuhan, Hubei province of China in December 2019 (Hamid et al. 2020). It was declared a pandemic by the World Health Organization (WHO) on 11 March 2020 (De Vito and Gomez 2020). SARS Cov-2 is genetically similar to SARS-Cov, the cause of the Middle East Respiratory Syndrome (MERS). By the time of writing this report (August 2020), the WHO had reported over 20 million confirmed cases of infection, 12.5 million recoveries and 740,000 deaths from the pandemic (WHO 2020). Besides health implications, industries have shut down, the transport sector brought to near stand-still and many factors of production rendered inoperable. Additionally, the containment measures introduced by governments to slow the spread of the virus, such as social distancing, restricted movements and lockdown, have inflicted varying social-economic effects to actors across most sectors of the economy (Gortázar and De la Fuente 2020).

Like many other governments worldwide, the Kenya government took strict measures to contain the spread of COVID-19. In addition to the World Health Organization (WHO) recommended protocols such as frequent handwashing, social distancing and wearing face masks, the government introduced a countrywide dusk to dawn curfew (1900–0500 hrs). As cases of COVID-19 increased, the government subjected Nairobi, Mombasa, Kwale, Kilifi and Mandera counties to a boundary lockdown, restricting the movement of people into and out of respective counties. In addition to lockdown in these counties, county governments required the enforcement of other prevention measures: social distancing, wearing of masks and a strict observance to curfew hours. In response to these measures, most events where people usually gathered, such as open-air markets, churches, mosques, ‘barazas’ (open-air meetings), were suspended. Some of the suspended activities such as livestock markets and restricted operations of butcheries and slaughterhouses are critical for the lives and livelihoods of people, particularly the pastoralist communities in the arid and semi-arid regions of northern Kenya.

The arid and semi-arid lands (ASALs) of northern Kenya are characterized by high incidence of poverty, acute malnutrition and deficient access to essential social services such as infrastructure, health, water and education facilities (Ref-vision 20230 on northern Kenya). This situation is depicted by low economic development, limited market integration, poor access to safe and diverse foods, inappropriate infant and young child feeding practices, erosion of traditional management systems, and generally lack of enabling policy environments to enhance the resilience of pastoralists amidst such risks and shocks in the region. The effects of COVID-19 are likely to exacerbate these challenges, putting additional stress on the already fragile economies in northern Kenya.

USAID funds the Accelerated Value Chain Development (AVCD) program under the Feed the Future (FtF) initiative and seeks to accelerate the reduction of poverty and malnutrition in Kenya through value chains approach. The AVCD livestock value chain component is one of the four value chains in the program and is implemented in the USAID resilience Zone of Influence (ZOI) semi-arid areas (SA3). The region covers five counties—Isiolo, Garissa, Marsabit, Wajir and Turkana. The project partners with the counties to scale up technologies and innovations in rangelands management, community nutrition, animal health service delivery and disease surveillance. It promotes activities focusing on improved livestock policy environment to catalyze community development that is driven by both the private and public sectors. These interventions aim at improving food and nutrition security for pastoralists through increased income pathways, empowerment, and production, inclusive agricultural and economic development, and enhanced resilience of communities and systems.

There is fear that the COVID-19 pandemic and its associated effects is likely to erode the gains made by the project in the areas cited above. This could potentially increase pastoralist’ vulnerability to various shocks and stresses, worsening their already fragile food and nutrition security which had begun to recover from recent excessive rainfall, flash floods and widespread desert locust invasion.

Given the above concerns, AVCD livestock component commissioned a study aiming to investigate how the pandemic has affected the livelihoods and food systems of actors along the livestock value chain, and how they have coped during this period. The findings of the study will provide AVCD program management, county governments and other Partnership for Resilience and Economic Growth (PREG) partners with useful data to enable evidence-based response to the situation at different levels.

Study methodology

The study was conducted between 29 May and 16 June 2020 and data collection was done through a phone-based survey. Both quantitative and qualitative techniques were employed to allow triangulation and to enrich information on the subject under investigation. This entailed administration of a structured questionnaire to a sample of 2,010 actors along the livestock value chain, with an overall response rate of 94%. The actors included livestock producer households, agrovets owners, community disease reporters (CDRs), community health volunteers (CHVS), abattoir/slaughter slab operators, butcheries, livestock traders, livestock market associations and livestock transporters. The study also interviewed associated businesses along the value chain including food kiosks (eateries)/food vendors, motorcycle transporters (*boda-boda*), cereals and pulses traders, and fruits and vegetables traders.

Furthermore, to supplement and triangulate the information collected from the other actors, the study conducted key informant interviews of county government officers. The following officers were selected for interview in each county: county directors of veterinary services, county directors of livestock production, county directors of agriculture, chief finance officers, heads of economic planning and budgeting, finance/budget/revenue collection, county nutrition coordinators, county directors for special programmes/special duties/disaster management and early child education. Self-administered questionnaires were sent to the officers which they filled and returned to the study team.

Quantitative data analysis was conducted using SPSS to generate descriptive and cross-tabulation data for reporting. Similarly, qualitative information from county officers was organized in themes and concepts which were interpreted to inform the findings reported here. This report provides key findings from the study which can be used by AVCD, ILRI, USAID and other development partners for evidence-based communication and planning purposes.

Key findings

The measures introduced by the government to control the spread of COVID-19 pandemic had devastating effects on a wide range of actors along the livestock value chain. Different actors responded to the evolving adverse situation with a variety of coping mechanisms.

Livestock producers faced the greatest brunt. They had a significant reduction in the mean household income caused by the closure of livestock markets in some counties (Isiolo and Marsabit) and a general reduction in prices of livestock affecting nutrition and consumption behavior of the people. Findings show that there was a reduction in food availability (as a result of increased prices and lower incomes), lower dietary diversity, and reduced quality and quantity of food consumed.

The pandemic also affected service providers such as agrovets; livestock transporters; community health volunteers; community disease reporters; businesses such as food kiosks, butcheries, *boda-boda* transporters and livestock traders. In addition to reduced demand for their services, these livestock value chain actors experienced sudden loss of business due to the measures introduced by government to prevent the spread of COVID-19.

The county governments also experienced the effects of COVID-19. Much of the financial resources from sectors such as agriculture, livestock production, veterinary services, health and nutrition and extension services have been redirected to emergency COVID-19 response. Redirection of resources from these sectors meant that critical services such as agriculture and livestock extension, nutrition education, animal disease surveillance and response were reduced. This situation is likely to lead to reduced agricultural production, rise in animal diseases, and a resurgence of malnutrition and other health-related issues at the community level.

In response to the challenges caused by COVID-19 prevention measures, different actors adopted various coping mechanisms including eating fewer meals per day, diversifying income generating mechanisms, changing businesses and scaling down activities.

The study concludes that addressing the aftermaths of COVID-19 will require concerted efforts by the national and county governments and development partners to support livestock actors to deal with the specific impacts identified in this study and to support communities to mitigate the potential adverse effects.

I Introduction

The novel Corona virus disease (COVID-19) was first reported in Wuhan, Hubei province of China in December 2019. The disease has since ravaged the whole world with global infection and death reaching unprecedented levels. The global spread of COVID-19 led WHO to characterize the infectious disease as a pandemic on 11 March 2020. By August 2020, WHO had reported over 20 million confirmed cases of infection, over 12.5 million recoveries and about 740,000 death from the pandemic. Besides human deaths, industries have been shut down, both road and air human transport sector brought to a stand-still and many factors of production rendered unproductive. Additionally, measures introduced to contain the disease, such as social distancing, restricted movements and lock-down of many aspects of economies, have tremendously affected the production and distribution of goods and services. With thousands of people infected by the virus, the disease has further deprived the economy of the much-needed labor force vital to engage in production. In a situation where consumption is increasing amidst declining production, this has led to serious deficits in the economies of many countries globally, including Kenya.

In Africa, the disease had been reported in all 54 countries. By 23 June 2020, it had claimed 5,000 lives, with about 225,000 cases reported. Kenya reported its first coronavirus disease (COVID-19) case in March 2020. By 30 June 2020, COVID-19 had been reported in 43 out of the 47 counties of Kenya with a total of 6,366 confirmed cases and 148 deaths. The majority of all the 15 counties where Accelerated Value chain Development (AVCD) Program operates have reported at least one case. The worst hit was Wajir, which had reported 20 confirmed cases as of June 2020.

In response to the outbreak, the Kenya government took strict measures to contain its spread countrywide. In addition to the WHO recommended protocols such as frequent handwashing, social distancing and using face masks, the government introduced a dusk to dawn curfew with restricted movements of people. Only vehicles with goods and food supplies could be allowed to traverse counties. As the rise in COVID-19 cases increased, government decided to put some counties under lock-down with restricted movement of people. Counties which were affected by the lockdown included Nairobi city, Mombasa, Kwale, Kilifi and Mandera.

The northern part of Kenya is mainly arid and semi-arid land (ASALs) with high incidences of poverty, acute malnutrition and very low access to basic social services such as infrastructure, health, water and education. A complex web of factors contributes to this situation. This manifests as low economic development, limited market integration, poor access to safe and diverse foods, inappropriate infant and young child feeding practices, erosion of traditional management systems and lack of an enabling policy environment which reduce the ability of pastoralists to successfully manage these risks. Climate change, declining pasture productivity and water resources further increase stress to pastoral economies with livestock losses, severe hunger, malnutrition and increased inter-ethnic conflicts that often result in deaths.

The Accelerated Value Chain Development (AVCD) program seeks to contribute to the USAID Feed the Future (FtF) country plan, and subsequently contribute to the agricultural sector development objectives of the Government of Kenya. The program is implemented by the International Livestock Research Institute (ILRI) and is structured in a value chain approach. Livestock value chain is one of the program components and is implemented in five counties—Turkana, Garissa, Wajir, Isiolo and Marsabit. The component interventions seek to enhance the capacities of the pastoralists to manage current and future climate-related risks, increase pasture productivity and water resources and mitigate against resultant stresses. Such interventions require not only more public and private sector investment but also sustained support to the reforms and development of the agricultural and health sectors, spearheaded by both the national and county governments with support from development partners. The component focuses on FtF interventions in animal health, rangeland management and nutrition at the county level, all aimed at reducing hunger and poverty while enhancing food and nutrition security. The impact of COVID-19 is likely to erode the resilience

capacities of the pastoral communities in the project area and increase their vulnerability to various shocks and stresses, hence, worsening the food and nutrition security situation in the counties that are recovering from recent flush floods and widespread desert locust invasion.

In terms of nutrition, the COVID-19 health crisis can potentially turn into a food crisis and further aggravate disease burdens. Resilience and nutrition are intrinsically related; well-nourished populations are more resilient to disease shocks and stresses because their immunity is strong, they are more resistant and recover faster from diseases. On the other hand, malnourished populations are less resilient, prone to frequent infections and take longer to recover from diseases. This diverts family labor and income that otherwise would have been used for food and nutrition benefits. Model predictions, initial empirical evidence and experiences from previous crises indicate that COVID-19 will bring about a food crisis with the economically fragile countries suffering more, leading to reduction in food consumption and in nutrition status (Reardon et al. 2020).

The purpose of the study was to investigate how the pandemic had affected the socio-economic welfare, food systems and coping mechanisms of the people and local institutions among the pastoralist communities in northern Kenya, and how people and local partners were coping. For instance, the northern region of Kenya is the main source of red meat for the city of Nairobi and other major towns in Kenya. Yet, this production is dependent on flourishing livestock markets and effective transportation for animals and traders, which were both disrupted by the movement restrictions imposed by the government as a measure of containing the spread of COVID-19 pandemic. Although restrictions on movement, closure of markets and the borders with Somalia and Tanzania were aimed at minimizing community transmission, the same caused disruption of food supply chains for meat, fruits, vegetables, pulses and cereals in and out of the study counties. Like most other African countries where the pandemic has mainly been confined to capital cities, infections in Kenya have largely been reported in major cities of Nairobi and Mombasa. The measures were therefore meant to minimize COVID-19 spread from cities to the rural areas. In addition, livestock markets in the ASALs have become economic hubs that go beyond livestock sales becoming important sources of other food commodities like cereals and pulses.

Results from this study provide critical information on the extent of damage to people's livelihoods, identify community and institutional resilience mechanisms that need to be reinforced and recovery interventions that AVCD and other partners can support in their response to rejuvenate the local economy from the effects of COVID-19. The results may help to structure, streamline, prioritize and guide any intervention towards the affected people. Results may also be helpful in creating synergy and coordination among partners in support of the local governments' initiatives towards rebuilding the affected communities. In addition, the study findings to some extents have quantified the effects of COVID-19, which might provide county governments with useful data to enable better planning in case of future pandemics. Also, results from the study might form a baseline situation for any future related studies, mitigation, or response measures undertaken by county and national governments, ILRI and its partners. The study provides some recommendations that should enable pastoralists, traders and other livestock market participants and county governments to cope better during and post-COVID-19 recovery phase. Part of the recommendations identified include interventions where the project and other partners would optimally respond during the current phase of the crisis in addressing the needs and priorities of project beneficiaries.

2 Methodology

The study was conducted between 29 May and 16 June 2020 and data collection was done through a phone-based survey. Both quantitative and qualitative techniques were employed to allow data triangulation and to enrich information of the subject under investigation. This entailed administration of a structured questionnaire to a sample of 2,010 actors along the livestock value chain, with an overall response rate of 94%. The actors included producer households; agrovets owners; abattoirs, slaughter slab and slaughterhouses; butcheries; livestock traders; livestock market associations and livestock transporters. Other actors included in the study were food kiosks, vendors and eateries; motorcycle transporters (*boda-boda*); cereals and pulses traders; fruits and vegetables traders; community health volunteers (CHVS) and community disease reporters (CDRs).

In addition, the study conducted key informant interviews targeting county government officers. The information collected from this category of respondents was meant to supplement and triangulate the information collected from the other actors. Consequently, the following officers were selected as respondents in each county: county directors of veterinary services; county directors of livestock production; county directors of agriculture; chief finance officers; heads of economic planning and budgeting; finance, budget and revenue collection; county nutrition coordinators; county directors for special programs, special duties and disaster management; and early child education. Self-administered questionnaires were sent to the officers which they filled and submitted to the study team. Quantitative data analysis was conducted using SPSS to generate descriptive and cross-tabulation data for reporting. Similarly, qualitative information from county officers was organized in themes and concepts which were interpreted to inform the findings reported here.

2.1 Quantitative design and sample size calculation

The study used a cross-sectional design which involved key actors along the livestock value chain in the target counties (Turkana, Wajir, Isiolo, Garissa and Wajir). These included livestock producers, animal health service providers, market actors and key informants. Suppliers of other food items including vegetable, fruits, pulses and cereals were also included.

The number of livestock producers recruited for the study was determined using a formal sample size determination technique. The sample size estimate was derived considering the following assumptions.

- The study assumed that COVID-19 would reduce the ability of a subject to access services and pursue his/her livelihood activities. It was further assumed that this effect could be represented by a score whose standard deviation would be 0.6. This was in reference to a previous study that used a similar approach to assess poultry value chain actors' knowledge, attitude and practices on HPAI control measures in the high potential areas of Kenya with estimated mean scores ranging between 2.8–3.5, and a standard deviation ranging between 0.6–0.9 (John and Sam 2009).
- The desired precision of the effect would be 5%, and that the score would be estimated with a confidence of 95% using a 2-tailed test.
- A small proportion (about 20%) of selected subjects would decline to participate in the survey due to various reasons including lack of access to a mobile phone. In this case, the naïve sample size was amplified by 20%.
- Analyses for confounding and interactions would be done; an adjustment of 30% was used for this purpose.
- Multivariable models that account for occupation, education, etc. of the subjects would be used to determine the effects of COVID-19 on scores. The estimation of model parameters for each of the variables used would require adequate number of records (e.g. for each covariate pattern while using logit models).

The sample size of 798 for producers was distributed equally to all the five counties, allocating 180 producers per county. A multi-stage random sampling technique was then used to identify specific producers to sample from each county. The first step involved the selection of 10 sub-locations from each county. A sampling frame that included sub-counties that had access to phone was established and used for this purpose. A random sample of 13 sub-locations was drawn from each county without replacement. The extra three sub-locations were used for replacement of any of the selected sub-location if it was deemed not usable due to challenges with mobile phone network, or if the chiefs and sub-chiefs in the area declined to participate. After this, a list of households that keep livestock in the selected sub-locations was drawn with the help of sub-chiefs, village leaders and community disease reporters. The main inclusion criterion for a subject was ownership of livestock. Heads of households could delegate the interview to a member of their household provided the respondent was older than 18 years.

For the other actors, including traders, transporters, vegetable vendors and others, a sample sizes of 30 per county was used. This is the smallest sample size that is required for statistical inferences to be made. Participants were selected randomly using lists obtained from their welfare organizations.

2.2 Qualitative design

Key informants at county level were selected dependent on the role of the department and how it is associated with AVCD-Livestock project work in the county. Consequently, the following officers were selected as respondents: (i) directors of veterinary and livestock services, (ii) directors of agriculture, (iii) directors of finance/budget/revenue collection, (iv) directors of nutrition, (v) directors of special duties/disaster management, and (vi) directors of early child education. A structured open-ended interview guide was sent to the officers to fill at their convenience. The approach was to enable the officers to complete the questionnaire at the appropriate time, allow them to cross-check information and provide the relevant details required. Each of the officers filled the questionnaire and submitted them to the study team for analysis.

2.3 Data collection

Data was collected from different value chain actors primarily through phone using multiple tools including Likert Scale questionnaires, structured forms and checklists. These tools were pretested before being used. Enumerators were recruited competitively and trained on the questionnaire. During the study, each enumerator was assigned a group of randomly selected respondents from a randomly selected sublocation. The enumerators were placed in a single large hall under a supervisor and made phone calls to each of the respondents assigned while at the same time filling the questionnaire tool. The quantitative tool was filled using an Open Data Kit (ODK) fitted android phone. At the end of each day, a team in Nairobi responsible for data management accessed filled questionnaires from all the enumerators and checked them for consistency, completeness and alignment with the targeted respondents. Likert scale questionnaires were administered to producers, animal health service providers, traders, slaughterhouse workers, butchers, food vendors and transporters. The questionnaire collected background information on age, sex, education, religion, location and number of livestock owned. Likert Scale items using five-point scale—strongly disagree, disagree, neither disagree nor agree, agree and strongly agree—were included in the questionnaires to obtain perceptions on the impact of COVID-19 on the livelihood activities of actors. Additional questions were provided to gauge the actors' knowledge on COVID-19 control measures. Furthermore, open-ended questions were included in the questionnaires to collect more information that could explain responses captured using Likert items. Enumerators collected all the data using ODK forms.

Data collection through phone interviews was carried out for five days and achieved a 94% response rate which was considered relatively high given the challenges of administering phone surveys.

2.4 Data management and analysis

The enumerators submitted data collected at the end of each day to an online database hosted at ILRI in Nairobi. The data was cleaned by correcting coding and numbering errors before they were analyzed and exported to SPSS statistical software for analysis. Initial descriptive statistics on each questionnaire item was done to determine trends and identify items that required further cleaning.

The open-ended questions were analyzed using text mining approaches. Analyses on losses/profits made by selected actors such as agrovets were analyzed. The basic components of the analyses focused on: (a) revenues i.e., the value of goods or services an actor sold/provided in the period, (b) costs of goods and services i.e., direct and indirect costs of goods and services and other incidental costs. From these cost components, gross and net profit margins were determined by month.

3 Results

3.1 Characteristics of respondents

3.1.1 Number of market actors interviewed

A total of 2,010 sampled respondents in five counties willingly took part in the study. Study participants were drawn from 13 actors within the livestock value chain and food system in the target counties. They included livestock producers (798); boda-boda operators (144); fruits and vegetable vendors (132); community disease reporters (130); community health volunteers (123); butchery operators (113); traders of cereals and pulses (103); livestock traders (110); food vendors, kiosks and eateries (108); livestock transporters (90); livestock marketing associations (73); agrovets operators (63); and slaughterhouse managers/proprietors (19). Table 1 shows the distribution of respondents by the type of actor across the five counties. Producers formed the largest proportion of the actors (40%) and were well represented in all the counties except Isiolo where the number was lower than the average. The other actors were also well represented with the majority approaching the target of 30 except for abattoirs/slaughterhouses. It turned out that these were not as many as expected in any of the counties. In Turkana County, the number of agrovets, livestock traders, food kiosks and traders in cereals and pulses were generally lower than in other counties perhaps reflecting the level of commercial activities in that county.

Table 1: Distribution of actors by county.

SN	Livestock value chain actor	County					Total	%
		Isiolo	Marsabit	Garissa	Wajir	Turkana		
1	Producer	76	105	225	212	180	798	40%
2	Agrovet	14	11	25	13	4	67	3%
3	Abattoir/slaughter slab/slaughterhouse	7	4	2	2	4	19	1%
4	Butchery	18	18	26	30	21	113	6%
5	Livestock traders	26	20	30	29	5	110	5%
6	Livestock market associations	19	20	9	18	7	73	4%
7	Livestock transporter	16	17	12	21	24	90	4%
8	Food kiosks/vendors/eateries	30	13	28	29	8	108	5%
9	Boda-boda business	30	27	30	29	28	144	7%
10	Trader of cereals and pulses	30	21	15	29	8	103	5%
11	Trader of fruits and vegetables	31	30	29	30	12	132	7%
12	Community health volunteers (CHVS)	23	21	29	30	20	123	6%
13	Community disease reporters (CDRS)	32	19	29	30	20	130	6%
Totals		352	326	489	502	341	2010	100%

3.1.2 Mean ages of participants by county

The average mean age of the participants in the five counties was 40.7 years (Table 2). The lowest mean age was recorded among the boda-boda operators (mean = 30), while the highest mean age was among the slaughterhouse proprietors (mean = 52). Among the counties, the lowest average mean age was recorded in Turkana (37.7), while the highest mean age was recorded in Wajir (40.9). An interesting feature of this data is that the majority of the value chain actors are below the age of 40 years, which is an indication of a healthy labor force in the ASAL food systems and livestock value chains.

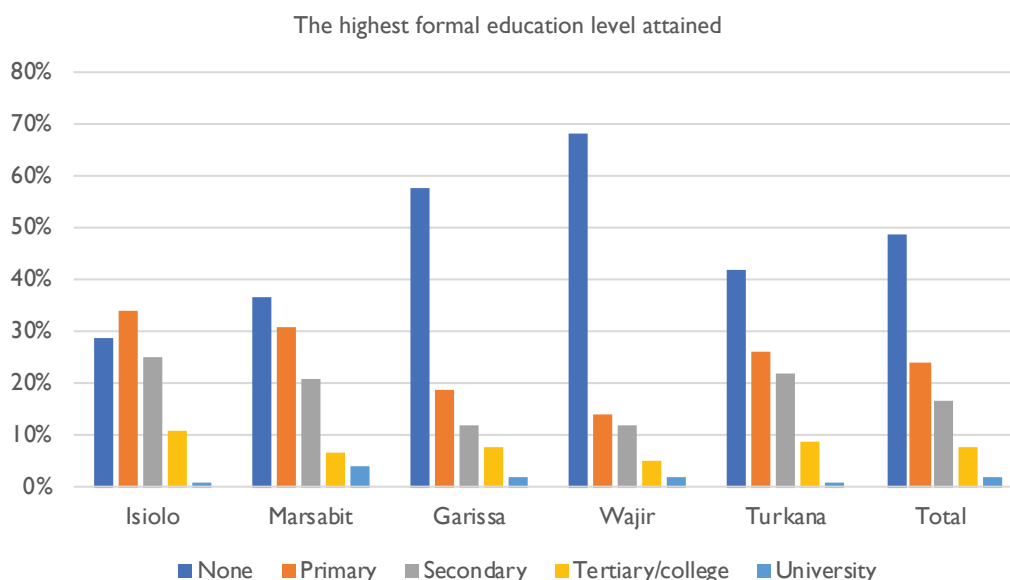
Table 2: Mean Age distribution by county.

Livestock value chain actor	County					Total	Total N
	Isiolo	Marsabit	Garissa	Wajir	Turkana		
				Mean			
Producer	38	36	40	41	36	39	798
Agrovet	43	35	36	39	36	38	67
Abattoir/slaughter slab/slaughterhouse	58	51	46	37	51	52	19
Butchery	45	44	49	43	37	44	113
Livestock trader	43	45	51	47	37	46	110
Livestock market associations	50	47	46	58	46	50	73
Livestock transporter	38	38	40	43	33	38	90
Food kiosks/vendors/eateries	36	38	37	34	39	36	108
Boda-boda business	29	26	33	31	32	30	144
Trader of cereals and pulses	37	38	37	41	35	38	103
Trader of fruits and vegetables	39	35	32	37	33	36	132
Community health volunteers (CHVS)	38	32	40	45	37	39	123
Community disease reporters (CDRS)	38	51	42	47	38	43	130
Average mean ages per county	40.9	39.7	40.7	41.8	37.7	40.7	

3.1.3 Level of education by county

The highest number of respondents who didn't have formal education was recorded in Wajir (68%), followed closely by Garissa at 58%. The lowest number of respondents who didn't have formal education was recorded in Isiolo (29%). The highest number of respondents with secondary and tertiary education was also recorded in Isiolo with 25% and 11% respectively. The lowest attainment of secondary and tertiary education was recorded among respondents in Wajir County with 12% and 5% respectively.

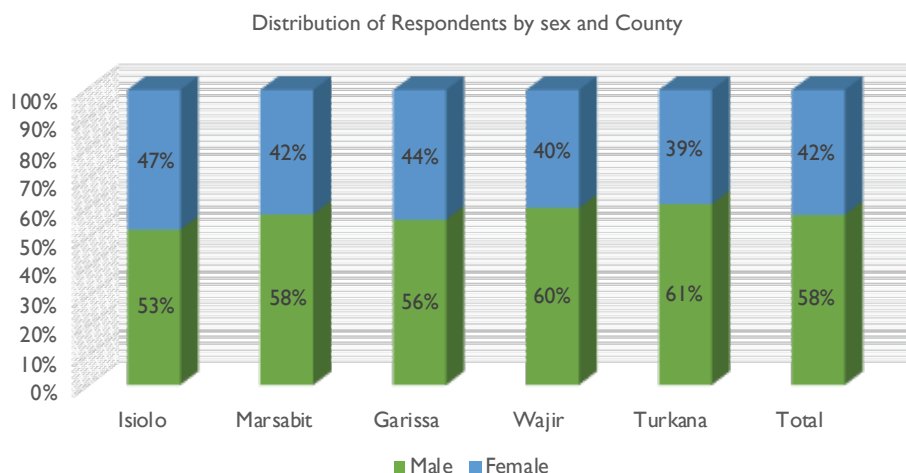
Figure 1: Distribution of respondents' level of education by county.



3.1.4 Respondents' sex by county

Overall, 58% of the participants in the study were male. Turkana recorded the highest number of males interviewed at 61%, with Isiolo recording the lowest percent of men interviewed (53%), meaning Isiolo had the highest percent of females interviewed at 47%. The gender distribution observed in the study is consistent with the population census of Kenya (2019) in the respective counties.

Figure 2: Distribution of respondents by sex and county.



3.1.5 Occupation by county

Out of the 798 producers interviewed, 77% had no other occupation apart from their primary enterprise of livestock keeping. Of the 23% producers who indicated that they had an additional occupation, 40% were from Garissa, 32% from Wajir, 13% from Isiolo, 12% from Turkana and 3% from Marsabit (Table 3). Additional occupation among pastoralists is considered as a risk management strategy due to a host of challenges which affect their livelihoods such as, droughts, animal diseases, pasture and water resources competition, and intermittent conflicts (Deng 2010).

Table 3: Additional occupation by county.

County	Additional occupation		
	No	Yes	Overall
Isiolo	9%	13%	10%
Marsabit	16%	3%	13%
Garissa	25%	40%	28%
Wajir	25%	32%	27%
Turkana	26%	12%	23%
Total	77%	23%	100%

3.2 Effects of Covid-19 on value chain actors

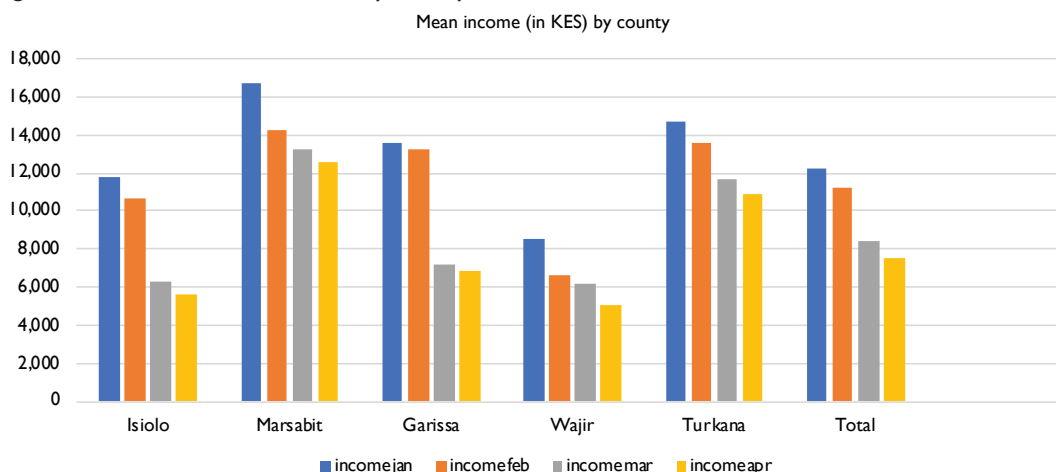
3.2.1 Producers

3.2.1.1 Household incomes

The study sought to assess how COVID-19 prevention measures affected household incomes for livestock producers in the five target counties. COVID-19 prevention measures led to the closure of major livestock markets, leading to disruption to the most reliable source of income for the pastoral communities. Findings from the study illustrate a drastic fall in the average incomes of producers across the target counties. The mean income per household declined by 38.9% during the period from January–April 2020 (Figure 3). In some counties such as Isiolo where all primary markets were closed, the drop was even higher at 52%.

In a situation of diminished farm-derived incomes, some households typically fall back to non-farm incomes. Asked whether they received income from any other business activity during this period, 85.6% of the respondents reported they had not received any income. Moreover, about 87% of respondents indicated that none of their household members had received any income from casual/wage job during the same period. Similarly, about 92% of the respondents reported that none of their household members had received income from salaried employment. Therefore, the situation implies that about 90% of the households did not have any non-farm supplementary income.

Figure 3: Mean household income by county.

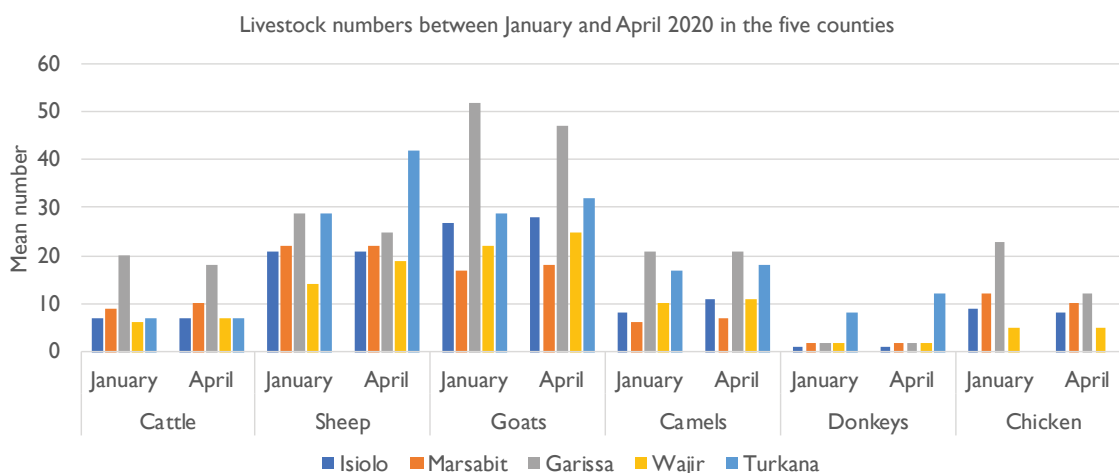


Such a dramatic fall in household income paints a grim picture of the household food and nutrition security. It further increases the risk of associated malnutrition consequences, especially among the vulnerable members of the household such as children under 24 months, pregnant and lactating mothers, the sick and elderly. The pertaining situation is likely to deteriorate if the current suspension of livestock markets is maintained, leading to weakening the already overstretched resilience capacity of households, who might potentially slip into the category of households' dependent on relief food supplies.

3.2.1.2 Livestock assets

Figure 4 summarises the average number of various livestock species raised by respondents between January (before COVID 19) and April during (COVID 19) 2020 in the five counties. All the main livestock species were kept by producers in all the target counties, probably as a risk mitigation strategy and in line with the various roles played by livestock in the livelihoods of pastoral communities. In terms of numbers, sheep and goats were the largest followed by camels, cattle and chicken in that order. Understandably, donkeys, which are mainly used for transport, were the least. A surprising finding was the widespread raising of chicken in all the counties except Turkana. This is a recent trend among the pastoral communities and could be a response to climate variability leading to further diversification of livestock.

Figure 4: Changes in livestock numbers between January and April 202 in the five northern Kenya counties.



There was no major change in the number of livestock between January and April in any of the counties. In some counties, the average number of some species changed between January and April but not by a huge margin. For instance, in Garissa, the average number of sheep dropped from 29 to 25 while that of goats dropped from 52 to 47. In Turkana, the number of sheep increased from 29 to 42 between January and April. However, the average number of chickens dropped between January and April in all the counties, although the drop was not significant given that the average numbers were already low (Figure 4).

3.2.1.3 Sales of livestock

The fall in household income was mainly due to the inability of producers to sell their livestock and the lower prices of livestock. A small majority (53%) of respondents said they could not sell their livestock due to COVID-19, but about 43% of the producers were able to sell their livestock although it was at distressed farm-gate prices offered by middlemen.

Table 4 summarises the average number of livestock species sold per household in the five counties between January and April 2020. On average, most households sold small livestock species such as chicken, goats and sheep compared to larger species like camels and cattle. In terms of counties, there were more sales of livestock species per household in Garissa and Isiolo compared to Marsabit, Turkana and Wajir.

Table 4: Average number of livestock species sold per household in the five counties.

Livestock species	Average livestock sold between January–April by county					Average total (n=798)
	Garissa (n=225)	Isiolo (n=76)	Marsabit (n=105)	Turkana (n=180)	Wajir (n=212)	
Camels	1	0	1	0	2	1
Cattle	4	2	2	1	2	3
Chicken	20	3	2	0	1	6
Goats	5	7	4	3	3	4
Sheep	5	7	4	3	3	4

3.2.1.4 Household consumption and nutrition

(a) Effects on food availability and access

The effects of COVID-19 impacted both the demand and supply side of the food system affecting both the available food at the markets or households and the purchasing power of households. Typically, households sourced their food from food kiosks, open-air markets, supermarkets, groceries, mobile vendors and neighbors. Some farmers also produce their food such as milk and vegetables particularly by farmers with kitchen gardens. Study findings show the proportion of those who sourced fruits and vegetables from mobile vendors sharply dropped from 5.6 to 3.1% between January and April 2020, while those who sourced the same foodstuffs from open-air market dropped from 54.1 to 45.2% during the same period. Equally, those who accessed cereals and pulses from open-air markets dropped from 41.5 to 38.6% during the pandemic.

Sourcing milk from milk shops increased from 8.3 to 10.3%, while those who obtained milk from neighbors increased from 4.5 to 6.0% over the same period. Likewise, those who accessed milk from mobile vendors dropped from 2.6 to 1.3%. These changes might be from heightened anxiety among people about the spread of COVID-19 in the early phase of the pandemic. People were worried about possible infection from strangers and the effectiveness of social distancing, preferring more familiar sources like neighbors and shops. The reduced food source options led to limited food availability for household consumption.

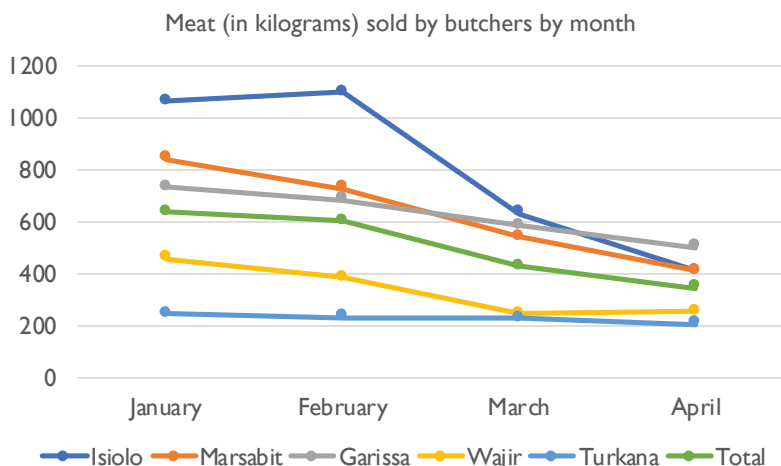
Furthermore, access to food at household level was affected due to high food prices coupled with reduced household income during the COVID-19 pandemic. The findings indicated that 99% of the respondents across the five counties incurred a reduction in businesses and wages. The movement restrictions and closure of some major livestock markets, for instance in Isiolo and Marsabit, resulted in reduced food supply raising the cost of food. Moreover, most of the livestock markets are equally commercial hubs for other food commodities such as pulses, fruits and vegetables. The few markets that remained open reported a slow-down in the volume of businesses. The decrease in the volumes of sales was also occasioned by decreased demand and less trading time due to curfew.

Furthermore, traders indicated an increase in their operational costs because they were required to procure materials related to COVID-19 preventive measures such as setting up washing areas, and making available sanitizers, masks and soaps. For instance, 86.1% of the butchers reported incurring additional costs and this varied between 539 Kenyan shillings (KES) in Marsabit (lowest) to KES2,618 in Wajir (highest). Also, household incomes were affected due to movement restrictions between counties. These restrictions mainly affected the unskilled labor coming from other counties. Such labor was mainly in the agriculture and construction sectors.

(b) Effects on food consumption

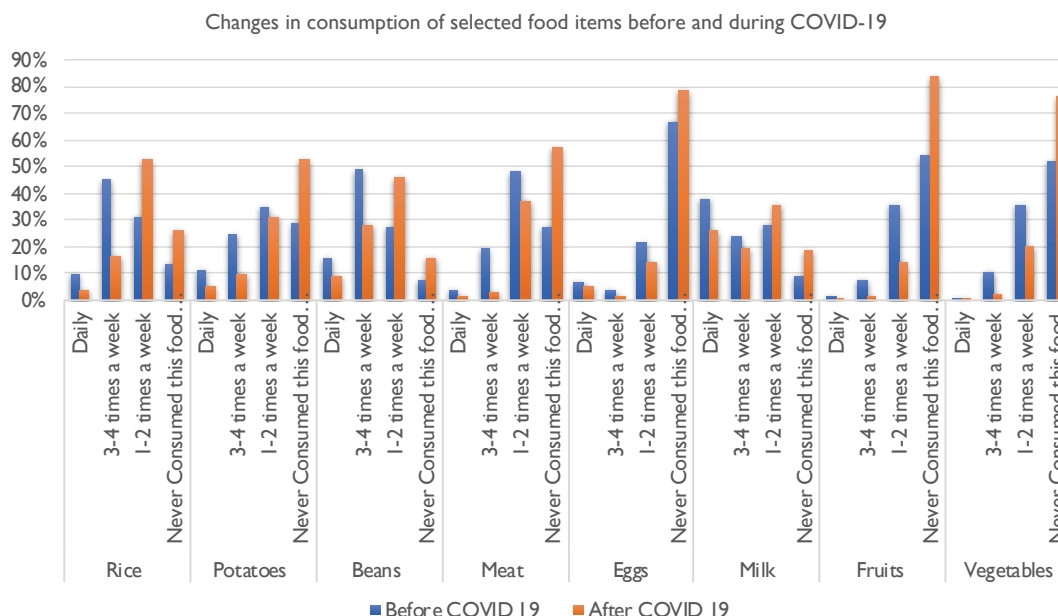
Overall, the study found a reduced frequency in the consumption of fruits, meat, eggs and vegetables among all the value chain actors demonstrated by the amount of meat in kilograms sold during the period between January and April 2020 across the five counties (Figure 5). The reason was due to reduced availability and high prices. However, the frequency in the household consumption of rice and beans grew from once to twice per week.

Figure 5: Meat (kg) sold between January and April 2020 by county.



On average, frequency of consuming rice and beans once or twice a week increased from 31.0 and 27.4% to 52.8 and 46.4% respectively during COVID-19, indicating a significant reduction in access to diversified nutritious foods. The findings show that most people shifted from animal protein to plant-based protein, possibly due to factors of availability and affordability. Similarly, the proportion of people who did not consume certain types of foods in the week preceding the interview increased across all the counties, an indication of reduced dietary diversity. The proportion of respondents not consuming cereals and pulses in the previous week increased from 1.4 to 3.0%. In comparison, those not consuming milk in the same period increased from 2.4 to 4.1% between January and April 2020.

Figure 6: Consumption of selected food items before and during COVID-19.



Furthermore, the study revealed a reduction in the number of meals consumed by households per day. Of significant concern was an observation of the reduction in the frequency of consumption of recommended food groups. Consumption of fruits, vegetables and meats had the most significant drop in frequency during the COVID-19 period as shown in figure 6. Unfortunately, these are protective and body-building foods that are mostly needed for a healthy body and the strong immunity required to fight infections, including COVID-19.

(c) Effects on nutrition outcomes

The COVID-19 preventive measures have had effects on the underlying causes of malnutrition such as household food security and care practices and utilization of health and nutrition services due to suspension of routine supervision at health facilities and nutrition education at the community level in all the counties. Ante-natal and post-natal services were also greatly affected. County nutrition coordinators reported that more women were delivering at home for fear of infection while travelling to health facilities or at the health facilities, or for fear of not finding healthcare workers to attend to them. Early initiation of infants to the breast within the first hour of birth is likely to have declined during this period.

At the onset, the government directed a halt to preventive services except for children below 12 months who were still receiving immunization. As a result, counties reported sharp declines in supplementation of Vitamin A, Iron and Folic Acid micronutrients; reduced uptake of family planning services and deworming. Growth monitoring for children as required by the WHO guidelines for children under five years of age was equally affected. Community health service delivery, including one-on-one counselling and household visits drastically reduced. This led to limited monitoring and follow-up on appropriate infant and young child feeding practices, including exclusive breastfeeding.

The above sudden changes will potentially have adverse effects on the short- to long-term nutrition and wellbeing outcomes of the most vulnerable, mainly women and children under 23 months. Similarly, reduced livestock production and trade lowered incomes for the producer households, reducing their purchasing power for diverse nutritious foods and insufficient quantities, potentially worsening their nutrition outcomes.

3.2.1.5 Access to animal health products and services

Overall, most producers (53%) reported that they were no longer able to purchase veterinary drugs or farm inputs/equipment from the local agrovet shops since the COVID-19 pandemic. This was either because the inputs were not available at the local veterinary shops, or due to lack of money to purchase the inputs. Furthermore, 70% of the respondents reported that they could no longer access the local animal health assistant or a veterinarian for advice since the outbreak of the COVID-19 pandemic. This finding corroborated the information obtained from the County Directors of Veterinary Services. They indicated that their extension work was significantly curtailed for fear of contracting or spreading the virus. This is a matter of concern because it pauses potentially harmful implications to animal health management during this period. Normally, livestock keepers obtained animal health advice from their local animal health assistants on possible diagnosis and procure the appropriate drugs from agrovet shops.

However, these observations were not similar across the five counties. In Isiolo, 80.6% of the respondents reported that they could purchase veterinary drugs or farm equipment from their local agrovet shops. In Turkana, a smaller majority of the respondents also reported that they could access veterinary drugs. The reverse was the case in Wajir where 70.3% of the respondents reported that they could not purchase any veterinary drugs from their local agrovet shops. Similarly, a smaller majority in Marsabit (54.9%) and Garissa (56.8%) also reported that they could not access veterinary drugs from the local agrovet shops.

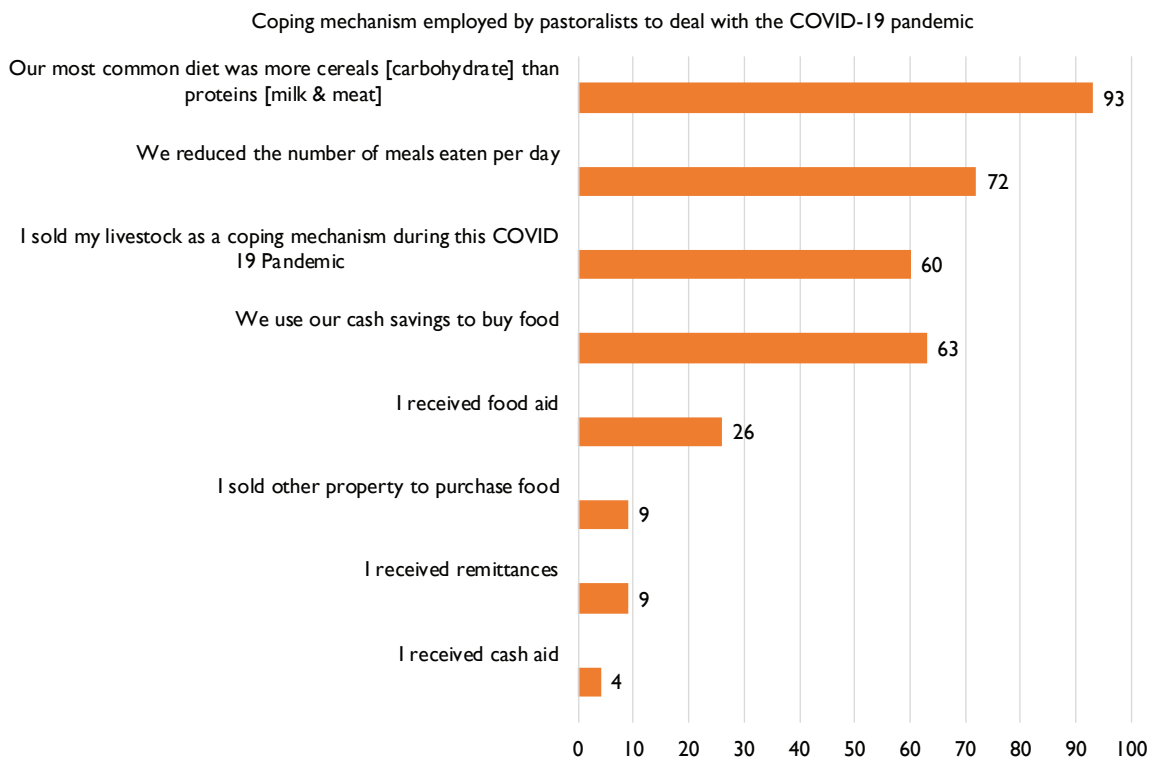
Similarly, 79% reported the availability of key veterinary drugs in Isiolo, while the opposite was true in the other counties. Most respondents in Isiolo (79.4%) also reported that COVID-19 had no effect on the availability of labour required for raising livestock. In Marsabit, Garissa and Wajir, the majority of respondents reported no effect on availability of labour for raising livestock during the pandemic. This might have been because schools had closed due to COVID-19 and children were at home to provide the required household labour.

3.2.1.6 The coping mechanisms adopted by producers

The study found out that pastoralists employed different strategies to cope with the COVID-19 pandemic. The most common strategies (Figure 7) adopted by the producers across the target counties include:

- i. lowering the quality of diets at household level by switching from protein foods like milk and meat to more affordable plant-based foods such as rice and beans across all five counties.
- ii. reduction in the frequency of consumption or number of meals eaten daily (from three to two, and sometimes one).
- iii. resorting to household cash savings and other budgets like school fees and liquidating other family assets to buy foodstuff.
- iv. selling livestock at throwaway prices to feed their households.
- v. dependence on food aid and remittances during the period, although only 26% of households reported having received food aid and less than 10% received remittances.

Figure 7: Coping mechanism employed by pastoralists to deal with COVID-19 pandemic.



3.2.2 Traders, transporters and livestock marketing associations (LMAs)

3.2.2.1 Effects on livestock markets, prices and income

Livestock markets are a critical source of livelihood and resilience for the pastoralist communities in northern Kenya. Any disruption in the livestock market system, as caused by COVID-19, has severe implications on the actors across the value chain.

On average, each household had sold one camel, three cattle, four goats, four sheep and six chicken between January and April. In terms of price, the average price of camels, cattle and shoats was KES34,704, KES17,256 and KES3,082 respectively. There is a notable decline compared to the similar period in 2019, where the average price for a camel was KES48,573, for cattle KES24,680 and for shoats KES4,363. The decline of prices is attributed to the fact that producers stayed away from overcrowded livestock markets (the few that remained open), preferring to sell their livestock to brokers at farm-gate fetching lower prices. Besides, producers in counties such as Isiolo and Marsabit resorted to selling their livestock in primary markets which remained operational during the pandemic. However, such markets usually fetch low prices for livestock due to fewer traders. As shown in Table 5, Isiolo and Marsabit sold the least livestock mainly due to market closures.

Table 5: Average number of livestock sold per household and the average prices per species sold per county.

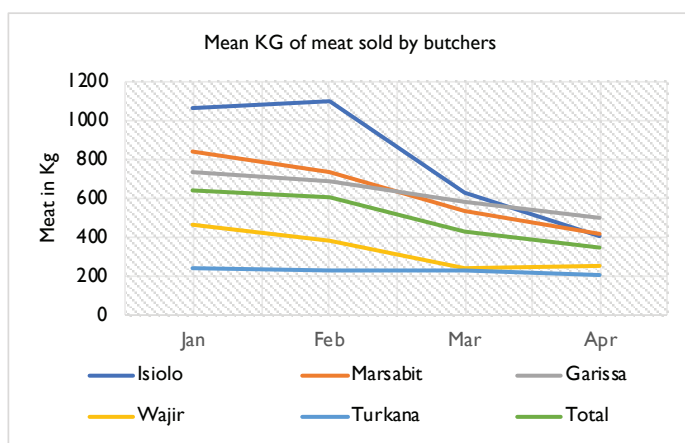
Average livestock sold between January–April by county						
Livestock species	Garissa (n=225)	Isiolo (n=76)	Marsabit (n=105)	Turkana (n=180)	Wajir (n=212)	Average total (n=798)
Camels	1	0	1	0	2	1
Cattle	4	2	2	1	2	3
Chicken	20	3	2	0	1	6
Goats	5	7	4	3	3	4
Sheep	5	7	4	3	3	4

Average prices in KES of livestock species by county						
Camels	47,444	-	31,667	-	25,000	34,704
Cattle	27,609	23,750	17,446	1,200	16,273	17,256
Chicken	850	386	433	-	250	480
Goats	4,022	3,407	2,574	2,962	3,713	3,336
Sheep	2,747	2,468	2,033	3,473	3,416	2,827

3.2.2.2 Effects on livestock trade volumes and pricing

Figure 8 shows the mean weight of meat in kilograms sold by butchers, across the five counties between January and April 2020. There was a sharp decline in the meat sold from March when most livestock markets in the region were closed. Isiolo county had the highest mean of meat sold in January at 1,062 kg, which sharply declined to 412 kg in April attributable to market closure compared to Turkana with the lowest average in January at 245 kg which declined marginally to 205 kg in April since the markets remained open. Moreover, the closure of the Somali-Kenya border in Garissa and Wajir counties affected trade involving regional traders. The traders usually come to Kenya to buy large volumes of animals in the secondary markets to sell to other countries.

Figure 8: Mean weight (in kilograms) of meat sold by butchers.



In Isiolo and Marsabit counties, for instance, all primary markets were closed, and therefore, the numbers presented in the few open secondary markets in other counties were significantly low. Besides serving as regional livestock sales outlets, some markets such as Oldonyiro market in Isiolo County is the only major livestock market in the county that serves the Nairobi, Nyeri, Laikipia, Meru, Kajiado and Kiambu markets.

Figure 9 and 10 show that while there was a significant fall in the prices of livestock between March and April, the average price of meat did not show any significant change except in Isiolo where prices declined in March. This reaction could be attributed to a change in household consumption of meat, in which most respondents reported a reduction in the consumption of animal-based proteins due to either loss of income or saving for uncertain future in case the situation worsened. The reduction in the average prices of livestock may be attributed to the reduced number of traders and animals traded in the markets. This was due to movement restrictions and the closure of some major livestock markets in most counties. The closure of crucial markets created a situation where the sale of livestock occurred at the farm gate, where prices are usually low compared to prices at major markets.

Figure 9: Average price of a kg of meat by a butcher.

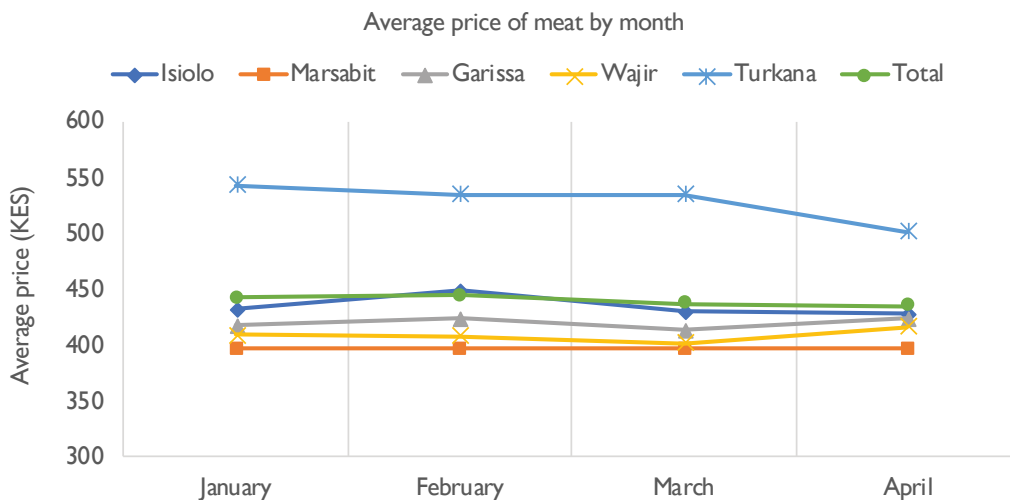
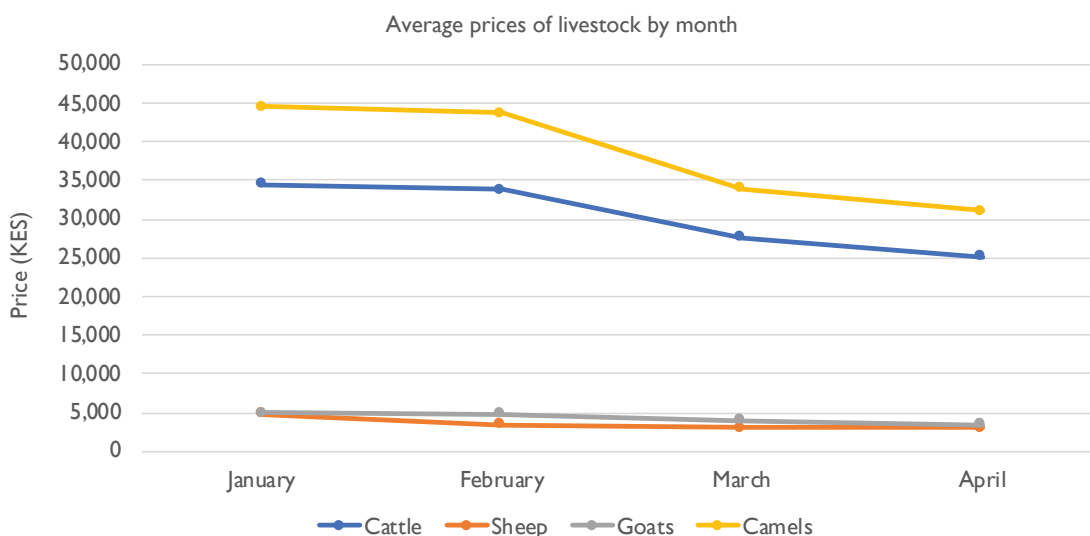


Figure 10: Average price of a live animal by trader.



3.2.2.3 Effects on incomes of livestock traders

Reduction in the number of animals sold and reduced prices per animal species meant that the income of butchers and livestock traders reduced significantly. In all the five counties, the livestock trader’s income reduced drastically in March. Similarly, there was a decline in the butchers’ income in March and April. The decline in income equally affected the income of livestock producers who depended on selling animals to sustain their livelihoods.

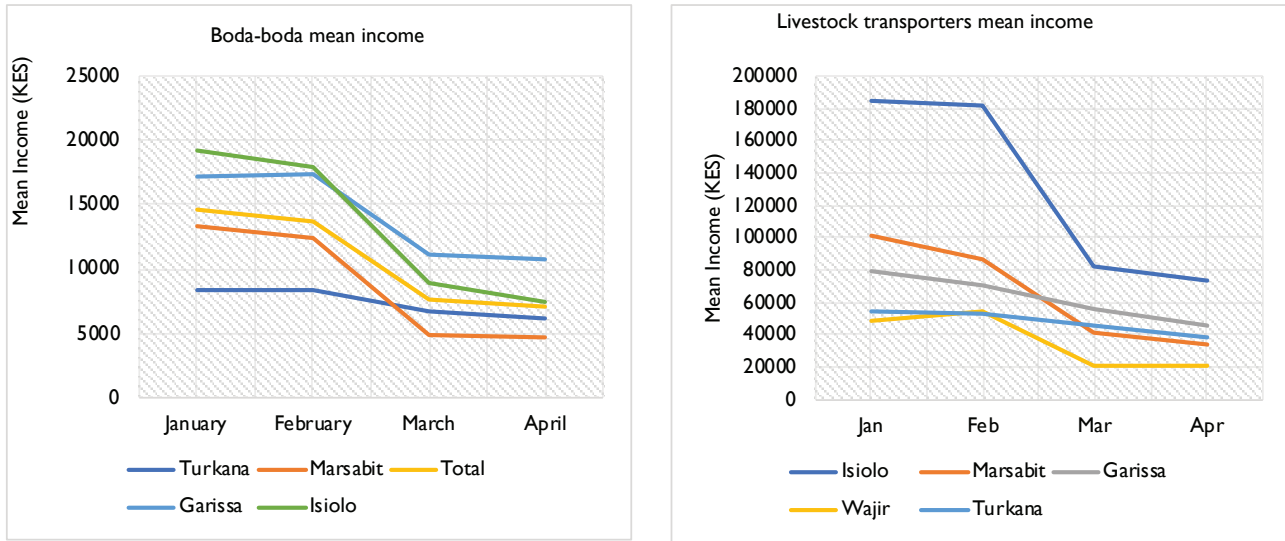
3.2.2.4 Effects on livestock transporters

Livestock transportation plays a crucial role in facilitating the movement of livestock for purposes of trading, breeding or solely for relocation, and provides income to truck owners and drivers. Other important actors in livestock transportation are the youth who own carts and motorbikes (boda-bodas). Boda-bodas are commonly used to transport traders, meat and other commodities to and from the livestock markets and slaughterhouses/ slaughter slabs.

The restriction of movement due to COVID-19 affected the movement of trucks carrying animals, especially to Nairobi and Mombasa during the lockdown. The sparse rural road networks and the long distances covered to reach livestock markets became a challenge for transporters to limit themselves within the curfew regulation timeframe. The dusk to dawn curfew limited boda-boda riders to conduct business during the night, depriving them of the income earned when they worked at night.

As a result, livestock transporters and boda-bodas lost income from their hitherto active businesses (Figure 11). A sharp decline in the income of both actors occurred in March. It is reflected further by the decline in the number of trips made by livestock transporters in March and April.

Figure 11: Mean income for boda-boda transporters and livestock transporters.



In Isiolo county, for instance, the decline in income may be attributed to the closure of some livestock markets which kept transporters out of business. In other counties, the low number of animals brought into the market was not economically viable for transporters; hence some of them opted out of business during the COVID-19 period. Boda-boda transporters are secondary beneficiaries of a thriving livestock market. The transport service is valuable because it is cheaper, flexible, and reliable, especially for shorter distances. The youth are the majority in the boda-boda business, and it is their critical source of employment and income in many Counties. Due to the nature of their business, the government considered them as potential high spreaders of COVID-19, forcing them to reduce the number of passengers they usually carried, from two or sometimes three, to only one. Besides the reduction in the hours of work, the restriction on the number of passengers carried further diminished the income of the boda-boda operators.

3.2.2.5 Effects on livestock market associations (LMAs)

Some youth are usually employed in livestock markets to manage cess collection, marking of sold animals for traders for ease of identification and provide order and security at the markets. They also link market users and the county government and community to identify gaps, share progress and strengthen institutions for sustainable management of markets. During the study, 64% indicated that the number of youths employed in the collection of market levies declined by half during the pandemic. Also, 61% of LMAs reported decline in security in few operational markets. The decline in the numbers of wage earners was due to the near collapse of the livestock business in livestock markets, especially in Isiolo and Marsabit. The response was to lay-off most of the people who provided services such as cess collection and security. Figure 11 indicates a decline in the levies collected by LMAs between January and April.

3.2.2.6 The coping mechanisms adopted by livestock traders and transporters

Livestock transport forms the business lifeline for livestock traders. Livestock bought from livestock markets are delivered to other smaller markets, or major towns like Nairobi, Mombasa and Kisumu where they are slaughtered and sold to butchers, feedlots and consumers. Therefore, the closure of major livestock markets had adverse effects on the business. In effect, the actors responded to the adverse situation with various coping mechanisms.

To survive the situation and sustain businesses and livelihoods during this period, livestock transporters devised the following coping mechanisms:

- a. Business diversification: this was the most common coping mechanism mentioned by most of respondents in this category of actors.
 - Some transporters ventured into the transportation of construction materials such as metal bars, cement, blocks and iron sheets on their return trips from Nairobi to the counties.
 - Others converted their truck to transport foodstuffs such as potatoes and cabbage from Meru, Laikipia, Nyeri, Nyandarua and Nandi due to low supply of livestock in the few operational markets.
 - Additional extra merchandise on trucks carrying livestock to major towns includes charcoal and other foodstuffs bought from centres along the highways to the major towns to compensate space left due to fewer animals.
- b. Staying at home: this was a coping avoidance mechanism by some transporters in fear of contracting COVID-19 in pursuit of their business. During this period, respondents indicated that they used their saving to sustain their families.
- c. Pooling animals: this was mainly due to inadequate supply of animals in the market and because no single trader could fill the truck. Traders pooled animals to fill a single truck to transport animals to end markets in various towns.
- d. Increased transportation cost: some transporters opted to increase transportation costs to sustain themselves during the pandemic. The extra cost also supported these transporters in acquiring COVID-19 permits which were an added cost to their business operations that came with COVID-19.

3.2.2.7 Closure of major markets

The closure of the major markets had adverse ripple effects on the different categories of the market actors because livestock markets are not only centres of business for livestock, but also hubs for various other commodities. Therefore, all these were affected when most major markets were closed. Examples of other subsidiary businesses that were affected include boda-bodas who carry producers, traders, meat and other merchandise; M-Pesa operators; food kiosks; and milk vendors. Butchers and slaughterhouses were hit hard by the closure of livestock markets. As a result, most of them either closed businesses or remained open but with limited volumes of meat to sell.

The immediate effect to the above situation was increased unemployment, especially among the youth who dominated auxiliary services aligned to livestock markets. Loss of employment was also high among livestock traders, transporters and owners of slaughterhouses as some of them opted to close when most major livestock markets were closed.

3.2.2.8 Coping mechanisms adopted by the butchers, slaughterhouses and boda-boda riders

I Butchers

The coping mechanisms devised by butchers in response to the effects of COVID-19 include the following:

- a. Reselling of animals: as the demand for livestock increased amidst low supply, some butchers found it more profitable to resell the animals bought for slaughtering to livestock traders. This reselling was also due to the deficient demand for meat from local buyers fuelled by diminished purchasing capacity.
- b. Buying and sub-dividing carcasses: the majority of the butchers coped by pooling money to buy and sub-divide a carcass because they could not afford it alone, or because the demand for meat from local producers was so low that they feared a loss if the meat was not finished.
- c. Early opening and late closure: respondents devised a strategy of opening their businesses much earlier (at 0600 hrs) than the usual time (0700 hrs); and closed much later (1830 hrs) shortly before the government-imposed curfew time (1900 hrs).

- d. Lowering prices: some butchers resorted to lowering of prices to attract more customers, earn little but keep in business and reduce losses due to spoilage.
- e. Adaptation: due to reduced demand for meat, butchers adapted by lowering the number of the large ruminants slaughtered in preference for small ruminants such as goats and sheep to stay in business. Also, butchers adapted by initiating home-delivery of meat to customers through phone orders.
- f. Lay-off of workers: most butchery owners resorted to laying-off of workers to cut down on operational costs and ensure business survival during this period of COVID-19.
- g. Opting-out of business: a few butchers diversified into new businesses as TukTuk operation and vegetable business.
- h. Use of own savings to boost business: since the business is making too little compared to a similar period in the previous years, most butchers opted to use their savings to boost their businesses.
- i. Other operational modes: some businesses started using mobile phones to market their businesses as well as deliver meat to customers.

2 *Boda-boda transporters*

Boda-boda or motorcycle riders are important actors in the livestock value chain. They provide flexible, cheaper and timely transport services to butchers, livestock traders, slaughterhouse operators, fruits and vegetables vendors, restaurants and meat buyers. In response to COVID-19 prevention measures, boda-boda riders adopted the following measures:

- a. Adaptation in working hours: boda-boda riders usually worked more than 16 hours per day starting as early as 0600 hrs and work until 2200 hrs. They mentioned adjustment in their working hours to respect government-imposed curfew hours from 0500 hrs to 1900 hrs.
 - The reduction in working times had associated effect on their daily incomes and they had to survive on savings during this period.
 - The majority also mentioned diversification to other income sources such as selling of khat, eggs and home deliveries of groceries and other foodstuffs during the pandemic.
- b. Other adjustments: boda-boda riders also adopted other coping mechanisms such as:
 - increasing transport charges for their clients, and
 - adjustment of household consumption by quantity, quality and frequency of meals per day, such as eating one meal of mainly carbohydrates.

3.2.3 Effects of COVID-19 on provision of veterinary services

3.2.3.1 Agrovets

A total of 67 agrovets were interviewed across the five counties. Garissa had the highest number (25) while Turkana had the lowest (4) (Figure 12). The majority of the respondents (52.2%) reported that they were able to provide ambulatory services to the same level as before COVID-19. About 60% of respondents mentioned that communications and consultations with county veterinary staff had not been affected. In addition, 68.7% indicated that the number of consultations from clients remained the same. A total of 55.2% reported that the supply of veterinary drugs and other farm inputs was not affected by the COVID-19 pandemic.

However, an overwhelming majority of respondents (92.6%) reported that the volume of sales had declined due to COVID-19 (Figure 13). There was wide variation in the mean sales of agrovets in different counties with Turkana having the highest mean sales of KES570,000 in January, while the lowest was reported in Marsabit with mean sales of

KES27,455. The declining trend was similar in all the counties, a consistent drop from January–April except in Wajir, where the sales in February and March were higher than those in January.

Figure 12: Levies collected by LMAs between January and April and total levies by month.

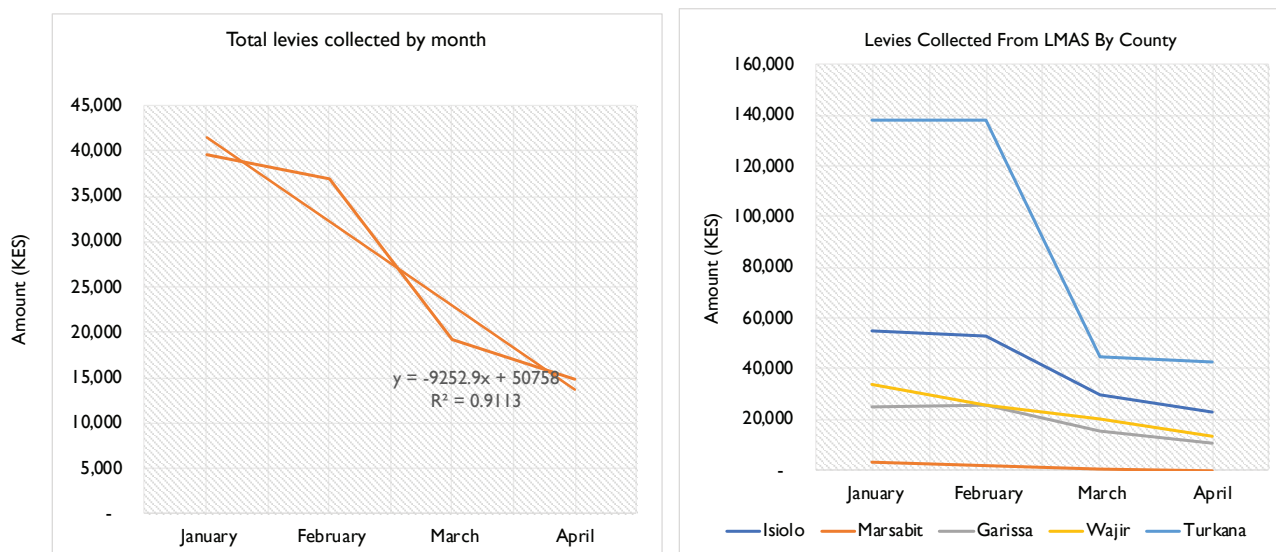
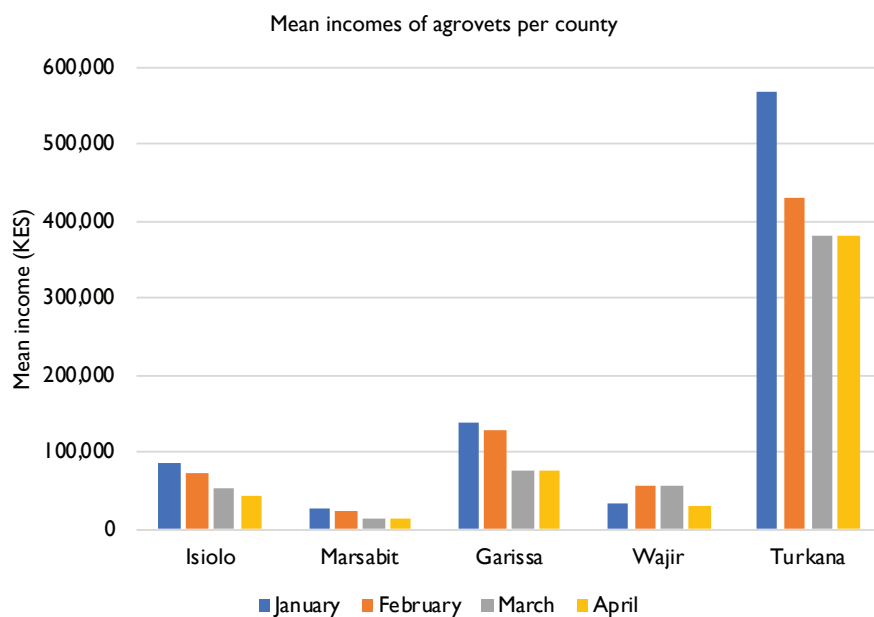


Figure 13: Mean sales by agrovets by county.



Reduced agrovets sales imply that there was less purchase of agrovets supplies by producers, and this has possible implications on animal health and disease management during the period. About 90% of agrovets operators reported having incurred extra cost (average of KES2,000 per week) on COVID-19 related precautions, e.g., masks, sanitizers and soaps.

The volume of sales declined by an average of 40% ranging between 10% in Wajir to 49% in Isiolo (Figure 14). The decline in sales was accompanied by the corresponding decline in the number of clients served (Table 6). The decline in clients ranged from 19.2% in Wajir to 70.8% in Isiolo.

Figure 14: Percentage decline in volumes sold by agrovets between January–April 2020.

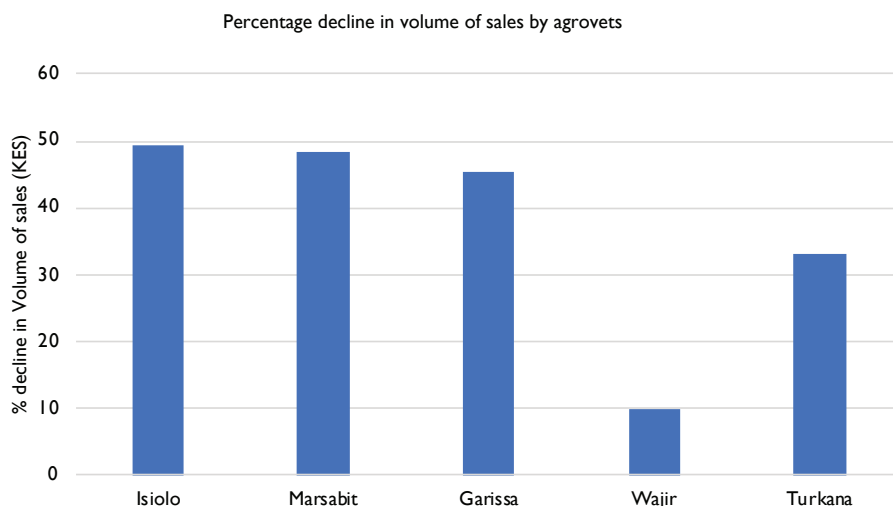


Table 6: Mean percentage decline in the number of clients served by agrovets between January and April in five counties in northern Kenya.

County	January	February	March	April	% decrease
Isiolo	682	598	284	199	70.8
Marsabit	61	52	28	20	67.2
Garissa	113	100	62	41	63.7
Wajir	99	250	222	80	19.2
Turkana	700	842	785	425	39.3
Total	256	270	177	101	60.5

More than 90% of the respondents reported that there had been an additional cost to their business because of COVID-19. Wajir had the lowest percentage of respondents (76.9%) reporting an increase in the cost of business. On average, businesses spent an extra KES2,000 per week, ranging from KES674 in Isiolo to KES3,750 in Turkana (Table 7).

Table 7: Agrovets reporting additional cost and mean amount of extra expenditure per week by agrovets spent per week.

County	% business reporting additional cost	Mean amount (KES)	n
Isiolo	100	674	14
Marsabit	90.9	1367	11
Garissa	92	1998	25
Wajir	76.9	2400	13
Turkana	100	3750	4
Total	91.96	1800	67

Agrovets are key actors in the supply of animal health services in Kenya. Although the transport of goods was authorized and animal health services were considered essential services, agrovets lost more than 40% of their sales in all the counties.

Since agrovets reported that their ambulatory services and consultations with their clients were not affected, the most likely explanation for the massive decline in sales is that clients could not afford animal health services because their incomes declined. Most producers reported a loss of jobs, with additional loss by those who relied on remittances. An explanation might be that producers prioritized other expenses such as food and medical expenses at the expense of animal health. This decline is a warning sign that there might be an upsurge in the incidence of animal diseases, including zoonotic diseases.

The other effect of COVID-19 reported by agrovets was the additional expenses probably arising from the measures instituted to prevent the spread of the disease, such as the use of personal protective equipment (PPEs) and sanitizers. The agrovets business reported spending on average KES2,000 as extra expenses per week. Coupled with the reduction in business volumes, the effect might be too hard for such small businesses, resulting in the closure of some of them by the end of the pandemic.

3.2.3.2 Community disease reporters (CDRs)

a. Characteristics of community disease reporters

CDRs are community members trained by veterinary authorities and deployed to be involved in disease surveillance and participate in vaccination activities under the supervision of county veterinary staff. They are vital in the early detection of disease outbreaks because they live among livestock keepers. Many of them were trained in the 90s and early 2000. The average age of the CDRs in the study sample was 43 years, indicating that there have been no young entrants into the activity in recent years.

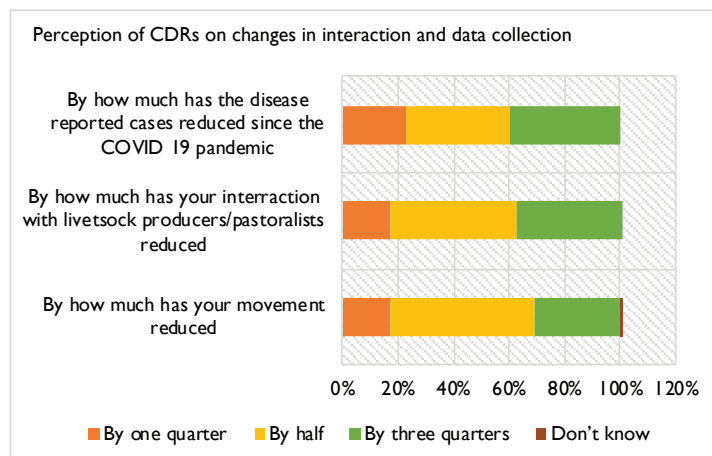
The majority of CDRs in Marsabit (79%) and Turkana (75%) did not have any other occupation. In the other counties, approximately half of the CDRs have other occupations. Table 6 lists other occupations cited. The majority are in private business, but a small number were in other professions including civil servants. Surprisingly, only 18% were pastoralists contrary to the notion that CDRs are all pastoralists.

Table 8: Other occupations by Community Diseases reporters.

Occupation	Frequency	Percent
Agrovets	2	4
Business	12	21
Casual labor	3	5
Civil servant	4	7
Community health workers (CHWs)	6	11
Service delivery (drivers, boda-boda, watchmen, etc.)	6	11
Pastoralist	10	18
Teacher	7	13
Crop farmer	6	11

Overall, 60% of the CDRs either agreed or strongly agreed that there had been a decline in the collection of surveillance data. More than three quarters (77%) of the respondents reported that the decline had been between 50 and 75% (Figure 15). A majority of the CDRs also reported that their interactions with livestock producers had also declined during the COVID-19 pandemic. A whopping 84% reported a decline of between 50 and 75% in their interaction with producers. Furthermore, 73% of CDRs reported that their movement to carry out disease surveillance activities had significantly reduced by 50–75%.

Figure 15: Perceptions of CDRs on the impact of COVID-19 on the performance of their duties.



b. Support to CDRs during the COVID-19 pandemic

None of the CDRs in the five counties had received training on COVID-19 awareness and prevention in the course of their work. In Turkana county, 60% of the CDRs reported they had been provided with PPEs for use during their work. In Isiolo, Marsabit and Wajir, only 11% were supplied with PPEs. In Garissa, none of the CDRs had been supplied with PPEs. In Isiolo, Marsabit and Wajir, PPEs consisted of only face masks while in Turkana CDRs were provided with several types of PPEs, including face masks, sanitizers, aprons and gumboots.

In different counties, CDRs got their PPEs from a variety of sources (Table 9). In Marsabit, CDRs received PPEs from the national government while in Isiolo the majority (75%) received PPEs from the county government, and 25% received from the national government. In Wajir and Turkana, CDRs didn't received PPEs from the national government, but a majority received from the county government while others received it from NGOs, family and friends.

Table 9: Sources of PPEs for CDRs in different counties.

PPEs provider	Isiolo	Marsabit	Garissa	Wajir	Turkana
National government	25%	100%	0%	0%	0%
County government	75%	0%	0%	60%	50%
NGO	0%	0%	0%	20%	46%
Friend/relatives	0%	0%	0%	20%	4%

c. Coping measures adopted by CDRs

CDRs employed various mechanisms to cope with the COVID-19 pandemic. Some tried reaching households through phone calls to avoid direct contact with them. Others requested local chiefs to update them on the status of livestock diseases within their localities. They also reported that some livestock keepers were reaching them through phone calls and text messages to report disease outbreaks. It reported that some CDRs drastically scaled-down their activities to avoid interactions with many people. Naturally, all these measures affected their ability to carry out disease surveillance activities.

3.2.4 Effects of Covid-19 on key county departments and their operations

3.2.4.1 Effects on fiscal status of target counties

The study found that in Kenya, most county funding comes from national transfers, with Marsabit receiving (86.8%), Isiolo (88.8%), Turkana (86%), Wajir (86.0%) and Garissa (90%) of its 2020 funding exclusively from the national government. On average, only about 8% of the revenue of five counties is generated locally, while the balance comes from external sources/partners. In northern Kenya, most of the local revenues are collected from livestock-related enterprises. Therefore, it follows that closure of some livestock markets in the region due to COVID-19 led to reduced incomes for the counties. For example, in Garissa county in FY2019/2020 the total county revenue budget was KES150 million. Out of this, KES21 million was expected to be collected from the livestock market operations. However, the county managed to collect only KES13 million, representing 61% underperformance as compared to the same time the previous year when the county managed to collect 16 Million.

In addition, the study revealed that health-related expenditures in the target counties have been increasing as the counties attempted to respond to COVID-19. For example, Wajir county reported having spent 10% of its 2019/20 development budget on COVID-19 related activities. Wajir county, even with its high prevalence of malnutrition, had to reallocate 40% of the grants meant for nutrition to COVID-19 prevention initiatives, with grave nutrition consequences in the medium and long term. Hence, this pandemic poses a big threat to the county's future nutritional status, which is already at a very fragile stage. Notably, across the five counties, substantial amount of money meant

for development programs have been transferred to the health sector to mitigate against the pandemic, which is currently their main priority. In Turkana, for instance, the County Director of Veterinary Services (CDVS) budget was reduced by KES15 Million which was a 25% reduction of the department budget and the funds transferred to the Ministry of Health for the same reasons. This transfer took away all the public money budgeted for e-surveillance operations, hence, impacting negatively on the much-anticipated public financing of the platform.

3.2.4.2 Agriculture supplies in five counties

Although the economies of the counties in northern Kenya are predominantly dependent on livestock, agriculture plays an essential source of food and employment to many people. In Isiolo, Marsabit and Garissa, agriculture is as important as livestock keeping. However, all the five counties still depend on food commodities delivered from other counties such as Meru, Nandi, Nyandarua, Nakuru, Uasin Gishu and others. Some food commodities also come from neighbouring countries of Ethiopia and Somalia.

The COVID-19 prevention measures affected both local food production and the flow of food supplies into the five counties from other regions. While agriculture and agriculture-related goods and services were classified as essential by the government and meant to enjoy unfettered movement across the region based on the forces of supply and demand, survey interviews with key informants revealed a myriad of challenges. Trucks carrying food items and agricultural inputs had to endure several roadblocks along the roads, and each of them required drivers to stop, show permit of operation and take temperature checks. These processes caused delays leading to the increased cost of delivery of the goods, which in turn was passed on to consumers. Moreover, some trucks would take overlays whenever curfew hours approached to resume the journey the next day, seriously confounding delivery timelines. Consequently, as the supply chains became constrained, there was a sharp rise in food prices across the counties.

In addition to private trucks that transport food supplies from other counties to northern Kenya, some traders relied on public transport to carry their merchandise from other counties. At the outbreak of COVID-19, most of the public transport was halted by the government. As a result, there was a sudden hike in commodity prices due to reduced marketable volumes, thus directly impacting on the capacity of small traders to procure and market diverse food commodities.

The study revealed that local production equally faced challenges due to COVID-19 prevention measures like social distancing, restricted movement and the wearing of face masks (this agitates the livestock and thus affect milk let down, subsequently affecting the milk yield). Most counties reported a drastic reduction in their ability to provide extension services to farmers for fear of contracting and/or spreading COVID-19. Even with organised visits, farmers declined to meet extension agents due to misconceptions and fear of COVID-19. Such fears also affected the ability to hire farm labour. In Marsabit, for instance, during the weeding season which falls in March and April, casual workers from Meru and Isiolo counties did not come as expected, resulting in crop loss and associated poor crop yields.

Furthermore, the closure of open-air markets hit the farmers hard, as explained by county officers during the study. Most of the major livestock markets in north-eastern Kenya act as trade hubs for not only livestock, but also other food and non-food goods. Farmers visit the markets to sell their produce or buy household food items. When the markets were closed, farmers were stuck with their produce and could not obtain other food items they required. In one of the interviews, a female banana trader in Marsabit indicated that before the pandemic, she used to sell 40 metric tonnes (MT) of bananas per month (up to February 2020), but when COVID-19 struck, she could only sell about 20 MT per month (a decline of 50%). Similar responses were mentioned by other small traders in other counties during the study.

Besides, most hotels and restaurants were closed, yet these were significant buyers of foodstuff produced by farmers. The net result of all these challenges was the loss of household income and a weakened purchasing power for those market actors whose livelihoods largely depended on on-farm and off-farm agricultural activities.

3.2.4.3 County level animal health service delivery

COVID-19 pandemic has had unprecedented negative impacts on service delivery in the counties because of the measures put in place by the national government to contain the spread of the disease. The measures have affected access to essential services like agricultural extension and veterinary services. Some of the immediate negative consequences of these control measures include a sharp increase in transportation cost by an average of 52% (highest in Marsabit with 69% and lowest in Turkana with 24%). Lower commodity supplies, longer delivery times and higher prices were experienced, especially in Garissa, Wajir, Turkana and Marsabit due to disruption of cross-county and border trade flows. For instance, in Turkana, the study revealed over 20% increase in input prices (veterinary drugs and vaccines).

Additionally, the study found a general overemphasis on COVID-19 preparedness, resulting in reallocation of most resources from other sectors to the health sector to manage the pandemic crisis. Expenditures to other sectors like animal health, including disease surveillance and prevention and control, has made the livestock sector vulnerable and exposed to a myriad of disease threats. As such, any disease outbreak would potentially lead to devastating loss of livestock and livelihoods and would have grim consequences on food and nutrition security.

Most extension delivery methods vis-a-vis pastoral farmer field schools, agricultural shows, field days and exhibitions require groups of farmers coming together for the service. The COVID-19 pandemic has affected the traditional approaches of holding training for the beneficiaries because of its unique transmission methods. This pandemic has virtually brought to a halt most of the formal methods of training and skills enhancement through extension education.

Besides, most of the local and international NGOs that ordinarily augment government extension services had halted their operations, including extension, and withdrew their staff from these areas when COVID-19 broke out. The cessation of operations by such organisations meant that the crisis exacerbated lack of access to extension services to the already compromised resilience of these communities.

3.2.4.4 County level nutrition service delivery

The study focused on the effect COVID-19 prevention measures on county nutrition services, including at community level and health facility level, with potential short- and long-term negative consequences on nutrition outcomes especially for the most vulnerable women and children. Household food security has been affected mainly through a reduction in purchasing power brought about by loss or reduction in income. Factors contributing to limited physical and economic access to food include working for fewer hours due to the curfew with loss of jobs due to closed businesses. The reduction in hiring of casual workers at community level due to fear of infection, loss of jobs by household members and restricted movement by traders to sell commodities to communities in hard-to-reach areas led to significant number of households depleting their food reserves and shifted resources meant for other needs to food, hence, making these communities more vulnerable.

Nutrition service delivery such as the suspension of routine supervision at health facilities and nutrition education at the community level was significantly affected when COVID-19 broke out. Ante-natal and post-natal services were also greatly affected. County Nutrition Coordinators reported that hospital deliveries had dropped since the onset of COVID-19 implying that more women were delivering at home, either due to fear of lack of health care workers to attend to them or of getting infected with COVID-19 while in transit, or even at the health facility. Consequently, the usual early infant initiation to the breast within the first hour of birth declined during this period. At the onset of the pandemic, most county governments directed a halt to preventive services except for the cohort of children 0–12 months still receiving immunization. For instance, in Isiolo and Marsabit counties, growth monitoring for children stopped at the height of COVID-19. Growth monitoring is recommended by the WHO guidelines for children under five years of age. A combination of such issues is expected to have adverse effects on the nutrition outcomes of the most vulnerable, especially women and children both in the short- and long-term.

In response to the pandemic, most counties reallocated budgets mainly to the health sector to counteract COVID-19. Key among the activities whose budget was slashed include nutrition when it is known to contribute to enhancing body immunity required to fight COVID-19. As a social safety-net, most of the counties distributed foodstuffs to the vulnerable household through the national government to cushion them against the effects of the pandemic. Similarly, capacity building on COVID-19 prevention was extended to healthcare providers. CHVs were also trained on key messages to sensitize the community on COVID-19 preventive protocols issued by the government. In addition, counties procured PPEs for staff and handwashing facilities were placed at strategic points to maintain hygiene.

Besides, some development partners also provided various forms of support to the counties in preparation to fight the pandemic. Support included health items and training of CHVs/community health workers (CHWs); community sensitization through FM radios; and consignments of handwashing facilities, masks, hand sanitizer and liquid soups. Some of the partners that responded include the World Food Program (WFP), UNICEF, Kenya Red Cross, CRS-K-Rapid, NAWIRI, FBOs, Save the Children and the World Vision, among others.

4 Conclusion and recommendations

4.1 Conclusion

- a. COVID-19 prevention measures have had very significant impacts on nearly all actors along the livestock value chain including producers, agroveter owners, abattoir/slaughterhouse, butcheries, livestock traders, livestock market associations, community health volunteers (CHVS) and community disease reporters (CDRS) and livestock transporters. The measures also affected businesses that are not directly associated with livestock such as food kiosks/vendors/eateries, motorcycle transporters (boda-boda), cereal and pulses traders, and fruits and vegetables traders.
- b. Household incomes significantly reduced by as much as 50% in some counties as a result of the closure of livestock markets, reduced prices of livestock and loss of employment for many members of the households because of reduced businesses along the value chain.
- c. The most significant impact of reduced household incomes was on household nutrition. Households were forced to reduce the quantity (fewer meals), quality (less protein and more carbohydrate) and food diversity consumed. The COVID-19 measures also affected underlying causes of malnutrition such as household food security, care practices and utilization of health and nutrition services. Change in dietary practices, such as eating fewer meals and reduced protein intakes, is likely to have severe implications on household nutrition, especially for the most vulnerable groups such as children under five years, lactating mothers, the sick and the elderly.
- d. Closure of livestock markets had a devastating effect not only on livestock keepers, but also on most of the other actors along the value chain such as transporters, butchers, slaughterhouses and livestock market associations. The closure of livestock markets for a much longer time would inevitably threaten the very livelihoods of the pastoralists and the entire livestock sector in the country.
- e. The other major effect of the measures to control the spread of COVID-19 was access to services including, agricultural extension, health and nutrition, animal health and agricultural inputs and services. These services were inaccessible for several reasons such as suspension by providers due to COVID-19, reluctance of households to go and receive the services for fear of infection, affordability of services because they had become too expensive or because households had lost income.
- f. Many businesses along the value chain were severely affected. Livestock traders, agroveter shops, butchers, slaughterhouses, transports and food kiosks all had reduced demand for their services because of the measures to prevent the spread of COVID-19. In addition, business which remained open during the pandemic had to incur additional costs due to the demands for increased hygiene such as establishing washing stations and provision of soap and sanitizers. Considerable job losses were reported among all the actors in the livestock value chain with associated negative impact on household incomes. For instance, nearly half of the youth who provide services at livestock markets lost jobs following the closure of the major markets.
- g. The county governments were affected too. Most counties were already underperforming on collection of local revenue collection, but COVID-19 exacerbated the situation. The local revenue of most counties dropped by as much as 60%. The immediate response by most county governments to deal with the pandemic was to reallocate resources from other sectors to the health sector.

- h. Although the general trends were similar across counties, there were substantial differences in the impact of COVID-19 measures in different counties and how they responded to the pandemic. For instance, the Garissa county government deferred payment of pending bills and reduced all county social contributions and expenditures. In addition, they opted for low-interest loans and reprioritising of development projects to be funded. Some counties provided food aid to households during the pandemic, while others did not. Turkana, for instance, provided PPEs to CDRs so that they could continue with their services, while Garissa did not provide any PPEs to CDRs.

4.2 Recommendations

Without urgent socio-economic responses, the effect of COVID-19 is likely to jeopardise lives and livelihoods of pastoralists and other livestock value chain actors in the foreseeable future. Immediate development responses in this crisis must focus on sectors that will drive the local economy, boost the private sector and advocate for social safety-nets to target the vulnerable people in the communities.

- a. The leading cause of most of the negative impacts was the closure of livestock markets. Efforts should focus on reopening the markets to prevent further deterioration of the livelihoods of people and institutions who depend on them. This can be achieved by engaging stakeholders to agree on a set of standard operating procedures/protocols to guide actors in the livestock markets on how to open the markets safely to reduce the risk of COVID.
- b. The national and county governments should jointly establish mechanisms to support small- and medium-sized enterprises (SMEs) with credit or grants to revive their businesses, particularly those that create employment to youth and women and have a direct impact to the economy.
- c. County government should prioritise animal health services along with the COVID-19 response interventions to safeguard the short- to long-term livelihoods of the pastoral communities. Counties could, for instance, reduce some levies charged on agrovets to enable them to operate.
- d. County governments and development partners should support food production activities by facilitating farmers with technical and organisational support and strengthening existing farmer organisations and groups to enhance production. Support of farmer groups with necessary farm inputs, such as fertilisers and improved seed, and enhanced extension services would bring immediate benefits in terms of employment and nutrition.
- e. County governments need to intensify nutrition social behaviour change communication to sensitise communities on proper nutrition for stronger immunity, maternal infant health and young child nutrition focusing on diet diversity and Infant and young childcare and feeding. The messages need to be in the county COVID-19 response communication packages.
- f. In-kind food aid coverage should be widened to include at-risk categories of people, especially school-going children from poor households who no longer benefit from school meals program since schools are closed. Food vouchers and cash transfers should be delivered to vulnerable households, including those who have been directly affected/infected by COVID-19 to help with recovery.
- g. Utilise digital applications (where applicable) for nutrition messaging for more extensive coverage within safer spaces (social distancing). National and county governments should support community health strategy by equipping CHVs and CHWs. Equipped with PPEs and other means, CHVs and CHWs can work within the constraints of COVID-19 by providing agri-nutrition training at household level and undertake follow-up on malnourished cases, hygiene and sanitation, immunisations, micronutrient supplementation and ante-natal clinic attendance in the community.
- h. A partnership between government and the private sector should establish e-commerce/trade platforms through which livestock are sold and not necessarily in open-air livestock markets.

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