

**National Drought Management Authority**  
**LAMU COUNTY**  
**DROUGHT EARLY WARNING BULLETIN FOR FEBRUARY 2018**



A Vision 2030 Flagship Project



**FEBRUARY 2018 EW PHASE**

**Drought Status: ALERT**



**Maandalizi ya mapema**

**Drought Situation & EW Phase Classification**

**Biophysical Indicators**

- The County experienced insignificant off season rainfalls during the Month under review.
- The vegetation condition Index VCI-3Month) was 20.71 in the month of February 2018, showing a decrease of 41percent compared to previous month.
- The VCI indicated vegetation condition was moderate vegetation deficit towards worsening trend. The overall drought phase in the county was at Alert in February 2018. Forage condition remained fair to poor during the month.

**Socio Economic Indicators**

**Production indicators**

- All livestock species exhibited fair to poor body condition and on a worsening trend.
- Milk production decreased to nine percent compared to previous month of January due to poor forage and increased trekking distances.

**Access indicators**

- The average Term of Trade increased for the month of February, from 117 compared to 114Kg in January, 2018.
- Average return household watering distance increased from 13.6km in January to 14.8 Km in February due to unavailability of rainfall. The increase is 8percent compared to previous month.
- Milk consumption in February was at 0.9 litres higher than the long term Average of 0.7 litres.

**Utilization indicators**

- The proportion of children at risk of malnutrition increased from 5.3percent in January to 5.7percent in February.
- The average coping strategy Index was 9.47 in February an increase from 6.80 in January 2018.

**Early Warning (EW) Phase Classification**

LIVELIHOOD ZONE	EW PHASE	TRENDS
Agro pastoral/Fishing	Alert	Worsening
Irrigated cropping	Alert	Worsening
Fisheries /Mangroves	Alarm	Worsening
Farming /Casual Labour	Alert	Worsening
Agro pastoral	Alert	Worsening
County	Alert	Worsening
Biophysical Indicators	Value	Normal ranges
Rainfall (% of Normal)	< 2 percent	80-120
VCI	20.71	35 to 50
Forage	Fair -poor	Good
Water Distance	14.8km	0-2.6Km
Production indicators	Value	Normal ranges
Livestock Migration Pattern	Normal	Normal
Livestock Body Conditions	Fair -poor	Good
Livestock Death from Drought	No death	No death
Milk Production	2.0Lts	>12.75Lts
Access Indicators	Value	Normal ranges
Terms of Trade (ToT)	117Kg	>89
Milk Consumption	0.9 Lts	>15.87Lts
Utilization indicators	Value	Normal ranges
Coping strategy index-CSI	9.47	<14.5
MUAC	5.7%	<5.0%

<ul style="list-style-type: none"> <li>• Reduced milk yields</li> <li>• Increased HH Food Stocks.</li> <li>• Short rains harvests</li> <li>• Land preparation</li> </ul>	<ul style="list-style-type: none"> <li>• High Calving Rate</li> <li>• Milk Yields Increase.</li> <li>• Planting/Weeding</li> </ul>	<ul style="list-style-type: none"> <li>• Land preparation</li> <li>• Increased HH Food Stocks</li> <li>• Kidding (Sept).</li> <li>• Long rains harvests</li> </ul>	<ul style="list-style-type: none"> <li>• Planting/weeding</li> <li>• Increase Milking</li> <li>• Livestock mating</li> <li>• kidding</li> </ul>	6.63	>56						
Short dry spell		Long rains		A long dry spell		Short rains					
Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec

Seasonal calendar

## 1.0 CLIMATE CONDITION

### 1.1 RAINFALL PERFORMANCE

- The off season rainfall patterns showed inconsistency of continuity during the month.
- The current NDVI values were below the historical NDVI values due to poor season. The trend is worsening with the decreased precipitation.

#### Rainfall & NDVI performance for Lamu-February 2018 Vs the long term

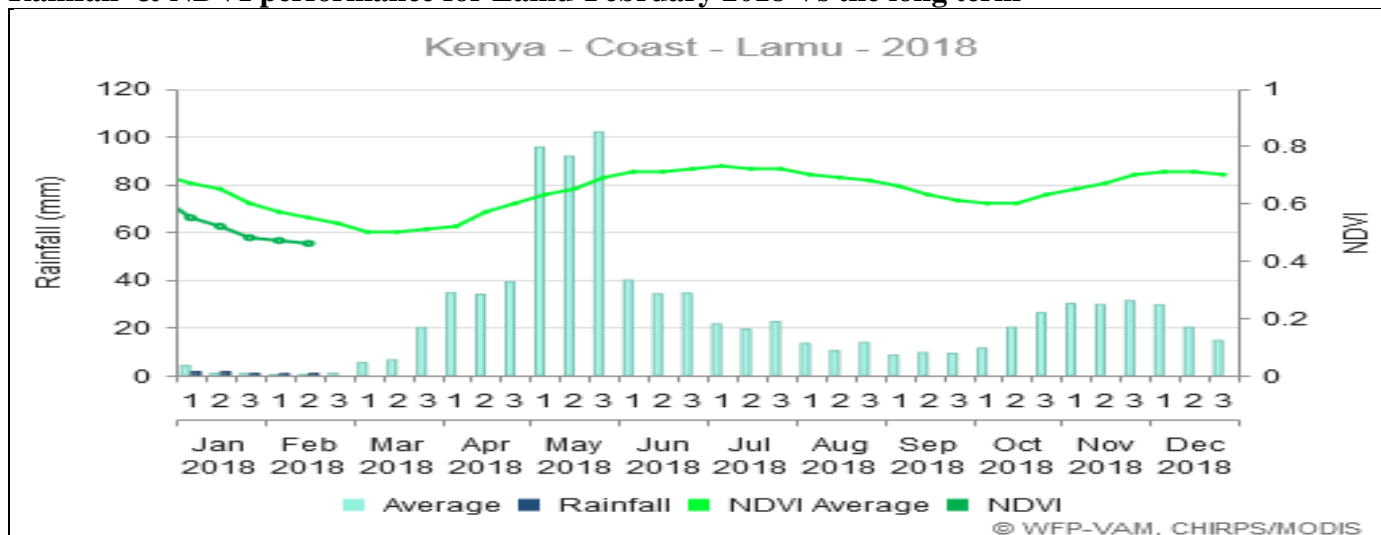


Figure1: Rainfall Satellite data. (Source: WFP-VAM)

## 2 AMOUNT OF RAINFALL AND SPATIAL DISTRIBUTION

- According to VAM WFP rainfall data, the County received an average rainfall of 1.5mm in the Month of February in the 1<sup>st</sup> and 2<sup>nd</sup> dekad. This is less than two percent of the normal rainfall.
- This was higher than the amount of 0.9 mm received in same period of the previous year.
- In addition, the current amount of rainfall received was higher than Long term average of 0.7mm.
- The performance of the off season rains was below normal compared to previous years..
- The month was characterized by low rainfall levels with poor temporal and unevenly spatial distribution in all the livelihood zones.

## 1.3 OTHER EVENTS

### 1.3.1 Flooding or any other hazards

- No floods or hazards were reported during the month.

## 2.0 IMPACTS ON VEGETATION AND WATER

### 2.1 Vegetation Condition

#### 2.1.1 Vegetation Condition Index (VCI)

- The vegetation condition index for the month of February declined by 41percent compared to the previous month. This was due to poor rainfall.
- The vegetation condition for the month of February was 20.71 compared to 34.98 in the previous month.
- The VCI indicated moderate vegetation deficit in Lamu West and severe vegetation deficit in Lamu East Sub-Counties as in the table below is the VCI-3Months.

**Table 1:February 2018 VCI (3M)**

ADMINISTRATIVE UNITS		Vegetation greenness	
County	Sub-County	VCI-3Month as at 25 <sup>th</sup> January 2017	VCI-3Month as at 26 <sup>th</sup> February 2018
LAMU	County	34.98	Alert 20.71
	Lamu East	33.52	Alarm 18.63
	Lamu West	35.82	Alert 21.92

Figures below show three month Vegetation Condition Index (VCI) matrix for Lamu County {Source: Boku University, Austria}

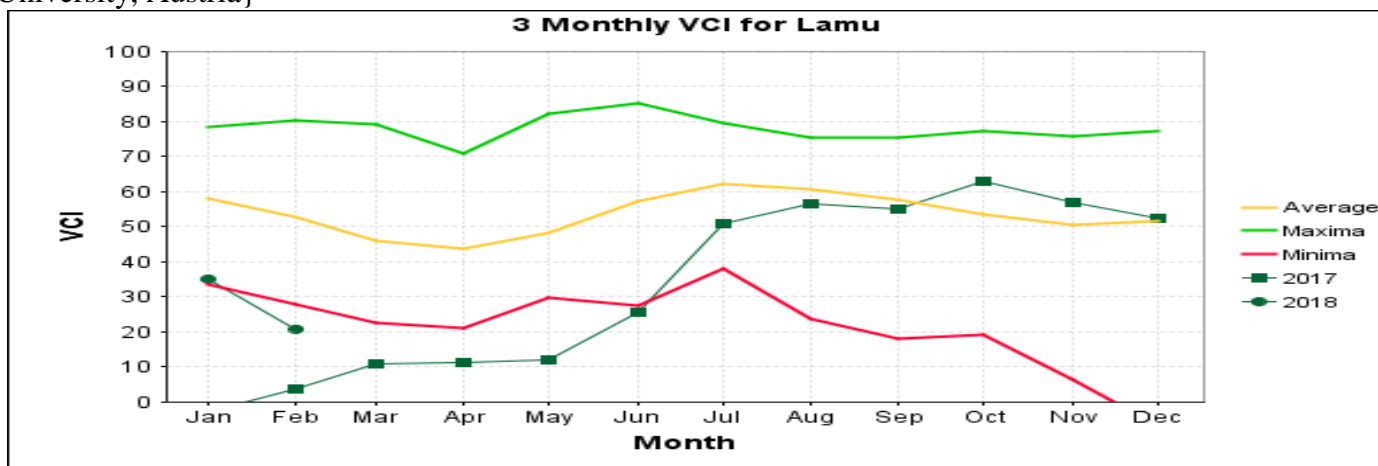


Figure 2: VCI for Lamu

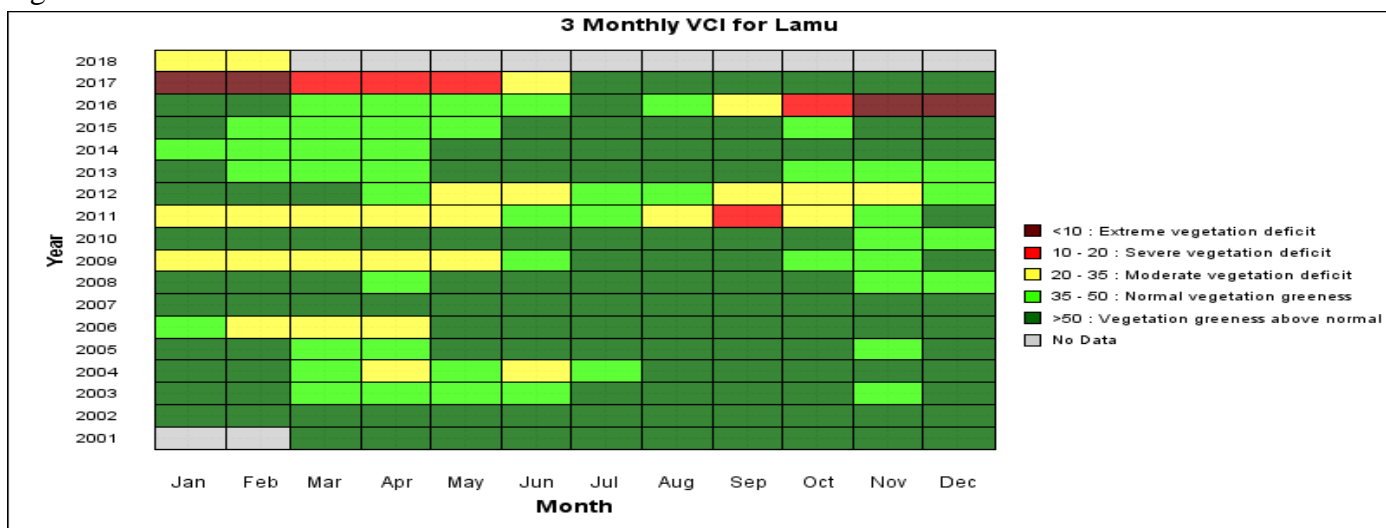


Figure 3:VCI for Lamu County

## OBSERVATIONS

### Pasture and Browse Conditions

#### 2.1.2 Pasture

- Pasture condition was fair to poor across all livelihood zones both in quality and quantity. Community interviews indicated that 50percent of pasture is fair and 50percent poor and worsening trend.
- Pasture condition by livelihood zones; Agro pastoral is fair to poor, mixed farming is fair and fishing mangrove is poor.
- The available pasture is expected to last not more than one month due to the presence of migrant livestock from neighbouring counties.

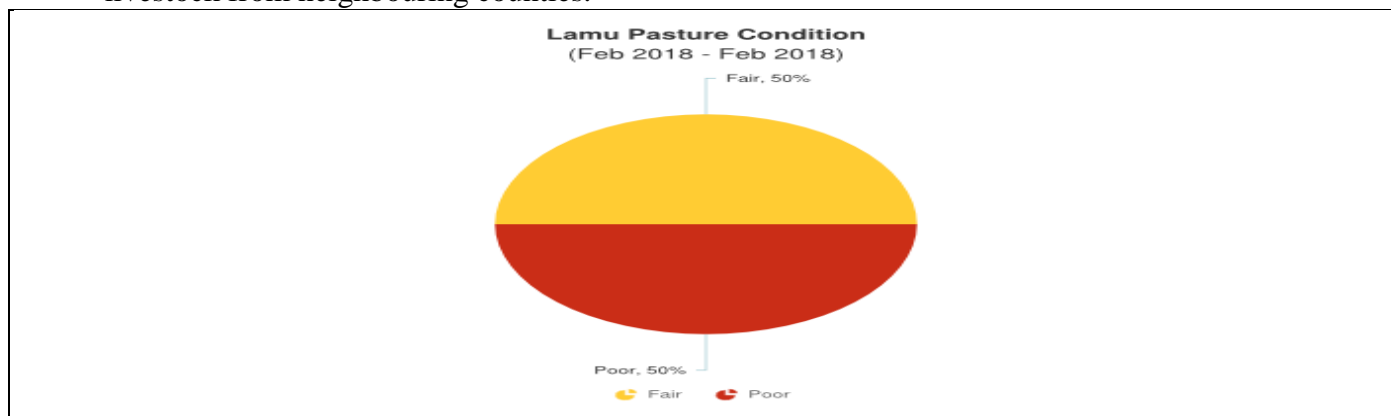


Figure 4: pasture condition for Lamu County

#### 2.1.3 Browse

- The quantity and quality of browse was poor across all livelihood zones for the month of February, Community interviews indicated that 83percent of browse is poor and 17percent fair and on worsening trend due lack of rains and high rate of transpiration.
- Browse condition by livelihood zones; Agro pastoral and fishing mangrove was poor while mixed farming was fair to poor.
- The available browse quantity is below normal compared of atypical normal year.
- The browse is expected to last for less than one month.

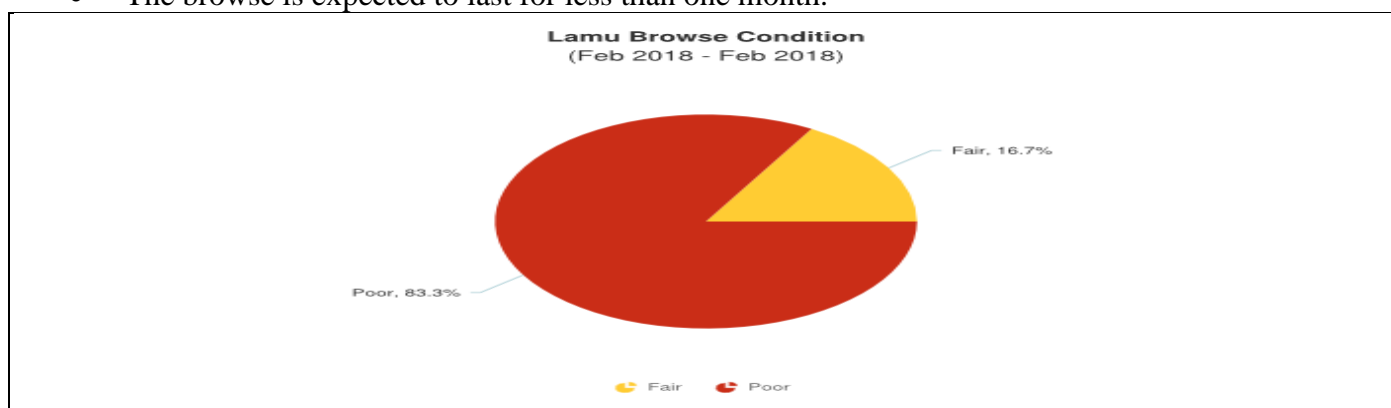


Figure 5: Browse condition for Lamu County

## HYDROLOGICAL DROUGHT

### 2.2 Water Sources and Availability

#### 2.2.1 Main water sources

- The state and condition of water sources in the County was fair to poor across most livelihood zones. However the current water situation is worsening compared to previous month.
- The main water sources in the month of February:-Pans and dams -12.5percent, Boreholes-37.5, shallow wells-37.5 and Rivers-12.5.

Sources of water for Lamu County February,2018.

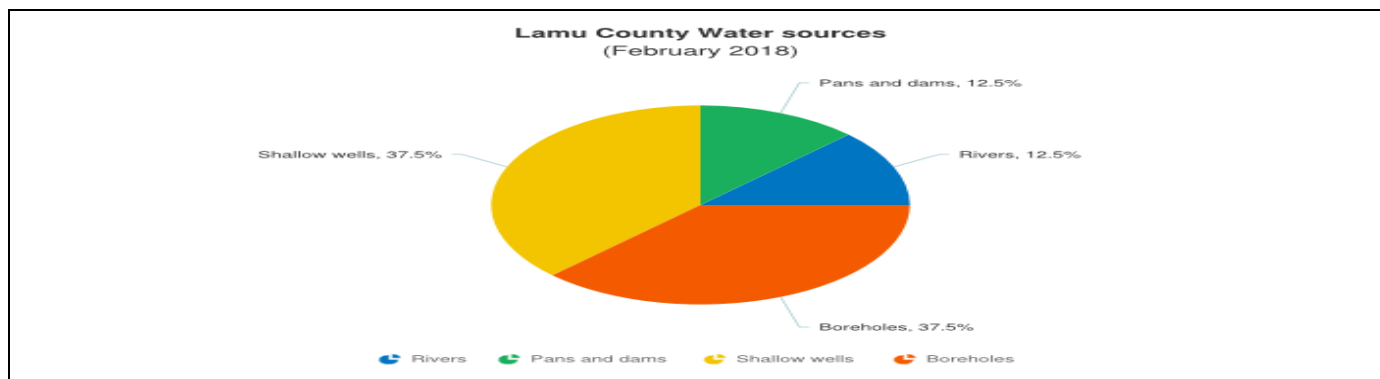


Figure 6: Main sources of water

#### 2.2.2 Household access and Utilization

- Average Household watering return distance was 14Km in February an increase from 12.6Km in January. This was due to insignificant rainfall amount which led to decreased in water levels.
- Household return water distances per livelihood zone were as follows: the Agro pastoral -3.9Km, Fishing & Mangrove Harvesting 3.6Km and for Mixed Farming Zone it was 2.2Km and irrigated farming 3.4Km respectively.
- The 2013-2017 average household water distances for February was 4.9 Kilometers which was lower than the current average household watering distance for February as figure 7.
- The average household water consumption per person per day is at 5-10 litres in the Pastoral zone whereas in the Fishing 3-5 litres per person per day.
- Water costs at source is 5Kshs in towns centers for 20 litre Jerrican while in Fishing zone 20litre Jerrican costs 50 Kshs and transport cost is 50Kshs from water sources.

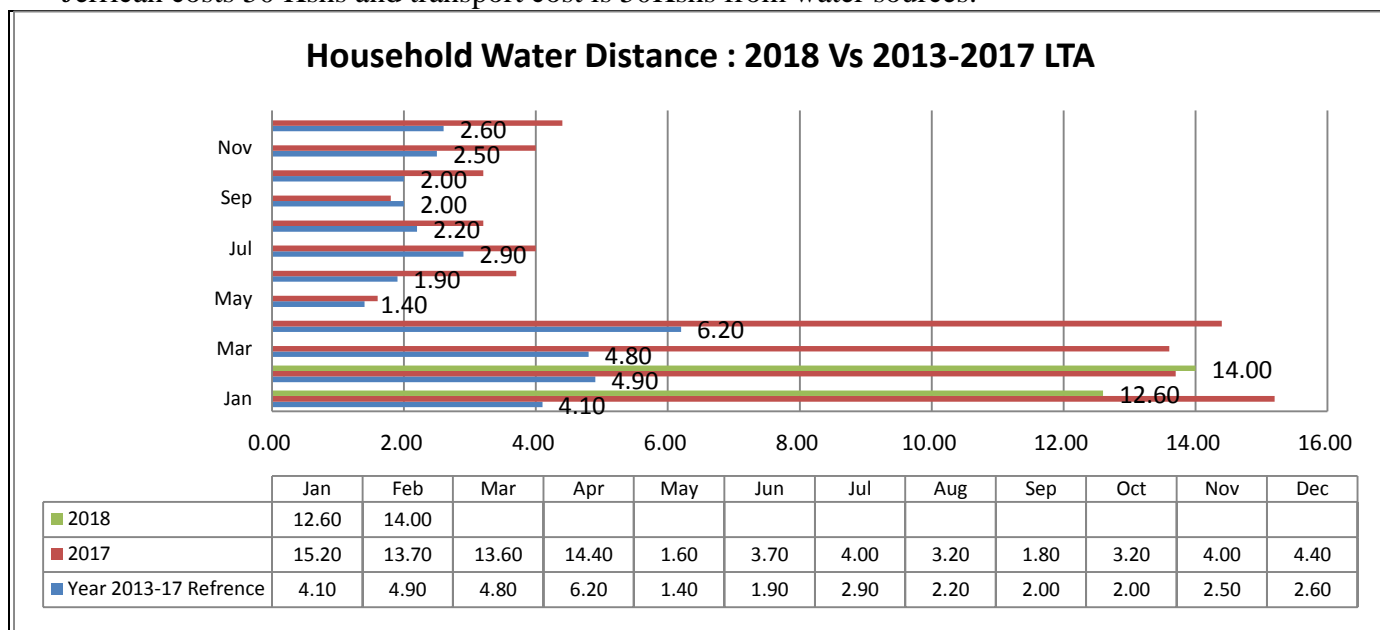


Figure 7: House hold water distance

n=150

### 2.2.3 Livestock access to Water

- Livestock average distance to water source from grazing Area was 13.6 kilometres in the month of January from 14km in month of February, 2018. The increase from last month's distance was due to poor rainfall which led to less recharge.
- Frequency for watering cattle and goats is 3-4 times in a week.
- The current average grazing water distance for January is 13.6 Kilometers was higher than the year 2013-2017 long-term average of 6.3 Kilometres.

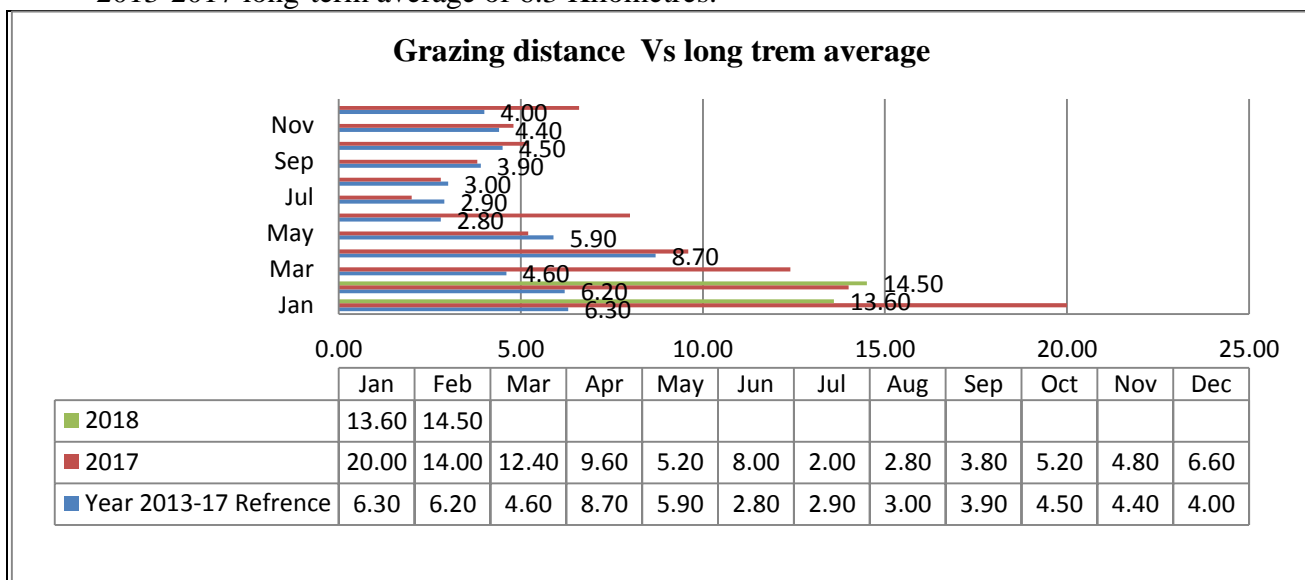


Figure 8: Grazing Distance-Km

n=150

### 2.2.4 Household Income

- The main household income for the month of February was as follows: Casual labour - 56percent, Employment - 19percent, trade - 17percent, sale of Livestock/Livestock products - 8percent respectively. However, employment increased by three percent while there was decrease in trade and sale of livestock products compared to previous month.

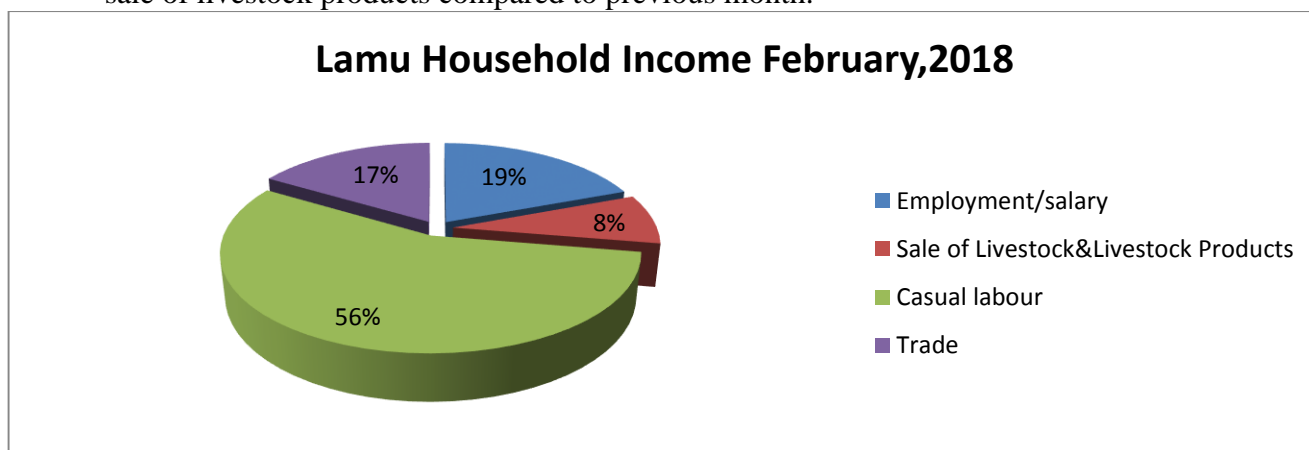


Figure 9: Household source of income

## 2.4 Implication to Food Security

- Insignificant rainfall recorded during the month of February with no recharging of major open water sources leading to long distance access to water for both livestock and domestics uses.
- Agro Pastoral, Fishing and Mangrove zones livelihood zones were mainly affected especially in Faza, Tchundwa, Mtanga-wanda, Kiunga, Ndau, Bargoni, Pandanguo and Milimani where the cost of water is 50-100 Kshs per 20 litre Jerrican.
- The long distances to water sources have had a negative impact on the body condition of animals and household hygiene standards.

### 3.0 PRODUCTION INDICATORS

#### 3.1.0 Livestock Production

##### 3.1.1 Livestock Migration Patterns

- The huge numbers of in-migrant herds of Livestock from neighboring counties were still present in the county. However, no new in-migrations observed during the month under review.

##### 3.1.2 Livestock Body Condition

- Livestock body condition was fair to poor for all species across all the livelihood zones. This is attributed to reduced pasture and browse condition in quality and quantity.
- The livestock body condition of livestock was fair to poor for cattle and good to fair for goats in both the Pastoral and Agro Pastoral livelihood zones with worsening trend.
- Livestock body condition is expected to worsen in coming months across all the livelihood zones due to poor and early cessation of the short rains.
- In comparison to similar periods during previous years, the body condition of all species was fair to poor and this is attributed to declining forage condition in all the livelihood zones.

##### 3.1.3 Livestock Diseases

- There were no incidences of Livestock diseases reported during the month of February.

##### 3.1.4 Milk Production

- Milk production increased from 2.2litres in January to 2.0litres in February 2018. This was higher than the long-term average of 0.9 litres in February as in figure10 below.
- In comparison to a normal season, the current household milk production is below the normal by 83 percent.
- There slight change from the household milk production recorded during the previous month is due to calving especially in Goats and the insignificant rainfall received especially in Lamu west.
- Milk productions were distributed as follows: Mixed farming Produced 3litres, Fishing 1.5litres, and Irrigated 2.8litres while the Agro pastoral Zone produced average of 1litres.

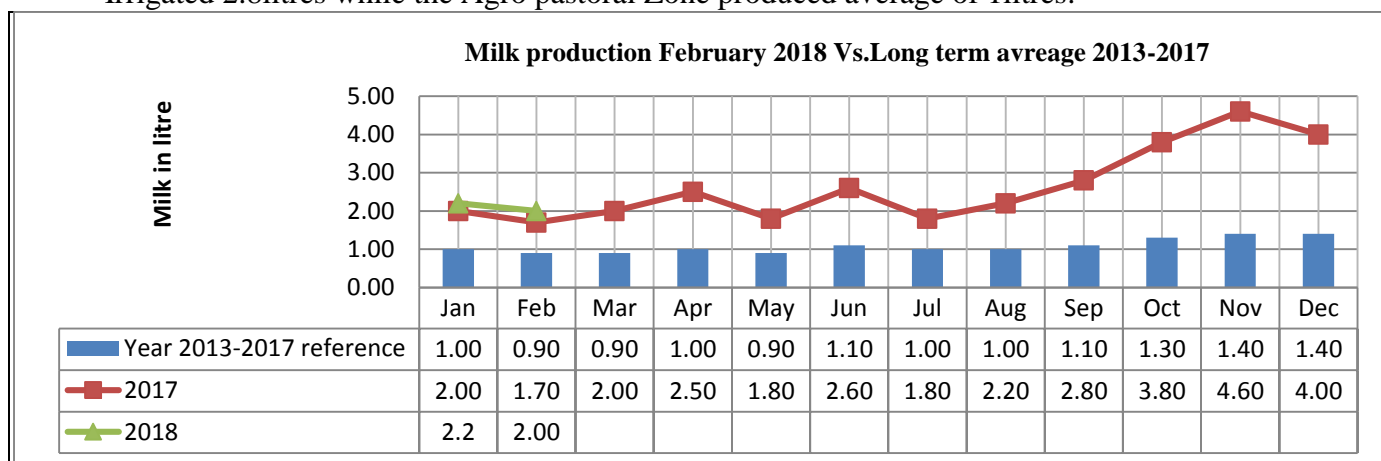


Figure 10: Milk production

n=150

### 3.2 RAIN FED CROP PRODUCTION

#### 3.2.1 Stage and condition of food crop

- The main crops grown are Maize, Cowpeas and Green grams in the County.
- There is no plantation currently in crop farmer. With the few who planted the crop wilted due poor rainfall and high transpiration. This affected crop harvest which was below normal compared to previous season.

### 3.3 Implications on Food Security

- The fair body condition of cattle across the livelihood zones has increased the prices resulting to increased income for livestock farmers.

## 4.0 MARKET PERFORMANCE

### 4.1 LIVESTOCK MARKETING

#### 4.1.1 Cattle Prices

- Average cattle market price in the month of February was Kshs 22,500 which is slight increase from previous month as in figure 11 below.
- This increase in price could be attributed to high demand and fewer supplies in the markets owing to long rains expected next month.
- The cattle average market prices were distributed as follows: Faza - Kshs 30,000, Witu - Kshs 15,000, Kiunga - Kshs 31,000 and Mokowe - Kshs 21,500 respectively.
- The average market cattle price for the month of February was, however higher than the 2015-2017 long-term average price of Ksh.15, 900.

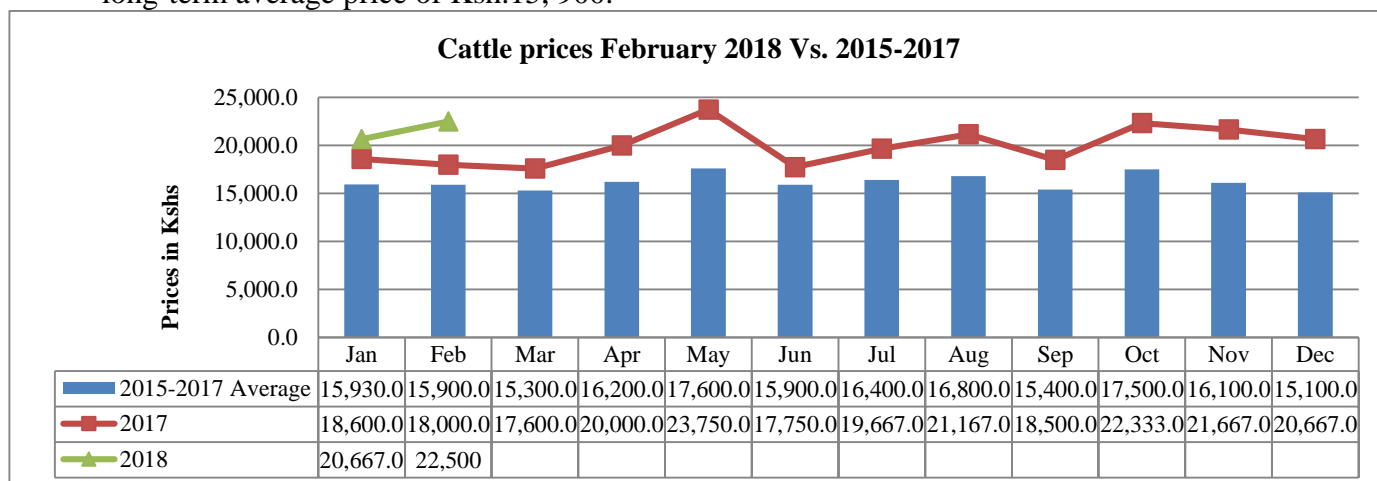


Figure 11: Cattle prices

#### 4.1.2 Small Ruminants Prices

#### 4.1.3 Goat Prices

- Goat prices for medium size animal increased from Kshs 4,450 for the month of January to Kshs 4,950 in February as shown in figure 12 below. This increase in price of goats could be attributed to long rainfall expected next month and high market demands.
- The goat average market prices were distributed as follows: Mpeketoni Kshs 3,800, Witu Kshs 4,750, Kiunga Kshs 6,500 and Mokowe Kshs 5,000 respectively.
- The long-term average goat price for the month of February was Kshs. 3,720 which was lower than the current average price for the month of February.



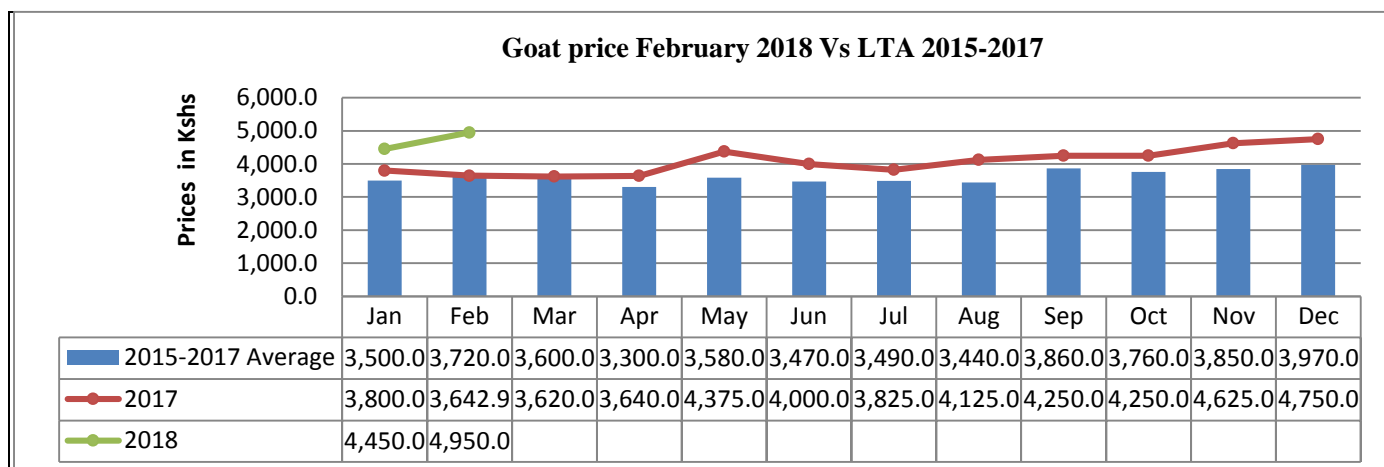


Figure 12: Goats prices

## 4.2 CROP PRICES

### 4.2.1 Maize price

- Average price of a Kg of maize in the Month of February was Kshs 43.0/Kg which was an increase from Kshs 39 during the previous month as shown in figure 13 below.
- The prices were distributed as follows: Hindi centre Kshs 40, Patte Kshs 60, Witu Kshs 35, Mpeketoni Kshs 35 and Kiunga Kshs 60 respectively. However price ranges is determined by commodity supply in the different markets.
- The average price of maize in February was higher when compared with the long term-average price of Kshs 34.

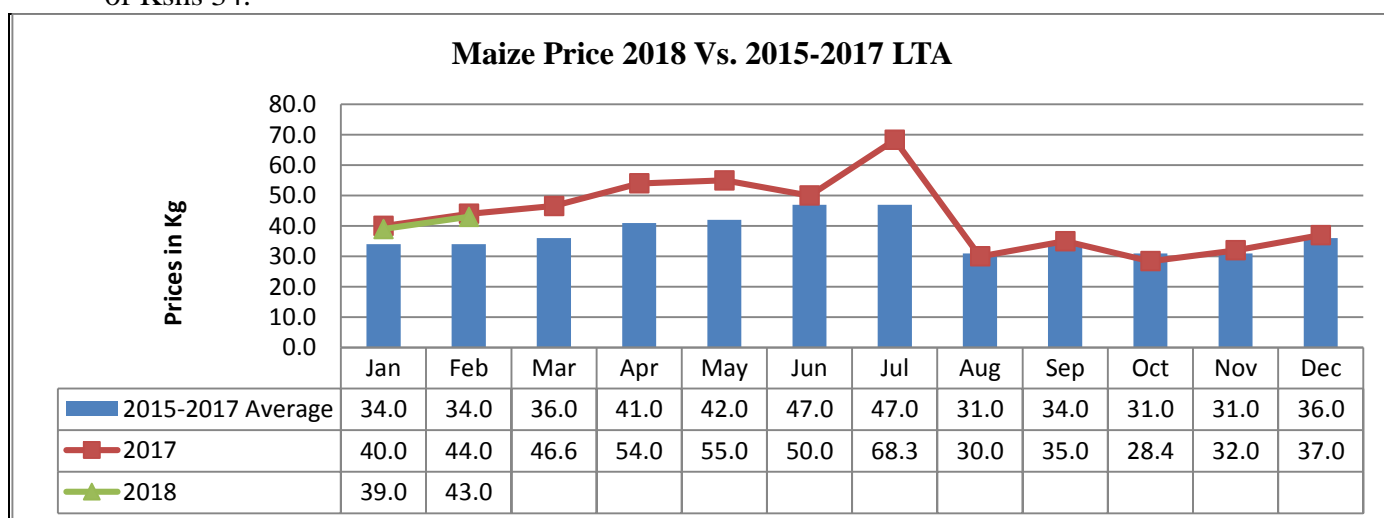


Figure 13: Maize prices

### 4.2.2 Beans

- Average price of Kg of beans was Kshs 102 in February, and remained stable as previous month as in figure 14 below.
- The beans price was distributed as follows: Mswakini centre, Patte Kshs100 and Witu Kshs 90, Mpeketoni Kshs 80 and Kiunga 120 Kshs respectively. However price ranges is determined by commodity supply in the different markets.
- The long-term average price of beans was Kshs. 93.0 which was lower than the current average beans price for the month of February.

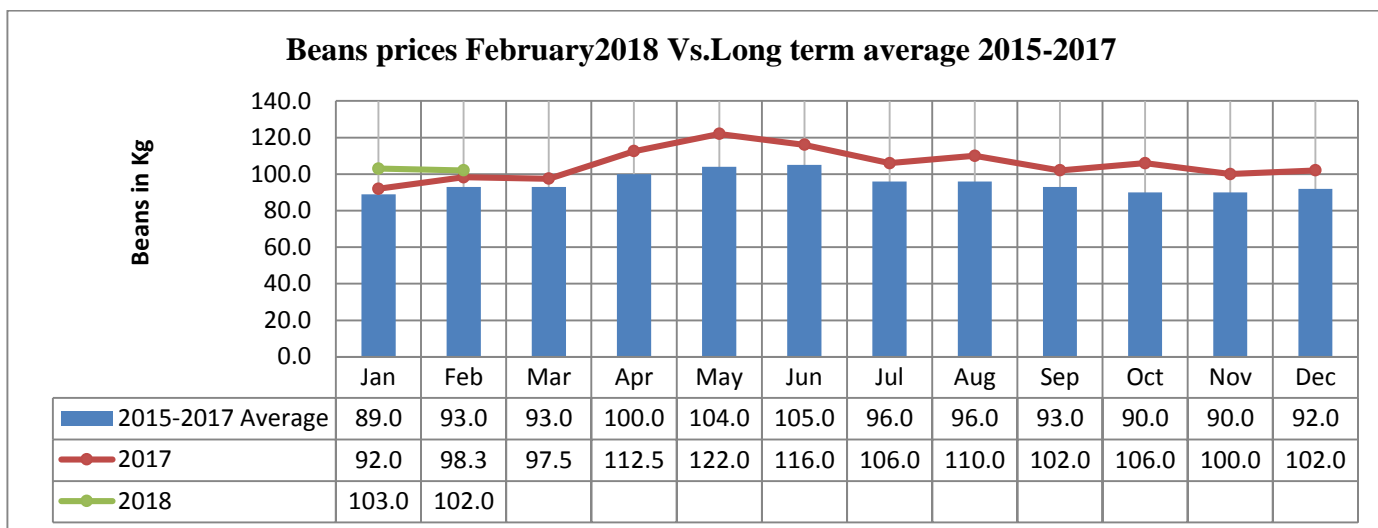


Figure 14: Beans prices

#### 4.3 Livestock Price ratio/Terms of Trade

- The average Term of Trade (ToT) for the month of February was 117kg, slight increase compared to 114Kg during the previous month as in figure 15 below.
- Sale of a medium goat in February would cost a household about 117.0 kg of maize. This showed the exchange ratio increased in favour of goat sellers to crop farmers. However this was determined by supply in the different markets.
- The ToT was 126Kg in Lamu West and 108Kg in Lamu East. The ToT for February was slightly higher than the long term average of 116Kg.

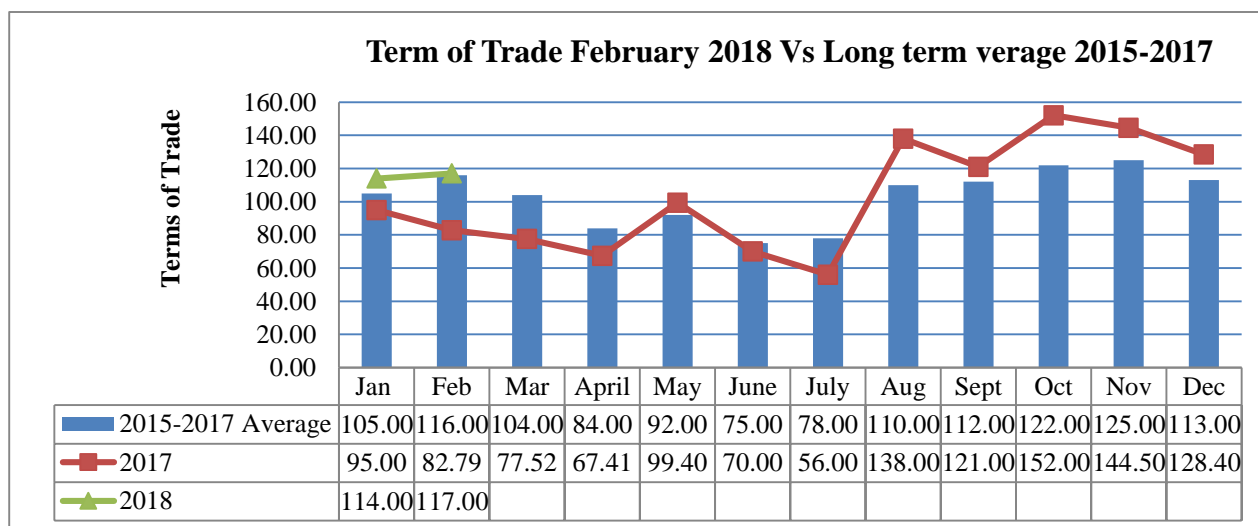


Figure 15: Terms of trade

#### 4.4 IMPLICATION ON FOOD SECURITY

- The fair body condition of livestock have increased livestock prices especially for cattle and goat, therefore livestock farmers are able to get better value for their livestock contributing to food security in Mixed and Agro pastoral zones.
- Maize prices increased due to low supply and poor harvest during of the short rains of the product in the markets.
- Farmers are able to sell livestock (especially goat and cattle) at fair prices, hence improves food security at household level.
- The terms of trade favors livestock farmers than crop farmers during the month under review.

## 5.0 FOOD CONSUMPTION AND NUTRITION STATUS

### 5.1 Milk for Household Consumption

- Milk Consumption was 0.9litres in the month of February which decreased slightly compared to one litre during the previous month as in figure 16 below.
- The decrease in milk consumption level is as a result of fluctuating production attributed to the worsening forage and increasing livestock trekking distances to water points.
- February long term average milk consumption of 0.70 litres which was lower than the current average of milk consumption per household.

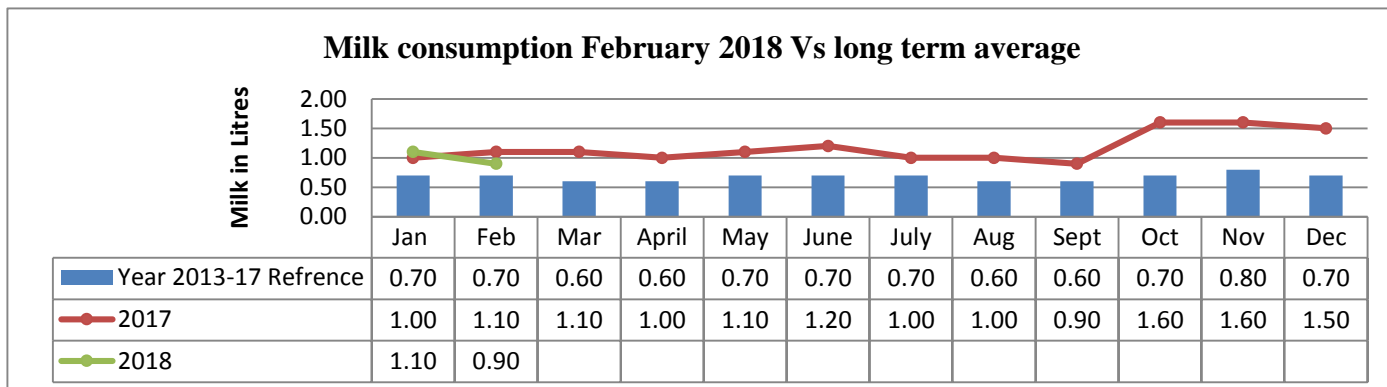


Figure 16: Milk Consumption

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## 5.2 HEALTH AND NUTRITION STATUS

### 5.2.1 MUAC

- The percentage of children aged between 6 months and 5yrs in the County with mid upper arm circumference of less than 125 mm increased from 5.3 percent in January to 5.7 percent in February. The proportion of children under five at risk of malnutrition with Mid Upper Arm Circumference below 135mm was 5.7 percent in February 2018 compared to long term average of 4.2 percent indicating worsening situation. This increase was attributed to reduced food availability and dietary diversity, reduced milk consumption and reduced purchasing power.
- The rates of Malnutrition cases are increasing in the Agro pastoral and Mixed farming Zones of Witu, Hindi and Basuba ward.
- This figure of 5.7 percent MUAC for February was higher compared to long term average of 5.10 percent as in figure 17 below.

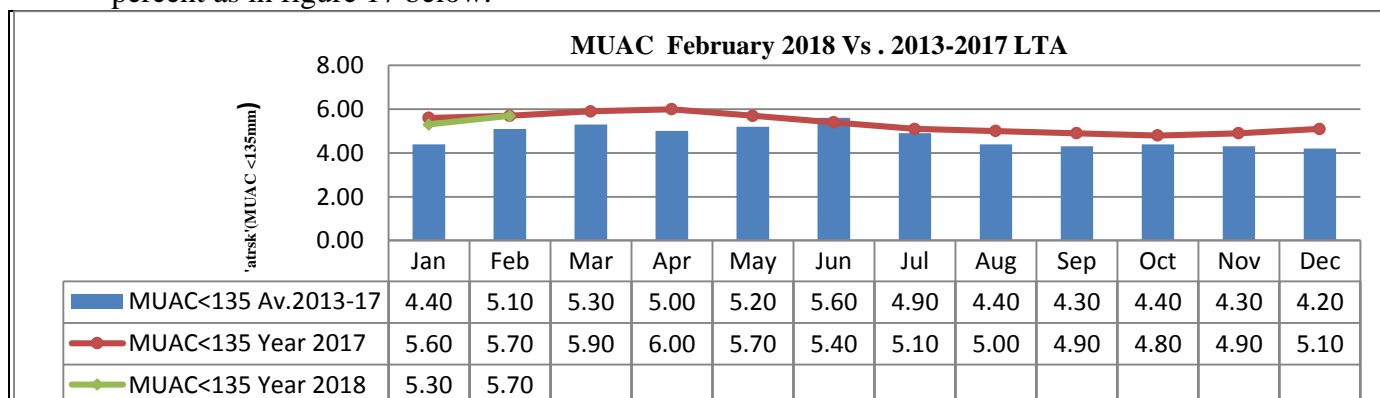


Figure 17: MUAC

n=150

### 5.2.2 Health

- There were no cases of major disease outbreak both for children and general population in the County.

### 5.3 FOOD CONSUMPTION SCORE (FCS)

- Fishing/Mangrove livelihood zone had the highest number of Households with poor dietary diversity at five and 6.7 percent poor with mixed farming having poor at 1.7 percent and 48.3percent borderline for Month of February but shows improvement from the previous month.
- Acceptable FCS were noted in Agro pastoral and fishing /Mangrove zone with 81.7 and 63.3percent of households respectively owing to availability of food in the markets with improved purchasing power.
- Household percentage with poor FCS increased significantly from 0 in January compared to 6.7percent in February in Fishing/Mangrove livelihood zones as shown in figure 18 below.

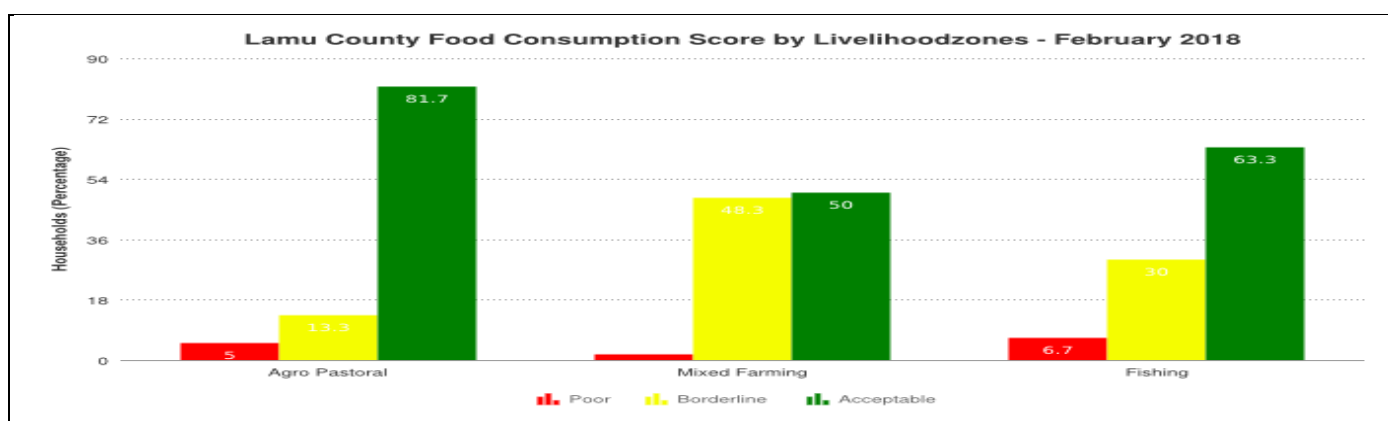


Figure 18: Food Consumption Score (FCS)

### 5.4 COPING STRATEGY INDEX

- The mean coping strategy Index in the Month of February increased to 9.47 from 6.80 in January, indicating increased coping strategies at household level.
- Agro pastoral Zone had CSI of 8; Mixed Farming livelihood zone had 11.2 while Fishing Livelihood zone had a coping strategy index of 9.1 as shown in figure 19 below.
- Common coping strategies employed by food insecure households in the month of February were:
  - ✓ Opting for less preferred or cheaper meals.
  - ✓ Reduction in the number of meals.
  - ✓ Purchase on credit/remittances from relatives.
  - ✓ Borrow food from friends or relatives.

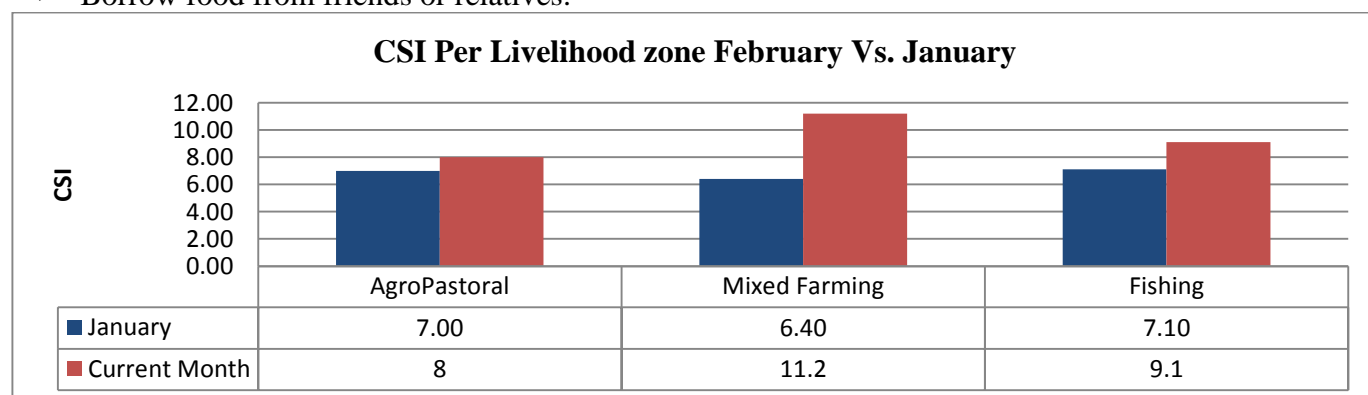


Figure 19: Coping strategies Index

### 5.5 Implication on Food Security

- Low milk consumption at household levels across all the Livelihood zones could lead to decreased dietary diversification and thereafter a negative impact on food insecurity.

- The increase in the percentage of children under five, who are both at risk of malnutrition, have been deteriorating from January to February in areas of Agro pastoral Zones of Witu, Hindi and Basuba wards respectively.

## **6.0 CURRENT INTERVENTION MEASURES (ACTION)**

### **6.1 NON-FOOD INTERVENTIONS**

#### **6.2 Drought Response Interventions**

- Cash transfer by the Social protection department to 3000 households for older persons, Orphans and people with severe disabilities respectively for the entire county.
- The cash transfer will improve the purchasing power of the households to access food of their preferences.

## **7.0 EMERGING ISSUES**

### **7.1 Insecurity**

- There were no cases of insecurity reported during the month under review.

### **7.2 Migration**

- No Livestock in-migration reported during the month under review.
- There were no abnormal cases of human migration during the month.

## **7.3 FOOD SECURITY PROGNOSIS**

- The long rains season (March – May 2018) will be below average tending to average in terms of performance.
- Markets will continue to operate normally.
- Cases of insecurity will be contained
- Food prices are expected to increase.
- Nutrition cases are expected to worsen.
- Term of trade is expected to decline due to increase in goat prices.
- Water availability and accessibility situation is declining for both domestics and livestock due to insignificant rainfall and high evapo-transpiration rates, hence increasing in trekking distances to water sources in the next one month.
- Households will continue employing consumption related coping strategies.
- Browse and pasture condition will continue worsening and hence destabilize both livestock body conditions, production and prices in coming one month.
- The February 3-Month Vegetation Condition Index indicating Moderate agricultural drought for the entire County and hence on worsening trend in the next one month if it doesn't rained.
- The worsening livestock body condition will reduce the purchasing power of farmers to access commodities in the markets in the next one month hence food insecurity at household level.

## **8.0 RECOMMENDATIONS**

### **Water**

- Water trucking to affected hot spot areas of Kiunga, Kiangwe, Mtangawanda, Bargoni and Pandanguo.

- Promotion of rain water harvesting, repair of Djabias, roof catchment areas, installation of gutters and tanks in Villages and Institutions.
- Constructions of water pans and dams for preparedness.
- Conducting of hydro geological survey and drilling of boreholes.

### **Livestock**

- Accelerate completion of Nagele Livestock market for Linkage to other Livestock markets.
- Livestock disease surveillance and control to curb spread of livestock diseases.
- Upscale efforts aimed at stock piling livestock feeds in strategic hay reserves for use during the dry season by providing farmer groups with pasture seeds so as to maximize production over the long rains season.
- Promote Pasture and fodder planting in the county during the next rainy season and under irrigation.
- Provision of hay band machines for harvesting.
- Provision of storage facilities for Animal feeds.
- Promote livestock insurance services.
- up scaling & accelerating of the poultry value chain in the county.

### **Agriculture**

- Provision of relief seeds, fertilizers and subsidized tractor services for crop farmers.
- Build Capacity of crop farmers to plant drought resistance food crops.
- Mobilization and sensitization of farmers' on crop insurance.

### **Health and Nutrition**

- Strengthen malnutrition screening and active case search as well as strengthen integrated management of acute malnutrition in the community.
- Enhance disease and nutritional surveillance.

### **Education**

- Support to schools feeding programmes for the most vulnerable communities focusing on the most vulnerable areas in the county to minimize drop outs.
- Provide Food for fees for students hailing from Vulnerable and poor families.
- Provision of boarding facilities to vulnerable communities within the County.

### **Peace and Security Sector**

- Peace and security meetings should be enhanced in the County and her neighboring counties to avert future livestock and Crop farmers conflicts.

### **Information Communication Technology**

- Promote use of ICT on Drought information sharing and development programmes.

## **REFERENCE TABLES**

**Table 1: Drought Phase Classification**

Normal	Alert	Alarm	Emergency
All environmental Agricultural and pastoral indicators are within the seasonal ranges	Meteorological drought indicators move outside seasonal ranges	Environmental and at least two production indicators are outside Long term seasonal ranges	All Environmental, Metrological and Production indicators are outside normal ranges.

**Recovery:** The drought phase must have reached at least Alarm stage. Recovery starts after the end of drought as signalled by the environmental indicators returning to seasonal norms; local economies starting to recover

**Table 2: Standardized Precipitation Index (SPI)**

Color	SPI Values	Metrological Drought Category
	> +1.5or more	Wet Conditions
	0 to +1.5	No drought
	-0.1 to -0.99	Mild drought
	-1 to -1.99	Severe drought
	<-2 and less	Extreme drought

**Table 3: Vegetation Condition Index Values (VCI)**

Color	VCI values 3-monthly average	Agricultural Drought Category
	≥50	Wet
	35 to 50	No agricultural drought
	21 to 34	Moderate agricultural drought
	10 to 20	Severe agricultural drought
	<10	Extreme agricultural drought

**Table 4: Livestock Body Condition**

Level	Classification	Characteristics (this describes majority of the herd and not individual isolated Stock)
1	Normal	Very Fat Tail buried and in fat
		Fat, Blocky. Bone over back not visible
		Very Good Smooth with fat over back and tail head
		Good smooth appearance
2	Moderate	Moderate. neither fat nor thin
3	Stressed	Borderline fore-ribs not visible. 12th & 13th ribs visible
4	Critical	Thin fore ribs visible
5	Emericiated	Very thin no fat, bones visible
		Emaciated, little muscle left

## Definition of Early Warning Phases

The EW phases are defined as follow:

**NORMAL:** The normal phase occurs when **biophysical drought indicators ( VCI and SPI) show no unusual fluctuations** hence remain within the expected ranges for the time of the year in a given livelihood zone, division or county

**ALERT:** The alert phase is when either the **vegetation condition index or the standard precipitation index (biophysical indicators) show unusual fluctuations below expected seasonal ranges** within the whole county or livelihood zones.

**ALARM:** The alarm phase occurs when both **biophysical and at least three production indicators fluctuate outside expected seasonal ranges** affecting the local economy. The production indicators to be considered are livestock condition, crop condition, milk production, livestock migration and livestock mortality rate.

If **access indicators** (impact on market, access to food and water) move outside the normal range, the status remains at “alarm” but with a worsening trend. Proposed access indicators include ToT, price of cereals, availability of cereals and legumes, and milk consumption. The trend will be further worsening when also welfare indicators (MUA and CSI) start moving outside the normal ranges.

**EMERGENCY:** In the emergency phase, **all indicators are outside of normal ranges**, local production system has collapsed within the dominant economy. The emergency phase affects asset status and purchasing power to a level that seriously threatens food security. As a result, coping strategy index, malnutrition (MUAC) and livestock mortality rates move above emergency thresholds

**RECOVERY: Environmental indicators returning to seasonal norms.** The drought phase must have reached at least Alarm stage. Recovery starts after the end of drought as signalled by the environmental indicators returning to seasonal norms while production indicators are still outside the normal seasonal range but local economies start to recover. The status changes to normal once the bio physical and production indicators are back to normal range.