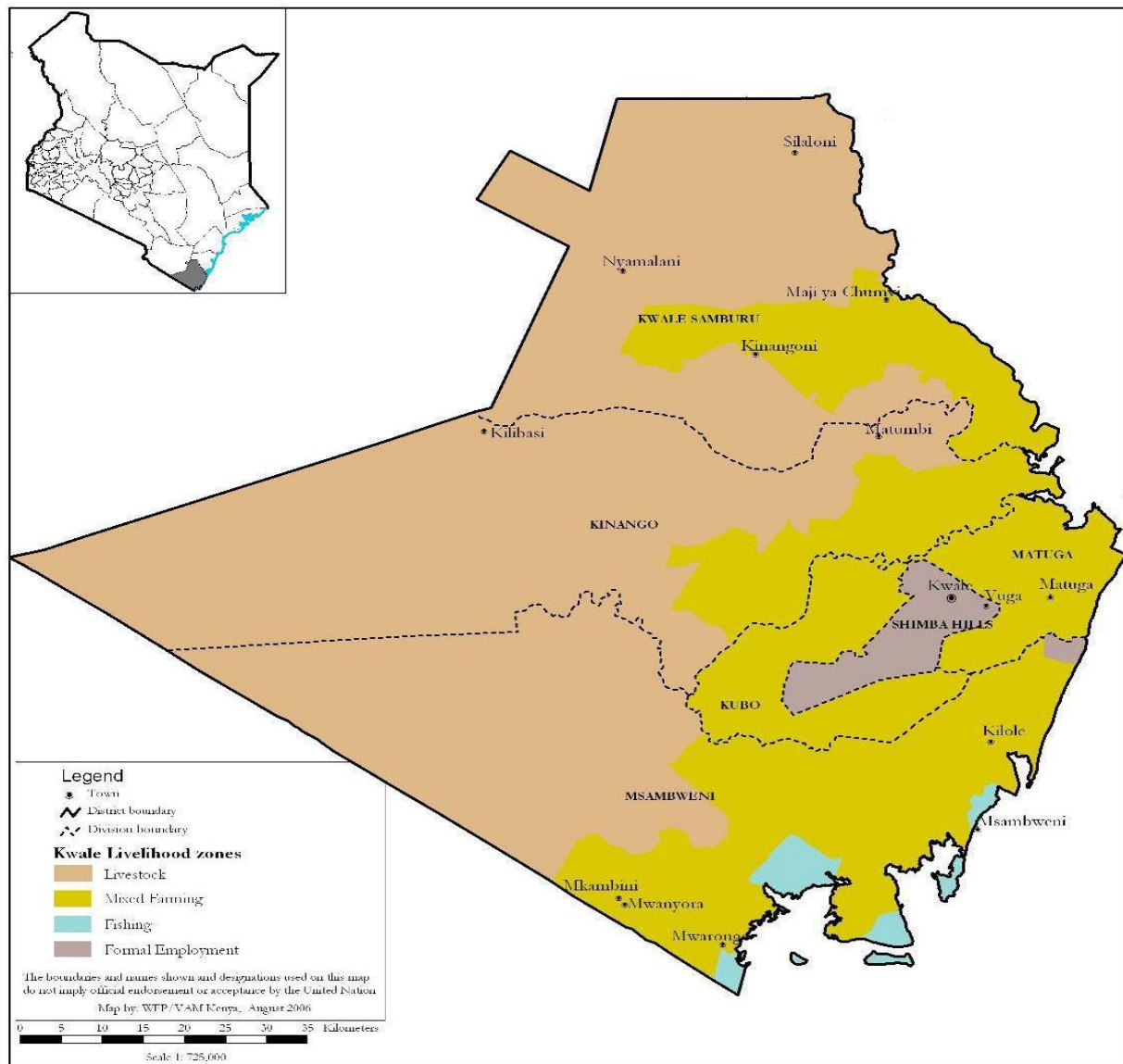


# KWALE COUNTY 2017 LONG RAINS FOOD AND NUTRITION SECURITY ASSESSMENT REPORT



## A Joint Report of Kenya Food Security Steering Group<sup>1</sup> and Kwale County Steering Group

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## **Executive Summary**

Kwale County is classified in the Stressed Phase (Phase 2) of the Integrated Food Security Phase (IPC), which imply that even with any humanitarian assistance, household groups have minimally adequate food consumption but are unable to afford some essential non-food necessities without engaging in irreversible coping strategies. The main drivers to the current food insecurity situation are attributed Fall Army worms that have led to massive crop damage across all livelihood zones. High food prices and unavailability of maize flour continue to limit household access to food. Maize production is expected to decrease by 40 percent.

Maize stocks held by household are less than one percent of Long term average (LTA) while traders are holding 58 percent of LTA. Currently, millers have no stocks left. A kilogram of maize was trading between Ksh. 65 – 75 per Kg, which is about 60 percent above the long term average of Ksh. 44 per kg. A medium-sized goat is selling between Ksh. 2.500-3000, which is approximately 30 percent above the five-year average.

Due to the previous drought, most households in the Food crop/food crop zone lost their livestock and as a result, their income level has deteriorated. Milk production has also reduced. Body condition of goat and sheep is good across the County. Due to fair pasture in the Livestock livelihood zone, cattle body condition is fair. Domestic water consumption have above the minimum emergency threshold with Mixed farming consuming 25-40 litres and Livestock farming zone are consuming between 15-20 litres per person per day.

The average return trekking distances from grazing area to watering points have reduced from six to four kilometres and livestock is watered daily. Currently there is no migration of livestock into or out of the County, neither disease outbreaks nor unusual livestock deaths reported in the county. The proportion of children (6-59 months) at risk of malnutrition in June 2017 remained stable at 5.7 percent, slightly below the LTA of 5.8 percent. The leading three common diseases among under-fives are upper respiratory tract infections (URTIs), malaria, diarrhoea, pneumonia and diseases of the skin diseases are on the increase.

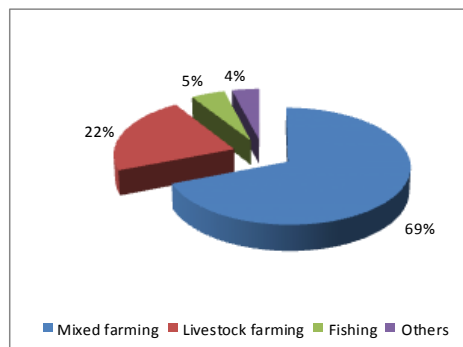
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## 1.0 INTRODUCTION

### 1.1 County Background

Kwale County is located in the coastal region of Kenya and constitutes four sub counties namely; Matuga, Msambweni, Kinango and Lungalunga which are further fragmented into 20 wards. The county covers an area of 8,960 square kilometers and has an estimated population of 649,931 (KNBS census 2009). The county borders Taita Taveta County to the west, Kilifi County to the north, Mombasa to the northeast, the Indian Ocean to the east and the Republic of Tanzania to the south. The main livelihood zones are: mixed farming, livestock farming and fishing (Figure 1).



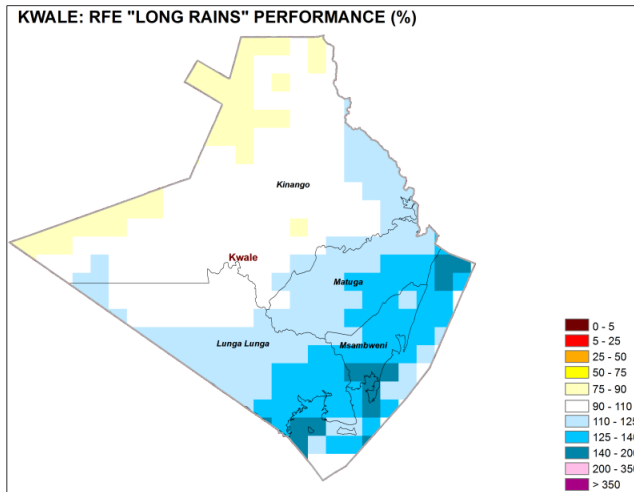
**Figure 1: Proportion of population in livelihood zones**

### 1.2 Objectives and approach

The main objective of long rains food security assessment was to develop an objective, evidence-based and transparent food security situation analysis following the long rains season of 2017, taking into account the cumulative effect of previous seasons, and to provide immediate and medium term recommendations for possible response options based on the situation analysis. Primary data was collected during the field visits at the County where community and market interviews were conducted. Technical reports were also provided by the sectoral technical members at the County level. Secondary data collected from the early warning system was relied upon to provide trends for the different food security indicators.

## 2.0 DRIVERS OF FOOD AND NUTRITION SECURITY IN THE COUNTY

### 2.1 Rainfall Performance



**Figure 2: Spatial distribution of rainfall**

The onset of the long rains was late with rainfall experienced in the third dekad of March in most parts of the County compared to the normal 1<sup>st</sup> dekad of March. In Matuga sub-county, the rainfall onset was 24<sup>th</sup> of March which was normal. Most parts of MSambweni, Matuga and Lungalunga received normal rainfall between 110 to 140 percent of normal while the larger part of Kinango received rainfall between 90 to 110 percent of normal (Figure 2). Temporal distribution of the rains was however poor as most of the recorded rainfall above normal was received in the first and third dekads of May and this led to flash

flooding in some areas. Most while the other dekads in the season had below normal rainfall. A total of 79.5 mm of rain was recorded at Kwale between 24<sup>th</sup> and 31<sup>st</sup> March, 2017. The temporal distribution was poor with most parts of the county experiencing floods due to high rainfall intensity in the second dekad of May.

### 2.2 Current Shock and Hazards

The main hazards contributing to food insecurity in the county is Fall Army worms that have led to massive crop damage across all livelihood zones. Due to the army worms, crop production is expected to reduce with crop failures estimated to about 40 percent. This is likely to affect the household food security with reduced availability and also reduced household income derived from sale of food crops.

High food prices and unavailability of maize flour continue to limit household access to food. Low latrine coverage of less than 10 percent has led to poor hygiene and sanitation especially in Kinango exacerbating the risk of water-borne diseases. Late onset of the long rains led to late planting that was followed by poor temporal distribution of the rains hence the season is likely to perform poorly.

### 3.0 IMPACT OF IMPACTS OF DRIVERS ON FOOD AND NUTRITION SECURITY

#### 3.1 Availability

##### 3.1.1 Crop Production

###### Crop Production

The long rains season is more dependable for crops production in the county than the short rains season. The main food crops grown in the county are maize, cowpeas, cassava and green grams. Maize accounts for 50 percent and nine percent of food and income sources respectively in the mixed farming livelihood zone. In the livestock farming livelihood zone, cowpeas contribute 14 percent of household income respectively.

###### Rain fed crop production

The major food crops grown under rain fed agriculture include maize, cassava and cow peas. During the Long Rains of 2017, the achieved hectare under all the main crops decreased by between three percent compared to the long-term average. The area under Maize decreased by 7.5 percent compared to the long time average while production is expected to decrease by 40 percent. Similarly, the area under cassava decreased by six percent and its production is expected to decrease by two percent compared to long term average. On the other hand, area under cowpeas increased by 84 percent while production is expected to increase by 14.8 percent. Increase in area planted under cowpeas is attributed to provision of seeds.

The decline in area planted under maize and cassava was attributed to non-availability of planting seeds by farmers and below normal rains forecast by the meteorological department of Kenya. Increase in area under cowpeas was linked to farmers putting more land to cowpeas, reducing the land under Maize owing to adverse weather forecasts. In the livestock farming livelihoods zones, farmers reported to have opened more land for crops to increase harvests since there has been poor crop performance over time.

The expected reduction in yields is attributed to poor temporal distribution of rainfall in the County. Crops planted at the onset of rainfall in late March, were affected by the dry spell that followed. The crop which were planted later which was very promising was affected by floods and later attacked by both African army worm and later Fall Army worm. Table below shows the hectare and expected food crop production.

**Table 1: Comparison of area planted and production with the long term average**

Crop	Area planted during 2017 Long rains season (Ha)	Long Term Average area planted during the Long rains season (Ha)	2017 Long rains season production (90 kg bags) Projected/Actual	Long Term Average production during the Long rains season (90 kg bags)
Maize	45,541	49,237	256,016	426,693
Cowpeas	6,274	3,400	38,147	33,210
Cassava	28,200	30,000	48,000MT	49,000MT

In the mixed farming areas, the expected maize crop yields are 50-60 percent of normal in Matuga and Msambweni and Lunga Lunga sub counties due to infestation of fall army worm and poor temporal rainfall distribution. The livestock farming livelihood zone, is expected to face crop failure of between 80 - 90 percent particularly in Mwereni ward and Kinango Sub County owing to infestation of Fall Army worm, late rainfall onset which led to late planting and poor temporal rainfall distribution resulting in 10 - 20 percent crop yields. Flooding was experienced

in some parts of Kikoneni and Vanga in Lunga Lunga Sub County in May, affecting approximately 4,000 hectares (10,000 acres) under maize. Farmers in areas that experienced floods planted rice instead of replanting maize after flooding. Maize yields in Kikoneni and Vanga area are expected to be 40-50 percent of the normal.

### Irrigated crops production

The main crops grown under irrigation in the county are rice, tomatoes, Okra, capsicum and other green leafy vegetables. The area under irrigation has been increasing at the County following the establishment of new irrigation sites for 3-4 groups in every ward. The main rice farming areas are in Vanga and Kikoneni wards in Lunga Lunga Sub- county and Ramisi in Msambweni. Area under rice is 60 Hectares in Vanga, five Hectares in Kikoneni in Lunga Lunga Sub County and about 15 Hectares Msambweni. The area under rice increased by about 30 ha as result of heavy rains that resulted to filling of ponds of which farmers put under rice instead of the usual maize planted in flooded lands.

**Table 2: Comparison of area planted and production with the long term average**

Crop	Area planted during the 2017 Long rains season (ha)	Long Term Average (3 years) area planted during Long rains season (ha)	2017 Long rains season production (90 kg bags) Projected/actual	Long Term Average (3 years) production during 2017 Long rains season (90 kg bags)
Tomato	11	-	800	-
Onions	33	-	225	-
Okra	2	-	25	-
Capsicum	13	-	1000	-
Rice	60	58	1800	1450

### 3.1.2 Cereals stocks

The main staple foods consumed in the both mixed farming and livestock farming livelihood zones of the county are maize, cassava, beans and cowpeas. The combined stocks of maize held in the county by both household and the traders were below the long-term average by a significant 84 percent. The stock held by household and traders were below respective long-term averages by 99 and 58 percent respectively due to shortage caused by total crop failure experienced during the last season. Millers had no stock due to the current maize shortage in the County. However, harvesting of maize is yet to be done. A total 3800 bags of maize were held in National Cereal and Produce Board (NCPB) depots in the County. Currently there is high demand for rice due to maize shortage, hence the stocks held by both households and traders are below the long term average.

**Table 3: Cereal commodity stocks in the county**

Commodity	Period	Households	Traders	Millers	NCPB	Total
Maize (in 90 kg bags)	Current	197	17,300	0	0	17,497
	LTA	70,000	41,300	-	3,800	115,100
Rice (in 50 kg bags)	Current	70	7,400	N/A	N/A	N/A
	LTA	200	10,000	N/A	N/A	N/A

The stocks in the mixed farming livelihood zone are expected to last 1-2 weeks, while in the livestock farming zone, households have no stocks and are dependent on the market.

### 3.1.3 Livestock Production

The main livestock kept in the county are cattle, goats, sheep and poultry. In the mixed farming and livestock farming livelihood zones, livestock production contributes 18 and 20 percent respectively to cash income. Poultry farming is also practiced across the livelihoods and contributes about 8 percent of the cash income in the mixed farming livelihood zone.

#### Forage Condition

Pasture and browse condition were good both in quality and quantity in the mixed farming zone, however, while browse was good, pasture was fair condition in the livestock livelihood zone. The areas experiencing fair pasture condition in the livestock livelihood zone are in Mwereni ward in Lunga Lunga and Samburu, Mackinnon Road wards and Gandini in Kinango Sub-County.

**Table 4: Pasture and browse condition**

Livelihood Zone	Pasture condition			Browse condition		
	Current condition	Situation in June 2016	Projected period to last (Months)	Current condition	Situation in June 2016	Projected period to last (Months)
Mixed farming	Good	Good	3-4	Good	Good	4-5
Livestock Farming	Fair	Fair	2	Good	Good	3-4

#### Livestock Productivity

##### Body condition

Body condition of goat and sheep is good in both mixed farming zone and Livestock farming livelihood zone. In the areas with fair pasture, particularly in Samburu, Gadini and Mackinnon road wards in Kinango and Mwereni ward in Lunga Lunga sub counties, the cattle body condition is fair while body condition of other species is good. In both livelihood zones, cattle are smarting from severe drought that hit the county and hence the current fair body condition as opposed to very good in mixed farming and good in livestock livelihood zone normally. Table shows body condition of various livestock species.

**Table 5: Livestock body condition across the livelihoods**

Livelihood Zone	Cattle		Goats		Sheep	
	Current	Normally	Current	Normally	Current	Normal
Mixed farming	Fair	Good	Good	Good	Good	Good
Livestock	Fair	Good	Good	Good	Good	Good

The body conditions are expected to improve in all species owing to abundant graze and browse as well as enough water for all animals and in both the mixed farming and livestock farming livelihood zones. Birth rates for all species are, however, lower than expected because animals are just recovering from the severe drought where they malnourished and haven't recovered their body condition.



### **Milk Production, consumption and prices**

Milk production is mainly from the dairy cows in the mixed farming zone while in the livestock farming zone, milk is mainly from indigenous cattle and improved goat breeds (galla goats). Average milk production ranges from 2-3 litres per day while milk consumption range from 1-2 litres per day. Average price of milk is Ksh. 60 per litre across the County. Milk production has declined from April while milk consumption has remained stable compared with LTA.

### **Tropical livestock units (TLUs) and Birth rate**

**Table 6: Tropical Livestock Units by wealth grouping**

Livelihood Zone	Tropical livestock units	
	Low income households	Middle income households
Mixed farming	0-1	5-10
Livestock	2-3	10-20

The current Tropical livestock units (TLUs) in both Mixed Farming livelihood zone and Livestock Farming livelihood zone are comparable to similar period previous year. The birth rates for the county were within normal range

### **Migration**

Currently there is no migration of livestock into or out of the County, however, Intra-county and in-migrations are expected from month of September when pastures will be depleted in in northern parts of Kinango and Mwereni in Lunga Lunga Matuga and Msambweni. Influx of livestock in to the County is also expected from Tana River, Garissa, Wajir and Tanzania.

### **Livestock Diseases and Mortalities**

Currently, there is neither disease outbreak nor unusual livestock deaths reported in the county. Vaccinations were done in the month of January and February in Kinango and Lunga Lunga Sub counties against CCPP.

### **Livestock Mortality Rates**

**Table 7: Livestock mortality**

Livelihood zone	Cattle		Sheep		Goat	
	Current	Normal	Current	Normal	Current	Normal
Mixed farming	5%	3%	5%	3%	2%	1%
Livestock zone	8%	5%	8%	5%	3%	2%

### **Water for Livestock**

The main sources of water for livestock in the county are boreholes, water pans, shallow wells, tap water and rivers which is normal sources at this period of the year. The livestock trekking distance in March to June declined by 33 and 50 percent of the LTA in livestock farming livelihood and mixed farming zones respectively. Currently there is more water due to heavy rains which being experienced. Most of the well-maintained dams/pans had a recharge of 100 percent and have enough water to last for 4 months in livestock farming livelihood zone and about seven months in the mixed farming livelihood zones, which is above normal during this period of the year.

**Table 8: Water availability and access**

Livelihood zone	Sources		Return average distances (km)		Expected duration to last (months)	
	Current	Normal	Current	Normal	Current	Normal
Livestock zones	Rivers Water pans Ponds and Shallow wells	Rivers Water pans Ponds and Shallow wells	4	6	3-4	3
Mixed Farming zone	Rivers Ponds Tap water Wells	Rivers Ponds Tap water Wells	1.5	3	7	5

**Watering frequency**

Currently, there is water available in natural ponds, wells and rivers hence livestock drink water they graze and the watering frequency is normal.

**Table 9: Watering frequency in days per week**

Livelihood zone	Cattle		Goats		Sheep	
	Current	Normal	Current	Normal	Current	Normal
Mixed farming	Ad libitum	7	7	7	7	7
Livestock	7	5	7	4	7	5

**3.2 Access****3.2.1 Markets and Trade****Market operations**

The major markets in the county include Samburu, Kinango, Vigurungani, Mwakijembe, Taru and Mwangulu. Other important markets that feed the major markets are Ndavaya, Mkangombe and Samburu. Market disruption has been observed as maize and maize flour is not readily available. However, households are able to access other food crops and livestock products. The key staple foods consumed in the different livelihoods of the county are maize flour, rice, cow peas and green grams. The three main foods sold in the markets were tomatoes, potatoes, beans and vegetables. Maize is not available in most markets except in Kikoneni market where few traders were selling maize. The main source of maize in the mixed farming livelihood zone is Tanzania and local production from early harvested maize from Dzombo. Government subsidized maize flour was not available in most markets but where available was being sold above the recommended prices. The main source of food stuff in the Livestock farming livelihood zone is external supplies from Mombasa, Taita Taveta, and Matuga sub-counties.

### Maize price

The average maize price in the county is ranging from Ksh. 65 – 75 per Kg, which is about 60 percent above the long term average of Ksh. 44 per kg (Figure 3). The average price of maize in the mixed farming livelihood zone ranges from Ksh. 60 to 65 per kg while in the livestock farming livelihood zone the average is Ksh. 60-80 per Kg. Supply in the Mixed farming livelihood zone is expected to stabilize from August due to harvesting of early maize crop.

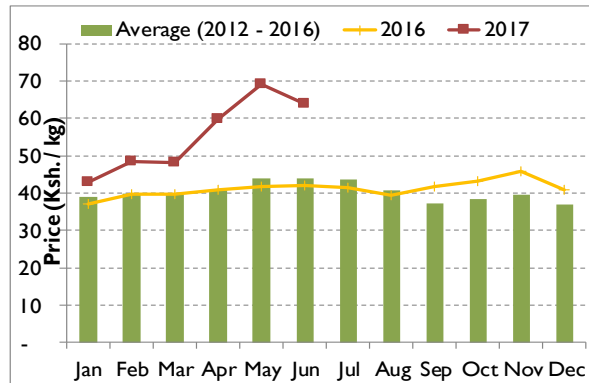


Figure 3: Trends of Maize Prices in the County

### Goat price

The average market price for a medium-sized goat ranges from Ksh. 2,500-3000. The current price is approximately 30 percent above the five-year average of Ksh. 2,087. Improved goats are selling above Ksh. 10,000. Goat prices are lower in the Livestock farming zone compared to the Mixed farming zone. Tuliani/Eshu recorded the lowest goat prices ranging from Ksh. 1,500-2,000. Goat prices were lowest in May. Largest number of goats was sold in March to enable farmers buy farm inputs. Goat prices are expected to increase as the body condition continues to improve due to the generally good forage in all livelihood zones.

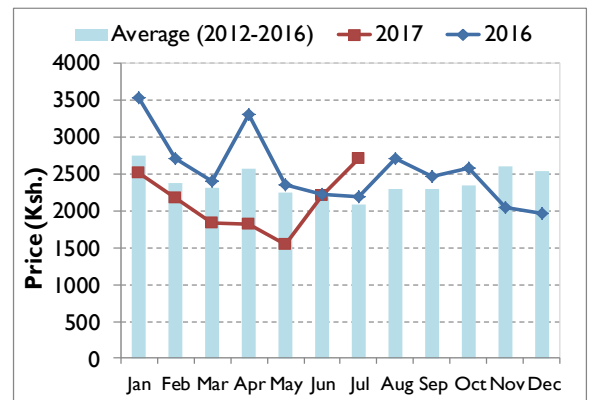


Figure 4: Trend of goat prices in the County

### 3.2.2 Terms of trade

Households are able to purchase 39 Kgs of maize with the sale of one medium-sized goat. Normally, households would access 48 Kgs with the sale of a goat as indicated. ToT are expected to improve from August when maize prices are expected to reduce with goats fetching good prices.

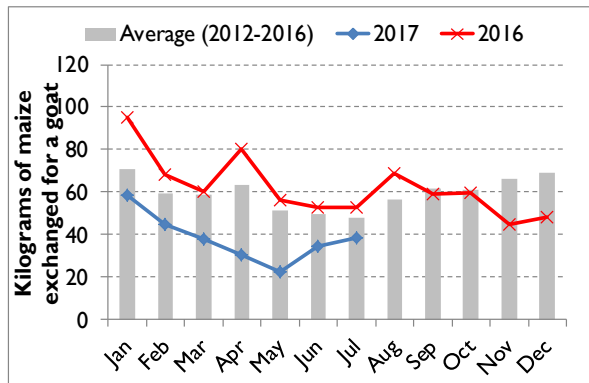


Figure 5: Terms of trade

### 3.2.3 Income Sources

The current main income source in the Mixed farming zone is sale of passion, mangoes and Tangerine. Other cereals in the market include cowpeas, green grams and beans which contribute to 14 percent, 15 percent and 8 percent respectively.

### **3.2.4 Water Access and Availability**

#### **Major water sources**

The current main sources for domestic water in the County include: shallow wells, springs, water pans, boreholes, dams, and piped water. Rivers are mainly in the Livestock farming zone. All major water sources are operational and all pans and dams are fully recharged. Kakwajuni and Kahindi dams broke their banks while Nyalani-Mwakijembe-Vigurungani pipeline was also swept away by floods. Most water sources in both livelihood zones are expected to last to the next rain season in October. In the mixed farming zone, water points that usually experience high concentration include Makondeni, Tsunguni, Mbweka, Mabatani, Guladze, Minywani, Golini Primary School, Mteza, Magodzoni, Lukore, Jimbo, Simanya Mkomba and Maponda which are currently serving about 1,655 persons instead of the usual 1,862 persons. Water sources that are normally highly concentrated serving about 6,500 persons are currently serving about 2,550 in the Livestock farming zone. These include; Kinango Baraza Park tanks, Dumbule tank, Vigurungani Center kiosks; Nyalani dam; Wamasa dam, Ganazolwa pan; Dzihoeni pan; Ndavaya Town Kiosk, Gulanze dam; Dzihunduni pan; Kirongo pan, M'bwaleni dam; Mtaa dam; Kibandaongo pan, Lutsangani Center kiosks; Kasemeni Center kiosks, Silaloni dam; Egu dam; Busho pan; Kinagoni Center kiosk, Mwabila Center kiosk; Mavirivirini kiosks; Mwabila dam and Kalalani kiosks.

#### **Distance to water sources**

Average return distances to domestic water sources have significantly reduced from the normal 4-6Km to a range of 2-4Km in the Livestock farming livelihood zone. Return distances to water sources in the mixed farming zone are normal ranging from 0.5 to 1Km and can be attributed to availability of water from the normal sources.

#### **Waiting time at the source**

The current waiting time at the water source across all livelihood zones is within the normal range of between 10 to 15 minutes due to full recharge of the water sources. Most household water sources are separate from those of livestock and where they both rely on the same source, there is a separate collection point for livestock and human.

#### **Cost of Water**

Due to good recharge of all sources, water is readily available thus most households are relying on free open water sources such as shallow wells, water pans, rivers and springs. In the mixed farming livelihood zone, most households have reserved rain water purely for drinking and cooking. A small proportion is buying water at Ksh. 2-3 per 20 litres jerrican and few boreholes selling at five shillings mainly for drinking and cooking. No cases of water vending have been reported.

#### **Water Consumption**

The average water consumption has improved from the previous season. Households in the Mixed farming livelihood zone are consuming between 25-40 litres while in the Livestock farming zone they are consuming between 15-20 litres per person per day. The current consumption level is normal at this period of the year. Consumption levels are expected to remain stable until the next rainy season in the Mixed farming zone while in the Livestock farming zone, sources may last until September.

## Sanitation and Hygiene

Latrine coverage in the County averages 52.5 percent. The highest coverage of 75 percent was recorded in Matuga Sub-County. Latrine coverage ranges from 41 to 52 percent in other parts of the County. The current latrine coverage in Kinango is less than 10 percent. Most households relieve themselves in the bush. Poor hygiene and sanitation may be attributed to the high incidence of waterborne diseases across all livelihood zones including typhoid, diarrhoea and dysentery. A total of 3,042 cases of dysentery have been recorded between January and June 2017 compared to 2,347 cases recorded between June and December 2016. Hand washing at critical times is low as at 20 percent.

### 3.2.5 Food Consumption

About 17.3, 42.1 and 40.6 percent of households have poor, borderline and acceptable Food Consumption Score (FCS) respectively. Food consumption gaps could be attributed to above-average food commodity prices, reduced income from casual labour which is a major source of income in the county and reduced milk consumption as milk was sold for income. Acceptable score implies that households were consuming at least a staple and vegetables on a daily basis complemented by a frequent consumption of pulses and oil.

### 3.2.6 Coping Mechanisms

The coping strategy index for the county in June averaged 16.56, quite comparable to 16.63 recorded in May 2017. The index implies that about 17 percent of the population is engaging in consumption-related coping strategies. The main coping mechanisms employed include reliance on less preferred/expensive food, reduction of the portion and/or number of meals and credit purchases.

## 3.3 Utilization

### 3.3.1 Health and Nutrition

#### Morbidity and Mortality Patterns

The five most common diseases among under-fives are upper respiratory tract infections (URTIs), malaria, diarrhoea, pneumonia and diseases of the skin. The three main diseases for the general population are Upper respiratory tract infections (URTIs), malaria and diarrhoea. Most disease cases among both the under-fives and general population are on the increase. Most households reported that mosquito nets supplied are now worn out and are not useful. Cases of diarrhoea could be attributed to increased water contamination resulting from relieving on bushes coupled with lack of hand washing during critical times.

## Immunization and Vitamin A supplementation

The proportion of fully immunized children from January to June 2017 was 62.5% which was a decline compared with to 79 percent between July and December 2016. Decline in coverage is attributed to reduced number of outreaches due to lack of support from partners. Defaulter tracing has also been compromised as

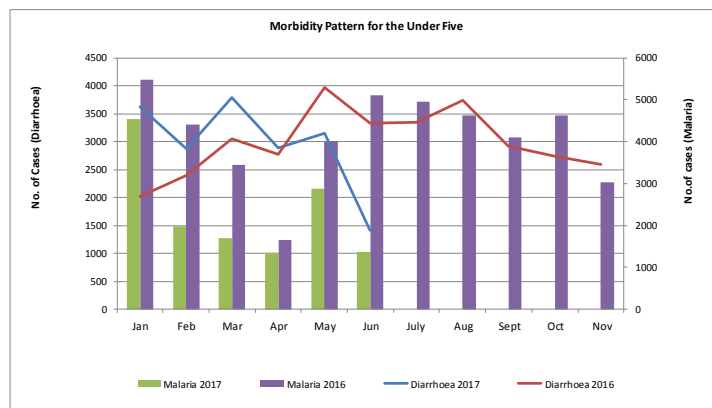


Figure 6: Morbidity trends

well as poor documentation due to reduced frequency in supportive supervisions visits from the CHMT teams. A total of 12,652 children aged less than one year and 59653 children aged between one and five years have received Vitamin A between January and June 2017. The proportion of children 6-59 months supplemented with vitamin A is 40.7%, 12-59 months 51% and 6-11 months 87.1%.

There was noted decrease in vitamin coverage for children between one and five years because children aged 1 and 2 are not in school and not attending child welfare clinics for growth monitoring while those aged between 3 and 5 in ECD are not being captured due to poor recording.

### Nutrition Status and Dietary Diversity

The proportion of children (6-59 months) with MUAC below 135mm in June 2017 remained stable at 5.7 percent, slightly below the LTA of 5.8 percent. Meal frequency was reported to be two meals in a day in Matuga and Msambweni sub-county, comprising of tea, *ugali*, potatoes, beans, fish and vegetables. However, in Kinango and lungalunga meal frequency reduced to 1-2 meals per day with less dietary

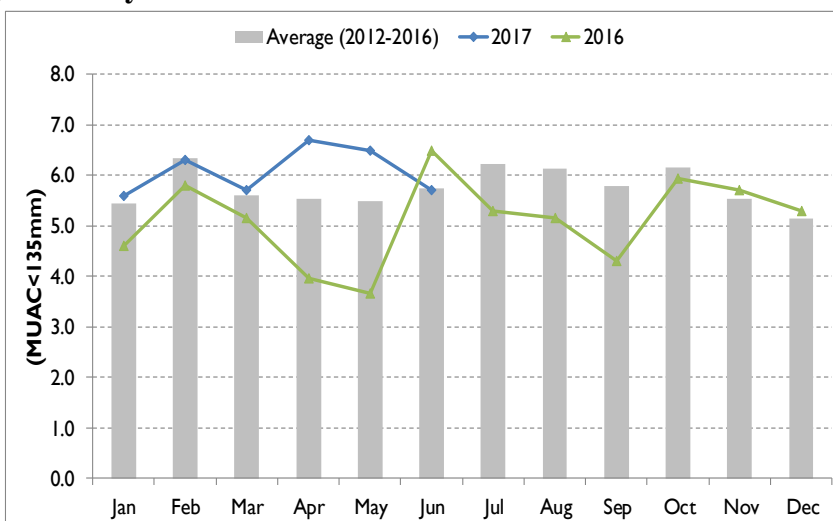


Figure 7: Percentage of children MUAC below 135mm

diversity since the common meal is *ugali* and porridge. Qualitative assessments conducted indicated households employed coping strategies which includes: taking less preferred meals, skipping of meals and reduced meal frequency. Supplementary Feeding Programme (SFP) admissions have significantly increased since January 2017 which could be attributed to the increasing food insecurity and availability of commodities.

### 3.4 Education

#### Enrolment

The total enrolment in term II (2017) in ECDEs, primary and secondary schools were 64,967, 172,051 and 19,636 respectively. Due to flooding, two schools in Kinango sub-County were closed for a few days but re-opened. More girls are transiting to Secondary schools than boys. There has been a noticeable stability in both ECDE and primary schools enrolment from the community interviews. Enrolment for boys is higher than girls in both ECDEs and primary schools. However, more girls are enrolled in secondary schools than boys. School feeding has proven to be a major incentive to get children into schools and retain them. Participation is stable across the County.

**Table 10: Comparison of enrolments for term I and II of 2017**

Sub-County		Term I 2017			Term II 2017 (includes new students registered and drop-outs since Term I 2017)		
		Boys	Girls	Total	Boys	Girls	Total
Kinango	Enrollment						
	ECD	14773	14085	28856	14778	14090	28856
	Primary	32581	31957	64538	32581	31957	64538
	Secondary	3812	2746	6558	3812	2746	6558
Lunga	ECD	9355	9184	18539	9043	8769	17812
	Primary	20492	18914	39406	20416	18956	39372
	Secondary	2090	2161	4261	2090	2161	4261
Matuga	ECD	5308	5002	10670	5921	5346	11267
	Primary	20887	19892	40869	20013	19326	39147
	Secondary	1116	1489	2605	1219	1621	2840
Msambweni	ECD	4420	5896	10316	3695	3337	7032
	Primary	15226	14876	30142	14693	14381	28994
	Secondary	2421	3190	3611	2592	3385	5977

**Retention**

Drop outs in ECDEs is minimal. Retention in ECDE is mainly attributed to sustenance of feeding programmes, construction of ECDE centres, availability of teachers and desks. ECDE, primary and Secondary schools have regular attendance. Notably was the high number of children in Tuliani/Eshu who were away from school since they had not paid school levies. The main reasons why children have dropped out of ECD are lack food in the schools, unfavorable weather conditions and high levies. Drop outs in primary schools is due to lack of food and migration/ moving away from school area. In secondary school, drop outs are mainly due to high school fees/levies and migration/ moving away from school area. High school levies are meant to cover salaries of cooking staff and teachers employed by the school board where each pupil is expected to pay Ksh. 400 per term. Most schools have reported lack of textbooks for class three pupils.

**Transition**

Transition rate from ECDE to Primary school average 99 percent while transition rate from class 8 to form one average 76 percent. Most pupils who pass KCPE transition to secondary due to provision of bursaries by NG-CDF and County Government. Transition rate is below the national transitional rate of 82 percent. Drop out in primary schools for boys is due to engaging in *Bodaboda* businesses and high school levies. Girls drop out is mainly due to early pregnancies and early marriage.

**School Meals Programme (SMP)**

All ECDE centres have access to school meals programme with the meal composing of porridge. Most public primary schools have no SMP in place due to late disbursement of funds to cater for Home Grown School Meals Programme (HGSM). Kinango Sub-County, 38 schools with a total population of 15,459 is being targeted with HGSM and 10,560 under Expanded School

Meals Programme (ESMP). Only five schools are targeted under ESMP in Matuga and 78 in Lunga Lunga Sub-County. All schools targeted under ESMP are yet to receive funds to facilitate the programme hence no feeding in school is taking place as confirmed during our field visits. Where SMP is available, some pupils miss meals due to inability to raise school levies, food deficit due to surplus children, food delivery delays, lack of water for cooking and late disbursement of funds for feeding programme. The SMP has contributed to improved retention and attendance.

### 3.5 Trends of key food security indicators

**Table 11: Comparison of the Current food security indicators with SRA 2017**

INDICATOR	SRA 2017	LRA 2017
Distance from source(km)	Average 2-3Km	2-4Km in the Livestock zone. Mixed farming: 0.5 to 1Km.
Waiting time(min)	Within 15 minutes	Within 15 minutes
Cost of water at source	Ksh. 2-5, vendors Ksh. 50-100	Ksh. 3-5, no vendors
Consumption (Liters/person/day)	Mixed Farming 20-30 Livestock Farming 10-15	25-40 litres in Mixed farming, Livestock zone: 15-20 litres per person per day
Goat Prices	Average at Ksh 3,300	Average Ksh. 2,700
Maize prices/Kilogram	Averagely Ksh 43	Average Ksh. 70/kg
Terms of Trade	76 kilogram/goat	39Kilogram/goat
% of maize stocks held by households	14% of LTA	No stocks available
Livestock Body condition	Mixed Farming - Good Livestock Farming-Fair-good	Shoats are good across the County, Cattle is fair.
Coping strategy Index	Mean CSI: 22	Mean CSI: 16.6
Food Consumption Score	Poor-20 percent	Poor: 17.3 percent (June 2017)
	Borderline-46 percent	Borderline: 42.1 percent,
	Acceptable-34 percent	Acceptable: 40.6 percent
Food security phase	Stressed in both Mixed farming Livestock farming zones but deteriorating	Stressed in both Mixed farming Livestock farming zones with improving trend
MUAC<135mm	5.3 percent in December 2016	5.7 Percent in June 2017



## **4.0 FOOD SECURITY PROGNOSIS**

### **4.1 Prognosis Assumptions**

Kwale County food security prognosis for the next six months is based on the following assumptions:

- The current on-going long rains will continue until August
- Current markets disruptions due to rare availability of maize/maize flour is likely to end as early harvest crops will have access to the markets
- The fall army worm will be managed in good time to save crops
- The County is likely to experience influx of livestock from neighbouring counties such as Tana River that didn't receive good rains
- Food deficit in the county is likely to be met by imports by traders, and this is likely to push prices of maize and other basic commodities down
- Farm inputs including certified seed stock, fertilizers and tractor services are likely to be availed in good time and subsidized by the County Government
- The onset of the short rains is likely to be timely with good rainfall amounts

### **4.2 Food Security Outlook**

#### **July to September:**

The overall food security situation is expected to improve especially in the Mixed farming zone when farmers begin harvesting maize. Early harvest maize crop has already started in Dzombo ward. The current government subsidized maize flour is likely to cushion households in the Livestock farming zone. Farmers will lose about 30 percent of expected production due to Fall Army worms. With the on-going rains, farmers who planted late are likely to harvest substantial amount of maize. In-migration of livestock is likely to be experienced from the month of August, hence increased completion for pasture and browse. Increased incidences of livestock disease outbreaks are likely to be experienced. Water access for both human and livestock is likely to remain stable.

#### **October to December**

With timely onset of the October to December short rains, food security is likely to improve. Livestock that had in-migrated will be expected to return to their Counties. Availability of milk at the household level from the local livestock is expected to improve while food consumption gaps will be expected to reduce. Price of food commodities is likely to reduce after the harvests while livestock market prices will increase, hence improving the household access to food. Nutrition status will likely stabilize or improve as access to food at the household level improves.

## **5.0 CONCLUSION AND RECOMMENDATIONS**

### **5.1 Conclusion**

#### **5.1.1 Phase classification**

Both Mixed farming and Livestock farming zone have been classified under Stressed Food Insecurity Phase (IPC Phase 2).

#### **5.1.2 Summary of the findings**

The main drivers to food insecurity in Kwale County include Fall Army worms, high food prices and unavailability of maize flour, poor hygiene and sanitation practices. Farmers are expected to lose about 40 percent of expected production. The price of maize flour selling at Ksh. 70 per kilogram is expected to decline due to early harvested maize crop. Nutrition status of children under five years is likely to stabilize below emergency threshold. Households are expected to consume the minimum recommended amount of 15 litres per person across the County. The current good body condition of shoats is likely to be sustained until the next rainy season. Cattle body condition will continue improving but influx of livestock from neighbouring Counties may pose a big threat. There is urgent need to employ additional teachers in most primary school to avoid high levies being charged to cater for non-TSC teachers. Though there is significant improvement from the previous season, vulnerable households need to be supported for them to recover fully for the next six months. Recommended Non-food interventions need to be implemented with immediate effect to improve community resilience to shocks and hazard.

#### **Monitoring Required**

- Maize and maize flour availability and prices
- Disease prevention through treatment and husbandry management: enhance dipping
- pasture conditions, pasture conservations efforts and creation of grazing reserves
- Conflicts that may arise out of common resource use for instance wildlife.
- Human disease outbreaks especially water borne diseases.
- Nutrition status of children under five years.
- Onset of the coming short rains.
- Influx of livestock from neighbouring counties experiencing drought.
- Situation of water sources for livestock.
- Livestock diseases surveillance and vaccinations.
- Market food commodity and livestock prices.
- School attendance.
- School levies charged limiting access to basic education.

### 5.1.3 Sub-County Food Security Ranking

**Table 12: Sub-County Food Security Ranking**

Sub County	Food security rank (1-10)		Main food security threat (if any)	
	Very Good (9-10)	Good (7-8)		Fair (5-6)
Msambweni		8	Maize crop moderately infested by army worms hence low expected yields (Ramisi ward)	
Matuga		7	Maize crop severely infested by army worms hence low expected yields (Tsimba Golini, Mkongani, Kubo South)	
Lunga Lunga		6	-Maize crop moderately infested by army worms hence low expected yields -Less income sources -Less alter alternative crop -Mwereni, Vanga most affected	
Kinango		5	-Severely infested by army worms hence low expected yields with no alternative crop. -Late planting due to late rainfall onset. -Less income sources. -High food prices with most areas having difficulty accessing markets.	

## 5.2 Ongoing Interventions

### 5.2.1 On-going Food Interventions

### 5.2.2 On-going Non Food Interventions

**Table 13: On-going Non Food Interventions by Sector**

Sub County	Intervention	Location	No. of beneficiaries	Implementers	Impact on food security	COST	Time Frame
<b>Agriculture Sector</b>							
All	Food security(certified maize seed provision)	All the sub-county	8000	CG-KWALE	Increased food security /household	10m	Long rains
All	Capacity building on agronomic practices	All wards	12000	CG-KWALE	Increased food security /household	600000	Long rains
	Ploughing of 1 acre for maize production	All wards	5000	CG-KWALE	Increased food security /household	5m	Long rain period

Sub County	Intervention	Location	No. of beneficiaries	Implementers	Impact on food security	COST	Time Frame
All	Promotion of pulses	All the wards	All farming households	CG-KWALE	seeds	Extension messages	6 months
	Micro irrigation	Some wards	600	CG-KWALE	Increased food security /household income	10m	12months
	Marketing initiatives- Grain stores	Dzombo and Vanga	30000	CG-KWALE	Increased food security /household income	10m	6months
Sub County	Intervention	Location	No. of beneficiaries	Implementers	Impact on food security	COST	Time Frame
Livestock Sector-Immediate							
All	Dairy goats distribution	All	110	Livestock section	Milk availability	6000000	By June 2017
Msambweni and Matuga	Dairy cows	All Wards	80	Livestock section	Avail milk	15000000	By June 2017
Kinango and Lunga Lunga	Provision of feed	All Wards	700	FAO/Samaritan purse/NDMA	Maintain body condition	2M	By June 2017
Medium and Long term							
All 4 Sub counties	Livestock Disease surveillance	All	3000	Veterinary Division	Control diseases in Livestock	4M	Continuous
Kwale	Zinc Supplementation	All	309,184	MOH	Reduces severity and occurrence of diarrhoea.	309,184	Continuous
Kwale	Management of Acute Malnutrition (IMAM)		5,618	MOH	Reduces risks of morbidity and	7,229,229	Continuous

Sub County	Intervention	Location	No. of beneficiaries	Implementers	Impact on food security	COST	Time Frame
					mortality.		
HEALTH SECTOR.							
Kwale	MIYCN Interventions (EBF and Timely Introduction of complementary Foods)	All Sub-counties	177,894	MOH	Promotes the general health of children.	5,620,000	Continuous
Kwale	Iron Folate Supplementation among Pregnant Women	All Sub-counties.	177,894		Promotes the good health of mothers translating to proper health of babies.	2,570,734	Continuous
Kwale	Deworming	All sub-counties.	112,823	MOH	Promotes proper utilization of foods.		
	Sensitizations on Food Fortification			MOH	Increases availability of micronutrients.	840,000	Continuous
WATER SECTOR							
Lunga Lunga	Construction of Makwenyeni dam	Lunga Lunga	30,000	NIB/GOK		11M	
	Maili nane nzovuni pipeline	Kinango	3,000	CGK			2016/2017
	Kinango-Mazola pipeline	-Puma	2,000	Coast Water/GoK CGK		80M	
	Nyalani vigurungani water pipeline	-Puma	3000			11M	

Sub County	Intervention	Location	No. of beneficiaries	Implementers	Impact on food security	COST	Time Frame
	Nyalani Mwakijembe water pipeline  Dudu dam	Ndavaya (Mwandimu)	1,500  2,000	Coast Water/GoK  CGK		80M	
	Construction of 2 water storage tank	Kasemeni- (Minyenzeni and Majengo)	1,800	CGK		2.5 1.7	
	Mwanzungi dam construction	Chengoni	2,500	CGK		5m	
Lunga lunga- (Vanga)	Rainwater harvesting structure	Chengoni	1,200	CGK		4M	
	Construction of Nimbodze dam	Msambweni	5000	CGK		5M	6Months
	Construction of water supply	Matuga - Mbuguni	1500	CGK			
	Construction of water supply	Kubo- Majimboni	2000	CGK			
<b>MEDIUM TO LONG TERM ON GOING INTERVENTIONS.</b>							
	Constraction of Makwenyeni dam	Lungalunga	30,000	NIB/GOK		11M	
	Construction of Pipeline for water.	Kubo- Majimboni, Kinango- (Kilibasi Macnon Rd), Mavatara, Marere- mkongani, Matuga- tsimba/golini, lunga lunga,	14,200	CGK		70 M	

## 5.3 Recommended Interventions

### 5.3.1 Recommended Food Interventions

**Table 14: Proposed population in need of food assistance**

Sub-County	Population in the Sub-County	Pop in need ( % range min – max	Proposed mode of intervention	Remarks
Msambweni	135,039	5-10	CFA	
Matuga	151,978	5-10	CFA	
Lunga Lunga	153,354	15-20	CFA	
Kinango	209,560	25-30	CFA	

### 5.3.2 Recommended Non-Food Interventions

#### From Field interviews

- Provision of improved breeds (Gadini, Tuliani).
- Vaccinations and disease surveillance – Across the County.
- Treatment chemicals provision - – Across the County, special attention to Kinango sub-county.
- Hygiene promotion, special attention to Kinango Sub-County. Teachers in mwakijembe pry relieving themselves in nearby public toilet. The only toilet block available is for girls
- Laboratories in Gadini, tuliani,
- Construction of Dispensaries in Mwakijembe (community paying Ksh. 400ksh to the nearby dispensary 10km away, Nguluku and Manyatta covering >5Km.
- Timely Provision of Farm inputs (Fertilizer, seeds)
- Guidance on control of Army worms i.e Right pesticide, quantity and when to spray.
- Class 3 text books across the County, in most schools, 15 to 20 pupils sharing a one text book.
- Employment of primary school teachers to regulate levies (Each kid pay Ksh. 400 per term to cater for salaries for Teachers employed by school boards and kitchen staff)
- Provide food to reduce drop outs in Mwakijembe – 2pupils/day, due to lack of food in school and home. 30 pupils have dropped out this term
- Timely disbursement of funds for Expanded school meals programme.
- Enforcement of recommended price control for Unga. GoK Sub-sidized Unga selling at Ksh. 140 per 2Kgs
- De-silting of pans across the County.
- Borehole drilling in Kichaka Simba primary school, nearest water source is 5km away in manyatta (UNICEF Borehole).
- Post-harvest management in Nguluku.
- Promote green houses and micro irrigation extended to Nguluku.
- Dipping services needed in nguluku and a safe permanent water source required. Many people have lost lives due to crocodile attacks in River Ramisi collecting water.

- Water connection to masifini pipeline, and Mkanda river feeding Kikoneni dam to serve neighbouring communities (Most water kiosks visited have no water in the Lunga Lunga Kinango sub-counties.
- Promote exclusive breast feeding. More than 90% of mothers breast feed exclusively for only 1 month mainly due to lack of adequate/ proper meals.
- Ploughing services increased to 3 acres.
- Fruit processing plant to benefit farmers growing oranges, passion, mangoes which are fetching low prices due to competition from Tanzania.

**Table 15: Recommended Non-Food Interventions**

Sub County	Intervention	Location	No. of beneficiaries	Proposed Implementers	Required Resources	Available Resources	Time Frame
<b>Agriculture Sector - Medium and Long Term recommended Interventions</b>							
All	Micro irrigation-up scaling	Countywide	300	KG-Kwale	10M	10M	1yr
	Establish a Large scale irrigation scheme.	Lunga Lunga	400	KG-Kwale	500M	-	5yr
	Establish county food reserve	Countywide	County	KG-Kwale	12000	20M	20M
	Zoning of county.	County	All	KG-Kwale	-	-	
<b>LIVESTOCK SECTOR.</b>							
Kinango	Establish a Tannery in Samburu	County	1000	County Govt. Livestock Division Dev.Partners.	Land Funds Labour	Land Labour	July 2017 to June 2018
	Establish a modern Slaughter house at Mwereni	County		CG, Dev. Partners	Land, Funds, Labour	Land, Labour	July 2017 to June 2018



Sub County	Intervention	Location	No. of beneficiaries	Proposed Implementers	Required Resources	Available Resources	Time Frame
	Promotion of Dairy Cattle in Ramisi and Ukunda Wards,	County	500	CG, Dev. Partners	Funds Technical staff	Technical staff	July 2017 to June 2017
	Enhancement of Veterinary Services	All wards		CG & and Development partners			
	Capacity building for 20 BMUs for 5 days each (5 clusters)			CG & and Development partners			
	Upgrading of 2 landing areas e.g. Gazi and Mkunguni			CG & and Development partners		6 Million	
	Establish other sources of fish food supply Stoking 5 dams; Chengoni, Nyalani and other 3 major dams			County governments		3.65 Million 900,000	
	Purchase of iceboxes for 20 BMUs and 5 clusters			NG, CG, development partners		57 million	
	Construction of Modern fish market at Tsunza			National and County government and development partners		40 million	
<b>Water Sector: Immediate recommended Interventions</b>							
	Canals maintainance ,drains intake disilting		1,260	Farmer			

Sub County	Intervention	Location	No. of beneficiaries	Proposed Implementers	Required Resources	Available Resources	Time Frame
L/Lunga(Godo)	Repair of Kihindi dam	L/Lunga(Godo)	3,000		3.5m		4 months
	-Re-construction of Ngomeni dam -Treatment of Sapo and Mwalukombe B/Holes to reduce levels of salinity		2,000	GoK/CGK	5m 1m		
Kinango-(Vigurungani)	Rehabilitation of Mwaluvuno dam	Kinango(Ndavya)	1,500	CGK	2.8M		
	Rehabilitation of Kahindi dam	Lunga Lunga	800	CGK	3M		
	Rehabilitation of Kakwajuni Dam	Matuga(Mkongani)	8,00	CGK	2M	June-Aug 2017	
	Rehabilitation of Nyando waterpan Drill borehole-Nyando	Matuga(Tsimba/Golini) Matuga	500 1000	CGK	2.2M 2M	County machinery	
	Replacement of gensets	Msambweni			800,000		
	Water treatment chemicals	ALL wards					
<b>Medium and Long Term recommended Interventions</b>							
Kinango and L/Lunga	Construction of more 4 dams and water pans			GoK	24M		12 months
	Extension of Kinango-Mwalukomb	Kinango	1,000	GoK/CGK			

Sub County	Intervention	Location	No. of beneficiaries	Proposed Implementers	Required Resources	Available Resources	Time Frame
	e pipeline						
	Construction of New Water Weir/dam	Kinango(Kirazi ni river)	3,000	GoK/CGK	2.7M		
	Construction of New water pan	Kinango(Tsahuni)	3,500	GoK/CGK	3.2M		
	Rehabilitation of Sappo B/Hole water supply & 110 mm Ø pipeline	Kinango(Mwalukombe)	2,500	GoK/CGK	4M		
	Extension of Vigurungani-Nyango pipeline	Kinango(Vigurungani)	6,000	GoK/CGK	10M		
	Extension of Vigurungani-Bang'a-Bumburi pipeline	Kinango(Puma)	4,500	GoK/CGK	16M		
	Extension of Chigutu-Makamini pipeline	Kinango(Makamini)	2,000	GoK/CGK	15M		
	New water pan Construction	Kinango(Magulani)	3,500	GoK/CGK	5.6m		
	New Water pan construction	Kinango - Puma(Gonzani)	6,200	GoK/CGK	5.6m		
	Rehabilitation of Ndavaya B/Hole water supply & 110 mm Ø pipeline.	Kinango (Ndavaya)	5,000	GoK/CGK	2.2m		
	Extension of Bofu-Mtaa pipeline.	Kinango-Kasemeni(Mtaa)	3,000	GoK/CGK	7M		

Sub County	Intervention	Location	No. of beneficiaries	Proposed Implementers	Required Resources	Available Resources	Time Frame
	Rehabilitation of Bofu water supply & 110 mm Ø pipeline.	Kinango( Mtaa)	2,500	GoK/CGK	5M		
	Extension of Matumbi-Mtaa pipeline.	Kinango (Mtaa)	2,500	GoK/CGK	12M		
	Rehabilitation of Mwanda-Matumbi water pipeline.	Kinango (Mwanda)	1,500	GoK/CGK	12M		
	Construction of 2 pans	Msambeni . Matuga	2400	Gok/CGK	16M		12 months
	Borehole	Matuga(Zungu)	2000	CGK	2M		
	Pipeline construction	Matuga(Burani-Milimani)	1500	CGK	12M		12MT HS
	Pan/Dam construction	Matuga(Voya Mulungu)	1800		6M		
<b>HEALTH SECTOR</b>							
	Conduct Nutrition assessment and integrated outreaches for malnutrition cases to the most affected areas in all children below 5 years (Mass screenings and		6,400	MOH, UNICEF, IMC,WFP,KRCS,KR DP/NDMA	2,000,000		

Sub County	Intervention	Location	No. of beneficiaries	Proposed Implementers	Required Resources	Available Resources	Time Frame
	outreaches)						
	Comprehensive Health and Nutrition survey		305,566	MOH, UNICEF, IMC,WFP,KRCS,KRDP/NDMA	6,000,000		By end of March 2017
	Conduct Supplementary feeding to children under 5yrs		4,448	MOH, UNICEF, WFP,KRCS,KRDP/NDMA	244,464,000		End of 2017
	Scale up coverage of High Impact Nutrition Interventions in Kwale county to reach at least 80% of the target population.		305,566	MOH., UNICEF, IMC,WFP,KRCS,KRDP/NDMA	3,900,300		Continuous
	Strengthen and train Health workers on CLTS		120	MOH, UNICEF, IMC,KRCS,KRDP/NDMA,PLAN	2,000,000		Continuous
	Procure and distribute water treatment chemicals		350,000	MOH,/Water/NDMA/Plan international	1,000,000		June 2018
	Constructing more health facilities in the county						Continuous until May

<b>Sub County</b>	<b>Intervention</b>	<b>Location</b>	<b>No. of beneficiaries</b>	<b>Proposed Implementers</b>	<b>Required Resources</b>	<b>Available Resources</b>	<b>Time Frame</b>
							2018
<b>EDUCATION SECTOR</b>							
All Sub-Counties	Provision of food to public schools and ECD centres	All schools		GoK, CG			July to Dec 2017
Kinango, Lunga Lunga	Employment of primary school teachers	Schools in Kinango Lunga Lunga		GoK,			July to Dec 2017
All Sub-Counties	Mass de-worming of pupils			GoK, CG			
Kinango, Lunga Lunga	Provision of desks and books	Schools in Kinango Lunga Lunga		GoK, CG			July to Dec 2017

### Annex 1: Irrigation schemes in the County

Ward /Livelihood zone	Name of the Irrigation Scheme and Size	Type of irrigation	Acreage During the Previous LRA	Current Acreage	Potential Acreage for Irrigation
LIVESTOCK ZONE	Dumbule pan	Drip ( Micro)		1 Acre	2 Acres
	Moyeni pan	Drip ( Micro)		1 Acre	2 Acres
	Mwachinga WRUA	Drip ( Micro)		1 Acre	2 Acres
	Nyalani dam	Drip		104 Ha	500 Ha
	Gangani pan	Drip ( Micro)		1 Acre	2 Acres
	Dzihoeni pan	Drip ( Micro)		1 Acre	2 Acres
	Kisimani pan	Drip ( Micro)		1 Acre	2 Acres
	Kwa Mfuko pan	Drip ( Micro)		1 Acre	3 Acres
	Gulanze pan	Drip ( Micro)		1 Acre	2 Acres
	Julani pan	Drip ( Micro)		1 Acre	2 Acres
	Chikwakwani pan	Drip ( Micro)	-	1 Acre	2 Acres
	Kibandaongo pan	Drip ( Micro)	-	1 Acre	2 Acres
	Miyani pan	Drip ( Micro)	-	2 Ha	3 Acres
	Kaza Moyo pan	Drip ( Micro)	-	1 Acre	1 Acre
	Gonja pan	Drip ( Micro)	-	1 Acre	3 Acres
	Mwabila pan	Drip ( Micro)	-	1 Acre	2 Acre
	Waga- 375	Basin (Gravity)	230	230	450
	Machame	“	12.5	37.5	187.5
	Vichigini	“	150	150	162.5
	Matoroni	“	175	175	187.5
Mpepeni	“	0	0	187.5	
MIXED FARMING ZONE	Msambweni	“	0	0	80
	Muhaka	“	0	0	60
	Burani	Drip	6ha	6ha	78ha
	Nyando	basin	3ha	-	40ha
	Chimya Patanani	drip basin	2ha	2ha	40ha
		basin	1.2ha	1.2	10ha