REPUBLIC OF KENYA

MANDERA COUNTY GOVERNMENT

DEPARTMENT OF HEALTH SERVICES

SMART SURVEY REPORT

PREVALENCE OF ACUTE MALNUTRITION, FOOD SECURITY & RETROSPECTIVE MORBIDITY SURVEY REPROT

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Abbreviations & Acronyms

BCG	Bacillus Calmette–Guérin
CHMT	County Health Management Team
CI	Confidence Interval
CMR	Crude Mortality Rate
CSI	Coping Strategy Index
ENA	Emergency Nutrition Assessment
EPI	Expanded Program on Immunization
FSL	Food Security and Livelihood
GAM	Global Acute Malnutrition
HAZ	Height for Age Z-score
ID	Index of Dispersion
IDP	Internally Displaced Persons
IFAS	Iron Folate Supplementation
IMAM	Integrated Management of Acute Malnutrition
MAM	Moderate Acute Malnutrition
MIYCN	Maternal Infant and Young Child Nutrition
MUAC	Mid Upper Arm Circumference
NIWG	Nutrition Information Working Group
ODK	Open Data Kit
OPV	Oral Polio Vaccine
PPS	Probability proportional to size
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SMART	Standardized Monitoring and Assessment in Relief and Transitions
U5MR	under Five Mortality Rate
UNICEF	United Nations Children's Fund
VAS	Vitamin A supplementation
WAZ	Weigh for Age Z-score
WFP	World Food Program
WHO	World Health Organization
WHZ	Weight for Height Z-score

Executive Summary

Mandera County department of health in collaboration with nutrition partners and Nutrition Information Working Group (NIWG) conducted a County wide SMART survey covering all seven sub counties in January 2023. The main goal of the survey was to determine the prevalence of malnutrition among the children aged 6-59 months old and women of reproductive age (WRA) in Mandera County.

The specific objectives of the survey were;

- To estimate the prevalence of acute malnutrition in children aged 6-59 months.
- To determine the coverage of immunization (BCG, Measles and OPV1 and OPV 3) of children aged 0-59 months.
- To estimate the coverage of Vitamin A supplementation, deworming and Zinc supplementation among the targeted children.
- Estimate the coverage of iron folate supplementation for women of reproductive age.
- To determine the nutrition status of women of reproductive age (15-49 years) based on MUAC.
- To determine possible underlying causes of malnutrition.
  - Determine dietary diversity score, household food consumption score, household coping index, identify current hygiene practices, water sources and distance to water sources.
- To recommend appropriate interventions based on survey findings.

The Standardized Monitoring of Relief and Transitions (SMART) methodology was used which included a two-stage cluster sampling. A total of 889 children aged 6-59 months from 719 households in 42 clusters were selected for anthropometric measurements. Household related data that includes food security and livelihoods, water sanitation and hygiene as well as access to health care were also collected in the 719 households during the survey.

The survey covered the entire Mandera County except forty-six villages that were excluded from the sampling frame due to insecurity, limited population or deserted. The survey was carried out from 26th to 31st January 2023. The population involved were children 6-59 months for anthropometry survey with the primary respondents being mothers/care takers of the children in the household for the household and mortality questionnaires. In addition, the nutrition status of reproductive women aged 15-49 years was also assessed.

The prevalence of Global Acute Malnutrition (GAM) rate for the County was **29.8%** (26.0 - 33.8 95% C.I.), and the severe acute malnutrition (SAM) rate was **7.4%** (5.6 - 9.6 95% C.I.).
Compared to March 2022 (same season), Prevalence of acute reduced from 34.7% (29.7 - 40.1 95% C.I.) and 7.9 %(5.7 - 10.8 95% C.I.) for GAM and SAM respectively. However, this was not significant different for both GAM (P=0.132) and SAM (P=0.786). 37.0% (n=329) Children had been ill within the last 14 days compared to 38.1% (n=136) in March 2022, majority having ARI and fever with chills like malaria. Vitamin A supplementation for 6-11months was at 48.3% which is below the national target of 80% and slight decrease compared to 51.8% in March 2022; with 43.5% of the sampled

children 12-59 months had received the recommended two doses of vitamin A in the last one year, which is a significant increase compared to 22.1% in the previous year. More so, Vitamin A supplementation for children 6-59 months indicates 61.3% which is an increase compared to 2022 (60.4%). 54.5% (n=543) children have been dewormed at least once in the past one year out of which only 20.6% (n=171) have been dewormed twice or more within the same period. Those who had been dewormed twice had significantly increase from 2.3% reported in the March 2022.

In conclusion the nutrition situation in Mandera County remains in ***very critical phase*** according to WHO classification for severity of nutrition situation with significant rate of malnutrition increase. The risk factors for acute malnutrition such as low coverage of health services, poor childcare practices, low dietary diversity, sanitation and hygiene must be addressed as part of comprehensive recovery strategy in the county.

The results of key indicators are summarized in table 1 below.

Table 1: Summary of Key findings

Demographic Household Characteristics	**n**	**Findings**
Nutritional Status (6 – 59 months) Weight- for-Height Z – scores (Wasting) WHO 2006 Standards		
GAM: Weight for Height (WHZ) <-2 Z score or Oedema	263	29.8 % (26.0 - 33.8 95% C.I.)
Prevalence of SAM (<-3 z-score and/or oedema	65	7.4 % (5.6 - 9.6 95% C.I.)
Nutritional Status (6 – 59 months) Weight- for-Age Z – scores (Underweight) WHO 2006 Standards		
Prevalence of underweight (<-2 z-score)	201	22.8 % (19.5 - 26.5 95% C.I.)
Prevalence of Severe Underweight (<-3 Z-score)	40	4.5 % (3.0 - 6.9 95% C.I.)
Nutritional Status (6 – 59 months) Height- for-Age Z – scores (Stunting) WHO 2006 Standards		
Prevalence of Stunting (<-2 Z-score)	111	13.0 % (10.5 - 16.1 95% C.I.)
Prevalence of Severe Stunting (<-3 Z-score)	18	2.1 % (1.3 - 3.3 95% C.I.)
Immunization coverage (6-59 months)		
BCG	863	97.1%
OPV1	861	96.9%
OPV3	803	90.3%
Measles 9 months	767	88.7%
Measles 18 months	537	73.7%

Vitamin A (6-11 months)	28	48.3%
Vitamin A (12-59 months)	517 237	Once – 62.2% Twice – 43.5%
Deworming (12-59 months)	453 171	Once – 54.5% Twice – 20.6%
Child Morbidity (0 – 59 months)		
Sickness two weeks prior to survey	329	37.0%
Acute Respiratory Infection /cough	297	33.4%
Fever with chill	184	20.7%
Watery diarrhoea	105	11.8%
Maternal malnutrition based on MUAC of <210mm		
All women Malnourished <21.0CM	18	3.1%
All women at risk (21-23CM)	130	22.4%
PLW women Malnourished <21.0CM	10	2.8%
PLW women at risk (21-23CM)	96	26.4%
Maternal nutrition status of women of reproductive age		
ANC coverage	290	92.1%
First ANC visit in Month 1 to Month 3	65	22.4%
Four times and above ANC visits	22	7.6%
Iron folate coverage	275	87.3%
Iron folate supplementation Duration	275	<90 days – 77.1% 91-180 days – 22.2% Above 80 days – 0.7%

1 INTRODUCTION

1.1 Geographic Description of the Survey Area

Mandera County is in the Northeastern part of Kenya, it borders Ethiopia to the North, Somalia Republic to the East, and Wajir County to the South and Southwest. It has 9 sub-counties, with an estimated population of 959,236 persons of which 15.5% (148,583) are children less than 5 years of age (KNBS 2023 population projections). It is characterized by low lying rocky hills located on the plains that rise gradually from 400 meters above sea level in the south at Elwak to 970 metres above sea level on the border of Ethiopia. The rest of topography is low lying, characterized by dense vegetation with thorny shrubs of savannah type found along foots of isolated hills. The flat plains make drainage very poor, causing floods during heavy rain downpours. Mandera County has three main livelihood zones i.e. a pastoral economy zone in the east and agro-pastoral economy zone in the west and an irrigated cropping zone in the north along the Daua River. Mandera has 9 sub-counties, with an estimated population of 959,236 persons of which 15.5% (148,583) are children less than 5 years of age (KNBS 2023 population projections). The population ratio in these zones represent pastoral zone of 28.4%, agro pastoral zone of 39.2% and irrigated cropping zone of 32.4% (there is mixed livelihood of agro-pastoralism). Rainfall is scanty and unpredictable averaging at 255mm per year. It has hot temperatures ranging at a mean annual average of 24 0C in July to a high of 42 0C in February/March. The county is prone to unpredictable climate changes, leading to either severe droughts or heavy rains.

Figure 1: Mandera County zones

1.2 Health and Nutrition situation:

The poor nutrition status of the community is associated with many factors that range from poor socio-economic and civil security, food insecurity, poor childcare practices and poor health seeking behaviors, frequent disease outbreaks, water, sanitation and hygienic infrastructure which lead to a cycle of malnutrition that only reduces slightly during the post rain season. There were consistently high levels of admissions in 2022 and 2023 compared to the last three years. IMAM performance against both target and caseloads was good for SAM, above 50% coverage but low for MAM. Cumulative number of cases of SAM and MAM admissions was increasing trend from 2020 to 2022; SAM admissions; 3621, 3487 and 5709 while MAM admissions; 13,446, 15,371 and 23,545 in the past 3 years period.

Though these is happening, disease specific challenges exist as a result of limited health system infrastructure, lack of access to services at the community level, high staff turnover which inhibits county efforts to improve quality of health care. The county also receives

malnourished cases from neighboring countries – Somalia and Ethiopia, increasing the number of severe malnutrition cases requiring inpatient treatment through the County referral hospital in Mandera, Sub County hospitals, health centers and dispensary along the boundaries.

1.3 Survey Justification

According to December 2022 NDMA drought early warning updates, Mandera County is in the alarm drought phase classification with a worsening trend. The shorts rain of October, November and December have failed which marks the fifth failed season. Pasture condition is completely depleted across the County and water availability is also worsening. The livestock body condition is poor and milk production is below the long-term average. Measles outbreak has been reported in Mandera West, Kutulo and Lafey sub counties. The County has been responding to the extremely critical malnutrition rates by scaling up high-impact nutrition interventions with financial and technical support from partners (UNICEF, WFP SCI, ACF, KRCS, RACIDA). To determine the current nutrition situation, the county department of health is proposing to conduct a SMART survey in January 2023.

1.4 Survey Objectives

The overall objective of the survey was to determine the prevalence of acute malnutrition in children aged between 6-59 months in Mandera County

Specific Objectives:

The specific survey objectives were;

1. To estimate the prevalence of acute malnutrition in children aged 6-59 months.
2. To determine the morbidity rates among children 6-59 months, two weeks prior to survey start.
3. To determine the coverage of immunization (BCG, Measles and OPV1 and OPV 3) of children aged 0-59 months.
4. To estimate the coverage of Vitamin A supplementation, deworming and Zinc supplementation among the targeted children.
5. Estimate the coverage of iron folate supplementation for women of reproductive age.
6. To determine the nutrition status of women of reproductive age based on MUAC
7. To determine possible underlying causes of malnutrition.
8. To recommend appropriate interventions based on survey findings.

1.5 Survey timing

Table 2: Survey timing calendar

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dry Season			Long Rain			Dry Cool Season			Short Rains		

The survey was conducted towards the start of dry season and toward the end of short rains.

2 METHODOLOGY

The SMART Methods are used to conduct the survey in planning, training, field test, data entry and analysis. Other data sets collected concurrently included data on Water Sanitation and Hygiene (WASH) and Food security and livelihood (FSL). The entire exercise was done in consideration with all guidelines as stipulated by the MoH at county and national level. The survey methodology was presented to the County Steering Group (CSG) and National Nutrition Information Working Group (NIWG) for validation before commencement of data collection.

2.1 Sample size

The Sample size was determined using ENA for SMART software (11th January 2020). The table below outlines factors considered when determining the sample size calculation. The parameters used were drawn from the SMART survey conducted in January 2023 in Mandera County. The table 3 below summarizes the sample size calculations.

Table 3: Sample size calculation for anthropometric

Survey parameter	Anthropometry sample	Rationale
Estimated prevalence	34.0%	Malnutrition rates based on July 2022 SMART survey were critical GAM of 28.8% (24.2 - 34.0 95% C.I.). From contextual, (NDMA EWS) the food security situation is worsening, hence the use of 34% GAM estimate
Desired Precision	5%	This is based on SMART methodology guideline recommendations
Design effect	1.5	This is sufficient to cater for any heterogeneity based on the expected prevalence. Obtained from SMART survey results of June/July 2022
Average household size	5.7	Based on the KNBS 2019 kphc-analytical-report-on-population-projections
% under five children	15.4%	Based on the KNBS 2019 kphc-analytical-report-on-population-projections
% non-response	1%	This is the anticipated non-response rate based on the July 2022 SMART survey which has a non-response rate of 0.2%
Children to be included	563	
Households to be included	715	
Number of clusters	42	

2.2 Survey Design

A cross-sectional descriptive nutrition SMART survey was conducted for children aged 6-59 months for the anthropometric measurements and mothers of children below 5 years of age

as primary respondents to the household questionnaires. The study covered both the residents and internally displaced persons (IDPs) within the seven sub counties. Quantitative data was captured by taking children's physical anthropometric measurements using calibrated weighing scales, height boards and MUAC tapes. The readings were recorded in the tablet. Validated semi structured questionnaires built in the ODK software, were used to collect data on child health, food security and WASH. Qualitative data was collected through observation. Considering the time spent on travelling to each household, introductions and breaks, 15 households were sampled per cluster.

2.3 Sampling

The study area and population were drawn from the entire residents/ inhabitants of the seven sub-counties of Mandera County. A multistage sampling technique was used for this purpose. The first stage was assignment of clusters based on proportion to population size (PPS), the population for each location/ village was established based on the 2009 census projected by 3.0% growth per annum. Clusters were defined as villages within Mandera County. A sampling frame of 540 villages was used and based on PPS, 42 clusters were randomly generated using ENA for SMART. However, forty-six villages were excluded from the sampling frame due to insecurity, limited population or deserted majority of these villages are in the Sub Counties close to Somalia border or recent incident of insecurity reported.

2.3.1 Sampling procedure:

The second stage involved random selection of households, and selection was done as per the National guidelines for Nutrition Assessments in Kenya. Simple random method was employed to select the surveyed households.

Upon entry into the household the survey team leader did introduction, clearly explaining the objectives of the survey and as well assuring household members of confidentiality as well as identify survey respondent.

2.3.2 Selection of the households

The definition of a household was a shelter or more whose residents ate from the same "cooking pot". Updated list of households in the villages were developed in conjunction with the village chiefs and elders through the Sub county nutritionist and County health record information officer, while excluding abandoned households. Using a table of random numbers 15 households were randomly selected from the updated household lists. In case the village had a large number of households, segmentation was done after which one segment would be randomly selected to represent the village.

2.3.3 Selection of children for anthropometry

All children between 6-59months of age staying in the selected household were included in the sample. In cases where there was no eligible child, the household was still considered part of the sample and only the household questionnaires (general questionnaires) were administered. The respondent was the primary caregiver of the index child/children. If a child

and/or the caregiver were temporarily absent, then the survey team re-visited the household to collect the data at an appropriate time.

2.3.4 Selection of women for determination of nutritional status

All women within the reproductive age (15-49years) in the identified households were enlisted in the study and their MUAC measurements taken.

2.4 Case Definitions

In all selected households, all children 6-59 months were included in the anthropometric survey. The age of the children was determined using a local historical and seasonal calendar of events and birth record if available. If there were no children 6-59 months in the household, the household was still interviewed for WASH and Food Security and Livelihoods (FSL). Data on, morbidity, WASH and food security was collected by recall.

The following case definitions were used in the assessment:

- **Household**: Group of persons who live together under the same roof and eat from the same pot for at least a period of 3 months preceding the assessment. In homes with multiple spouses, those living and eating in different houses are considered as separate households. Wives living in different houses but eating from the same pot are considered as one household.
- **Head of household:** One who controls and makes key decisions on household resources (livestock, assets, income, and food), health and social matters for and on behalf of the household members
- **Respondent:** The person responsible for food preparation on the recall day. For the child, this refers to the mother or caregiver.
- **Diarrhea:** having three or more loose or watery stools per day
- **Measles vaccination**: a jap in the upper arm given to children after 9 months and 18 months of age at health clinics or by mobile health teams.
- **Meal**: food served and eaten at one time (excluding snacks) and includes one of the three commonly known: - breakfast, lunch and supper/dinner
- **Oedema**: Swollen limbs leaving depression 3 seconds after pressing on both feet (bilateral)

2.5 Indicators, guidelines and formulas used in acute malnutrition

2.5.1 Weight for Height (WHZ) index

This was estimated from a combination of the weight for height (WHZ) index values (and/or oedema) and by sex based on WHO standards 2006. This index was expressed in WHZ indices in Z-scores, according to WHO 2006 reference standards.

Z-Score:

Severe acute malnutrition is defined by WHZ < -3 SD and/or existing bilateral Oedema

Moderate acute malnutrition is defined by WHZ < -2 SD and >-3 SD and no Oedema.

Global acute malnutrition is defined by WHZ < -2 SD and/or existing bilateral Oedema.

2.5.2 Mid Upper Arm Circumference (MUAC)

MUAC measurements was also undertaken to determine the nutrition status of eligible children and mothers/caretaker (15-49 years of age) from sampled households. The following MUAC criteria were applied.

Table 4: MUAC Guideline

MUAC Guideline Children 6 - 59 Months	**Interpretation**
MUAC< 115mm and/ or bilateral oedema	Severe acute malnutrition
MUAC 115mm and <125mm (no bilateral oedema)	Moderate acute malnutrition
MUAC 125MM and 135mm (no bilateral oedema)	At Risk of Malnutrition
MUAC >135 MM	Adequate nutrition
Maternal MUAC Cut off	**Interpretation**
MUAC< 21cm	Malnourished
MUAC 21 - 23 cm	At risk of malnutrition
MUAC > 23cm	Normal

- **Global Acute Malnutrition (GAM):** weight-for-height Z scores less than -2 and/or presence of oedema (WHZ<-2 and/oedema)
- **Severe Acute Malnutrition (SAM):** weight-for-height Z scores less than -3 and/or presence of oedema (WHZ<-3 and/oedema)
- **Global Acute Malnutrition based on MUAC (GAMMUAC**): Mid Upper Arm Circumference less than 125 mm and/or presence of oedema (MUAC<125 mm and/oedema); and severe acute malnutrition as MUAC<115 mm and/oedema
- **Wasting**: weight-for-height Z scores less than -2 (WHZ<-2); and severe wasting as WHZ<-3.
- **Underweight**: weight-for-age Z scores less than -2 (WAZ<-2); and severe underweight as WAZ<-3.
- **Stunting**: height-for-age Z scores less than -2 (HAZ<-2); and severe stunting as HAZ<-3.

2.6 Questionnaires, Training and data collection

2.6.1 Survey Questionnaires/ tools

The survey adopted the data collection tools recommended by the Nutrition Information Working Group (NIWG) for conducting standard integrated nutrition surveys but converted to Open Data Kit (ODK) format to enable data collection using android smart phones. The questionnaires were written in English and the enumerators translated them to Somali/Garre/Rahanweyne language during the training and used the same in the field. The

questionnaire included Anthropometry (6-59 months); household questionnaire (maternal; food security and livelihoods; Water, Sanitation and Hygiene practices; Morbidity; food consumption and dietary diversity).

Age: Determined from child card where available, using a local historical and seasonal calendar of events in case no card was available.

Weight: was measured using a bathroom Scales for children between 6 to 59 months. The reading was done by an enumerator and verified by team leader then recorded to nearest 0.1kg.

Height/Length: was measured using a standard UNICEF height/length board – taking a standing height for children 24-59 months (or 87 cm) and recumbent length for children 6-23 months (or <87 cm). Both height and length were measured to the nearest 0.1 cm. Measurement was done by a measurer and recorder with assistance from the child's mother/caretaker.

MUAC: Mid-upper arm circumference measurements for children 6-59 months were taken using a flexible and non-stretch tape (UNICEF) in cm to the nearest 0.1 cm.

Survey team

The survey was coordinated by the County Nutrition Coordinator and supervised by members from MOH and Sub County nutrition officers were team leaders. The team was supported by officers from implementing partners and the Nutrition and Dietetics Unit-National MoH. The survey was undertaken by eight teams that comprised of two enumerators and one team leader.

2.6.2 Survey Team Composition

The survey had eight teams of three members each (1 team leader and 2 survey measurers). At the village level, the team was joined by a village guide who is knowledgeable of the village. Each team visited 15 households for anthropometry and household survey in a cluster. The survey teams visited one cluster per day. All children aged 6-59 months in all selected households were measured regardless of attaining the required number of children per cluster for the last household.

2.6.3 Survey Team Training and supervision

A four days training workshop was held from 22nd to 25th January 2023 at Takaba. The training focused on: the purpose and objectives of the survey; familiarization with the questionnaire by reviewing the purpose for each question; recording of data using ODK software; how to take accurate anthropometric measurements; cluster and household selection. Demonstrations on how to take anthropometric measurements were conducted. Enumerators training also emphasized on field procedures, measurements, interviewing techniques as well as anthropometric standardization as recommended by SMART

methodology. The protocol and tools were reviewed and discussed for a better understanding by the survey team. Possible problematic situations that might arise during the training were described and solutions for them given.

Pretesting of the survey questionnaire was conducted on the last day of the training in two of the cluster not sampled, using ODK. This was to gauge the enumerator's level of understanding, ability to follow sampling procedures and ease in use of tablets; take and record measurements correctly as well as interact effectively with respondents. After the pre-testing, a debriefing session with the survey team was held where difficulties that arose were addressed.

2.7 Data Collection

Data collection took 6 days on 26th to 31st January 2023 under the supervision of 2 CHMT members and the County Nutrition coordinator and Nutrition officer from Save the Children. During data collection, all the field procedures were followed to select eligible households, identify children for anthropometric measurement as well as the respondents for the interviews. Survey teams first reported to the area chief or village elder for the respective selected clusters/villages updated the list of households and were then assigned a village guide. Using table of random numbers, households to be visited were randomly selected. Village guide then took teams around the village to the selected households.

Each day after data collection, all the teams were able to submit the data electronically. A central data manager was on stand-by to be able receive, review, export data, filter and give feedback teams through the field supervisor or what-sup group created for the Survey.

2.7 Variables Measured

Age: The exact age of the child was recorded in months. Calendar of events, health or baptismal cards and birth certificates were used to determine age.
Weight: Children were measured using a digital weighing scale
Height: Recumbent length was taken for children less than 87cm or less than 2years of age while height measured for those greater or equal to 87cm or more than2 years of age.
MUAC: Mid Upper Arm Circumference (MUAC) was measured on the left arm, at the middle point between the elbow and the shoulder, while the arm was relaxed and hanging by the body's side. MUAC was measured to the nearest Cm. MUAC measurements were taken for children 6-59months of age and for women in the reproductive age (15-45 years of age).
Bilateral oedema: Assessed by the application of normal thumb pressure for at least 3 seconds to both feet at the same time. The presence of a pit or depression on both feet was recorded as oedema present and no pit or depression as oedema absent.
Morbidity: Information on two-week morbidity prevalence was collected by asking the mothers or caregivers if the index child had been ill in the two weeks preceding the survey and including the day of the survey. Illness was determined based on respondent's recall and was not verified by a clinician.

Immunization status: For allchildren6-59months, information on BCG, OPV1, OPV3 and measles vaccinations status was collected using health cards and recall from caregivers. When estimating measles coverage, only children 9months of age or older were taken in to consideration as they are the ones who were eligible for the vaccination.

Vitamin A supplementation status: For all children6-59monthsofage, information on Vitamin A supplementation in the 6months prior to the survey date was collected using child health and immunization campaign cards and recall from caregivers.

Iron-Folic Acid supplementation: For all female caregivers, information was collected on IFA supplementation and number of days (period) they took IFA supplements in the pregnancy of the last birth that was within 24 months.

De-worming status: Information was solicited from the caregivers as to whether children12-59 months of age had received de-worming tablets or not in the previous one year. This information was verified by health card where available.

Food security status of the households: Food consumption score, Minimum dietary diversity score women source of predominant foods and coping strategies data was collected.

Household water consumption and utilization: The indicators used were main source of drinking and household water, time taken to water source and back, cost of water per 20-litre jerry-canand treatment given to drinking water.

Sanitation: Data on household access and ownership to a toilet/latrine, occasions when the respondents wash their hands were also obtained.

Mosquito nets ownership and utilization: Data on the household ownership of mosquito nets and their utilisation was collected

Minimum dietary diversity score women (MDD-W): A 24 hour food consumption recall was administered to all women of reproductive Age(15-49 years).All foods consumed in the last 24 hours were enumerated for analysis. All food items were combined to form 10 defined food groups and all women consuming more at least five of the ten food groups were considered to meet the MDD-W.

Household food consumption score (FCS). Data on the frequency of consumption of different food groups consumed by a household during 7 days before the survey was collected. The Table below shows WFP corporate thresholds for FCS used to analyse the data.

Table 5: FCS thresholds

Food Consumption Score	Profile
<21	Poor
21.5-35	Borderline
>35	Acceptable

Coping strategy index (CSI): Data on the frequency of the five reduced CSI individual coping behaviours was collected. The five standard coping strategies and their severity weightings used in the calculation of Coping Strategy Index are:

1. Eating less-preferred foods (1.0),
2. Borrowing food/money from friends and relatives (2.0),
3. Limiting portions at mealtime (1.0),

4. Limiting adult intake (3.0), and
5. Reducing the number of meals per day (1.0)

CSI index per household was calculated by summing the product of each coping strategy weight and the frequency of its use in a week (no of days).

2.8 Data Processing & Analysis

Anthropometric data entry and processing was done using the ENA for SMART software 10th January 2020 where the World Health Organization Growth Standards (WHO-GS) data cleaning and flagging procedures were used to identify outliers that enabled data cleaning as well as exclusion of discordant measurements from anthropometric analysis. The SMART/ENA software generated weight-for-height, height-for-age and weight-for-age Z scores to classify them into various nutritional status categories using WHO standards and cut-off points. Additional data for children aged 6-59 months, women aged 15-49 years, WASH, and food security indicators were cleaned and analysed using Epi-Info, ENA Epi Info and Excel.
The result of this survey was compared to WHO standard cut-off points

Table 6: Definition of boundaries for exclusion

1. If sex is missing the observation was excluded from analysis.
2. If Weight is missing, no WHZ and WAZ were calculated, and the programme derived only HAZ.
3. If Height is missing, no WHZ and HAZ were calculated, and the programme derived only WAZ.
5. For any child records with missing age (age in months) only WHZ was calculated.
6. If a child has oedema only his/her HAZ was calculated.

2.9 Survey Limitations

The main challenges were:

a) Determining the exact age of some children was a major challenge particularly with the use of calendar of events. The main difficulties relate to accuracy on recall (recall bias) and at some villages, respondents could not relate well with some of the events. The challenge in determination of accurate age may impact of some survey findings.
b) There were 30 children not assessed for anthropometric measurement as they were not at home during first and subsequent visit.
c) During sampling 46 villages were excluded from the sampling frame due to insecurity.

2.9 Ethical considerations

Sufficient information was provided to the local authorities about the survey including the purpose and objectives of the survey, the nature of the data collection procedures, the target group, and survey procedures. Verbal consent was obtained from all adult participants and

parents/caregivers of all eligible children in the survey. The decision of caregiver to participate or withdrawal was respected. Privacy and confidentiality of survey respondent and data was protected.

4 SURVEY RESULTS

4.1 Anthropometric Results

A total of 719 households were surveyed with an average household size of 5.5. The majority of the households were resident's permanent (99.3%), resident's nomadic pastoralist 0.4%, and Refugee 0.3% respectively. The villages were distributed in the following livelihood zones: Agro-pastoral 35.5%, Irrigated cropping 27.0% and Pastoral 37.6%. Majority of the household are male headed (68.9%).

4.1.1 Distribution by age and sex

Anthropometric measurements were taken on a total of 889 children (431 boys and 458 girls) aged 6-59 months to assess acute malnutrition. The distribution of the assessed children by age and sex shows that the younger (6-29 months) and older (30-59 months) were equally represented as were boys and girls, both with the ratio of around 0.9 as expected. The age distribution according to Table 7 below is within the expected limits which show that there was no selection bias during data collection process.

Table 7: Distribution of age and sex of sample

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy:girl**
6-17	78	48.4	83	51.6	161	18.1	0.9
18-29	111	47.4	123	52.6	234	26.3	0.9
30-41	95	44.8	117	55.2	212	23.8	0.8
42-53	92	50.8	89	49.2	181	20.4	1.0
54-59	55	54.5	46	45.5	101	11.4	1.2
Total	431	48.5	458	51.5	889	100.0	0.9

4.1.2 Prevalence of acute Malnutrition based on Weight-for-Height Z scores (WHZ)

The prevalence of Global Acute Malnutrition (GAM) rate for the County was **29.8 %** (26.0 - 33.8 95% C.I.) and the severe acute malnutrition (SAM) rate was **7.4 %** (5.6 - 9.6 95% C.I.). In this assessment no cases of oedema were observed. The findings indicate a *very critical* GAM phase of malnutrition according to WHO classification. Compared to March 2022 (same season), Prevalence of acute reduced from 34.7 %(29.7 - 40.1 95% C.I.) and 7.9 %(5.7 - 10.8 95% C.I.) for GAM and SAM respectively. However, this was not significant different for both GAM (P=0.132) and SAM (P=0.786). See Table 8 below.

Table 8: Prevalence of acute malnutrition based on weight-for-height z-scores and/or Oedema and by sex

	All n = 884	**Boys** n = 430	**Girls** n = 454
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(263) 29.8 % (26.0 - 33.8 95% C.I.)	(129) 30.0 % (25.3 - 35.2 95% C.I.)	(134) 29.5 % (24.6 - 34.9 95% C.I.)

Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(198) 22.4 % (19.3 - 25.8 95% C.I.)	(97) 22.6 % (18.4 - 27.4 95% C.I.)	(101) 22.2 % (18.2 - 27.0 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(65) 7.4 % (5.6 - 9.6 95% C.I.)	(32) 7.4 % (5.4 - 10.2 95% C.I.)	(33) 7.3 % (5.0 - 10.4 95% C.I.)

The findings indicate a shift to the left of the sample curve (figure 2below) with a mean score of -1.44±1.01 which indicates that, overall, the population exhibits a poor nutritional status compared with the WHO reference population.

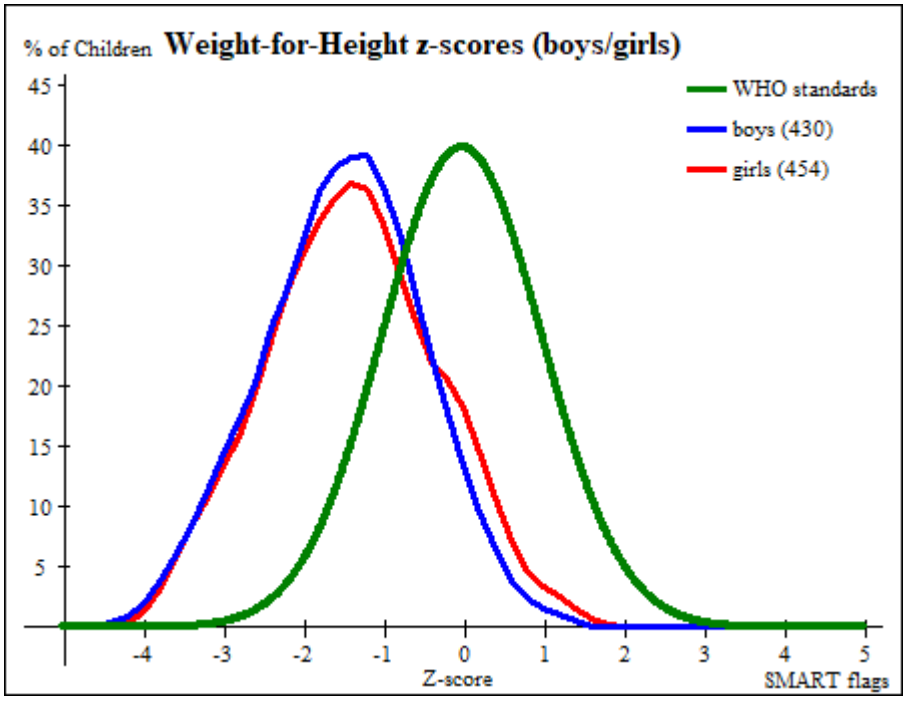


Figure 2: Weight for height z-scores curve

The standard deviation was good and is within the range of (<1.15+/- 0.99). The design effect determined was 1.61 that shows a significant intra cluster differences P=0.00.
The cases of malnutrition appeared to have aggregated into certain clusters as indicated figure below

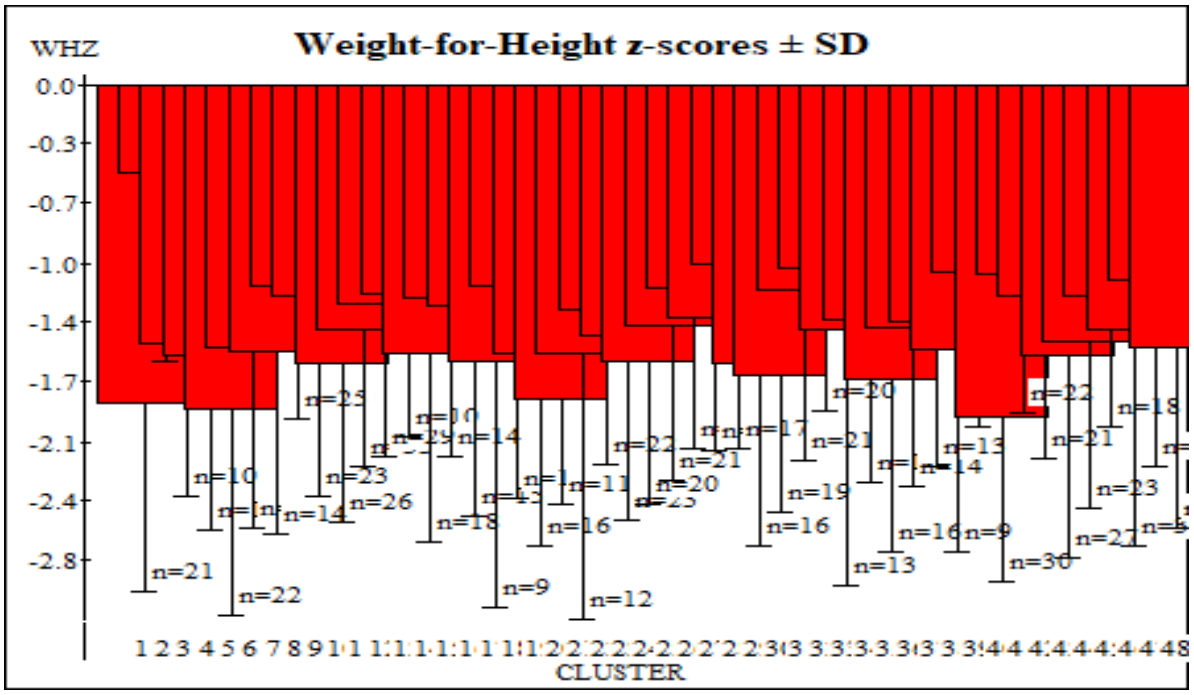


Figure 3: Weight for height Z scores averages across clusters

Figure 3 above indicates clusters with high cases of acute malnourished children. There are 25 clusters had cases of malnutrition (above 30% proportion of malnourished children). Based on average WHZ, the clusters with poor nutrition status were BURDURAS EAST B, B/Afya Libihiya, Sharif Iley Burabor, Elele WARGADUD, Kubi(Marothiley), TOSI(Rhamu) Lagadi(Rhamu), Bulla Dadcha Yattani, Gari Town, and Bulla Nguvuelwak.

The prevalence of acute malnutrition (WHZ<-2 and/or Oedema) by age is presented in Table 10 and shows a higher proportion of acutely malnourished among the children aged 54-59 months. This could be attributed to declining childcare practices as mothers concentrated on the younger children.

Table 9: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or Oedema.

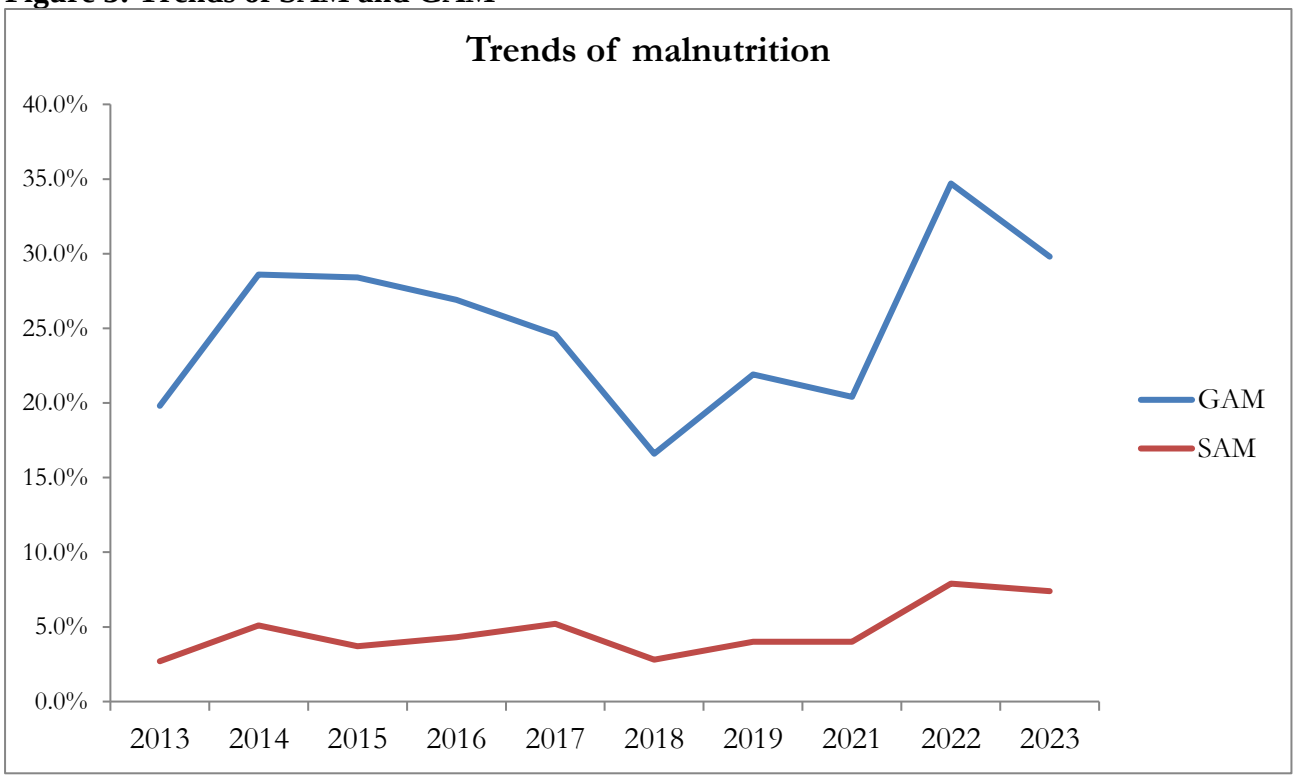
		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	160	9	5.6	35	21.9	116	72.5	0	0.0
18-29	233	14	6.0	41	17.6	178	76.4	0	0.0
30-41	209	11	5.3	43	20.6	155	74.2	0	0.0
42-53	181	20	11.0	45	24.9	116	64.1	0	0.0
54-59	101	11	10.9	34	33.7	56	55.4	0	0.0
Total	884	65	7.4	198	22.4	621	70.2	0	0.0

Table 10: Distribution of acute malnutrition and Oedema based on weight-for-height z-scores.

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor. 0 (0.0 %)	Kwashiorkor. 0 (0.0 %)
Oedema absent	Marasmic No. 68 (7.6 %)	Not severely malnourished. 821 (92.4 %)

There was no case of Marasmic kwashiorkor or kwashiorkor reported

Figure 3: Trends of SAM and GAM



3.1.3 Prevalence of acute Malnutrition based on Mid Upper Arm Circumference (MUAC)

MUAC is the best indicator for mortality and is used in the community (for screening) to identify individual children in need of referral and as an admission criterion for feeding programs. Generally, MUAC usually tends to indicate lower GAM levels compared to WHZ-Scores. The prevalence of malnutrition using MUAC is significantly lower compared to using Weight for Height Z-scores. This could be associated with the physiology of this population in Mandera, similar to the Somali and South Sudanese, with a high comic index. As shown in Table 12 below, the prevalence of global acute malnutrition based on MUAC (<125 mm) and/or Oedema was **8.5%** (6.5 - 11.1 95% C.I.) and of severe acute malnutrition MUAC<115 mm and/or Oedema) was **0.9%** (0.4 - 1.9 95% C.I.). Table 12 shows the distribution of acute malnutrition based on MUAC by age. The mean MUAC for the measured children was 140.3 mm with a standard deviation (SD) of ±11.8 for the sample n=688 children aged 6-59 months. From the GAM prevalence by MUAC, girls seemed to be more malnourished than boys; GAM 8.6 % & 6.8 % respectively. See Table 12 below

Table 11: Prevalence of acute malnutrition based on MUAC cut offs (and/or Oedema) and by sex

	All n = 889	**Boys** n = 431	**Girls** n = 458
Prevalence of global malnutrition (< 125 mm and/or oedema)	(76) 8.5 % (6.5 - 11.1 95% C.I.)	(33) 7.7 % (5.2 - 11.1 95% C.I.)	(43) 9.4 % (6.9 - 12.6 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(68) 7.6 % (5.7 - 10.3 95% C.I.)	(30) 7.0 % (4.6 - 10.4 95% C.I.)	(38) 8.3 % (5.7 - 11.9 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(8) 0.9 % (0.4 - 1.9 95% C.I.)	(3) 0.7 % (0.2 - 2.1 95% C.I.)	(5) 1.1 % (0.5 - 2.5 95% C.I.)

Table 12: Prevalence of acute malnutrition by age, based on MUAC cut offs and/or Oedema

		Severe wasting (< 115 mm)		**Moderate wasting (>= 115 mm and < 125 mm)**		**Normal (> = 125 mm)**		**Oedema**	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	161	7	4.3	30	18.6	124	77.0	0	0.0
18-29	234	1	0.4	20	8.5	213	91.0	0	0.0
30-41	212	0	0.0	10	4.7	202	95.3	0	0.0
42-53	181	0	0.0	3	1.7	178	98.3	0	0.0
54-59	101	0	0.0	5	5.0	96	95.0	0	0.0
Total	889	8	0.9	68	7.6	813	91.5	0	0.0

4.1.3 Prevalence of Underweight based on Weight-for-Age Z scores (WAZ)

The weight-for-age (WAZ) index provides a composite measure of wasting and stunting, and commonly used to monitor the growth of individual children in Mother-child booklet since it enables mothers easily visualize the trend of their children's increase in weight against age. A low WFA is referred to as underweight. The prevalence of children underweight was **22.8%** (19.5 - 26.5 95% C.I.) while severely underweight was 4.5% (3.0 - 6.9 95% C.I.).

Table 13: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 882	**Boys** n = 429	**Girls** n = 453
Prevalence of underweight (<-2 z-score)	(201) 22.8 % (19.5 - 26.5 95% C.I.)	(107) 24.9 % (20.6 - 29.8 95% C.I.)	(94) 20.8 % (16.7 - 25.5 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(161) 18.3 % (15.6 - 21.3 95% C.I.)	(79) 18.4 % (15.3 - 22.0 95% C.I.)	(82) 18.1 % (14.5 - 22.4 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(40) 4.5 % (3.0 - 6.9 95% C.I.)	(28) 6.5 % (4.2 - 10.1 95% C.I.)	(12) 2.6 % (1.4 - 5.1 95% C.I.)

Table 14: Prevalence of underweight by age, based on weight-for-age z-scores

		Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	159	8	5.0	21	13.2	130	81.8	0	0.0
18-29	230	13	5.7	58	25.2	159	69.1	0	0.0
30-41	211	8	3.8	34	16.1	169	80.1	0	0.0
42-53	181	6	3.3	31	17.1	144	79.6	0	0.0
54-59	101	5	5.0	17	16.8	79	78.2	0	0.0
Total	882	40	4.5	161	18.3	681	77.2	0	0.0

3.1.5 Prevalence of Stunting based on Height-for-Age Z scores (HAZ)

Height for Age (HAZ) measures linear growth and is therefore a reflection of the cumulative effects of long-term nutritional inadequacy and or recurrent chronic illness episodes. It is not affected by seasonality but is related to the long-term effects of socio-economic development and long-standing food insecurity situations. The survey findings indicate a prevalence of **13.0%** (10.5 - 16.1 95% C.I.), (HAZ<-2) with severe stunting (HAZ<-3) at **2.1%** (1.3 - 3.3 95% C.I.). This according to WHO classification indicates serious levels of malnutrition. The results showed that more stunted boys as compared to girls. See table 16 &17

Table 15: Prevalence of stunting based on height-for-age z-scores and by sex.

	All n = 852	**Boys** n = 412	**Girls** n = 440
Prevalence of stunting (<-2 z-score)	(111) 13.0 % (10.5 - 16.1 95% C.I.)	(63) 15.3 % (11.8 - 19.6 95% C.I.)	(48) 10.9 % (7.8 - 15.0 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(93) 10.9 % (8.7 - 13.6 95% C.I.)	(54) 13.1 % (10.2 - 16.7 95% C.I.)	(39) 8.9 % (6.0 - 12.9 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(18) 2.1 % (1.3 - 3.3 95% C.I.)	(9) 2.2 % (1.1 - 4.2 95% C.I.)	(9) 2.0 % (1.1 - 3.7 95% C.I.)

Table 16: Prevalence of stunting by age based on height-for-age z-scores

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	151	5	3.3	16	10.6	130	86.1
18-29	218	3	1.4	41	18.8	174	79.8
30-41	208	6	2.9	21	10.1	181	87.0
42-53	175	3	1.7	10	5.7	162	92.6
54-59	100	1	1.0	5	5.0	94	94.0

Total	852	18	2.1	93	10.9	741	87.0

The mean Z scores for wasting (WHZ), underweight (WAZ) and stunting (HAZ) were --1.44±1.01, -1.31±0.97 and -0.61±1.17 respectively, all indicating poorer nutrition situation compared to WHO reference population. The standard deviations for WHZ, WAZ and HAZ were within the acceptable range of 0.8-1.2. The sample design effect values showing slight inter cluster variability. See table 18.

Table 17: Mean z-scores, Design Effects and excluded subjects.

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	884	-1.44±1.01	1.61	0	5
Weight-for-Age	882	-1.31±0.97	1.51	0	7
Height-for-Age	852	-0.61±1.17	1.42	0	37

* contains for WHZ and WAZ the children with oedema.

4.2 Children's Morbidity and health seeking behaviour

According to UNICEF conceptual framework on causes of malnutrition, disease is an immediate cause of malnutrition. It also affects food intake which is also categorized as an immediate cause. It is important therefore to assess morbidity and whether it had some effect on malnutrition. 37.0% (n=329) Children had been ill within the last 14 days compared to 38.1% (n=136) in March 2022, majority having ARI and fever with chills like malaria. Most children (27%) suffered from fever, followed by ARI at 48% and watery diarrhea 22%. Table 19 summarizes the reported illnesses.

Table 18: Prevalence of reported child illness and health-seeking behavior

Ill children in the past two weeks (N=889)		
No	560	63.0%
Yes	329	37.0%
Type of illness (N=889)		
Fever with chills like malaria	184	20.7%
ARI /Cough	297	33.4%
Watery diarrhoea	105	11.8%

77.5% (n=225) sick children were taken for Health assistance during the episode of illness compared to 83.9% (n=198) March 2022. Worth to note is that majority (81.6%) sought health assistance from public health facilities as shown in Table 19.

Table 19: Healthcare Source

Healthcare source	**Frequency**	**Percentage**
Community health worker	4	1.6%
Private clinic/ pharmacy	41	16.1%
Public clinic	208	81.6%
Mobile clinic	35	13.7%

Local herbs	2	0.8%
Traditional healer	1	0.4%

66.6% of the household own at least one mosquito net with average of 1.63 (1.52 – 1.75 95% CI) nets per household. This is almost the same coverage of same season (March 2022) of 68.3% of HH owning mosquito nets.

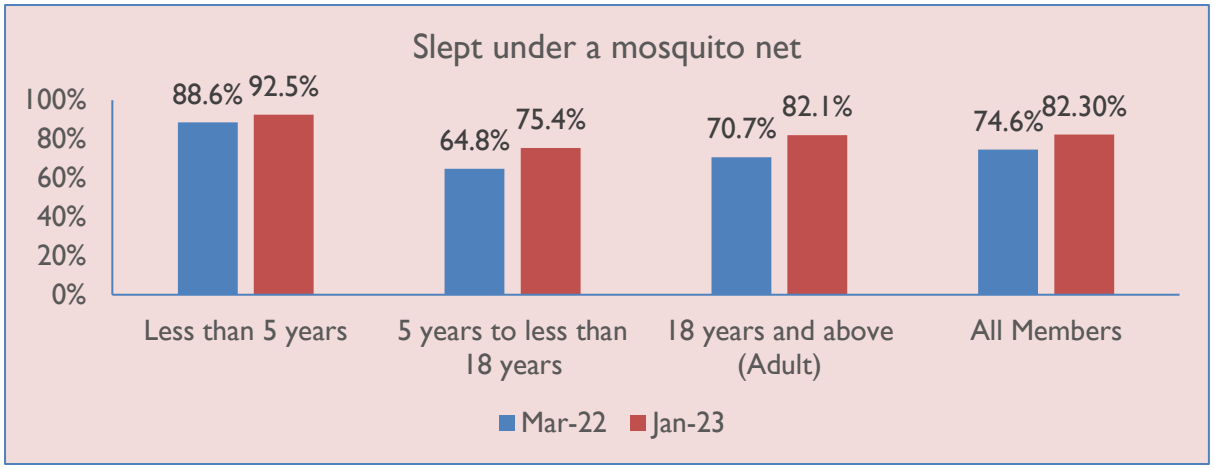


Figure 4: Mosquito nets use

3.3 Micronutrient supplementation and Deworming Vitamin A supplementation

Improving the vitamin A status of deficient children through supplementation enhances their resistance to disease and can reduce mortality from all causes by approximately 23 per cent. Therefore, vitamin A supplementation is critical, not only for eliminating vitamin A deficiency as a public-health problem, but also as a central element for child survival.

Poor data management on vitamin A logistics, inadequate social mobilization to improve vitamin uptake and placement of vitamin A at lower level of priority among other interventions have been cited as major challenges in achieving the supplementation targets (MOH Vitamin A Supplementation Operational Guidelines for Health Workers 2012).

To assess vitamin A supplementation, parents and caregivers were probed on whether children had been supplemented, for how many times and the place of supplementation. Reference was made to the child health card and in case the card was not available recall method was applied. In Kenya the government has adopted target of 80% coverage of vitamin A Supplementation (VAS) among children aged 6-59 months. The national guideline recommends that a child should be supplemented at-least every six months[1]. The survey established that vitamin A supplementation is at 48.3% for children 6 -11 months and 62.2% for children 12-59 months at once while twice or more doze stands at 43.5%; compared to 2022 there is a slight increase in vitamin A supplementation but below the national target. The increased coverage is attributed to vitamin A scale up done during *Malezi bora*. Caregivers do not take their children for supplementation after measles vaccination, health workers not exploiting opportunities to supplement and recall issues as mostly results were based on recall. Almost all the children who received vitamin A obtain them from either the health

[1] The Kenya National Technical Guidelines for Micronutrient Deficiency control, August 2008.

facility or during outreach sessions, however, documentation for the same is still poor. See Figure 6 below

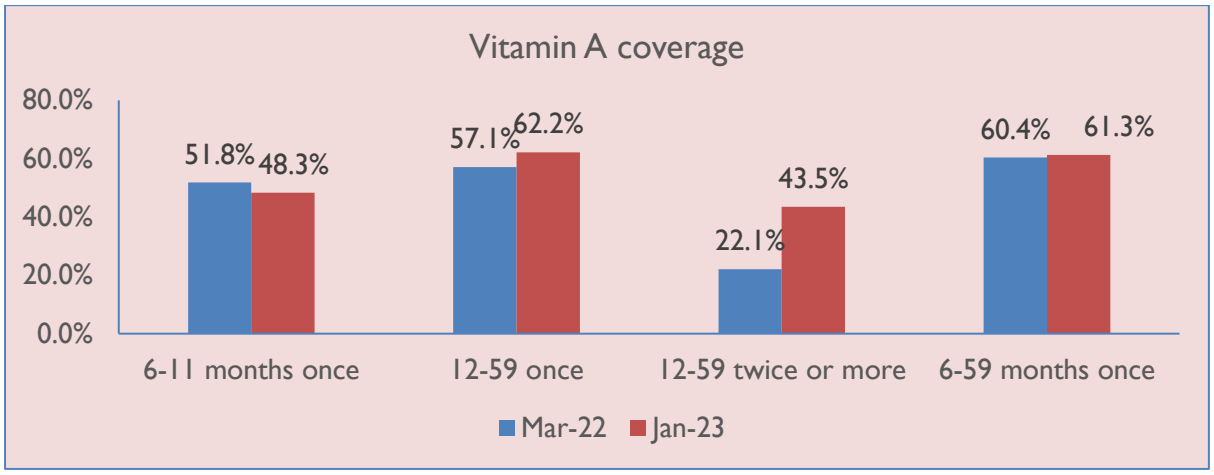


Figure 5: Vitamin A coverage among children 6-59 months

Zinc supplementation in diarrhoea

Zinc supplementation has been shown to reduce the duration and severity of diarrhoeal episodes as well as the prevention of subsequent episodes. Out of 105 children with watery diarrhea, 88.6% (n=93) were supplemented with therapeutic zinc. This is above the national target of 80% for Zinc and this could be because of increased awareness for caregivers to seek treatment for their sick child medication during diarrhoeal episodes.

Deworming

De-worming is important in controlling parasites such as helminths, schistosomiasis (bilharzias) and prevention of anaemia. WHO recommends that children in developing countries exposed to poor sanitation and poor availability of clean safe water to be de-wormed once every 6 months. De-worming was assessed for children aged 12-59 months old. The survey established 54.5% (n=543) children have been dewormed at least once in the past one year out of which only 20.6% (n=171) have been dewormed twice or more within the same period. Those who had been dewormed twice had significantly increase from 2.3% reported in the March 2022. This is a great improvement from last year although low compared to national coverage target of 80%. The low coverage could be attributed to service uptake by health workers who rarely give dewormers to children as well as inadequate recording.

4.4 Vaccination results

The Kenya guideline on immunization defines a fully immunized child as one who has received all the prescribed antigens and at least one Vitamin A dose under the national immunization schedule before the first birthday. This is meant to reduce child mortality and morbidity due to vaccine preventable diseases. This survey assessed the coverage of 4 vaccines namely, BCG, OPV1, OPV3, and measles at 9 and 18 months. The survey showed that BCG coverage was 96.8%, while 96.9% receive OPV 1 and 90.3% receive OPV 3 verified both by card and recall.

Additionally, all children aged 9 months and above ought to be vaccinated against measles. The survey results show that only 88.7% receive the first does of measles with only 73.7% receiving a second dose at 18 months. The low coverage of second doses of measles at 18 months may be attributed to low awareness among caregivers.

Table 20: Immunization Coverages

Immunization	Response	Percentage
BCG	Yes	96.8%
	No	3.2%
OPV 1	Yes, Card	32.9%
	Yes, Recall	64.0%
	No	1.6%
	Do not know	1.6%
OPV 3	Yes, Card	33.6%
	Yes, Recall	56.7%
	No	1.1%
	Do not know	8.6%
Measles at 9 months	Yes, Card	32.5%
	Yes, Recall	56.2%
	No	3.2%
	Do not know	8.1%
Measles at 18 months	Yes, Card	26.5%
	Yes, Recall	47.2%
	No	16.3%
	Do not know	10.0%

4.5 Maternal nutrition status and Iron folate supplementation

The consequences of poor nutritional status and inadequate nutritional intake for women during pregnancy not only directly affect women's health status, but also have a negative impact on birth outcome and early development for children. Gestational malnutrition leads to low birth weights and may ultimately culminate in poor child growth and development, thus there is an urgent need to address high rates of malnutrition among pregnant women. Household food insecurity is a key indicator/determinant for poor adult nutritional status. A high number of malnourished PLWs increase the risk of growth retardation of the fetus and consequently an increase in low birth weight and malnutrition burden spreads to both U5 children and caretakers from the same household faced with food insecurity and related vulnerabilities, a common scenario during nutrition emergency levels.

4.5.1 Acute Malnutrition

Maternal nutrition was assessed by measuring MUAC of all women of reproductive age 15 to 49 years (N=518) in all sampled households. Analysis was further focused on pregnant and lactating women.

The nutritional status of care givers as measured by MUAC showed a prevalence of malnutrition of 2.8% among PLWs. The table below shows the results for the maternal nutrition.

Table 21: Women of childbearing age nutritional status based on MUAC

	Malnourished (<21CM)		At risk (21-23CM)	
	2022	2023	2022	2023
All women	4.6%	3.1	35.2%	22.4%
PLW	5.3%	2.8	40.6%	22.6%

4.5.2 Iron and Folic Acid Supplementation (IFAS)

During pregnancy, women have increased need for additional iron to ensure they have sufficient iron stores to prevent iron deficiency. Iron supplementation is recommended in resource-limited settings as strategy to prevent and correct iron deficiency and anemia among pregnant women

WHO recommends daily consumption of 60mg elemental iron and 0.4mg folic acid throughout the pregnancy. These recommendations have since been adopted by Kenya government in its 2013 policy guidelines on supplementation of iron folic acid supplementation (IFAS) during pregnancy.

87.3% (n=275) reported to have consumed folic acid supplement during the last pregnancy compared to 93.6% (250) of mothers in March 2022. The mean number of days for iron and folic acid consumption was 58.3 (54.4 – 62.2 95% CI) compared to 46.6 days in March 2022. There was a significant difference (P=0.00) in IFAS consumption in women who attended ANC and those who didn't. This shows that ANC is a good predictor of IFAS coverage as shown in Table 22.

Table 22: Cross tabulation of IFAS Consumption and ANC attendance

	Took IFAS TABLETS			
ANC attendance	**Yes**	**No**	**Don't know**	**Total**
No	8	84	8	100
Yes	94.14	5.52	0.34	100
Total	87.3	11.75	0.95	100

4.6 Water, Sanitation & Hygiene (WASH)

Water and sanitation are deeply interrelated. Sanitation is essential for the conservation and sustainable use of water resources, while access to water is required for sanitation and hygiene practices. Furthermore, the realization of other human rights, such as the right to the highest attainable standard of health, the right to food, right to education and the right to adequate housing, depends very substantially upon the implementation of the right to water and sanitation. Increasingly current evidence on poor WASH indicators is being linked to under nutrition and more so, on high stunting levels. Diarrheal, the leading killer of young children is closely linked to poor/inadequate WASH (Pruss-Ustun et al, 2014), which often causes undernutrition, which in turn reduces a child's resistance to subsequent infections, thus creating a vicious circle.

4.6.1 Water Access and Quality

The main water sources (Fig 10) in the County are borehole/protected spring at 30.5% and earth pan/dam at 19.6%. This indicates no significance change compared to same period 2022. Majority of the population 52.9% (N=383) of the households obtain their water from unsafe sources compared to 83% in 2022.

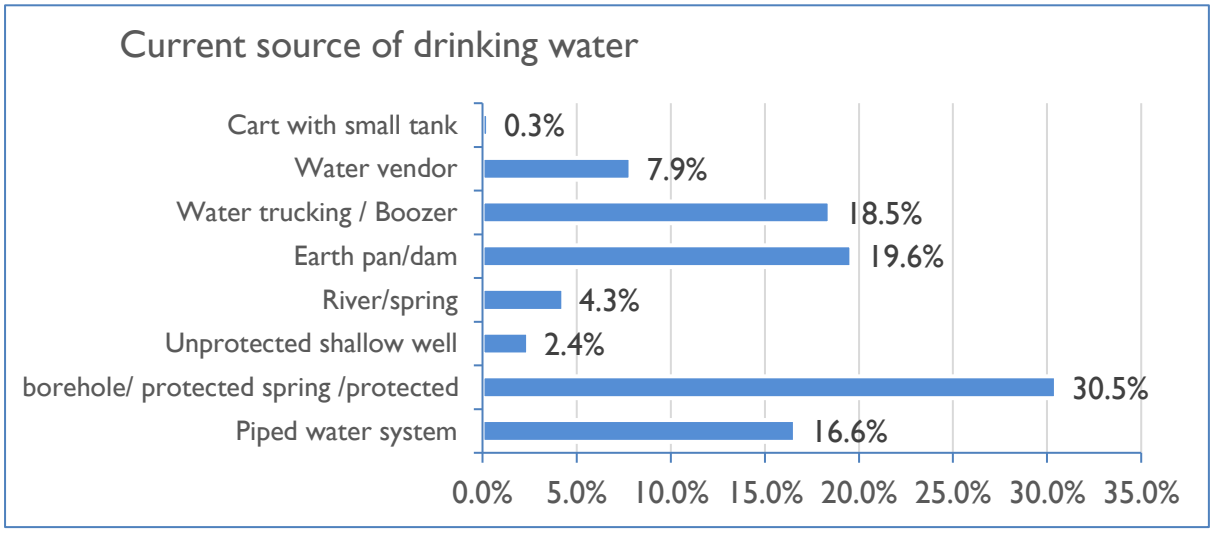


Figure 6: Water, sanitation and hygiene practices

Despite of the fact that household got water from unsafe sources, only 33.1% (n=288)) of the respondents were found to be treating their drinking water compared to 27.5% (n=127) in 2022. Those treat, 52.1% use boiling and 27.3% use chemicals respectively as a method of water treatment for domestic use as shown in Table 23. Majority of the respondents (84.6%) store their water in closed containers.

Table 23: Water treatment used.

Treatment Method	2022 (N=127)	2023 (N=288)
Boiling	39.4%	52.1%
Chemicals (Chlorine, Pur, Waterguard)	71.7%	37.4%
Traditional herbs	5.5%	50.4%
Pot filters	3.9%	0.4%

According to SPHERE handbook for minimum standards for WASH, the maximum distance from any household to the nearest water point should be 500 meters. It also gives the maximum queuing time at a water source which should be no more than 15 minutes and it should not take more than three minutes to fill a 20-litre container. The survey measured time taken to collect water, queueing and travel time. 64.4% of the population is taking less than 15 minutes to travel, 26.2% queue and fetch water for less than 30min, see the Table 24

below. Majority of the households using 77.1 liters per day. Given an estimated household size of 5.5 persons, the assessed households have a mean water utilization of 15.9 liters/ person/day, which is within the recommended average water requirement for drinking, cooking and personal hygiene of 15 liters/ person/day[2]. However, Only 44.7% (n=321) met the sphere per capita consumption of 15 liters per person per day.

Table 24: Trekking distance and queuing time

Trekking distance	**2022(N=461)**	**2023(N=719)**
Less than 500m (Less than 15 minutes)	50.0%	64.4%
More than 500m to less than 2km (15 to 1 hour)	38.4%	34.1%
More than 2 km (1 – 2 hrs)	11.7%	1.5%
Queuing time	**2022 (N=168)**	**2023 (N=188)**
Less than 30 minutes	50.0%	58.0%
30-60 minutes	24.4%	34.0%
More than 1 hr	25.6%	8.0%

4.6.2 Access to Sanitation Facilities

A large proportion of the surveyed households have access to sanitary facilities and most use latrines (76.4%) for defecation. However, 23.6% of the HH members were found to be relieving themselves in the Open/bush compared to 30.4% in 2022. Open defecation can be more in nomad population compared to settled population. This also is a risk factor for waterborne diseases given that majority of the household are using water from earth pan (surface run off) which is mostly untreated. Among those who have access to latrine (N=549), 76.5% own the latrine while the rest (23.5%) share.

4.6.3 Handwashing Practices

Hand washing with soap is the single most cost-effective intervention in preventing diarrheal diseases. The four critical hand washing moments include after visiting the toilet/latrine, before cooking, before eating and after taking children to the toilet/latrine. 86% (n=618) of the respondents are aware of the handwashing practices compared to 70.5% (n=325) in March 2022. Handwashing instances are as shown in Figure 7. About a fifth (20.4%) of the respondents reported they use soap and water for handwashing compared to 6.5% in 2022. Handwashing at all critical times was at 12.2% (n=88) compared to 8% (n=26) in 2022

[2] The Sphere Handbook, Humanitarian Charter and Minimum Standards in Humanitarian Response, 2011

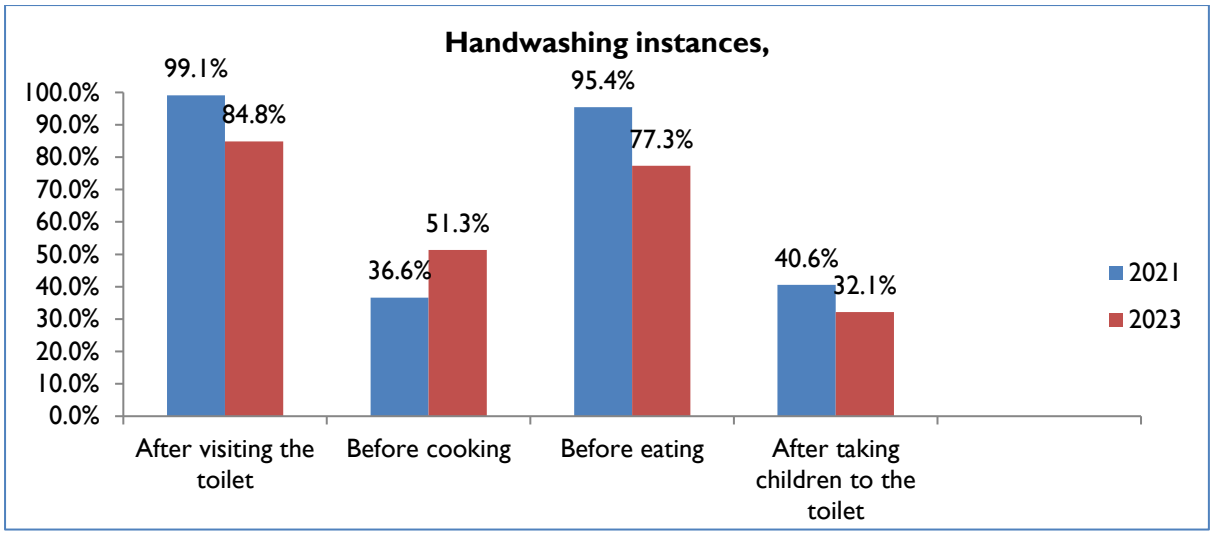


Figure 7: Instances of Handwashing

4.7 Food Security & Livelihoods

4.7.1 Households' Source of Income and Food

Household income is critical to food security at household level; the income sources and level have direct effect on availability and access for food items. The main occupation of the household will determine the main source of income in most period of the year, though this might change depending on the seasons among other socio-economic factors. The study shows the main occupation of the household head (which mainly reflect as the main source of income for household) is livestock herding at 40.6%, followed by casual labor at 32.6%. Main source of income was casual labor (39.6%) as shown in Table 25. A small proportion of household (27.3%) reported to have received cash transfer within 3 months prior to the survey.

Table 25: Main occupation of the household and current income source

Main Occupation of this Household Head		
Livestock herding	292	40.6%
Crop farming/Own farm labour	31	4.3%
Employed (salaried)	30	4.2%
Waged labour (Casual)	234	32.6%
Petty trade	55	7.7%
Merchant/trader	17	2.4%
Firewood/charcoal	10	1.4%
Others (Specify)	50	6.9%
Main current source of income		
No income	61	8.5%
Sale of livestock	170	23.6%
Sale of livestock products	6	0.8%
Sale of crops	21	2.9%
Petty trading e.g. sale of firewood	74	10.3%

Casual labor	285	39.6%
Permanent job	30	4.2%
Sale of personal assets	3	0.4%
Remittance	27	3.8%
Others (None, cash transfer)	42	5.8%

4.7.2 Households' Food Consumption and Dietary Diversity

The Food consumption score or "weighted diet diversity score" is a score calculated using the frequency of consumption of different food groups consumed by a household during the 7 days before the survey. The FCS is used to identify the most food insecure households. The prevalence of households with poor and borderline food consumption provides essential information on people's current diets and is helpful in deciding the most appropriate type and scale of food security intervention as well as the right target group for the assistance. Seven-day recall was used to collect data on food consumption. All the food items were grouped into 16 specific food groups using the food frequency data. The food consumption score was created by multiplying the frequency of food items consumed in last 7 days by a weight given to specific food groups. Each weight has been calculated based on nutrient density. The thresholds for the food consumption groups were presented using typical thresholds as illustrated in the table below: Majority of the households (86.2%) had acceptable score, proportion (10.2%) falling in the borderline while 3.6% had a poor food consumption sore, the most food unsecured households as shown in figure below (Table 26).

Table 26: Household food consumption score

Main Threshold	Nomenclature	2022 (N=461)		2023 (N=719)	
		n	%	n	%
0-21	Poor food consumption…mainly cereal	17	3.69%	26	3.62%
21.5-35	Borderline food consumption Cereal, protein or milk (3-4/week), oil, sugar	154	33.41%	73	10.15%
>35.5	Good food consumption Cereal, protein and milk (>5/week), or fruit or vegetable, oil, sugar	290	62.91%	620	86.23%

3.7.3 Household Food Consumption Frequency

Cereals and cereal products, oils and fats, sugar and sweets were the main staple food consumed by respectively. The sampled households less consume eggs, organ meats and fish. This is because of un-availability of these items in markets of rural communities; only found in big towns within the County. Low consumption of eggs in the County is an attribute of strong belief (eggs causes the fetus to grow big in the mother's womb during pregnancy and leads to obesity in children respectively). The widespread low consumption frequency of iron rich foods in Mandera County could indicate a higher risk of iron deficiency anemia and further explaining the relatively high rates of chronic and acute undernutrition prevailing in the county.

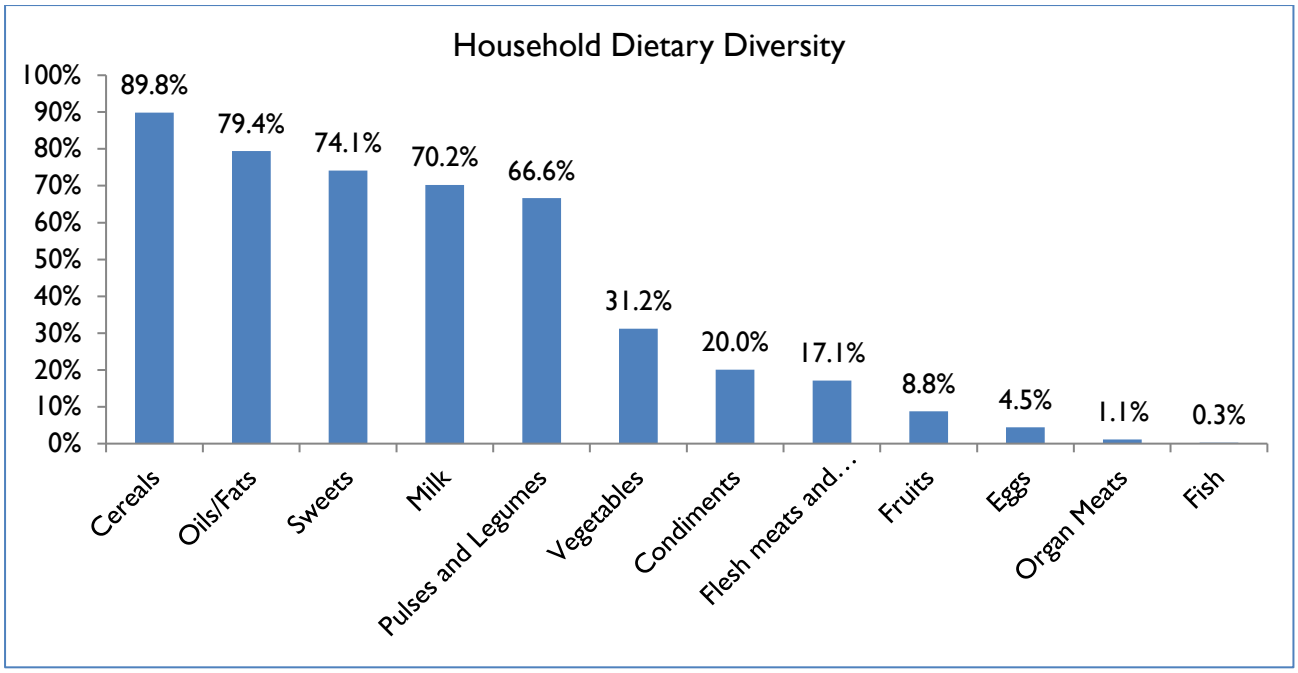


Figure 8: Household Food Consumption Frequency

4.7.3 Micronutrient rich food consumption

The poor quality of the habitual diet and the lack of dietary diversity in much of the developing world contribute to deficiencies of micronutrients. Micronutrient malnutrition is a global problem much bigger that imposes enormous costs on societies in terms of ill health, lives lost, reduced economic productivity and poor quality of life. Addressing the global challenge of micronutrient malnutrition requires the need for many strategies – both short- and intermediate-term and long-term sustainable approaches. In addition to the conventional approaches of micronutrient supplementation and fortification, promoting sustainable food based approaches to enable adequate intakes of micronutrients by much of the population includes dietary diversification strategies and agriculture-based approaches.

Survey results on the average day's food groups (based on 7 days recall) are consumed highlighting the consumption of micronutrients showed that proteins and staples were the most consumed at an average of 6.3 and 6.0 days per week. Fruits and vegetables and vitamin A were the least consumed at an average of 1.7 and 0.2 days as shown in Figure 9.

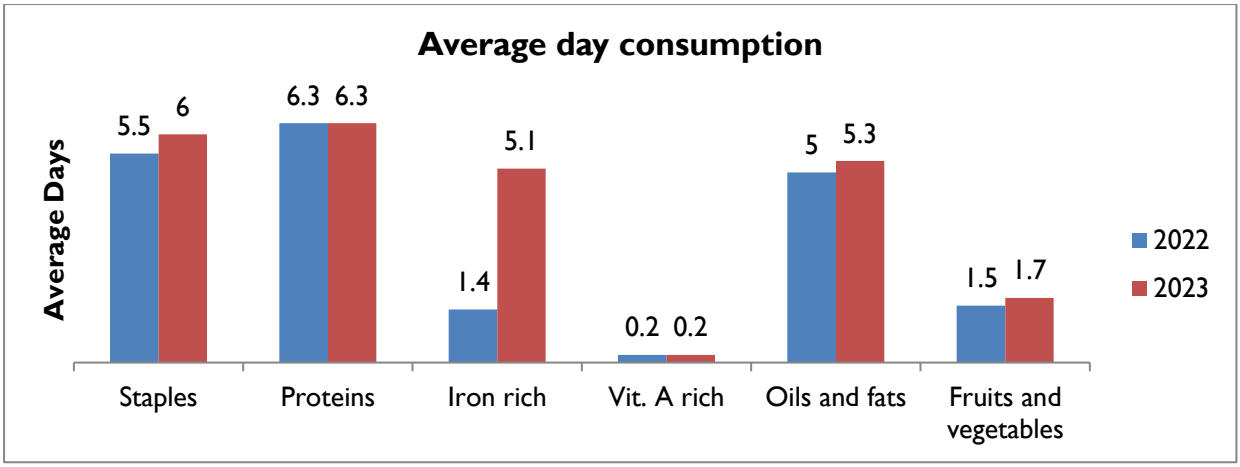


Figure 9: Micronutrient rich food consumption

4.7.4 Household Hunger scale

HHS is an indicator to measure household hunger. HHS is collected by asking three questions on potentially experienced food deprivation at household level over the past 4 weeks/30 days. Most of the households were within the households were within the little to no hunger (52.4%) and moderate hunger (47.3%) as shown in Table 27.

Table 27: Household Hunger Scale

Categories	Frequency	Percent
Little to no hunger in household (0-1)	377	52.4%
Moderate hunger in the household (2-3)	340	47.3%
Severe hunger in the household (4-6)	2	0.3%
TOTAL	719	100.0%

4.7.4 Minimum Dietary Diversity -Women Score (MDD-W)

Minimum dietary diversity for women (MDD-W) is a dichotomous indicator of whether or not women 15-49 years of age have consumed at least five out of ten defined food groups the previous day or night. The proportion of women 15–49 years of age who reach this minimum in a population can be used as a proxy indicator for higher micronutrient adequacy and an important dimension of diet quality. This indicator constitutes an important step towards filling the need for indicators for use in national and subnational assessments.

It is a population-level indicator based on a recall period of a single day and night so although data are collected from individual women, the indicator cannot be used to describe diet quality for an individual woman. This is because of normal day-to-day variability in individual intakes. Only 17.4% women ate 5 or more food groups which was almost similar compared to 18.0% in 2022. Women dietary diversity score (WDDS) was 3.4 compared to 3.7 in 2022.

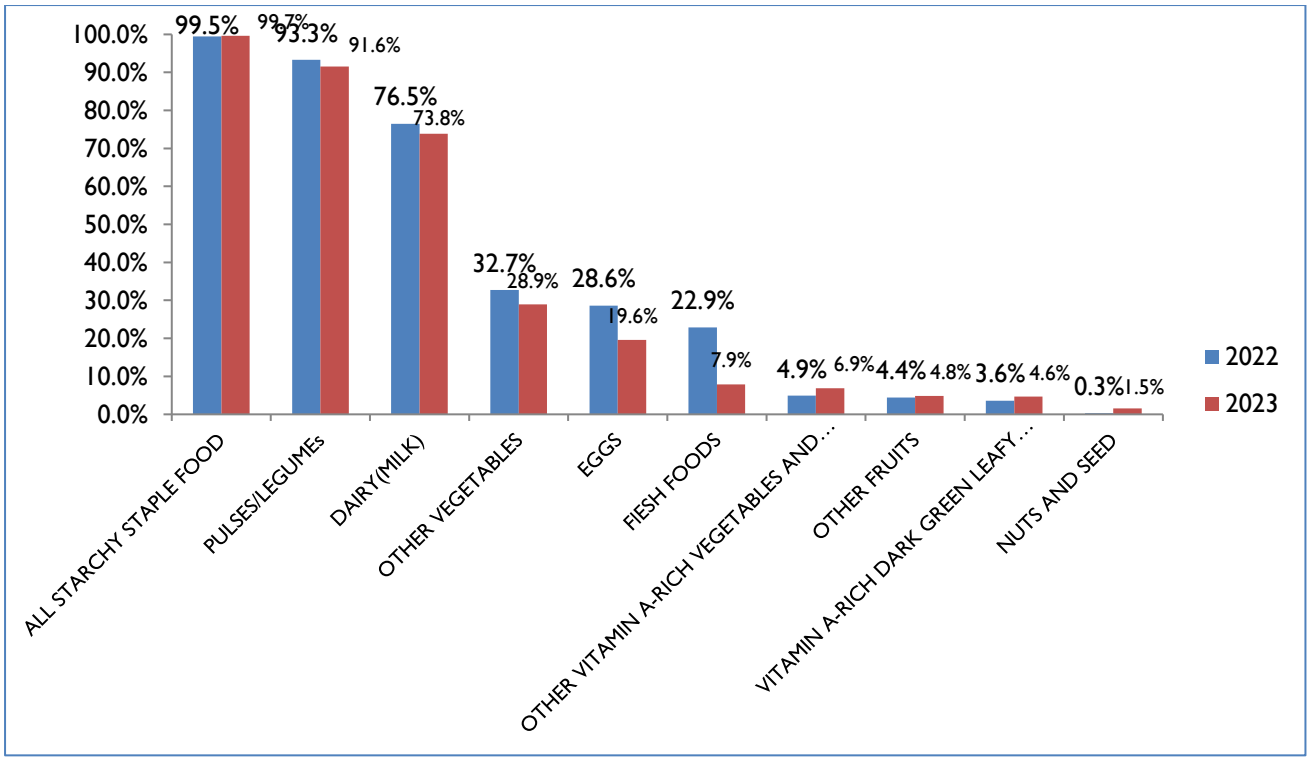


Figure 10: Minimum Dietary Diversity - Women

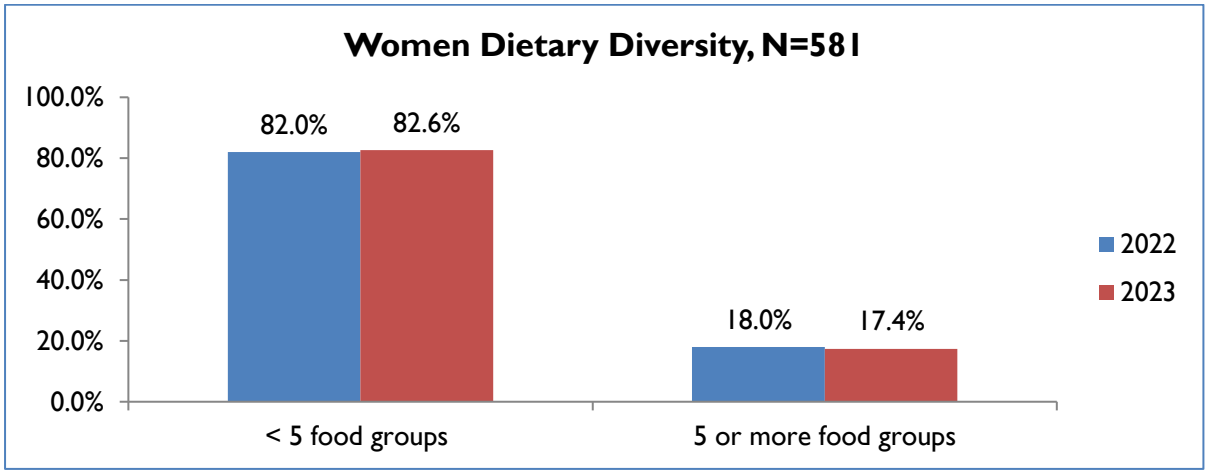


Figure 11: Women dietary diversity – Food Groups

4.7.5 Household's Livelihood Shocks and Coping Strategies

Assessment of coping strategies showed that 64.3% (n=462) of the household applied at least a coping strategy in the past 7 days with overall weighted score of 12.9 compared to 38.0% (n=175) and score of 13.6 in the previous survey. The main adopted coping strategies were; reduced meals eaten in a day while the list preferred is Restrict consumption by adult.

Table 28: Weighted coping strategy index

Coping Mechanism	Severity	Average score (0-7)	n (Employed at least once in the past 7 days	Percentage of HHs
Rely on less preferred and less expensive foods?	1	1.64	470	65.4%
Borrow food, or rely on help from a friend or relative?	2	2.38	403	56.1%
Limit portion size at mealtimes?	1	1.11	427	59.4%
Restrict consumption by adults in order for small children to eat?	3	2.13	291	40.5%
Reduce number of meals eaten in a day?	1	1.60	493	68.6%

5 DISCUSSION

5.1 Health and Nutrition status

The prevalence of Global Acute Malnutrition (GAM) (WHZ<-2 and/or Oedema) of 29.8 % (26.0 - 33.8 95% C.I.) and Severe Acute Malnutrition (SAM) rate of 7.4 % (5.6 - 9.6 95% C.I.) indicate a *very critical* phase of Malnutrition in Mandera according to the WHO classification. Compared to March 2022 (same season), Prevalence of acute reduced from 34.7 %(29.7 - 40.1 95% C.I.) and 7.9 %(5.7 - 10.8 95% C.I.) for GAM and SAM respectively. However, this was not sigificant different for both GAM (P=0.132) and SAM (P=0.786).

The very critical malnutrition rate could be attributed to prevailing drought situation which has affected the main occupation and source of income (livestock keeping) leading to poor food consumption and low access to clean and safe water. Other major factors that contribute to high levels of acute malnutrition in the county are; poor childcare practices, inadequate utilization of child survival interventions, poverty, unavailability of varied nutritious foods particularly fruits and vegetable in rural areas, suboptimal child care and feeding practices.

Immunization is meant to reduce child mortality and morbidity due to vaccine preventable diseases. This survey assessed the coverage of 4 antigens namely, BCG, OPV1, OPV3, and measles at 9 and 18 months. Apart from measles at 18 months, the other vaccination coverages remain above the national target of 80%. The low coverage of measles may explain the frequent outbreak of measles in Mandera East, Mandera west and Mandera North Sub Counties due to lack to herd immunity. The low coverage of second doses of measles at 18 months may be attributed to low awareness among caregivers. Immunization is an essential part of child's right to the highest attainable standards of health. Immunization protects against dangerous diseases, a child who is not immunized is more likely to become sick, undernourished or could die. This underscores the importance of vaccinations in children growth and survival; low immunization coverage could lead to increased morbidity resulting

to malnutrition. Morbidity in the surveyed population showed that 37.0% of the children had been sick in the last two weeks before the survey; ARI/cough was the leading 33.4%, fever with chills like malaria 20.7%, and watery diarrhoea (11.8%). The increased acute respiratory was associated with the dusty environments during the dry spell and contamination water sources. Likewise, the fever with chills is attributed to, Mandera being malaria endemic (seasonal), especially during the rainy seasons.

Resource allocation by County government also needs to factor critical nutrition status in the County which is currently the three highest rates of malnutrition (wasting) in the country. All actors and sectors need to work together in addressing the underlying factors as a priority with preventive measures being put in place to cushion the population from a further deterioration of the nutrition situation which has direct negative impact on their wellbeing and continues to fuel the cycle of poverty in the County from generation to generation.

5.2 Water and Sanitation

Access to potable water was of concern with only 47.3% of the population accessing water from safe sources. 86% (n=618) of the respondents are aware of the handwashing practices compared to 70.5% (n=325) in March 2022. 20.4% of the respondents reported they use soap and water for handwashing compared to 6.5% in 2022. Handwashing at all critical times was at 12.2% (n=88) compared to 8% (n=26) in 2022. A proportion of HHs (23.6%) had no access to latrines and were found to be relieving themselves in the Open/bush compared to 30.4% in 2022. Among those who have access to latrine (N=549), 76.5% own the latrine while the rest (23.5%) share. The poor hygienic practices and practice of open defecation can explain the incidents of water borne diseases such as watery diarrhoea. Many illnesses can be prevented by good hygienic practices: washing hands with soap and water (or a substitute, such as ash and water) after defecating or cleaning a child who has defecated, using clean toilets or latrines, disposing of faeces away from play field and living areas and water sources, washing hands before handling food, using water from a safe source, disinfecting drinking water if its safety is in question, and keeping food and water clean.
Hygiene promotion and education need to be scaled up in the county.

5.3 Food Security

Based on the food security outcome indicators the county is classified as Crisis (IPC AFI phase 3) and projected to deteriorate to Emergency phase in the projected period. All the three Livelihood zones are classified under crisis (IPC phase3) IPC food security phase classification. This classification is according to short rains assessment conducted in February 2023. 64.3% (n=462) of the household experienced food insecurity in the past 7 days with overall weighted score of 12.9 compared to 38.0% (n=175) and score of 13.6 in the previous survey. Based on Household hunger scale, 47.3% of the household were classified under moderate hunger while 0.3% were classified under severe hunger.

5.4 Possible factors triggering Malnutrition

Morbidity and inadequate dietary intake are the immediate causes of malnutrition underlined by food insecurity, poor maternal and child care and poor/unhygienic environment. Malnutrition is mainly caused by food insecurity that is persistent in the county and also illnesses caused by poor water, sanitation practices and poor health seeking behaviour.

- Morbidity levels are aggravated by the poor WASH conditions characterized limited access of sanitation facilities and poor hand-washing practices at critical times.
- Insecurity has also contributed largely to the high malnutrition rates in the county since people move from one place to another thus disrupting livelihood. This interferes with the household food security.
- Low micronutrient supplementation and deworming contributes to poor nutrition status of maternal and children under five years.

6 CONCLUSIONS & RECOMMENDATIONS

6.1 Conclusions

The nutrition situation is classified as very critical based on the IPC with a GAM of 28.9% and a SAM of 7.4%. The survey result indicates a decrease in malnutrition rates compared to same season in 2022; though the difference is not significant (P>0.05). Due to failed rains seasons within the County, contributes to high morbidity, food insecurity manifested by poor dietary diversity, poor hygiene and poor child care practices. Integrated approaches should be undertaken to reduce risk factors such as; unsafe drinking water, poor sanitation facilities, poor handwashing practices and improved coverage of nutrition programs would play a critical role in both preventing and treating morbidity and malnutrition. In spite of the current situation, it is important to note the role of chronic food insecurity, Food insecurity remains a big challenge that cannot be ignored and is likely the direct cause of inadequate food intake in the households.

6.2 Recommendations

The ***critical*** nutrition situation in the county, is attributed to multiple and interrelated factors that call for continued integrated intervention efforts to address both immediate needs in addition to developing long-term strategies to enhance access to basic services; support to sustain livelihood systems and social protection mechanisms. Specific recommendations include:

Table 29: Recommendations

Findings	Recommendations	Actors	Timelines
The nutrition situation for Mandera County is classified as Critical a GAM of 29.8% and a SAM of 7.4%.	Conduct mass screening for malnutrition (using both MUAC and WHZ criteria) to reach all children 6-59 months everywhere in Mandera County	County MoH and partners	April 2023
	Support Community Health Volunteers to conduct active case finding and referral of malnourished children, Pregnant and lactating women for treatment	County MoH and partners	Continuous
	Provide surge support (HR) in high volume facilities for six months and operationalized closed ones	County MoH and partners	March – September 2023
	Ensure IMAM program coverage assessment is done to identify program barriers and boosters.	County MoH and partners	March – April 2023
Only 20.5% of the respondents have seen Family MUAC tape	Scale up rollout and use of family MUAC screening of malnutrition by mothers and caregivers	County MoH and partners	From February 2023
A significant number of households at classified as having moderate hunger (47.3%) and severe hunger (0.3%) by household hunger scale	Enhance linkage of HH with acutely malnourished pregnant and lactating women to existing social safety net programs such as cash transfers, relief food distributions	County MoH and partners	March – October 2023
Only 20.4% of the respondents reported they use soap and water for handwashing. While handwashing at all critical times is at 12.2%	Use multi-strategies and platforms to sensitize/educate the community members on the importance of treating drinking water, safe sanitation practices, and practicing hand washing during critical times	County MoH and partners	Continuous

Children 12-59 months supplemented with vitamin A twice was 43.5% and 54.5% children have been dewormed at least once in the past one year out of which only 20.6% have been dewormed twice or more	Strengthen VAS delivery as part of routine immunization services at health facility and community health units and Scale up vitamin A supplementation and deworming during biannual Malezi bora campaigns	County MoH and partners	May 2023 and Nov/Dec 2023
Limited intake of micronutrients dietary food sources	Strengthen and advocate routine micronutrient supplementation i.e IFAS and MNPs	County MoH and partners	From March 2023
	Advocate to conduct KABP survey to ascertain true dietary intake indicators	County MoH and partners	June – December 2023
Open defecation remains at 23.6%.	Initiate community lead total sanitation in high burden sub-counties with most open defecation i.e Banisa, Mandera West, Mandera South	County MoH, Municipality and partners	From April 2023

7 APPENDICES

Appendix 1: Plausibility checks

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data (% of out of range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	0 (0.6 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	0 (p=0.365)
Age ratio(6-29 vs 30-59) (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	0 (p=0.365)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	0 (2)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	0 (5)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	0 (3)
Standard Dev WHZ	Excl	SD	<1.1 and	<1.15 and	<1.20 and	>=1.20 or	
.	Excl	SD	>0.9 0	>0.85 5	>0.80 10	<=0.80 20	0 (1.01)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	0 (0.02)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	1 (-0.31)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	5 (p=0.000)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	6 %

The overall score of this survey is 6 %, this is excellent.

Appendix 2: Assignment of Clusters per Sub-county and livelihood

SUBCOUNTY	CLUSTER NAME	LIVELIHOOD	CLUSTER Number
MANDERA EAST	sharif iley burabor	Irrigated cropping	1
MANDERA EAST	b/falah bulla mpya	Irrigated cropping	2
MANDERA EAST	b/corner B shashafey	Irrigated cropping	3
MANDERA EAST	jamhuria south	Irrigated cropping	4
MANDERA EAST	b/afya libihiya	Pastoral	5
MANDERA EAST	Bulla Nguvu	Irrigated cropping	6
BANISA	Zone 3A Banisa	Agro pastoral	7
BANISA	MATA'ARBA	Agro pastoral	8
BANISA	AFAR	Agro pastoral	9
BANISA	Bulla dadcha yattani	Agro pastoral	10
BANISA	Bulla safi derkale	Agro pastoral	11
BANISA	Bulla hara A Eymole	Agro pastoral	12
Mandera South	Elwak Town B	Pastoral	13
Mandera South	Bulla Watta	Pastoral	14
Mandera South	Bulla Power B	Pastoral	15
Mandera South	Elhagarsu A Elwak	Pastoral	16
Mandera South	Bulla NguvuElwak	Pastoral	17
Mandera South	Qalanqelsa B	Pastoral	18
Mandera South	QARARI HARO	Pastoral	19
Mandera South	Elele WARGADUD	Pastoral	20
Mandera South	HARSANGA wargadud	Pastoral	21
LAFEY	B/ALUNGU	Pastoral	22
LAFEY	AMBAAY	Pastoral	23
LAFEY	GARI TOWN	Pastoral	24
LAFEY	ALUNGU DAM	Pastoral	25
MANDERA NORTH	Bulla Hargesa A(Rhamu town)	Irrigated cropping	26
MANDERA NORTH	Bulla Abakaro(Rhamu)	Irrigated cropping	27
MANDERA NORTH	Bulla Nguvu B (Rhamu town)	Irrigated cropping	28
MANDERA NORTH	Lagadi(Rhamu)	Irrigated cropping	29
MANDERA NORTH	TOSI(Rhamu)	Irrigated cropping	30
MANDERA NORTH	BURJOHN (Rhamu Dimtu)	Irrigated cropping	31

MANDERA NORTH	kalicha town north	Irrigated cropping	32
MANDERA NORTH	Yabicho C(yabicho)	Irrigated cropping	33
MANDERA NORTH	Arda Hagarsu	Pastoral	34
MANDERA NORTH	Kubi(marothiley)	Pastoral	35
MANDERA NORTH	olla town DAM SIDE	Agro pastoral	36
MANDERA NORTH	Dagahturtur (olla)	Agro pastoral	37
KOTULO	BULA CENTRAL - DABACITY	Pastoral	38
KOTULO	BULA WEST A BH11	Pastoral	39
MANDERA WEST	BURDURAS EAST B	Agro pastoral	40
MANDERA WEST	SAKE A	Agro pastoral	41
MANDERA WEST	DANDU BORAAN	Agro pastoral	42
MANDERA WEST	ELDANABA B ELDANABA	Agro pastoral	43
MANDERA WEST	BULA SUKELA DIDKURO	Agro pastoral	44
MANDERA WEST	LAGSURE A TAKABA	Agro pastoral	45
MANDERA WEST	HARDAHALO A	Agro pastoral	46
MANDERA WEST	TAKABA BULA DANA A	Agro pastoral	47
MANDERA WEST	TAKABA BULLA HAMABALA B	Agro pastoral	48