# INTEGRATED HEALTH AND NUTRITION SMART SURVEYS TURKANA COUNTY

# 12th- 26th July, 2013.

# Final report

**Coordinated and implemented by**
**Ministry of Public Health and Sanitation**

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## ABBREVIATIONS

| | |
|---|---|
| ARTI | Acute Respiratory Tract Infection |
| ASAL | Arid and Semi-Arid Lands |
| CTC | Community Therapeutic Care |
| CHW | Community Health Workers |
| CI | Confidence Interval |
| CMAM | Community Management of Acute Malnutriton |
| CMD | Crude Mortality Rate |
| CSB | Corn-Soya Blend |
| CS | Community Strategy |
| DD | Dietary Diversity |
| DHMT | District Management Health Team |
| DMB | Drought Monitoring Bulletin |
| DNO | District Nutrition Officer |
| DoL | Diocese of Lodwar |
| EBF | Exclusive Breast Feeding |
| ECD | Early Childhood Development |
| EMOP | Emergency Operations Programme |
| ENA | Emergency Nutrition Assessment |
| EPI | Expanded Program on Immunizations |
| EWS | Early Warning System |
| FEWSNET | Famine Early Warning Systems Network |
| FFA | Food For Asset |
| GFD | General Food Distribution |
| GoK | Government of Kenya |
| HH | Household |
| HINI | High Impact Nutrition Interventions |
| IMAM | Integrated Management of Acute Malutrition |
| IPC | Integrated Food Security Phase Classification |
| IRC | International Rescue Committee |
| IYCF | Infant and Young Child Feeding |
| KEPI | Kenya Expanded Programme of Immunisation |
| KFSSG | Kenya Food Security Steering Group |
| KII | Key Informant Interview |
| LRA | Long Rains Assessment |
| MIYCF | Maternal, Infant and Young Child Feeding |
| Merlin | Medical Emergency Relief International |
| MoMS | Ministry of Medical Services |
| MoPHS | Ministry of Public Health and Sanitation |
| NDMA | National Drought Management Authority |
| NIB | National Irrigation Board |
| NCHS | National Centre for Health Statistics |
| NSO | Nutrition Support Officer (UNICEF) |
| OJT | On The Job Training |
| OTP | Outpatient Therapeutic Programme |
| PLW | Pregnant and Lactating Women |
| PPS | Probability proportional to size |
| PRRO | Protracted Relief and Recovery Operations |
| SFP | Supplementary Feeding Programme |
| SMART | Standardized Monitoring and Assessment of Relief and Transitions |
| TFP | Therapeutic Feeding Programme |
| UCT | Unconditional cash transfer |
| U5 | Under Five Years Old |
| UMR | Under-five Mortality Rate |
| UNICEF | United Nations Children's Fund |
| URTI | Upper Respiratory Tract Infection |
| VAS | Vitamin A Supplementation |
| WFP | World Food Programme |
| WHO-GS | World Health Organisation Growth Standards |
| WFH | Weight for Height |
| WHM | Weight for Height Median |
| WVK | World Vision Kenya |

EXECUTIVE SUMMARY

Turkana County is located in the northwestern region of the country within Rift Valley province. It is approximately 77,000 km2 in size and borders Uganda to the west, Sudan to the northwest and Ethiopia to the northeast. The county also borders West Pokot to the southwest, Samburu to the southeast and Lake Turkana to the East. Turkana County has an estimated population of 855,399[1] and is divided into 17 administrative divisions. The county has 6 Districts namely: Turkana Central, Turkana North, Turkana East, Turkana west, Turkana South and Loima. Turkana is the largest county classified as ASAL (Arid and Semi Arid Districts of Kenya). The ASALs in Kenya continue to be worst hit by continued chronic food insecurity as a result of poor rainfall, prolonged dry spells and severe successive droughts over the years. Turkana County is one of the ASALs that experienced serious drought in 2011, which gave rise to the Horn of Africa crisis. This was clearly marked by extremely high levels of acute malnutrition. Turkana North East (currently referred to as Turkana North) reported Global Acute Malnutrition (GAM) of 37% (33-42 95%C.I) and Severe Acute Malnutrition of 9.4% (7.2-12.3 95 C.I) in April 2011. The prevalence rates had significantly increased compared to the results in May 2010 where GAM was 17.1% (14.1-20.5 C.I). The current GAM, at 15.3% (11.7-19.6 C.I) signifies a slight reduction to 2010 levels. However, the situation seems to have peaked earlier in the year and is now deteriorating. The long rains were sub-normal due to late onset and early cessation in May and patchy distribution across livelihood zones[2]. The implications are beginning to be evident for all livelihood zones and have an adverse effect on malnutrition rates. For the agro pastoral zone, harvests in February were predicted improve household food supply although the domestic supply will begin to tighten much earlier than normal in May 2012[3], due to low carryover stocks coming into the July 2011-June 2012 production season. Following the long rains, the EWS Drought Monitoring Bulletins (March -May 2012) had shown an improving trend. However by June 2012, all livelihood zones were classified under alert warning stage, with a worsening trend[4]. The MUAC data reported 'at-risk-of-malnutrition' trend increasing from 15.45% recorded in May 2012 to 17.65% recorded in June 2012. This is was attributed declining food security situation at the household level. No rainfall was received in June and during the survey period (early July) the situation did not improve-characterized by a decline in quality and quantity of pasture and browse and household milk production[5]. The good short-rains season and onset of the long rains in March, with the had a positive effect on malnutrition rates in U5s by showing a temporary concurrent improvement[6] but in an overall sense, this is likely to again decrease rapidly with the effect of on-going hazards. These include an expected decrease in quantity/quality of pasture, start of migration to lowlands by pastoral herders and the resultant increase in food crisis. While water availability is still good for all livelihoods currently, human/animal pressure at clean water sources which are not re-charged is likely to increase. At present the price of all major foodstuffs has increased, with little concurrent trade in the agropastoral and fisheries zones. The prevailing high food prices are unlikely to relent at a time when livestock prices have also began declining, and this may moderate households' purchasing capacities, leading to inadequate food consumption. Milk production /consumption has also decreased to 15.33% per household in the month of June. The cumulative effect is a significant deterioration in household food security expected, pending performance of the short rains. Although food security outcomes have started to decline in some areas the majority of pastoralists are likely to remain Stressed (IPC[7] Phase 2) while some will be in Crisis (IPC Phase 3) through to September[8]. With the effect of recurrent shocks and prevailing conditions; nutrition status is expected to deteriorate further.

Turkana is currently under protracted relief and recovery operation (PRRO) which started in May 2012 and runs through to March 2015 and is targeting a total of 180,200 beneficiaries for both Food for assets program (FFA) and General Food Distribution. World Vision Kenya (WVK) and Oxfam are implementing the general food distribution while Child Fund and Turkana Relief Program (TRP) are implementing the FFA program on behalf of the Government of Kenya (GoK) and the World Food Program(WFP). The operations are aimed at Disaster Risk Reduction. Other ongoing food assistance are; Supplementary Feeding Program (SFP) targeting 11,000 pregnant and lactating mothers that is implemented by Ministry of Public Health and Sanitation (MOPHS),Ministry of Medical Services (MOMS), World Food Program (WFP), Merlin, International Rescue Committee (IRC) and World Vision; and the School Meals Programme (SMP) targeting 187,000 pupils in 292 public schools across the Turkana County. Since January 2012, over 2,327 severely malnourished and 7,600 moderately malnourished children have been admitted in the nutrition program. Currently there are 2,136 severely malnourished and 10,134 moderately malnourished children under treatment[9]. OXFAM-GB strategy has shifted from purely humanitarian to an Intergrated Project Approach. OXFAM-GB food security and livelihood activities include the following: Livestock off take/cash transfer. Ongoing is the piloting of an alternative food delivery mechanism through small scale traders, Cash for Work projects and Hunger-Safety Net Programme(HSNP).

MoPHS through the Division of Nutrition in collaboration with UNICEF and implementing partners has been implementing High Impact Nutrition Interventions (HINI) in Turkana. These interventions were scaled up in response to the drought and escalating food and fuel prices in May 2011. The interventions include treatment of severe and moderate acute malnutrition, exclusive breastfeeding, vitamin A supplementation, optimal complementary feeding, deworming, iron supplementation and hand washing.

[1] Turkana District; Kenya National Bureau of Statistics, May 2009
[2] KFSSG Turkana Long Rain Mid-Season Assessment Draft Report (June 2012)
[3] FEWSNET East Africa Food Security Brief-January 2012
[4] ALRMPII DMB-June 2012 placing all livelihood zones at Alert Warning Stage-deteriorating
[5] ALRMP II DMB- June 2012
[6] Malnutrition rates (% at risk of malnutrition) Jan-May 2012 have consistently been lower than average(reference year-2004)
[7] Integrated Food Security Phase Classification
[8] FEWSNET Kenya Food Security Outlook Update-May 2012
[9] DNTF Monthly Data Analysis

Funded by UNICEF, all Nutrition partners (Merlin, IRC and World Vision) with MoMS/MoPHS support the scaling up of HINI and strengthening the health system. As part of HINI support, each partner supports at least 3 CHVs per health facility and outreach sites. This complements the support that UNICEF and WFP are giving to the government to ensure the scale up of high impact interventions. Roll-out of the Community Health strategy is anticipated, with partners are supporting formation of Community Units (CUs) in parts of Turkana county. The proposed strategy is aligned with the MoH /UNICEF partnership framework of supporting the MoMS/MoPHS in delivering 12 high impact nutrition interventions in Kenya. Partners also aim to build on relationships with the MoMS/MoPHS, community leaders and local organisations, as well as enhance ownership of HINI interventions, to improve sustainability. Given the chronic gaps in health personnel, building the capacity of Community Health Extension Workers (CHEWS), volunteers, health facility committees and strengthening the referral mechanisms is essential. This will increase the capacity of the MoMS/MOPHS and the community to manage risk. In order to build the capacity to manage acute malnutrition at the health facility and community levels, the partners and UNICEF Nutrition Support Officer (NSO) facilitated trainings for the DHMT and CHEWS on Integrated Management of Acute Malnutrition(IMAM), Integrated Management of Childhood Illnesses (IMCI) and Maternal and Infant and Young Child Feeding (MIYCF). Strengthening the health facility-Community Linkage through involvement of CHVs is an important factor of HINI interventions. Community Health Volunteers (CHVs) are currently being trained on community mobilization and sensitization, case finding, follow-up and mentorship of pregnant and lactating women to promote better nutritional practices and effect positive behavioural change.

For purposes of informing stakeholders/partners in the district as well as the planning of appropriate response to the current nutritional situation in Turkana County, this nutrition survey was imperative. As the first round of surveys for 2012, four nutrition/health survey was conducted between 2nd-9th July 2012 with the purpose of establishing the current health and nutritional situation and recommend appropriate interventions. The main objective of the survey was to evaluate the extent and severity of malnutrition among children aged 6-59 months and analyse possible factors contributing to malnutrition and recommend appropriate interventions as well as provide data for use in monitoring the progression of the situation. There is need to assess the current prevalence of acute malnutrition, coverage and impact of interventions implemented. Measurement of the changes and linkage between causal factors and interventions will be useful in informing programs, strategy and policy.

The surveys utilized the Standardized Monitoring of Relief and Transitions (SMART) methodology and were also in accordance with both the National Guidelines for Nutrition and Mortality assessments in Kenya and the minimum key indicators to be reported in a nutrition suvey[10]. Anthropometric, Household, IYCF and mortality data were collected simultaneously during the survey. A two-stage cluster sampling with probability proportional to size (PPS) design was employed for the integrated nutrition survey. Sample size was determined on the basis of estimated prevalence rates of malnutrition (GAM), desired precision and design effect) using the ENA for SMART software and the surveys methodology presentation was approved by the National Nutrition Information Working Group (NIWG) before commencement[11].

**Specific objectives of the Surveys**

1. To determine the prevalence of acute malnutrition among under five year old children, pregnant and lactating women
2. To determine the Infant and Young Child Feeding Practices (IYCF) among children 0-23 months of age;
3. To investigate household food security and food consumption practices;
4. Establish hygiene and sanitation practices
5. Estimate coverage of the current nutrition interventions (IMAM, Micronutrient supplementation, deworming,) and immunization in the districts
6. To estimate crude and under-five mortality rates;
7. To estimate morbidity rates of children below five years; and
8. To determine the proportion of households with access to safe water and sanitation

**Methodology**

- Survey design: Cross sectional
- Target Population: Children 6-59 months of age in order to determine their nutritional status. In addition, children 0-23 months old to assess infant and young child feeding (IYCF) practices as well as women of the reproduction age (15-45 years) to establish their nutritional status.
- Calculation of sample size (including rationale for estimation of prevalence, precision, design effect, household size, nutrition vs. mortality sample size) presented and approved by NIWG before commencement of fieldwork.
- Anthropometry and mortality sample consisted of 38 clusters in all four surveys
- Selection of clusters, households and children: The clusters were selected using two stage Probability Proportional to Size (PPS) method. Modified EPI method was used to select households. All children between 6-59 months of age staying in the selected household were included in anthropometry sample. The IYCF sample was achieved by included age category 0-23 months. The target per cluster was 6 children 0-5 months and 6 children 6-23 months.
- Selection of women for determination of nutritional status: All women in the reproductive age (15-49 years) in the identified households were enlisted in the study and their MUAC measurements taken.

[10] Appendix 7.7 of National Guidelines for Nutrition and Mortality assessments in Kenya
[11] Appendix 7.6 of National Guidelines for Nutrition and Mortality assessments in Kenya

**COMPARISON OF KEY FINDINGS TURKANA NUTRITION SURVEYS JULY 2012 and JULY 2013**

| | TURKANA CENTRAL | TURKANA SOUTH | TURKANA NORTH[12] | TURKANA WEST[13] |
|---|---|---|---|---|
| **Total No. of HHs Assessed for Anthropometry** | **N=433** | **N=518** | **N=418** | **N=602** |
| **Total number of Households assessed for Mortality** | **N=630** | **N=673** | **N=878** | **N=776** |
| **Total number of Children:**<br>**Male**<br>**Female** | **583**<br>**285**<br>**298** | **734**<br>**406**<br>**328** | **585**<br>**292**<br>**293** | **796**<br>**388**<br>**408** |
| **Malnutrition and mortality results** | | | | |
| Wasting (WHO 2006) | **N=583** | **N=733** | **N=585** | **N=795** |
| **Global Acute Malnutrition (GAM)** | **17.2 % (13.2 -21.9)** | **16.5 % (13.6-19.9)** | **25.6 % (21.1-30.8)** | **09.7% (7.7 – 12.1)** |
| Global Acute Malnutrition (GAM) - July 2012 | 11.6 % (9.4 -14.3 9) | 17.1 % (13.7 - 21.1) | 15.3 % (11.7 - 19.6) | 14.3 % (11.4 -17.9) |
| **Severe Acute Malnutrition (SAM)** | **3.9% (2.5 -6.1 C.I.)** | **2.7 % (1.8 – 4.0)** | **7.4 %(5.2 – 10.2)** | **2.0% (1.1 - 3.6)** |
| Severe Acute Malnutrition (SAM) - July 2012 | 0.7 % (0.3 -1.7 C.I.) | 4.2 % (2.7 - 6.5) | 2.3 %(1.3 - 4.1) | 2.1 % (1.2 - 3.7) |
| **Mean z-scores ± SD** | **-1.03±1.09** | **-1.02±1.08** | **-1.35±1.07** | **-0.77±0.98** |
| **Mean z-scores ± SD**- July 2012 | -0.92±0.93 | -1.06±1.02 | -0.92±1.04 | -0.90±1.07 |
| **Design Effect (z-score < -2)** | **1.87** | **1.41** | **1.71** | **1.01** |
| **Design Effect (z-score < -2)** | 1.00 | 1.62 | 1.91 | 1.27 |
| Underweight (WHO 2006) | **N=589** | **N= 742** | **N=590** | **N=789** |
| **Prevalence of global underweight** | (179) **26.8 %** (22.2 - 32.0 C.I.) | (230) **31.0 %** (27.7 - 34.5 C.I.) | (169) **28.6 %** (24.0 - 33.7 C.I.) | (107) **13.6 %** (10.9 - 16.8 C.I.) |
| **Prevalence of global underweight**- July 2012 | 24.3 % (20.8 - 28.1) | 30.2 % (25.2 - 35.8) | 23.4 % (19.3 - 28.2) | 26.2 % (21.6 - 31.4) |
| **Prevalence of severe underweight** | (52) **7.8 %** (5.9 - 10.1 C.I.) | (55) **7.4 %** (5.5 - 9.8 C.I.) | (53) **9.0 %** (6.2 - 12.8 C.I.) | (22) **2.8 %** (1.8 - 4.4 C.I.) |
| **Prevalence of severe underweight**- July 2012 | 3.8 % (2.7 - 5.4) | 6.9 % (4.8 - 10.0) | 5.8 % (4.3 - 7.8) | 5.5 % (3.8 - 7.9) |
| Stunting (WHO 2006) | **N = 619** | **N = 701** | **N = 583** | **N = 771** |
| **Prevalence of global stunting (<-2 z-score)** | (136) **22.0** % (17.7 – 27.0 C.I.) | (211) **30.1 %** (26.5 - 34.0 C.I.) | (111) **20.6 %** (16.9 - 25.0 C.I.) | (141) **18.3 %** (15.1 - 21.9 9 C.I.) |
| **Prevalence of global stunting (<-2 z-score)** - July 2012 | 22.4 % (18.8 - 26.4) | 25.2 % (20.3 - 30.8) | 24.0 % (19.0 - 29.9) | 29.5 % (24.6 - 35.0) |
| **Prevalence of severe stunting (<-3 z-score )** | (31) **5.0 %** (3.3 - 7.5 C.I.) | (69) **9.8 %** (7.6 - 12.7 9 C.I.) | (27) **5.0 %** (3.2 - 7.8 C.I.) | (32) **4.2 %** (2.9 - 5.9 C.I.) |
| **Prevalence of severe stunting (<-3 z-score )** - July 2012 | 5.2 % (3.6 - 7.4) | 6.4 % (4.4 - 9.2) | 6.8 %( 5.2% - 8.9%) | 9.2 % (7.0 - 12.0) |
| Prevalence of acute malnutrition (% median NCHS 1977) | **N = 591** | **N = 738** | **N = 589** | **N = 801** |
| **Prevalence of Global Acute Malnutrition (<80% and/or oedema)** | (98) **16.6 %** (12.9 - 21.1C.I.) | (128) **17.3 %** (14.2 - 21.1 C.I.) | (141) **23.9 %** (19.2 - 29.4 C.I.) | (82) **10.2 %** (8.3 - 12.6 C.I.) |
| **Prevalence of Global Acute Malnutrition (<80% and/or oedema)** - July 2012 | 6.5 % (4.8 - 8.6) | 8.3 % (6.1 - 11.3) | 6.0 %( 4.0% - 9.5%) | 9.4 % (7.0 - 12.5) |
| **Moderate Acute Malnutrition(<80% and >= 70%, no oedema)** | (83) **14.0 %** (10.8 - 18.1 C.I.) | (109) **14.8 %** (11.9 - 18.3C.I.) | (110) **18.7 %** (14.9 - 23.1 C.I.) | (74) **9.2 %** (7.4 - 11.5 C.I.) |
| **Moderate Acute Malnutrition(<80% and >= 70%, no oedema)** - July 2012 | 6.0 % (4.5 - 8.1) | 7.3 % (5.4 - 9.8) | 5.3 %( 3.6% - 8.1%) | 8.6 % (6.3 - 11.7) |
| **Severe Acute Malnutrition (<70% and/or oedema)** | (15) **2.5 %** (1.5 - 4.3 C.I.) | (19) **2.6 %** (1.7 - 3.8 C.I.) | (31) **5.3 %** (3.3 - 8.2 C.I.) | (8) **1.0 %** (0.5 - 1.9 C.I.) |
| **Severe Acute Malnutrition** | 0.4 % (0.1 - 1.3) | 1.1 % (0.5 - 2.1) | 0.7 %( 0.2% - 2.2%) | 0.8 % (0.3 - 1.9) |

[12] Formerly referred to as Turkana North East
[13] Formerly referred to as Turkana North West

| | | | | |
|---|---|---|---|---|
| **(<70% and/or oedema)-2012** | | | | |
| Prevalence of Acute malnutrition MUAC | **N=597** | **N=746** | **N=597** | **N=803** |
| **Severe under nutrition < 115 mm** | **0.8% (0.4-2.0)** | **1.1% (0.4-3.2)** | **1.5% (0.8-2.9)** | **0.7% (0.3-1.6%)** |
| **Severe under nutrition < 115 mm**- July 2012 | 1.5 %(0.9 - 2.7) | 2.1 % (1.1 - 4.2) | 1.0% (0.4 - 2.6) | 1.9 % (1.1 - 3.2) |
| **Moderate ≥115–<125 mm** | **6.2% (4.3-8.9)** | **6.8% (5.1-9.2)** | **13.4%(9.5-18.5)** | **3.5% (2.3-5.1)** |
| **Moderate ≥115–<125 mm** | 5.6 % (3.9 - 7.8) | 7.1 % (5.1 - 9.9) | 5.8 % (4.2 - 8.1) | 6.0 %(4.4 - 8.1) |
| **Global Acute Malnutrition ≤125 mm** | **7.0% (4.9-10.1)** | **7.9% (5.9 – 10.5)** | **14.9%(10.6-20.5)** | **4.2% (3.0-6.0)** |
| **Global Acute Malnutrition ≤125 mm**- July 2012 | 7.1 % (5.3 - 9.5) | 9.3 % (6.5 - 13.0) | 6.9 % (5.1-9.3) | 7.9 % (6.0 - 10.4) |
| MORTALITY | **Central** | **South** | **North** | **West** |
| **Crude Death Rate (CDR)** | **0.52 (0.25-1.08)** | **0.59 (0.36-0.96)** | **0.70 (0.47-1.04)** | **0.83 (0.54-1.27)** |
| **Crude Death Rate (CDR)** | 1.04 (0.73-1.48) | 1.05 (0.75-1.47) | 1.51 (1.10-2.08) | 1.38 (0.82-2.31) |
| **Underfive Death Rate (U5DR)** | **0.32 (0.07-1.37)** | **0.74 (0.32-1.69)** | **0.32 (0.12-1.86)** | **1.00 (0.50-2.00)** |
| **Underfive Death Rate (U5DR)** | 1.27 (0.71-2.26) | 0.98 (0.49-1.93) | 1.78 (1.16-2.73) | 1.18 (0.36-3.80) |
| Maternal Malnutrition | **N=132** | **N=172** | **N=131** | **N=183** |
| **Pregnant/Lactating mothers of U6 MUAC: Wasted <21 cm** | **10(7.6%)** | **12(7.0%)** | **24(18.3%)** | **14(7.7%)** |
| **Pregnant/Lactating mothers of U6 MUAC: Wasted <21 cm** | 11(7.5%) | 16(10.2%) | 12(9.5%) | 12(6.9%) |
| **% Caretakers with MUAC< 21cm** | **(46) 10.8%** | **(38) 7.3%** | **(64) 15.4%** | **(38) 6.3%** |
| **% Caretakers with MUAC < 21cm**- July 2012 | 38(25.9%) | 56(35.7%) | 35(27.8%) | 51(29.5%) |

**Morbidity, immunization and supplementation results**

| | TURKANA CENTRAL | TURKANA SOUTH | TURKANA NORTH | TURKANA WEST |
|---|---|---|---|---|
| Child morbidity (6-59 months) | **N= 602** | **N= 747** | **N= 601** | **N= 809** |
| Prevalence of reported illness | **(274)45.5%** | **(409) 54.8%** | **(296)49.3%** | **(341) 42.2%** |
| Prevalence of reported illness | **(391)54.3%** | **(321)45.6%** | **(427)63.8%** | **(195) 30.9%** |
| **Fever /Malaria(alone or with other symptoms)** | **43.4%** | **44.7%** | **31.5%** | **44.5%** |
| **Fever /Malaria(alone or with other symptoms)** - July 2012 | 44.6% | 40.8% | 40.9% | 41.5% |
| **ARIs (cough and cough with difficult breathing)** | **32.3%** | **32.2%** | **40.1%** | **26.9%** |
| **ARIs (cough and cough with difficult breathing)** - July 2012 | 31.9% | 34.3% | 28.8% | 30.3% |
| **Watery Diarrhoea** | **20.8%** | **18.0%** | **22.5%** | **22.4%** |
| **Watery Diarrhoea**- July 2012 | 19.6% | 20.9% | 16.2% | 25.3% |
| **Bloody Diarrhoea** | **0.7%** | **1.6%** | **0.7%** | **1.2%** |
| **Bloody Diarrhoea**- July 2012 | 1.7% | 1.6% | 1.1% | 1.3% |
| **Others (Eye/ear, skin infections; oral thrush)** | **2.8%** | **3.4%** | **5.2%** | **5.0%** |
| **Others**- July 2012 | 2.2% | 2.5% | 13.0% | 4.4% |
| **Zinc supplementation (For diarrhoea cases)** | **(45) 75.0%** | **(54) 66.7%** | **(31) 57.4%** | **(45) 50.6%** |
| **Zinc supplementation (Diarrhoea cases)** - July 2012 | 33(37.9%) | 49(69.0%) | (52)68.4% | (37)36.3% |
| Immunization of children 6-59m | **N=601** | **N= 746** | **N= 597** | **N= 632** |
| **OPV1 (card and recall)** | **(583)96.9%** | **(732)98.9%** | **(570)95.5%** | **(714)90.5%** |
| **OPV1 (card and recall)-2012** | (688)97.2% | (663)94.7% | (650)97.8% | (596)94.6% |
| **OPV3 (card and recall)** | **(555)92.7%** | **(686)92.7%** | **(550)93.2%** | **(652)82.8%** |
| **OPV3 (card and recall)-2012** | (654)92.4% | (591)91.2% | (636)95.8% | (550)87.2% |
| **Measles (children ≥ 9 -59m** | **(510)92.9%** | **(630)91.4%** | **(499)89.9%** | **(546)77.7%** |
| **Measles (children ≥ 9 -59m** | (585)91.2% | (553)85.4% | (569)89.5% | (494)85.5% |

| Iron Supplementation | N=418 | N=513 | N=389 | N=525 |
|---|---|---|---|---|
| **Iron supplementation among pregnant women** | **310 (74.2%)** | **436 (85.0%)** | **352(90.5%)** | **376(71.6%)** |
| **Iron supplementation among pregnant women-** July 2012 | 274 (55.4%) | 407(79.5%) | 380(85.4%) | 289(69.4%) |
| Vitamin A Supplementation | **Turkana Central N=602** | **Turkana South N=747** | **Turkana North N=590** | **Turkana West N=785** |
| **Vitamin A supplementation 6-59months- Once** | **n=602 (490) 81.4%** | **n=721 (608) 84.3%** | **n=590 (590) 89.5%** | **n=785 (629)80.1%** |
| **Vitamin A supplementation 6-59months-Once** - July 2012 | n=716 (424) **59.2%** | n=694 (517) **73.4%** | n=669 (600) **89.7%** | n=632 (529) **83.7%** |
| **Vitamin A supplementation 6-11months-Once** | **n=111 (90) 81.1%** | **n=95 (73) 76.8%** | **n=90 (71) 78.9%** | **n=148 (98) 66.2%** |
| **Vitamin A supplementation 6-11months-Once-** July 2012 | n=109 (69) **77.6%** | n=111 (71) **64.0%** | n=90 (73) **81.1%** | n=103 (72) **69.9 %** |
| **Vitamin A supplement 12-59months More than once in last year** | **n=491 (234) 47.7%** | **n=626 (173) 27.6%** | **n=500 (253) 50.6%** | **n=637 (229) 35.9%** |
| **Vitamin A supplement 12-59months More than once in last year** | n=607 (357) **58.5%** | n=580 (330) **56.9%** | n=578 (224) **38.8%** | n=529 (376) **28.9%** |
| **Deworming once in the last 6 months(12-59 months)** | **(237) 48.8%** | **(339) 54.9%** | **(204) 39.9%** | **(286) 44.4%** |
| **Deworming once in the last 6 months(12-59 months)-2012** | **(180)30.1%** | **(296)51.9%** | **(315)54.0%** | **(316)59.9%** |
| **Percentage of Malnourished Sick children** | | | | |
| Child morbidity (6-59m) | **N= 274** | **N=409** | **N= 296** | **N= 341** |
| **Children ill during the recall period who were also acutely malnourished (<-2 Z-scores)** | **(55)20.1%** | **(82)20.0%** | **(89)30.1%** | **(33) 09.7%** |
| p-value | **0.000** | **0.000** | **0.000** | **0.000** |
| Child morbidity (6-59m)-2012 | **N= 339** | **N= 320** | **N= 424** | **N= 195** |
| **Children ill during the recall period who were also acutely malnourished (<-2 Z-scores)** | **(49)12.6%** | **(64)20.0%** | **(68)16.0%** | **(39) 20.0%** |
| p-value- July 2012 | **0.000** | **0.000** | **0.000** | **0.000** |

**Health and Sanitation**

| | Turkana Central N=489 | | Turkana South N=640 | | Turkana North N=584 | | Turkana West N=599 | |
|---|---|---|---|---|---|---|---|---|
| **Caretakers washing hands appropriately** | **n=465 (152)** | **32.7%** | **n= 630 (242)** | **38.4%** | **n=577 (268)** | **46.5%** | **n=585 (236)** | **40.3%** |
| **Caretakers washing hands appropriately** | **n=552 (143)** | **25.9%** | **n=535 (188)** | **35.1%** | **n=480 (291)** | **60.6%** | **n=470 263** | **56.0%** |
| **Access to safe water sources** | **258** | **52.9%** | **407** | **63.6%** | **319** | **54.6%** | **266** | **44.4%** |
| **Access to safe water sources** | **334** | **59.6%** | **275** | **51.1%** | **347** | **71.0%** | **263** | **55.0%** |
| **Access to safe (treated) drinking water** | **80** | **16.4%** | **50** | **07.8%** | **66** | **11.3%** | **55** | **09.2%** |
| **Access to safe (treated) drinking water** | **55** | **9.8%** | **141** | **26.2%** | **34** | **7.0%** | **46** | **9.6%** |
| **Access to toilet or latrine** | **98** | **20.1%** | **173** | **25.9%** | **70** | **11.9%** | **77** | **12.9%** |
| **Access to toilet or latrine** | **106** | **18.9%** | **64** | **11.9%** | **124** | **25.5%** | **72** | **15.1%** |

## INFANT AND YOUNG CHILD FEEDING (IYCF) PRACTICES- JULY 2012 and JULY 2013

### Breastfeeding Practices

| Breastfeeding Practices | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Initiation of breast feeding:** | | | | | | | |
| | Age Group | Turkana Central N=247 N=522 | Turkana South N=274 N=595 | Turkana North N=253 N=560 | Turkana West N=235 N=583 | **Target** | **Comment** |
| **Ever breastfed** | 0-23m | (516)**98.9%** | (561)**97.0%** | (557)**99.0%** | (572)**98.4%** | **>80%** | ✓ |
| **Ever breastfed** | 0-23m | (539)**99.4%** | (561)**99.4%** | (498)**99.2%** | (475)**98.4%** | **>80%** | ✓ |
| **Given colostrum** | 0-5m | (243)**98.4%** | (258)**94.2%** | (226)**89.3%** | (217)**92.3%** | **>80%** | ✓ |
| **Given colostrum** | 0-5m | (211)**94.2%** | (247)**99.6%** | (220)**94.4%** | (212)**96.4%** | **>80%** | ✓ |
| **Given pre-lacteals within 3 days of birth**<br><br>**Main Pre- lacteals:**<br>**Powder/fresh milk**<br>**Plain Water**<br>**Sugar/glucose water** | 0-23m | (35)**14.2%**<br><br>(11)04.5%<br>(10)04.0%<br>(10)04.0% | (42)**15.5%**<br><br>(40)02.6%<br>(34)08.1%<br>(23)04.4% | (07)**03.2%**<br><br>(6)02.4%<br>(1)00.4%<br>(1)00.4% | (42)**17.9%**<br><br>(21)08.9%<br>(10)04.3%<br>(09)03.8% | **n/a** | **Unsatisfactory** |
| **Given pre-lacteals within 3 days of birth**<br><br>**Main Pre-lacteals:**<br>**Powder/fresh milk**<br>**Plain Water**<br>**Sugar/glucose water** - July 2012 | 0-23m | (54)**24.1%**<br><br>(63)11.6%<br>(19)03.5%<br>(34)06.3% | (31)**12.5%**<br><br>(40)02.3%<br>(34)01.9%<br>(23)01.3% | (47)**20.2%**<br><br>(33)02.2%<br>(26)01.7%<br>(10)00.7% | (40)**18.2%**<br><br>(54)03.7%<br>(20)01.4%<br>(17)01.2% | **n/a** | **Unsatisfactory** |
| **Early introduction to complementary foods** | 0-5m | (25)**10.1%** | (51)**18.6%** | (39)**15.4%** | (65)**27.7%** | **n/a** | **Unsatisfactory** |
| **Early introduction to complementary foods**- July 2012 | 0-5m | (12)**05.4%** | (11)**04.4%** | (11)**04.7%** | (32)**14.6%** | **n/a** | **Unsatisfactory** |
| ***Key Indicator 1*** **Timely Initiation of Breastfeeding** (within1 hr.) | 0-23m | (398)**76.3%** | (398)**67.3%** | (440)**78.7%** | (287)**49.8%** | **>80%** | **Significant improvement in Central and North** |
| ***Key Indicator 1*** **Timely Initiation of Breastfeeding** (within1 hr.)- 2012 | 0-23m | (282)**52.1%** | (403)**71.6%** | (317)**63.4%** | (231)**48.2%** | **>80%** | ✓ |
| ***Key Indicator 2*** **Exclusive Breastfeeding** | 0-5m | (194)**78.5%** | (191)**69.7%** | (211)**83.4%** | (136)**57.9%** | **>50%** | **Significant improvement in Central and North** |
| ***Key Indicator 2*** **Exclusive Breastfeeding-201** | 0-5m | (141)**62.9%** | (196)**79.0%** | (164)**70.4%** | (152)**69.1%** | **>50%** | **Satisfactory** |
| ***Key Indicator 3*** **Currently Breastfeeding** | 6-23m | (469)**90.4%** | (519)**88.3%** | (487)**88.1%** | (499)**87.4%** | **>80%** | **Static** |
| ***Key Indicator 3*** **Currently Breastfeeding** | 6-23m | (475)**87.8%** | (494)**87.7%** | (431)**86.2%** | (408)**85.2%** | **>80%** | ✓ |

Timely initiation of BF and EBF rate has improved in Turkana North and Central. However, the early introduction of complementary foods and prelacteals still has a significant effect on optimal BF practices.

***Summary of Complementary Feeding Practices***

| **Complementary Feeding Practices** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Turkana Central | Turkana South | Turkana North | Turkana West | | ✓ |
| | 6-23m | N=275 | N=321 | N=307 | N=348 | | ✓ |
| ***Key Indicator 4*** **Introduction to solid and semi-solid food** | 6-8m | (62) **89.9%** | (47) **83.9%** | (57)**90.5%** | (71) **93.4%** | **n/a** | **Improvement** |
| ***Key Indicator 4*** **Introduction to solid and semi-solid food** - July 2012 | 6-8m | (27) **50.0%** | (44) **88.0%** | (22)**64.7%** | (39) **79.6%** | **n/a** | ✓ |
| ***Key Indicator 5*** **Minimum Dietary Diversity (Total)** | 6-23m | (198) **72.0%** | (212)**66.3%** | (216)**71.1%** | (164)**47.7%** | **>80%** | **Improvement** |
| ***Key Indicator 5*** **Minimum Dietary Diversity**- July 2012 | 6-23m | (27) **08.5%** | (03) **01.0%** | (27)**10.1%** | (33)**12.7%** | **>80%** | **Unsatisfactory** |
| **Dietary Diversity for BF children(+3)** | 6-23m | (154)**69.1%** | (154)**60.9%** | (161)**68.5%** | (127)**46.7%** | | |
| | | | | | | | |
| **Dietary Diversity for NBF children(+4)** | 6-23m | (32) **62.7%** | (49)**74.2%** | (43) **62.3%** | (23) **32.4%** | | |
| | | | | | | | |
| ***Key Indicator 6*** **Minimum Meal Frequency** | 6-23m | (181) **65.8%** | (223)**69.5%** | (210)**68.4%** | (180) **51.9%** | **>80%** | **Improvement** |
| ***Key Indicator 6*** **Minimum Meal Frequency**-July 2012 | 6-23m | (71) **22.4%** | (87) **27.6%** | (90)**33.7%** | (67) **25.9%** | **>80%** | **Unsatisfactory** |
| Children 6-23m (non-breastfed) mean number of times/day(Mean SD) | 6-23m | 2.43( SD±0.9) | 3.18( SD±1.5) | 2.58( SD±0.7) | 1.82( SD±1.1) | **4** | **Unsatisfactory** |
| Children 6-23m (non-breastfed) mean number of times/day(Mean SD) - July 2012 | 6-23m | 2.38( SD±1.5) | 2.21( SD±1.0) | 2.80( SD±1.3) | 2.32( SD±1.4) | **4** | **Unsatisfactory** |
| **% 6-23m (non-breastfed)** | **6-23m** | n=51 **(5) 09.8%** | n=66 **(25) 37.9%** | n=71 **(09) 12.7%** | n=71 (04) **05.6%** | | |
| **% 6-23m (non-breastfed)** -July 2012 | **6-23m** | n=65 **(9) 13.8%** | n=64 **(15) 23.4%** | n=49 **(4) 08.2%** | n=56 **(7) 12.5%** | | |
| Children 6-8m (breastfed)mean number of times/day(Mean SD) | 6-8m | 1.99( SD±1.1) | 2.55( SD±1.9) | 2.20( SD±1.2) | 1.74( SD±1.5) | **2** | **Unsatisfactory** |
| Children 6-8m (breastfed)mean number of times/day(Mean SD) - July 2012 | 6-8m | 1.30( SD±1.8) | 1.76( SD±1.2) | 1.74( SD±1.8) | 2.48( SD±2.1) | **2** | **Unsatisfactory** |
| **% 6-8m (breastfed)** | **6-8m** | n=69 **(48) 69.6%** | n=56 **(36) 64.3%** | n=63 **(42) 66.7%** | n=76 **(37) 48.7%** | | |
| **% 6-8m (breastfed)** - July 2012 | **6-8m** | n=54 **(16) 29.6%** | n=49 **(30) 61.2%** | n=32 **(18) 56.3%** | n=42 **(27) 64.3%** | | |
| Children 9-23 m(breastfed) mean number of times/day (Mean SD) | 9-23m | 2.17( SD±1.0) | 2.89( SD±1.6) | 2.55( SD±0.9) | 1.97( SD±1.3) | **3** | **Unsatisfactory** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Children 9-23 m(breastfed) mean number of times/day (Mean SD)-July 2012 | 9-23m | 1.88( SD±1.7) | 2.22( SD±1.3) | 2.73( SD±2.0) | 2.30( SD±1.5) | **3** | **Unsatisfactory** |
| **% 9-23m (breastfed)** | 9-23m | n=200 (5)**02.4%** | n=256 (98) **38.3%** | n=240 (94) **32.9%** | n=219 (49) **18.3%** | | |
| **% 9-23m (breastfed)** - July 2012 | 9-23m | n=254 (73)**28.7%** | n=251 (72) **28.7%** | n=184 (78) **42.4%** | n=154 (43) **27.9%** | | |
| ***Key Indicator 7*** **Minimum Acceptable Diet** | 6-23m | (148) **53.8%** | (160) **50.0%** | (155) **50.7%** | (103)**29.7%** | | **Improvement** |
| ***Key Indicator 7*** **Minimum Acceptable Diet** - July 2012 | 6-23m | (19) **06.0%** | (2) **00.6%** | (13) **04.9%** | (12) **04.6%** | | **Unsatisfactory** |
| ***Key Indicator 8*** **Consumption of iron-rich or iron-fortified foods** | 6-23m | (103) **37.6%** | (105) **32.7%** | (180) **58.6%** | (81) **23.3%** | | **Improvement** |
| ***Key Indicator 8*** **Consumption of iron-rich or iron-fortified foods** - July 2012 | 6-23m | (22) **06.9%** | (16) **05.1%** | (44) **16.5%** | (78) **30.1%** | | **Unsatisfactory** |

**HOUSEHOLD FOOD CONSUMPTION**

| **Meal Frequencies for household members** | **Turkana Central** | | **Turkana South** | | **Turkana North** | | **Turkana West** | |
|---|---|---|---|---|---|---|---|---|
| **HH Meal Frequency Yesterday (24 hour recall)** | | | | | | | | |
| **Other members (> 5 years) mean number of times/day (Mean SD)** | **1.61** | **±0.69** | **1.74** | **±0.73** | **1.66** | **±0.64** | **1.42** | **±0.62** |
| **Other members (> 5 years) mean number of times/day (Mean SD)** - July 2012 | **1.58** | **±0.75** | **1.64** | **±0.74** | **1.81** | **±0.68** | **1.58** | **±0.68** |
| **Meal Frequency: At least 3+ times a day** | **N=488** | **(55) 11.4%** | **N=640** | **(98) 15.0%** | **N=584** | **(46) 07.8%** | **N=599** | **(29) 04.9%** |
| **Meal Frequency: At least 3+ times a day** - July 2012 | **N=560** | **(66) 11.8%** | **N=538** | **(67) 12.5%** | **N=489** | **(76) 15.5%** | **N=478** | **(42) 08.8%** |
| **Meal Frequency: 2 times a day** | | **(189) 38.7%** | | **(285) 44.5%** | | **(299) 51.2%** | | **(200) 33.4%** |
| **Meal Frequency: 2 times a day** - July 2012 | | **(190) 33.9%** | | **(214) 39.8%** | | **(244) 49.9%** | | **(195) 40.8%** |
| **Meal Frequency: 1 times a day** | | **(243) 49.8%** | | **(250) 39.1%** | | **(233) 39.9%** | | **(363) 60.6%** |
| **Meal Frequency: 1 times a day** - July 2012 | | **(297) 53.0%** | | **(249) 46.3%** | | **(169) 34.6%** | | **(237) 49.6%** |
| **Meal Frequency: 0 times a day** | | **(1) 0.02%** | | **(7) 01.1%** | | **(6) 01.0%** | | **(7) 01.2%** |
| **Meal Frequency: 0 times a day** - July 2012 | | **(7)1.3%** | | **(8)1.5%** | | **0%** | | **(4)0.8%** |
| **Usual HH meal Frequency** | | | | | | | | |
| **No. of meals usually consumed(Mean SD)** | **1.72** | **±0.69** | **1.98** | **±0.78** | **2.06** | **±0.62** | **1.55** | **±0.62** |
| **No. of meals usually consumed(Mean SD)** - July 2012 | **1.58** | **±0.69** | **1.88** | **±0.74** | **1.94** | **±0.73** | **1.72** | **±0.70** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Usual meal Frequency: At least 3+ times a day** | **N=488** | **(62) 12.7%** | **N=640** | **(183) 28.6%** | **N=584** | **(126) 21.6%** | **N=599** | **(37) 06.2%** |
| **Usual meal Frequency: At least 3+ times a day** - July 2012 | **N=560** | **(58) 10.4%** | **N=538** | **(115) 21.4%** | **N=489** | **(113) 23.1%** | **N=478** | **(58) 12.1%** |
| **Usual meal Frequency: 2 times a day** | | **(230) 47.1%** | | **(259) 40.5%** | | **(367) 62.8%** | | **(259) 43.2%** |
| **Usual meal Frequency: 2 times a day** - July 2012 | | **(207) 37.0%** | | **(243) 45.2%** | | **(235) 48.1%** | | **(236) 49.4%** |
| **Usual meal Frequency: 1 times a day** | | **(194) 39.8%** | | **(197) 30.8%** | | **(90) 15.3%** | | **(299) 49.9%** |
| **Usual meal Frequency: 1 times a day** - July 2012 | | **(295) 52.7%** | | **(180) 33.5%** | | **(140) 28.6%** | | **(176) 36.8%** |
| **Usual meal Frequency: 0 times a day** | | **(1) 00.2%** | | **(1) 00.2%** | | **(1) 00.2%** | | **(4) 00.7%** |
| **Usual meal Frequency: 0 times a day** - July 2012 | | **0%** | | **0%** | | **1(0.2%)** | | **8(1.7%)** |

**HH Dietary Diversity (HDDS) Score**

| | **Turkana Central N=487** | **Turkana South N=640** | **Turkana North N=584** | **Turkana West N=599** |
|---|---|---|---|---|
| ***Mean*** | *3.98* | *4.08* | *4.38* | *3.19* |
| ***Mean***- July 2012 | *3.04* | *3.38* | *3.45* | *3.61* |
| ***Median*** | *4.00* | *4.00* | *5.00* | *3.00* |
| ***Median***- July 2012 | *3.00* | *3.00* | *3.00* | *3.00* |
| ***Mode*** | *5.00* | *5.00* | *5.00* | *3.00* |
| ***Mode***- July 2012 | *2.00* | *1.00* | *4.00* | *3.00* |
| ***Std. Deviation*** | *1.68* | *0.32* | *1.63* | *1.53* |
| ***Std.Deviation***-July 2012 | *1.62* | *1.93* | *1.46* | *1.78* |

## RECOMMENDATIONS

### Immediate Recommendations

***Nutrition and Health***

- Strengthen continuous nutrition surveillance through regular nutrition assessments and ongoing MUAC screening for both U5s and PLWs (active case-finding), with special emphasis in Turkana North zone. With the anticipated deterioration of food security, a short-rain season survey is indicated for preparedness and planning purposes.
- A high rate of SAM may be indicative of a shortfall in the identification and treatment of children with SAM. With 7.4% SAM rates in Turkana North, the short-term recommendation of establishment of additional stabilization centres in Turkana North is justified and should be retained. In addition, inadequate detection and referral of cases may also contribute to this high SAM.
- Establishment of accessible health and IMAM facilities in Kibish Division, which has no services.
- Timely monthly dissemination of stock summaries and distribution plans, for the supply chain, by the sub-zone nutrition officers is required to reduce the persistent stock-outs of therapeutic and supplementary stock.
- Observing the trends of malnutrition over the past 5 years, Turkana County is still recommended for targeted SFP and OTP for children age 6 to 59 months to address the micro-nutrient and macronutrient food gap, justified by the poor (West) and critical (South/Central/North) rate of GAM. In addition, flexibility in programming to address areas hit by seasonal vulnerability (e.g. flooding, pests and insecurity), to avoid missing rations. This will reduce the development of pockets of malnutrition.
- Scaling-up of both SFP and OTP interventions is currently ongoing with the Enhancing Nutrition Surveillance and Resilience project in Turkana West, Central and South/ East and Up-scaling of High Impact Nutrition Interventions in Turkana North/ Kibish. However, stronger active case-finding at the community level is required. Good practice that can be emulated by implementation in Turkana West zone includes increasing the number of outreaches (especially in Turkana North and East), and the partner support of MoH nutritionists in each HF.
- With regards to chronic malnutrition, poor uptake of Growth Monitoring Promotion should be addressed. This is evidenced by the poor use of CHANIS across the county. In addition to IMAM, health workers in facility and outreach must sensitize caregivers to have the weight of the children monitored every month up to 5 years of age.
- Following the establishment of 52 CUs, Quarterly mass screening in all zones to reinforce effective active case-finding is recommended.

- Following the critical GAM and SAM rates in Turkana North, South and Central, coverage assessment recommendations and SMART survey qualitative data point to the benefit of including key sources of referral including Traditional healers and TBAs, who have greater access and community confidence.
- While the Turkana County outreach strategy stipulates the minimum package is to be offered at an outreach, Vitamin A and deworming coverage is still sub-optimal. Poor coverage of Vitamin A (currently ≈75%) and deworming (currently ≈45%) needs to be addressed:

✓ Caregivers should be sensitized on the importance of taking the children to health facilities or outreaches for micronutrient Supplementation.

✓ Vitamin A Supplementation in the ECDs has rolled out, with the potential of reaching a high of number of children aged 12-59 months through targeting the 101,000 ECDs[14]. The ECDs are supported with the School Meals Program therefore enrolment or number of children at the ECDs at meals times is very high. SMART results captured only 3 responses from caregivers aware of VAS from ECDs. There needs to be an appropriate monitoring and documentation structure for children receiving VAS from ECDs so that caregivers are aware.

✓ Addressing the high morbidity load among U5s and access to essential health and nutrition services by strengthening the integrated outreach component- primarily focusing on regular medical outreach camps/mobile clinic to improve access to the migrating populations, especially as the dry season approaches.

- Strengthen programmes and strategies currently addressing infant and young child nutrition (IYCN) with a view to improving the protection, promotion, and support of optimal IYCF. Viable action points include:

✓ Systems strengthening would ensure facility and community level care for pregnant women and lactating mothers**.** This would ensure key support for timely initiation of breast feeding and iron-folate/Vitamin A supplementation, as well as identification of wasted/anaemic PLWs. Efforts such as the MtMSG, Baby Friendly Community Initiative, Community Strategy, Malezi Bora as well as outreach efforts should continue to optimize the care for maternal, infant and young child nutrition.

✓ As the HINI program is rolled out there is need for continual monitoring of both facility and community based interventions to track progress while also documenting the process to assess the trends in the outcomes as well as impact indicators. According to KIIs, a gap area in HMIS is inadequacy in collection of data from the community for local analysis and dissemination.

✓ Use of all available change agents (in addition to CHWs) e.g. TBAs mentorship of PLW women to promote better nutritional practices and effect positive behavioural change.

✓ To discourage inappropriate BF cultural practices, there needs to be involvement of the family in the naming process of the child i.e. the mother and the in-laws, to carry out the naming process immediately. Alternatively, having role models- those who did not wait for naming before breastfeeding to prove that, there is nothing wrong with breastfeeding before naming a child. This process requires a lot of community interaction for change to be effected. Community-based promotion through CHWs, peer-led MtMSGs, TBAs, traditional healers, community groups/meetings and religious leaders is critical. Trained TBAs would be critical in encouraging immediate BF and discouraging the use of prelacteals (e.g. sheep fat) due to risk of infection. The critical group of change, as also evidenced in other health indicators, is the young mothers who are educated at least up to primary-level. They are more likely to change than the older guards.

✓ Training on IYCF counselling and support for HC staff to provide IYCF education to mothers at nutrition service points. Facility-based promotion would include- strengthening mother support groups in facilities and delivery of context and culturally specific IYCN messages. These messages will address key barriers for improved feeding practices as well as improved nutritional recommendations. Strengthening of the programme is recommended, based on poor IYCF practices. Recommended areas for key messages include: elimination of pre-lacteals, time of introduction of complementary foods, risks of early or late introduction of complementary foods, food choices and preparation of appropriate complementary foods. Use of national tools/job aids and local adaptation of community mobilization and sensitization strategies (including community level materials), for BCC.

✓ To further improve complementary feeding targets, assessing the market access and utilization of newly-introduced crop species (especially traditional vegetables, fruits, pulses and legumes) is recommended, using combined KAP/market analysis assessment, to address complementary food access and subsequently reduce the current chronic malnutrition and improving access for beneficiaries.

***Water and Sanitation***

- As evidenced by hand-washing and sanitation results, further strengthening of hygiene practices to reduce the incidence of diarrhoeal disease associated with contaminated water in the household, is still required. A KAP for BCC has been carried out in Turkana West. Dissemination of the results would help to give direction to the community health education required and the appropriate channels.
- Recharge at water points was good following long rains. However, water stress is likely to heighten as boreholes dry up in the coming months. Maintenance of Gen-sets, submersible pumps and fuel subsidy for borehole supplies should continue for community owned boreholes to support free water distribution to communities as well as schools and health facilities.
- Implementation of mechanisms for regular water treatment at water points and establishment of a rota-system to separate

[14] County Department of Education (CDoE)

human and animal use of earth pans concurrently. This will improve access to safe water in all areas.

- Continue to support water-harvesting and conservation equipment, training and technology
- Strengthen awareness-creation of total sanitation through cascading trainings of community management committees.
- Continue strengthening community-led total sanitation training and support timely and consistent provision of water purification chemicals for water treatment at Household level

***Food Distribution, Food Security and Livelihoods Rehabilitation***

- Continue GFD until start of short rains and upscale the food aid targets as recommended by KFSSG long rains assessment. In addition, WFP, through World Vision/Oxfam can support the use of CSB Plus to ensure optimal micronutrient fortified foods for young children.
- Grain/fodder storage should be encouraged in wealthier households to prevent seasonality shortages
- Social Support systems are positive coping mechanisms for vulnerable households, and these should be facilitated.
- Migration has begun in search of pasture and water. The feasibility of providing fodder for the core breeding animals at these sites would be appropriate in the short term. In the medium-term, increase of fodder production and conservation to replace lost access to dry-season grazing areas, should be implemented in pastoralist areas
- For fisheries zones, training of sustainable fishing and maintenance of equipment (in addition to supply of equipment) should be strengthened. insecurity should be mitigated at targeted fish markets so as to enhance supply.
- Placing livelihoods at the centre of emergency preparedness and planning is a critical base for the design of timely and appropriate programmes and policy responses that mitigate hazards. This shift is already being implemented in the county. FFA implementation is recommended continue as this provides positive coping mechanisms in lean times. HSNP should be scaled-up, to enable timely responses that protect livelihoods.

***Long-Term Interventions (Remain the same as July 2012)***

***Nutrition and Health***

- Regular coverage assessments (SQUEAC) will maintain the effectiveness of IMAM programmes as well market analysis assess the impact of introduction of new food crops in Turkana County.
- Using livelihoods analysis for preparedness and response planning means that household coping strategies are more readily supported when a shock becomes evident. Analysing livelihoods also ensures that the underlying causes of food insecurity are addressed before and even during a crisis, and that targeting is effective and interventions are appropriate. Examples include livelihoods-based early warning systems employing Household Economy Analysis (HEA).
- Focus on programmes by relevant actors that improve and sustain dietary diversity and consumption of micronutrient.-rich foods. This can be led by assessing the viability of introducing market voucher system (that has been implemented in other ASAL districts). This would address improved complementary food access for children six months to two years.
- Establish regular nutrition surveillance through nutrition surveys-at both short and long rain periods.

***Water and Sanitation***

- To address the issues of limited access to safe water, there is a need for rehabilitation/protection of water systems including the unprotected wells (e.g. capping of wells), to upscale water storage.
- Orderly and efficient resource utilization should be championed by water-use management committees (members selected by the community) to regulate and reduce conflicts at water points, especially during shortage periods.
- Advocacy/public health campaigns on domestic water treatment such as boiling of drinking water and use of purification chemical to minimise risks of water-borne diseases, should be carried out.
- KAP studies to determine the barriers to utilization of latrines and other negative sanitation practices

***Food Distribution, Food Security and Livelihood Rehabilitation***

- Implementation of drought preparedness strategies as well as surveillance- data collection, monitoring and evaluation should be comprehensively done
- Effective linkages and collaboration between the community and the DSG, an effective feedback system and coordination so as to enhance drought preparedness strategies
- Strengthening by relevant actors of sustainable management of rangelands. During rainy/abundant season, priority activities should be re-seeding of fodder species, controlled grazing and making hay in preparation for downturn.
- Grazing committees to reinforce building reserves during abundant periods and ordered management of rangeland
- Support by relevant stakeholders to develop and sustain breeding herds and market other stock to increase resilience
- Since traditional animal husbandry is very vulnerable to drought, building of alternative and sustainable livelihoods to enhance resilience to drought, with a focus on gender empowerment should be encouraged. This is primarily targeted at increasing the household food security. Initiatives that have shown promise in Turkana include bee-keeping and poultry-keeping. This has the additional benefit of increasing HH dietary diversity diversity (e.g. consumption of eggs).
- The agropastoralist zones/sedentary farmers requires strengthening of training for mixed cropping and enhanced varieties (drought-tolerant; early-maturing). Species diversification and splitting in dry season is also necessary to maintain vibrant crop market and food security.
- Livelihoods programmes like FFA and HSNPs should continue to strengthen sustainable coping strategies during the lean times.
- Improve the road infrastructure to open up markets

### *Long-Term Interventions (Similar to July 2013)*

***Nutrition and Health***

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- Using livelihoods analysis for preparedness and response planning means that household coping strategies are more readily supported when a shock becomes evident. Analysing livelihoods also ensures that the underlying causes of food insecurity are addressed before and even during a crisis, and that targeting is effective and interventions are appropriate. Examples include livelihoods-based early warning systems employing Household Economy Analysis (HEA).
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# 1. INTRODUCTION

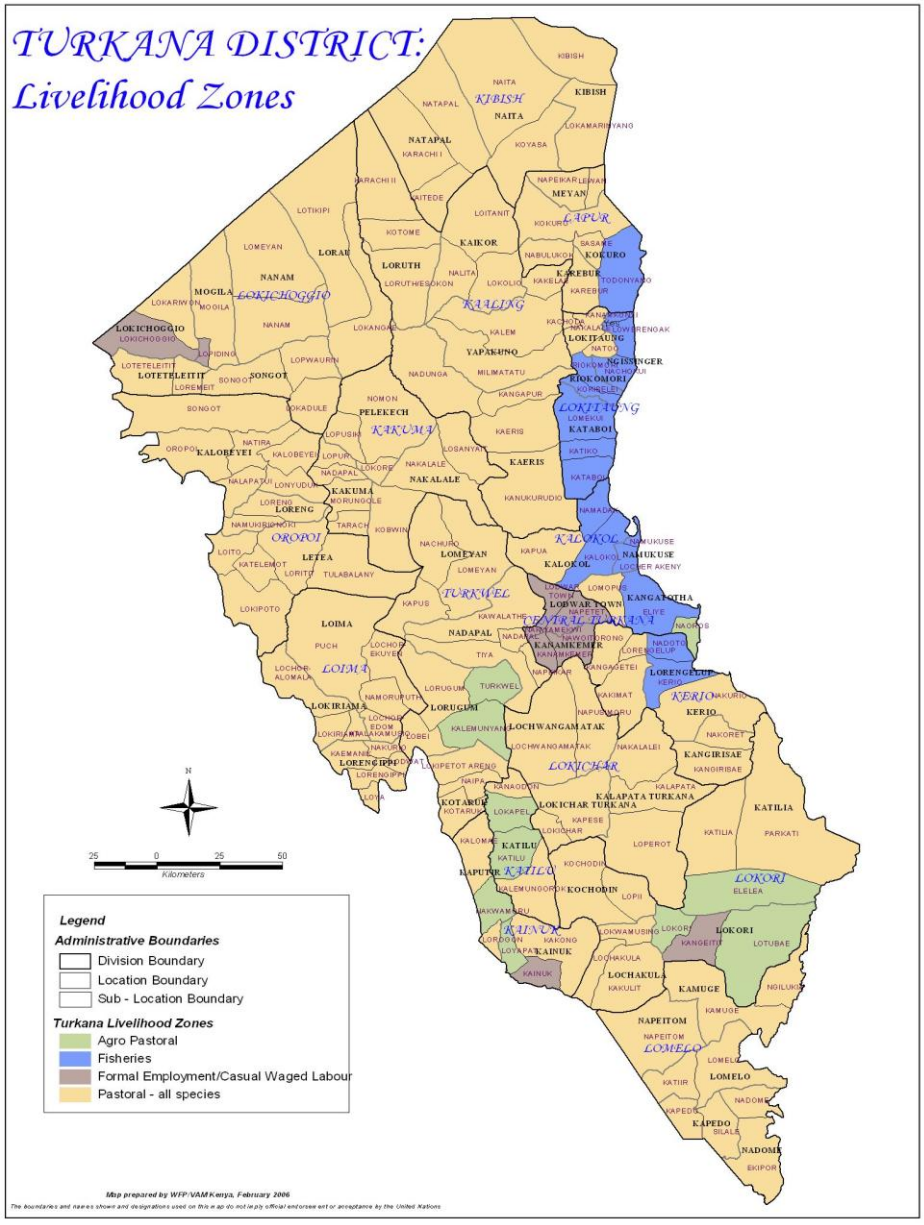
## 1.1 BACKGROUND INFORMATION

### Context

Turkana County is located in the northwestern region of the country within Rift Valley province. It is approximately 77,000 km2 in size and borders Uganda to the west, Sudan to the northwest and Ethiopia to the northeast. The county also borders West Pokot to the southwest, Samburu to the southeast and Lake Turkana to the East. Turkana County has an estimated population of 855,399[15] and divided into six sub-counties in line with the 2010 constitutional requirement: **Turkana Central, Turkana North, Turkana East, Turkana West, Turkana South a**nd **Loima.** They are further divided into 17 administrative divisions. Turkana County is inhabited mainly by the turkana community and other ethnicities that come for work/business. There are four main livelihoods namely pastoral, agro-pastoral, fisher folk and formal employment/casual labour.

The survey area was divided into 4 zones-Turkana Central[16], Turkana South, Turkana North[17] and Turkana West[18], that covered the 6 sub-zones of Turkana County with a total of 17 divisions, 57 locations and 158 sub-locations. The total area of the county is 77,000 km$^2$ . The estimated Under-5 target population of the survey was 138,326[19].

***Figure 1: Map of Turkana County with sub-locations***




### Geography

The major topographical features in the district are low-lying plains interspersed with isolated mountains and hills. Most rivers are seasonal, except Turkwel and Kerio rivers. Volcanic rocks cover about one third of the county and outcrops from the basement rocks occur in several hills and mountains scattered in the county. The soils are poor and shallow, which combined with low

[15] KNBS Current Population estimates from 2009 National Census Data
[16] Formally known as Turkana Central and Loima
[17] Formally known as Turkana North East
[18] Formally known as Turkana North West
[19] Under 5 population estimated at 15.5 % of the total population, based on KNBS projected population for 2013

vegetation cover, leads to a rapid run-off of surface water. Generally, the altitude rises from about 900m at the foot of the escarpment marking the Uganda border to the west, and then falls to 369m to the shores of Lake Turkana in the east.

The isolated mountains are mainly found in the central area with plains around Lodwar and Lotikippi in the north. The altitude of the mountains ranges between 1500-1800m, the highest being Koilongoi peak at 2067 metres. Rainfall amounts range from 120 to 430mm and the district is classified as 100% ASAL[20]. The low rainfall is also highly erratic and unreliable. The long rain season occurs between April and August, while the short rains occur in October and November. Rainfall variability in Turkana county, as has been noted in the past can be extreme with rainfall patterns highly skewed in distribution. When one part of the district receives rain, the other half may experience a drought. Hence, there is a natural dichotomy in the distribution of rainfall and vegetation. The mountains and hills which receive higher rainfall support richer vegetation growth, whereas the plains with low rainfall have a concomitant lower vegetation cover[21]. The county experiences rather high temperatures with a daily average of 24-38$^0$C, with a mean of 30$^0$ C . The area also experiences strong winds which, together with high temperatures, lead to high evaporation[22]. The District has two major rivers, Turkwel and Kerio both originating in the highlands to the south.

**Livelihoods**

The main livelihood in the county is pastoral, which accounts for 60% of the population-–mostly keeping cattle, shoats, camel and donkeys. Other livelihood zones include agropastoral, mainly in the Riverine areas of Turkwel and Kerio, which account for 20% of the population; fisher folks, situated along the shores of Lake Turkana account for 12% and the formal/casual waged labor/business and trade located in the located in the peri-urban and major towns including Lodwar, Lokichar, Kakuma and Lokichoggio, account for the remaining 8% of the population[23]. The most important season for crop production in the county is the long rains season. Irrigation is done in Turkana South, Turkana East, and Loima districts. The major crops grown in the agro-pastoral zones are; maize, sorghum, cowpeas (kunde), greengrams (ndengu), kales(sukumawiki), tomatoes, watermelons and bananas[24]. Permanently and semi-permanent settled areas in the county are found along Turkwell and Kerio rivers where irrigated farming is practiced. Along these areas, there are peri-urban market centres with the necessary social and economic infrastructures like schools, health facilities and shopping centres. There is no clear pattern of poverty distribution in the county as the poor and the rich exist side by side especially in the rural areas. However, it is further stated that most of the poor are found in the northern part and central plains due to recurrent droughts and diseases. Cattle rustling from the neighbouring counties and conflict have worsened the situation. The poor are also found in the major towns and market centres of the county. They include pastoralist drop-outs from other parts of the district in search of relief food and assistance from relatives engaged in productive economic activities in towns and market centres. High insecurity levels continue to be experienced in parts of the County especially along both the international and national borders. The conflict hotspots are at the borders including Sudan in the northwest; Ethiopia in the north and northeast; Uganda in the west; and West Pokot County in the south.

**Current climatic conditions and Food Security**

Rainfall pattern in the district is bimodal and ranges between 300-350 mm per annum. The March-May rains constitute the long rains while the October-December rains are the short rains. In 2013, the County received heavy long rains with average rainfall amounts of 247.79 mm which is 52% above normal rains. The onset was late in mid-March across the county spread through the month of May 2013 with variations. The rains caused massive damage where it resulted to flooding in areas covering the River Turkwel and towards Lake Turkana. In most parts of the county, the rains ceased normally during the first week of May 2013. However, some light showers were received in some of these areas during the first week of June and July 2013. In the north-western part of the county, rains extended until end of July 2013. Off- season showers that are normally received in July-August have started in most areas. [25].

According to the FEWSNET Kenya Food Security Outlook for April-September, households were in the Stressed Phase (IPC Phase II). This is an improvement to previous annual trends following adequate long rains. Pasture, browse and availability of water for domestic use and for livestock had improved. Though the long rains were good, there have been losses due to flooding in the irrigated and fisheries zones. Crop production was below normal since the start of the long rains. The flooding also affected food security in these areas due to the inaccessible roads/ flooded lagas effectively locking them out (leading to reduced access to food and markets)Insecurity and cattle rustling is still rampant in pastoral zone hence further slowing down the recovery process.

With good pasture and browse, livestock body condition for all species is good currently but expected to deteriorate. Some migration towards the Long rains season grazing areas (low lands) in search of water, and pasture has been observed. Pests have had a significant effect on milk availability with locust infestation causing 40% animal migration in Lokichar, Kibish and Lapur Divisions. Food access indicators are also flagging as reflective of a deteriorating situation. The food security situation is likely to continue declining in most of the pastoral livelihood zones until at the onset of the short rains. High cereal prices (i.e. high cereal: meat ratio) are likely to increase in these areas due to poor market supplies; the resultant benefits may not be significant because of livestock migrations and declining livestock prices. Distances or waiting time at water sources are likely to continue increasing. Therefore, households are likely to continue experiencing significant shortfalls in food consumption.

[20] Draft National ASAL Policy, 2004
[21] Gufu O. Ecological factors in land use conflicts, land administration and food insecurity in Turkana, Kenya.
[22] Turkana District Vision and Strategy 2005-2015
[23] KFSSG Turkana Long Rain Assessment Draft Report (August 2013)
[24] Ministry of Agriculture-Turkana County Food Situation-June 2013
[25] KFSSG Turkana Long Rain Assessment Draft Report (August 2013)

Milk availability at household level is significantly below normal across the county. On average only 2% of HH are accessing 0.25-1.0/day in the pastoral livelihood zone, below the usual 3L/day. Milk prices are above average and range from KES 45-80/L compared to the normal KES 30-45 in the pastoral livelihood zones. Malnutrition rates of U5s are likely to be on the increasing trend with the declining food security situation. If the expected short rains are favourable, the agro pastoral areas are likely to improve further as the available pasture will be sufficient up to the next season. Crop production in the irrigation schemes would further improve availability of food.

All livelihood zones are currently graded under 'Alert' warning trend with a worsening trend[26]. The food security situation is expected to worsen significantly owing to the cumulative effects of the above conditions.

Improvement of food security conditions are dependent on several factors, including the short rains, continued relief response and the need for the GoK and its donor partners to increase non-food investments aimed at mitigating vulnerability to hunger. In the short term, the timing and distribution of the short rains – which normally extend from October to December greatly influence recovery in both the pastoral and agro pastoral areas. If short rains are timely and normal, recovery will be much accelerated.[27].

### Food Distribution

Turkana County has been under Emergency Operations, now Protracted Relief and Recovery Operation (PRRO) since 2004. The current cycle started in May 2012 and runs through to April 2015. The April 2013 cycle runs through to September 2013, targeting a total of 111,500 beneficiaries out of which 58,000 are under food for assets program (FFA), 49,300 under general food distribution (GFD) and 4,200 beneficiaries are under unconditional cash transfer (UCT)[28]. World Vision Kenya (WVK) and Oxfam are implementing the general food distribution while Child Fund and Turkana Relief Program (TRP) are implementing the FFA program on behalf of the Kenyan Government and the World food program. The operations are aimed at Disaster Risk Reduction (DRR). Other on-going food assistance include Supplementary Feeding Program (SFP) in all divisions targeting 9,985 children under five years of age and 7,015 pregnant and lactating mothers that is implemented by MOPHS, MOMS,WFP, Merlin, IRC and World Vision. The School Meals Programme (SMP) targets 127,706 primary schools and 101,000 ECDs[29]. The government has also been distributing food to vulnerable households especially those not targeted under PRRO even though this supply is not consistent. The main challenge is transportation of food to the sites. The targeted beneficiaries are outlined in Table 1 below. All GFD commodities were available at 75% ration scale of 2100Kcal, the daily per capita energy requirement[30]:

***Table 1: Food assistance programme beneficiaries since 2010-2013***

| Divisions | Beneficiai esTargete d (n) 2010 | Beneficiaries Targeted (LRA 2011: Oct11-Mar12) | Beneficiaries Targeted (SRA 2012:Apr12-Sep12) | Beneficiaries Targeted (LRA 2012: Oct12-Mar13) | Beneficiaries Targeted (SRA 2013:Apr13-Sep13) |
|---|---|---|---|---|---|
| **Turkana Central** | 97,851 | 117,436 | 59,030 | 50,779 | 43,900 |
| **Turkana South** | 36,984 | 56,569 | 29,460 | 19,620 | 25,700 |
| **Turkana North** | 104,900 | 148,495 | 79,030 | 46,779 | 71,900 |
| **TOTAL** | **239,735** | **322,500** | **167,520** | **117,178** | **111,500** |

### Health

Due to the vastness of the County and the existence of few health facilities however, the MoH and implementing partners have identified outreach sites and implement services weekly or bi-weekly. The outreach sites form part of the catchment site for respective proximal health facilities. At present there are a total of 92 health facilities, 148 outreach sites and 5 stabilization centres distributed in the County as outlined in the table below:

***Distribution of health facilities, outreaches and stabilization centres***

| District | No of Health facility | No of Outreaches | Stabilization Centres |
|---|---|---|---|
| **Turkana Central** | 22 | 27 | 1 |
| **Loima** | 17 | 17 | 0 |
| **Turkana South** | 20 | 35 | 1 |
| **Turkana East** | 8 | 9 | 0 |
| **Turkana North** | 13 | 25 | 2 |
| **Turkana West** | 12 | 35 | 1 |

The 1st level of the health care system is Community Health Workers (CHWs) to form linkages between health facilities and communities. Thus, the formation of Community Units (CUs), to aid implementation of the Community Strategy (CS) has been a priority. Currently, the county has a total of 52 CUs compared to less than 10 in 2012. Current support is towards strengthening 100% functionality of these units[31]. Mother to mother support groups (MtMSG) are a link between the health worker and the under-fives, to help achieve HINI indicators. There are currently ≈ 40 mother support groups (MtMSG) in the county with a membership of over 550 mothers[32]. The District Health Management Committee (DHMT) has been trained on Community Health Strategy, High Impact Nutrition Interventions; IMAM-Part of HiNi; MIYCN-Part of HiNi and Use of District Health Information

[26] NDMA EWB-June 2013 placing all livelihood zones at Alert Warning Stage-Worsening
[27] Food Security Prognosis- KFSSG Turkana Long Rain Assessment Draft Report (August 2013)
[28] KFSSG Turkana Long Rain Assessment Draft Report (August 2013)
[29] County Department of Education (CDoE)
[30] Based on UNHCR/UNICEF/WFP/WHO Guidelines for Food and Nutrition Needs in Emergencies
[31] WVK Nutrition Manager-Turkana County
[32] WVK, IRC and Merlin operation areas

System (DHIS). The most prevalent diseases in the greater Turkana County have been malaria, Upper Respiratory Infections, diarrhoeal diseases, pneumonia and Skin diseases/eye infections in order of prevalence[33]. The HIV prevalence rate in the district stands at 6.7% (and rising) compared to 6% national rate. There has been no disease outbreaks reported so far in 2013. The diseases that are endemic during the rainy season are malaria, pneumonia and diarrhoreal disease (primarily due to contaminated surface runoff and non-treatment of drinking water)[34].

### Water access and availability

Water is pivotal to the viable sustainability of the ASAL region. The main sources of water in Turkana county are: boreholes, shallow wells, springs-protected and unprotected, traditional hand dug wells (THDW), Ground water dams – i.e. Sand dams, sub surface dams, Lake Turkana, rivers Turkwel and Kerio, streams and seasonal rivers. Others include: rain water harvesting structures (surface run off) such as water pans, earth dams, rock dams, ponds, rock pools, natural depressions, murram pits and roof water harvesting[35]. Water sources for livestock are below normal as most surface water sources that usually have water at this time of the year are dry or drying. The only remaining surface water sources are situated in the south, west, northwest and distant northern pastoral livelihood zones. While water in permanent sources, such as boreholes, is likely to last until onset of short rains, surface water is likely to last less than one month. Distances between pasture and water sources have increased from the usual 5-10 kilometers to 12-26 kilometers in parts of the pastoral livelihood zone in northeast, Loima, East and Central. However, distances to water are lowest in the agro pastoral livelihood zone averaging less than 6 kilometers, which is normal at this time of the year. Distances to water are high in locations of high livestock concentration, in the west, northwest and northern pastoral livelihood zones. Distances are likely to continue increasing as pastures deplete.

Majority of households are relying on boreholes, a few water pans, springs and the rivers for water. In Turkana North, 77% of the boreholes, 42% of the rock dams and 63% of pans are operational, but access is limited due to insecurity. Meanwhile, in Turkana South, 73% of the 69 boreholes are currently operational and only one out of twelve water pans have no water. Nearly 80% of rain water harvesting structures in Kaaleng, Lokitaung and Kibish divisions in Turkana North has dried up. In some of the areas with low concentration of water points such as Kibish and Lapur division, water potential has not been exploited due to insecurity.

Distance to water for domestic use range between 5-15 Km compared to the usual ½-3 Km. Households and livestock are currently concentrated near water points in parts of the northern pastoral livelihood zone leading to frequent breakdown of the pumping equipment. At the same time, high fuel costs have constrained operations of motorized water supply systems.

Waiting time for domestic water has increased from between 10 minutes to an hour to between 2-8 hours in parts of the northeast and eastern pastoral livelihood zones. At the same time, waiting time for livestock has increased by 66-75% in the affected areas. However, in most parts of Turkana Central, waiting time remained the same, with the exception of Kalokol division where waiting time has increased marginally, by between 5-15 minutes. The cost of water ranges between KES 2-5/20litres across the county, but reaches KES 15 is parts of the urban and peri-urban livelihood zones. Water consumption is below the recommended consumption of between 7.5-15 litres per person per day across all livelihood zones with the exception of the urban and peri-urban areas where water consumption average 10-15 liters per person per day. However, consumption of water in the urban and peri urban livelihood is only about half of normal (30lts). In the northeast and eastern pastoral livelihood zones, water consumption has declined from the usual 10-15 litres per person per day to two-five litres per person per day. This is below the emergency threshold of 15 liters per person per day.

### Nutrition

MoPHs/MoMs is continuously implementing the HiNi programme, as a ministry strategy with UNICEF/WFP support as part of the commitment in the National framework for support to deliver Essential Nutrition Services in Kenya. MoH through the Division of Nutrition in collaboration with UNICEF and implementing partners has been implementing High Impact Nutrition Interventions (HINI) in Turkana County. The interventions include management of severe and moderate acute malnutrition, exclusive breastfeeding, vitamin A supplementation, optimal complementary feeding, de-worming, iron supplementation and hand washing. Management of moderate malnutrition is further implemented in collaboration with WFP under the PRRO. The HINI strategy has encouraged formation of mother-to- mother support groups (MTMSG) for promotion of exclusive breast feeding and optimal complementary feeding. Nutrition implementing partners in the County are namely; International Rescue Committee(IRC) in Turkana West, Merlin in Turkana North, Central, Loima and South districts and World Vision Kenya (WVK) in Turkana Central, South and East. In addition, APHIAPlus IMARISHA offer support to health facilities through mentorships and OJTs on systems strengthening and on a range of livelihood projects amongst various groups including schools and community groups[36]. All programming is integrated into the existing MOH structures with the main objective being systems strengthening. Partners support the MOH to implement programs with minimal support to fill up gaps in the system (e.g. HR support where there are shortages, logistics support to carry out outreaches, supervisions and referrals of complicated cases to specialised centres (SCs/hospitals/health centres), field allowances to carry out outreaches/supervisions, top up allowances to

[33] DHRIO-Turkana Central
[34] UNICEF Health focal point/NSO Turkana
[35] KFSSG Turkana Long Rain Mid-Season Assessment Draft Report (June 2012)
[36] Turkana County Coverage Survey Report-May 2013

MOH staffs in order to retain staffs in hard to reach areas, trainings to improve the technical capacity of MOH staffs, procurement of drugs, medical supplies and nutritional supplements and support in HMIS and reporting)[37].

In order to build the capacity to manage acute malnutrition at the health facility and community levels, MOPHS/UNICEF/partners have facilitated trainings for health workers on management of acute malnutrition and Integrated Management of Childhood Illnesses (IMCI) i.e. Community Health Strategy, and Maternal, Infant and Young Child Nutrition (MIYCN)-Part of HiNi. In addition, ownership of HINI interventions at facility level through integration with other MOH programmes will help in its sustainability. Community Health Workers (CHWs) have also been trained on community mobilization and sensitization, case finding, follow-up. UNICEF provides technical support through the NSO, nutritional supplies and financial support to the project and contributes to monitoring and evaluation of the project through participation in the biannual assessments along with MoH and partners.

**Nutrition Surveillance:**

Nutrition surveillance data in Turkana is routinely collected by National Drought Management Authority (NDMA). Field monitors collect data on mid upper arm circumference (MUAC) of children 12-59 months old, from NDMA's sentinel sites as part of its early warning system(EWS), on a monthly basis. Data is then submitted to NDMA data analyst and outcomes published in the Early Warning Bulletin (EWB). Other organizations working in collaboration with MOPHS; WVK, OXFAM-GB, IRCd, and Merlin have received support from UNICEF and DFID to conduct nutrition surveys. SMART nutrition survey data collected from the 4 survey zone, from 2008, is used for annual/biannual trend analysis.

***Table 3: Relief programmes currently in the area***

| Organization | Activities |
|---|---|
| World Vision: | Lead Implementing Partner for GFD/FFA; IMAM |
| Merlin: | IMAM; PHC and Watsan; MIYCF |
| IRC: | IMAM; IYCF |
| Child Fund: | FFA implementation; Community Development; Livelihoods(Irrigation) |
| NDMA | Livelihood and surveillance |
| UNICEF | IMAM (Supplies)/Nutrition Support; Health; WatSan |
| FAO | Emergency Response; Livelihoods; WATSAN |
| OXFAM: | Lead Implementing Partner for FFA/GFD; Livelihoods; HSNP Pilot |
| VSF Germany | Livelihoods |
| AphiaPlus IMARISHA | Mentorships and OJTs on systems strengthening; livelihood projects |
| Turkana Relief Program | FFA Coordination |
| Diocese of Lodwar(DoL) | Outreach; Reproductive Health; WATSAN |
| World Relief | Outreach; Nutrition Support |
| Lutheran World Federation | Livelihoods; WATSAN |
| EGPAF | PLWHA/ Orphans |
| Kenya Red Cross: | Emergency relief; Cash Transfers; WATSAN; |
| WFP: | GFD / SFP/SMP (LS, Supplies);Coordination/ M&E/ Assessments |

## 1.2 SURVEY OBJECTIVES

This report summarizes the outcomes of a nutrition survey whose aim was to assess the nutritional status of children less than 5 years of age and determine the prevalence of global and severe malnutrition within the six districts of Turkana County. The assessment was commissioned by MoPHS, with support of World Vision, Merlin, Aphia Plus and IRC. The surveys were undertaken from 17th- 26th July and carried out in collaboration with UNICEF. The four independent surveys were categorized in the same zones, as previously, for continued surveillance.

These surveys aimed to determine the current nutritional status and underlying causes of malnutrition in the county to analyse the possible factors contributing to malnutrition and recommend appropriate interventions that would inform future programming. It also aims to produce a nutrition surveillance system in Turkana County. As all the surveys were designed and conducted in the same manner, singular descriptions are used to present the methods used throughout the process.

The specific objectives of this survey were:

1. To determine the prevalence of acute malnutrition among under five year old children, pregnant and lactating women
2. To determine the Infant and Young Child Feeding Practices (IYCF) among children 0-23 months of age;
3. To investigate household food security and food consumption practices;
4. Establish hygiene and sanitation practices
5. Estimate coverage of the current nutrition interventions (IMAM, Micronutrient supplementation, deworming) and immunization in the county
6. To estimate crude and under-five mortality rates;
7. To estimate morbidity rates of children below five years; and
8. To determine the proportion of households with access to safe water and sanitation

[37] Partner Organizations

## 2.0 METHODOLOGY

### 2.1 General Approach

The **2-stage cluster** survey methodology was employed in accordance with SMART and the National Guidelines for Nutrition and Mortality Assessments in Kenya. The SMART software sample size calculation gave the number of children required as the minimum number for the anthropometric surveys. The target population for the anthropometric survey was children aged 6-59 months. The survey tool used was the recommended Nutrition, Food Security and Mortality Household Questionnaire modified to include all the minimum indicators to be collected in a nutrition survey[38]. Data was collected on anthropometry, morbidity, vaccination and deworming status, Vitamin A supplementation, IYCF and care practices, livelihoods, food consumption and dietary diversity as well as hygiene and sanitation practices. To collect the qualitative data, Focus Group Discussion (FGD), clusters were randomly selected in each of the divisions based on the livelihood zones. These included pastoral, waged labour/formal employment, fisheries and agro pastoral livelihood zones. A total of 12 FGDs were conducted, and each group was composed of 8-12 participants. Key informants from MoMS/MoPHS, government departments and other implementing agencies were also interviewed to obtain additional information.

### 2.2 Type of Survey

This Anthropometric and Retrospective Mortality survey utilized the Standardized Monitoring of Relief and Transitions (SMART) methodology and was also in accordance with both the National Guidelines for Nutrition and Mortality assessments in Kenya. Both anthropometric and mortality data were collected simultaneously in all households visited during the survey. Qualitative data from FDGs, key informant interviews and general observations were also collected to complement the quantitative findings.

### 2.3 Sampling Methodology and Sample Size

A two-stage cluster sampling method with probability proportional to size (PPS) design was employed for this nutritional survey. The Emergency Nutrition Assessment (ENA) for Standardized Monitoring of Relief and Transitions (SMART) software was used to determine the sample size using sub-location population data for each of the four survey zones.

First Stage Sampling:

In the first sampling stage, survey sample size was determined by entering relevant information (estimated GAM rate, desired precision and design effect) into the ENA for SMART software:

***Table 3 : Anthropometry sample size***

| Survey | Total Population[39] | Under 5 population[40] | Estimated prevalence[41] | Precision[42] | Design effect[43] | Sample size Children | Average HH Size[44] | Sample size HH |
|---|---|---|---|---|---|---|---|---|
| **Turkana Central** | **267,945** | **(15.5%) 41,531** | **11.6%** | **3%** | **1.0** | **476** | **6.4** | **550** |
| **Turkana South** | **237,298** | **(15.5%) 33,782** | **17.1%** | **4.5%** | **1.6** | **468** | **5.4** | **641** |
| **Turkana North** | **135,923** | **(15.5%) 21,069** | **15.3%** | **4.25%** | **1.9** | **570** | **4.8** | **878** |
| **Turkana West** | **270,604** | **(15.5%) 41,944** | **14.3%** | **3.5%** | **1.3** | **544** | **5.6** | **718** |

[38] Appendix 7.7 of National Guidelines for Nutrition and Mortality assessments in Kenya
[39] Based on KNBS projected population for 2013
[40] Based on the Kenya Population Census 2009
[41] June 2012 Surveys point prevalence of four surveys in Turkana County was used to estimate prevalence. The availability of water, browse and pasture is normal to above normal in many places due to the good rains and it is inferred that the current prevalence should be similar to June 2012.
[42] Based on levels of malnutrition with consideration for highest C.I.
[43] Based on Turkana SMART survey report June 2012
[44] Based on Turkana SMART survey report June 2012

*Table 4: Sample size for mortality*

| Survey | Total Population[45] | Estimated CMR | Precision[46] | Design effect[47] | Recall period[48] | Population to include | HH to Include Average HH size |
|---|---|---|---|---|---|---|---|
| **Turkana Central** | **267,945** | **1.04** | **0.40%** | **1.3** | **109 days** | **3242** | **522** |
| **Turkana South** | **237,298** | **1.05** | **0.40%** | **1.0** | **109 days** | **2518** | **481** |
| **Turkana North** | **135,923** | **1.51** | **0.70%** | **3.0** | **109 days** | **3547** | **762** |
| **Turkana West** | **270,604** | **1.38** | **0.45%** | **1.3** | **109 days** | **3399** | **626** |

*Table 5: Sample size for IYCF*

| Survey | 0-5.9 m required per cluster | 6-23.9 m required per cluster |
|---|---|---|
| Turkana Central | **237/40= 5.9** | **229/40=5.7** |
| Actual | **6** | **6** |
| Turkana South | **199/40= 5.0** | **209/40=5.2** |
| Actual | **6** | **6** |
| Turkana North | **227/40=5.7** | **219/40=5.4** |
| Actual | **6** | **6** |
| Turkana West | **237/40= 5.9** | **209/40=5.7** |
| Actual | **6** | **6** |

For the IYCF practices **6 children** less than 6 months of age were selected from the households visited in each of the clusters. Similarly, **6 children** 6-23 months of age were selected from both anthropometry and IYCF each of the clusters making a total of 456 children for IYCF assessment (i.e. at least 12 children 0-23.9 m from each cluster). The sample was be attained by enlisting the children in these age categories as found in the households visited. In case the required sample size was not realized from the number of households visited, more households were sampled in a similar manner to those for the anthropometric survey (described above), as a purposive sample, until the required sample was realized.

*Table 6: Summary of parameters considered for sample size calculation for the district*

| Survey | Sample of 0-5.9m age-group | Sample of IYCF | Sample of Anthropometry | Children for anthro. In each cluster | # of HH to visit | # of HH for mortality | Sample size considered | # of households/ cluster | # of clusters | Excluded Clusters during data analysis |
|---|---|---|---|---|---|---|---|---|---|---|
| Turkana Central | 245 | 474 | 476 | 12 | 550 | 522 | 550 | 15 | 40 | |
| Actual | 268 | **543** | **601** | - | - | - | **630** | - | 40 | 4 |
| Turkana South | 199 | 408 | 468 | 12 | 641 | 481 | 641 | 16 | 40 | |
| **Actual** | **274** | **595** | **747** | - | - | - | **673** | - | **40** | - |
| Turkana North | 227 | 446 | 570 | 15 | 878 | 762 | 878 | 22 | 40 | |
| **Actual** | **253** | **560** | **602** | - | - | - | **864** | - | **39** | **9** |
| Turkana West | 245 | 454 | 544 | 14 | 718 | 626 | 718 | 18 | 40 | |
| **Actual** | **235** | **583** | **809** | - | - | - | **776** | - | **39** | - |

The second sampling stage comprised of village and household selection. In order to select survey clusters, the names of villages/sub-locations, their respective population sizes and the required number of clusters were entered into the SMART software, which generated the actual list of the villages to survey (including reserve clusters). At the field level, the EPI method

[45] Based on KNBS projected population for 2013
[46] Based on SMART Guidelines
[47] Based on heterogeneity of mortality patterns
[48] Easter/Pasaka 2013(31st March) was be used as the recall event. This date to mid-survey date (18th July), will be used as the recall period.

was employed to select the first household to be enumerated. The survey teams first reported to the area chief, assistant chief or a village elder who assigned them a cluster guide. With the assistance of the cluster guide, the teams then went to the approximate centre of the village and spun a pen to select a random direction to walk to the boundary of the village. Choosing this initial random direction ensured randomization of the households to be visited in order to avoid systemic bias which may arise if survey teams systematically sample households in a biased subjective manner e.g. in proximity to shopping centres. While at the boundary of the village, the teams spun the pen again to select a second direction and walked along counting the houses along this direction. The first household to be visited was randomly selected by drawing a random number from the random number tables between zero and the total number of houses counted when walking to the periphery. The subsequent households were selected by proximity always selecting households to the right. In villages with more than one cluster, the village was segmented and the centre of each segment determined and households selected as described above. In a cluster that was sparsely populated, all the households in the cluster were visited. All children aged 6-59 in every household visited were included in the anthropometric survey and 0-6 month category included in IYCF survey.

A household was defined as a group of people who lived together and shared a common cooking pot. In polygamous families with several structures within the same compound but with different wives having their own cooking pots, the structures were considered as separate households and assessed separately. In cases where there was no eligible child, a household was still considered part of the sample and its mortality data were collected. If a respondent was absent during the time of household visit, the teams left a message and re-visited later to collect data for the missing person, and no substitution of households was done. The teams visited the nearest adjacent village (not among those sampled) to make up for the required number of households if the selected village yielded a number below the minimum households, following the SMART methodology[8].

**2.4 Data collection Tools and Variables Measured**

A total of 5 survey teams, each comprising of 1 team leader and 3 enumerators collected the data. The five teams were managed by a survey coordinator. 2 sets of questionnaires were used for data collection. These included a Household health and nutrition and food security questionnaire and a mortality questionnaire. Also, a focus group discussion (FGD) guide to collect qualitative data was distributed to two FGD teams.

The Household Health, Nutrition and Food Security questionnaire was divided into different sections as shown below:

***2.4.1 The household questionnaire***

This was used to elicit general household information (demographic data, household water sources and consumption, household food consumption, dietary frequency and diversity, sanitation, food aid, livestock condition and household socio-economic status indicators.

***Socio-economic Status:*** Information on the households' main income activity in the last 30 days was obtained from respondents.

***Food Aid***: Information was also sought on whether a household had received any food aid in the past three months

***Shocks and coping Strategies:*** The main shocks that the household experienced were asked. In addition, information on coping strategies households employ during times of food scarcity was obtained from respondents.

***Household water consumption and utilization:*** The indicators used were main source of drinking and household water and treatment given to drinking water.

***Sanitation:*** Information on household accessibility to a toilet/latrine, disposal of children's faeces and occasions when the caretakers wash their hands was obtained.

***Food security status of the households:*** Information on the number of meals usually eaten and the number of meals eaten on the day preceding the survey was solicited to establish the food security status of the households.

***Household food diversity:*** Dietary diversity is a qualitative measure of food consumption that reflects household access to a wide variety of foods, and is also a proxy of the nutrient intake adequacy of the diet for individuals. Dietary diversity scores were created by summing the number of food groups consumed over a 24-hour period to aid in understanding if and how the diets are diversified. Household dietary diversity score (HDDS) is meant to reflect, in a snap shot the economic ability of a household to consume a variety of foods . A score of 1 was allocated to each food group that was consumed by the household and a score of 0 for each of the food groups not consumed by the household, and thus the highest possible score was eight.

***2.4.2 Child (6-59 months old) questionnaire (Anthropometry)***

Using this questionnaire, the following data were collected:

***Child age:*** the age of the child was recorded based on a combination child health cards, the mothers'/caretakers' knowledge of the birth date and use of a calendar of events for the district developed in collaboration with the survey team

***Child sex:*** it was recoded whether a child was male or female.

***Bilateral oedema:*** normal thumb pressure was applied on the top part of both feet for 3 seconds. If pitting occurred on both feet upon release of the fingers, nutritional oedema was indicated.

[8] SMART (2006): Measuring Mortality, Nutritional Status and Food Security in Crises Situations: SMART METHODOLOGY

***Child weight:*** the weights of children were taken with minimal light clothing on, using the electronic UNISCALE (mother and child scale) and recorded to the nearest 0.1kg. The teams were trained to use both the Uniscale and Salter scale so they were competent in use of both instruments.

***Child length/height:*** Children were measured bareheaded and barefooted using wooden UNICEF height boards with a precision of 0.1cm. Children under the age of two years were measured while lying down (length) and those over two years while standing upright (height). If child age could not be accurately determined, proxy heights were used to determine cases where height would be taken in a supine position (between 65cm-<87cm) or in an upright position (heights greater ≥87cm). Height rods with a marking at 87cm were used to assist in determining measuring position.

***Child MUAC:*** the MUAC of children were taken using child tapes, respectively, and recorded to the nearest 0.1cm. The results were used to decide if referral to the SFP/OTP program was needed or not. If the MUAC was below 11.5cm or presence of oedema, the caretaker received a referral slip. In the analysis, the Weight-for-height z-scores (WHZ) was calculated using the international reference population tables (WHO/CDC) for all children and analyzed by ENA software.

***Morbidity:*** a 2-week morbidity recall was conducted for all index children (6-59 months) to assess the prevalence of common diseases (e.g. fever/malaria, acute respiratory infections (ARI), diarrhoea, measles, stomach-ache, eye and skin infections).

***Child immunization and Vitamin A supplementation:*** data on vitamin A supplementation, deworming, and immunization for polio and measles were collected to estimate their coverage. The coverage for measles immunization and deworming was only done for eligible children (≥ 9 months) and (≥ 12 months) respectively.

***Feeding programme enrolment:*** it was established if children 6-59 months old were enrolled in SFP or OTP and the duration in the feeding programme. For all children 6-59 months of age, the caretakers were asked whether the child was currently registered in the supplementary feeding programme (SFP) or outpatient therapeutic programme (OTP). This was verified using the SFP/OTP card when available.

In the analysis, the coverage for the SFP was calculated using the direct method which required the recording of the proportion of children in SFP. The coverage rate for OTP was similarly calculated using the proportion of severely malnourished children registered in the programme.

***Maternal Health Data:*** MUAC of the primary caretaker of the index child (between 15-49 years) as well as physiological status, iron supplementation were taken

### *2.4.3 6-23 months old child questionnaire*

If the index child/ren were in this age category, information on breastfeeding, complementary and child feeding were collected. Dietary diversity information based on a 24-hour food intake recall was collected for the children to assess the number of food groups taken the previous day.

Dietary diversity for children 6 to 23 months of age: The dietary diversity indicator is based on the premise that the more diverse the diets are the more likely they are to provide adequate levels of a range of nutrients. For this indicator, the minimum dietary diversity for children 6-23.9 months is ≥4 food groups out of 7 groups. The food groups are summed, with each of the groups scored "1" If the child had the food group yesterday, and "0" if not. This results in a diversity score ranging from 0 to 7 for each child. Higher scores correspond to a more adequate range of foods groups in the diet.

The food groups were as follows:

- Grains, roots and tubers
- Legumes and nuts
- Dairy products (milk, yoghurt, cheese)
- Flesh foods (meat, fish, poultry and liver/organ meats)
- Eggs
- Vitamin A-rich fruits and vegetables
- Other fruits and vegetables

### *2.4.4 0-5 months old child questionnaire*

This was used to collect breastfeeding and infant and young child feeding (IYCF) practices data in the households that had a child in this age category**.** Information on timely initiation of breastfeeding, giving of colostrum and pre-lacteal feeds, maintenance of breastfeeding, liquids given and complementary feeds of the child, based on a 24-hour recall, in line with the WHO guidelines to minimize recall bias was used thus obtaining more valid information. Exclusive Breast Feeding (EBF) was computed based on a new variable based on responses to the existing indicators in this questionnaire.

### *2.4.5 Mortality questionnaire*

This elicited 3-month (90-day) retrospective recall information on whether there had been any deaths in households and the probable causes of death through verbal autopsy. The recall period was 109 days (31st March -18th July 2013). A household mortality questionnaire was filled out for all households visited and a summary mortality questionnaire filled out for the cluster.

### *2.4.6 Focus group discussion (FGD) guide*

A FGD guide was used to collect qualitative data to complement quantitative data**.**

## 2.5 Training and Supervision

The survey was supervised by an external consultant and assistant consultant. County Nutritionist, sub-zone nutrition officers (DNOs) coordinated each survey zone together with UNICEF NSO and Merlin Nutrition Officer as the Survey Coordinators.

For data collection, a total of 5 teams were recruited and trained for each survey. Each team comprised of a team leader and three enumerators. The consultant and assistant consultant carried out training assisted by the NSO and DNOs as survey supervisors. The local events calendar was developed jointly with the survey team and the questionnaires translated. A modified anthropometric standardization exercise[49], as recommended by the SMART methodology, was used as an assessment of the team members' anthropometry techniques. Each team member was given a score of competence based on performing measurements with accuracy and precision. The results of the training exercise were analyzed by entering the data in the ENA computer package and training report generated.

After the theoretical training, the team were equipped with a 'Surveyor's Manual' for reference during fieldwork. Practical field experience was conducted on the last day of training, in one of the unselected clusters to take anthropometric measurements of children and caretakers, conduct interviews and fill questionnaires. The pre-testing exercise was performed on 5 households.

Each team was supervised at least once a day throughout the data collection by either the survey consultant, assistant or supervisors. At the end of each day at base, there was a de-briefing session and review of questionnaires. The survey, including the training, lasted for a period of 14 days.

The following topics were covered during training:

- survey objectives, types and causes of malnutrition
- SMART survey and sampling methodologies
- verbal interpretation of the questions into the local languages during training for uniform contextual understanding by all the teams
- household, child and mortality questionnaire interviewing techniques
- anthropometric measurement procedures
- practical on conducting interviews and anthropometric measurements
- interview techniques
- duties and responsibilities
- research ethics
- community entry behaviour
- survey logistics

## 2.6 Data Entry and Analysis

Anthropometric and mortality data entry was done using SPSS and processing was done using the SMART/ENA software where the World Health Organization Growth Standards (WHO-GS) data cleaning and flagging procedures were used to identify outliers which 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[9] standards and cut-off points and exported back to SPSS for further analysis. IYCF and all the other quantitative data were entered and analysed in the PASW Statistics 18 (SPSS Version 18.0), ENA/EPI and Excel[50].

## 2.7 Nutritional Status Cut-off Points

*Table 7: Definitions of acute malnutrition using WFH and/or oedema in children aged 6–59 months*

| Acute malnutrition ( WFH ) | Percentage of the median | Z score | oedema |
|---|---|---|---|
| **Severe** | < 70 % | < - 3 z scores | **Yes / no** |
| | > 70 % | > -3 z scores | **Yes** |
| **Moderate** | >= 70 % - <80% | < –2 z-scores to ≥ –3 z-scores | **No** |
| **Global** | < 80 % | < –2 z-scores | **Yes / No** |

**Mid-Upper Arm Circumference (MUAC)**

Guidelines for the results were expressed as follows:

- Severe malnutrition is defined by measurements <115mm
- Moderate malnutrition is defined by measurements >=115mm to <125mm
- At risk of malnutrition is defined by measurements >=125mm to <135mm
- Normal >=135mm

MUAC cut off points for pregnant and lactating women: Cut off <21 cm signifying GAM (global acute malnutrition)

[49] SMART Regional Training Kit for Capacity-Building and Methodology (ACF Canada) 2010

[9] WHO 2006

[50] Infant and Young Child Feeding: Collecting and analyzing data, CARE USA 2010

The following nutritional indices and cut-off points were used in this survey:

### *2.7.1 Weight-for-height (WFH) and MUAC – Wasting among Children*

The prevalence of wasting (a reflection of the current health/nutritional status of an individual) are presented as global acute malnutrition (GAM) and severe acute malnutrition (SAM) using weight-for-height (WFH) z-scores, WFH percentage of median and MUAC indices. Results on wasting are presented as global acute malnutrition (GAM) and severe acute malnutrition (SAM):

- Children whose WFH z-scores fell below -2 standard deviations from the median of the WHO standards (WHO-GS) or had bilateral oedema were classified as wasted (to reflect GAM)
- Children whose WFH z-scores fell below -3 standard deviations from the median of the WHO-GS or had bilateral oedema were classified as severely wasted (to reflect SAM)
- A cut-off point of <12.5cm MUAC was used to denote GAM among the under-fives.

### *2.7.2 Weight-for-age (WFA) – Underweight*

The measure of underweight gives a mixed reflection of both the current and past nutritional experience by a population and is a very useful tool in growth monitoring.

- Children whose WFA z-scores fell below -2 standard deviations from the median of the WHO-GS or had bilateral oedema were classified as underweight
- Children whose WFA z-scores fell below -3 standard deviations from the median of the WHO-GS or had bilateral oedema were classified as severely underweight.
- Children whose WFH indices were <80% of the National Centre for Health Statistics (NCHS) median or had bilateral oedema were classified as wasted (GAM)
- Children whose WFH indices were <70% of the NCHS median or had bilateral oedema were classified as severely wasted (SAM)

### *2.7.3 Height-for-age (HFA) – Stunting[51]*

Height-for-age is a measure of linear growth and therefore an unequivocal reflection of the cumulative effects of past nutritional inadequacy and/or illness episodes.

- Children whose HFA z-scores fell below -2 standard deviations from the median of the WHO-GS were classified as stunted (to reflect Global Stunting)
- Children whose HFA z-scores fell below -3 standard deviations from the median of the WHO-GS were classified as ***severely stunted.***

### *2.7.4 Mortality Indices*

The crude mortality rate (CMR) is determined for the entire population surveyed for a given period. The CMR using the current census method is calculated as follows[52]:

$$\text{CMR} = \frac{10{,}000 \text{ people}}{\text{Number of recall days}} \times \frac{\text{number of deaths during recall}}{\text{number of current residents} + \frac{1}{2}(\text{No. of deaths during recall}) - \frac{1}{2}(\text{No. of births during recall})} = \text{Deaths/10,000/day}$$

The proportion of deaths among children under-five years of age (U5MR) is also calculated the same way using the under five population data. The thresholds are defined as follows[53]:

*Table 8: Proportion of deaths among total population (CRM) and children under 5 years (U5MR)*

| | Total population CMR | Under-five population U5MR |
|---|---|---|
| Alert level: | 1/10,000 people/day | 2/10,000 children/day |
| Emergency level: | 2/10,000 people/day | 4/10,000 children/day |

To determine the nutritional status the following variables were considered for analysis: sex, age, weight, height or length and oedema. The cluster number was also included for segregation purposes and to allow for smooth merging of data with the other household variables in EPI and the SPSS software. During z-score calculations the following facts were taken into consideration:

*Table 9: Definition of boundaries for exclusion*

| |
|---|
| 1. If Sex is missing the observation is excluded from analysis. |
| 2. If Weight is missing, no WHZ and WAZ are calculated, and the programme derives only HAZ. |
| 3. If Height is missing, no WHZ and HAZ are calculated, and the programme derives only WAZ. |
| 5. For any child records with missing age (age in months) only WHZ will be calculated. |
| 6. If a child has oedema only his/her HAZ is calculated. |

[51] The cut-off point for analysis was adjusted downwards from 65cm to 60cm for inclusion of this children. From prior experience, this is a relatively stunted population with youngest age-group(6-8months) found to have children <65cm length.
[52] Save the Children (November 2004) "Emergency Nutrition Assessment Guidelines for field workers"
[53] The Sphere Standards, 2004

Additional analyses for frequencies, descriptives, correlations, cross–tabulations and regressions were conducted using SPSS, Epi-Info, ENA Epi Info and Excel. Indices were expressed both in terms of z scores that represent the difference between observed weight and median weight of the reference population expressed in standard deviation. The result of this survey was compared to WHO standard cut-off points. The IYCF data was analysed to yield data for key indicatorsd in SPSS and excel spreadsheets using the step by step guidelines developed by CARE[54].

**Survey data validation process**

Data quality was ensured through:

- thorough training of team members for four days
- Additional anthropometry training based on poor standardization scores
- the majority of the enumerators and team leaders had prior experience in carrying out nutrition surveys
- standardization of interviewing procedures through verbal translation of questions by survey team members into the local language spoken in the county during training
- standardization of anthropometric measurement procedures
- practical sessions on interviewing and anthropometric measurements taking
- daily supervision of the teams by the consultant, assistant consultant, NSO, Merlin Nutrition Officer and 5 survey coordinators (as well as partner representatives of WVK and Aphia Plus that joined the teams on ad-hoc basis).
- review of questionnaires on a daily basis for completeness and consistency
- plausibility checks from SMART/ENA software specific to each team during daily data entry
- on-the-spot correction/feedback of any mistakes noted during data collection to avoid mistake carry-overs
- review of questionnaires by teams before leaving the household to ensure questionnaire completeness and consistency
- frequencies for all variables were first run and the data cleaned by cross-checking any aberrant values observed on the respective questionnaire before analysis
- triangulation of quantitative data using qualitative information-FGDs, KIIs, secondary data and observation
- Age of children verified by EPI health cards- in the absence of cards, the local calendar of events formulated was used to give estimates of the birth month and year.
- Validation of preliminary results by DHMT, District Nutrition Technical Forum (DNTF), partners and other stakeholders during dissemination meeting.

**Survey Limitations**

- There were inherent difficulties in determining the exact age of some children (even with use of the local calendar of events), as some health cards had erroneous information. This may have led to inaccuracies when analysing chronic malnutrition. Although verification of age was done by use of health cards, in some cases no exact date of birth was recorded on the card other than the date a child first seen at the health facility or just the month of birth. Recall bias may link to wrong age which then leads to wrong weight for age and height for age indices.
- There was poor recording of vitamin A and de-worming in the health cards. Some of the mothers indicated that their children had received Vitamin A and de-worming while it was not recorded in the health cards.
- There was high absence rate of index children and this led to less than the estimated number of children being captured per
- cluster. To make up for the shortfall, additional days were added for data collection and the exercise was extended.
- Survey duration was extended to collect more children from initial clusters

**Good Practice**

- It was noted that use of the Uniscale (rather than Salter Hanging Scale) was beneficial such that children were more compliant in having their weight taken and for this particular environment (no trees in the vicinity of households and absence of roof beams), it was more appropriate than the Salter scale.
- Community mobilization which incorporated a significant part of administrative authorities interaction and prior identification of cluster guides, would assist in enhancing ownership of the outcome results of the survey.
- Working closely with a cluster guide that was respected by community members, yielded better quality data especially on sensitive topics e.g. infant mortality data.
- Crosschecking the DoB with both health card and calendar of local events enhanced the age verification process

**Lessons Learnt**

- Overall (Turkana Surveys): Strong survey planning committee; Supervision of surveys is imperative. Supervision works best with movement planned 'radially' i.e. starting from nearest location and moving further subsequently.
- Planning for concurrent surveys requires 10-15 dedicated survey supervisors to supervise at most, 2 teams daily- this needs to be factored into the budget planning.
- Data entry supervision is best carried out centrally by a team of 4/survey. Transportation for returning collected data back to base daily has to be factored into movement plan by coordinator

[54] Infant and young child feeding practices, collecting and using data: a step by step guide. January 2010

## 3.0 RESULTS AND DISCUSSIONS

### General Characteristics of Study Population and Households

*Table 9: General Characteristics of Study Population and Households*

| Indicator | Turkana Central | Turkana South | Turkana North | Turkana West |
|---|---|---|---|---|
| **Total HH Sample** | 3186 | 3763 | 4511 | 3655 |
| **Total U5 Sample** | 939 | 1068 | 1196 | 1058 |
| **Number of persons/HH** | 5.1 (± 1.95) | 5.6 (± 2.07) | 5.2 (± 1.92) | 4.7 (± 1.71) |
| **Number of U5/HH** | 1.5 (± 0.75) | 1.6 (± 0.80) | 1.4 (± 0.84) | 1.4 (±0.76) |
| **% of U5 in the population** | 29.5% | 28.4% | 26.5% | 29.0% |
| **Male** | 1615 | 1845 | 2224 | 1772 |
| **CDR + Design Effect (D.E)** | 0.62 (0.28-1.36) 1.66 | 0.57 (0.27-1.16) 1.54 | 0.61 (0.35-1.07) 1.09 | 0.79(0.52-1.19) 1.33 |
| **Female** | 1687 | 1908 | 2235 | 2061 |
| **CDR + Design Effect (D.E)** | 0.61 (0.27-1.34) 1.70 | 0.42 (0.20-0.90) 1.26 | 0.54 (0.28-1.02) 1.36 | 0.85 (0.50-1.45) 1.31 |
| **Sex Ratio** | 0.96 | 0.97 | 1.00 | 0.86 |
| **Joined** | 14 | 106 | 40 | 56 |
| **U5 Joined** | 3 | 20 | 6 | 12 |
| **Left** | 85 | 220 | 337 | 144 |
| **U5 Left** | 3 | 31 | 31 | 40 |
| **Reason for leaving-Work/School** | 50.0% | 0.0% | 10.7% | 0% |
| **Reason for leaving-Migration/pastoralism** | 13.6% | 85.0% | 25.0% | 0% |
| **Reason for leaving-Instability/Insecurity** | 4.5% | 0.0% | 7.1% | 0% |
| **Reason for leaving-Social/other** | 27.3% | 15.0% | 51.6% | 100% |
| **Births** | 150 | 176 | 152 | 136 |
| **Total Deaths** | 18 | 24 | 35 | 33 |
| **CDR** | 0.52 (0.25-1.08) | 0.59 (0.36-0.96) | 0.70 (0.47-1.04) | 0.83(0.54-1.27) |
| **Design Effect (D.E)** | 2.34 | 1.45 | 1.37 | 1.48 |
| **U5 Deaths** | 3 | 8 | 4 | 9 |
| **U5 DR** | 0.32 (0.07-1.37) | 0.74 (0.32-1.69) | 0.32 (0.12-1.86) | 1.00(0.50-2.00) |
| **Design Effect (D.E)** | 1.59 | 1.36 | 1.00 | 1.32 |
| | | | | |
| **Resident Status of Household** | | | | |
| | N= 487 | N=640 | N=583 | N=599 |
| **Resident HH** | 99.6% | 96.1% | 94.5% | 95.2% |
| **Returnee HH( in the last 1 year)** | 0.4% | 2.0% | 2.7% | 04.5% |
| **IDP HH** | - | 1.6% | - | 0.20% |
| **Refugee HH** | - | 0.3% | 2.7% | 0.20% |

***3.1.2 Distribution by age and sex***

*Table 10: Distribution of age and sex of sample*

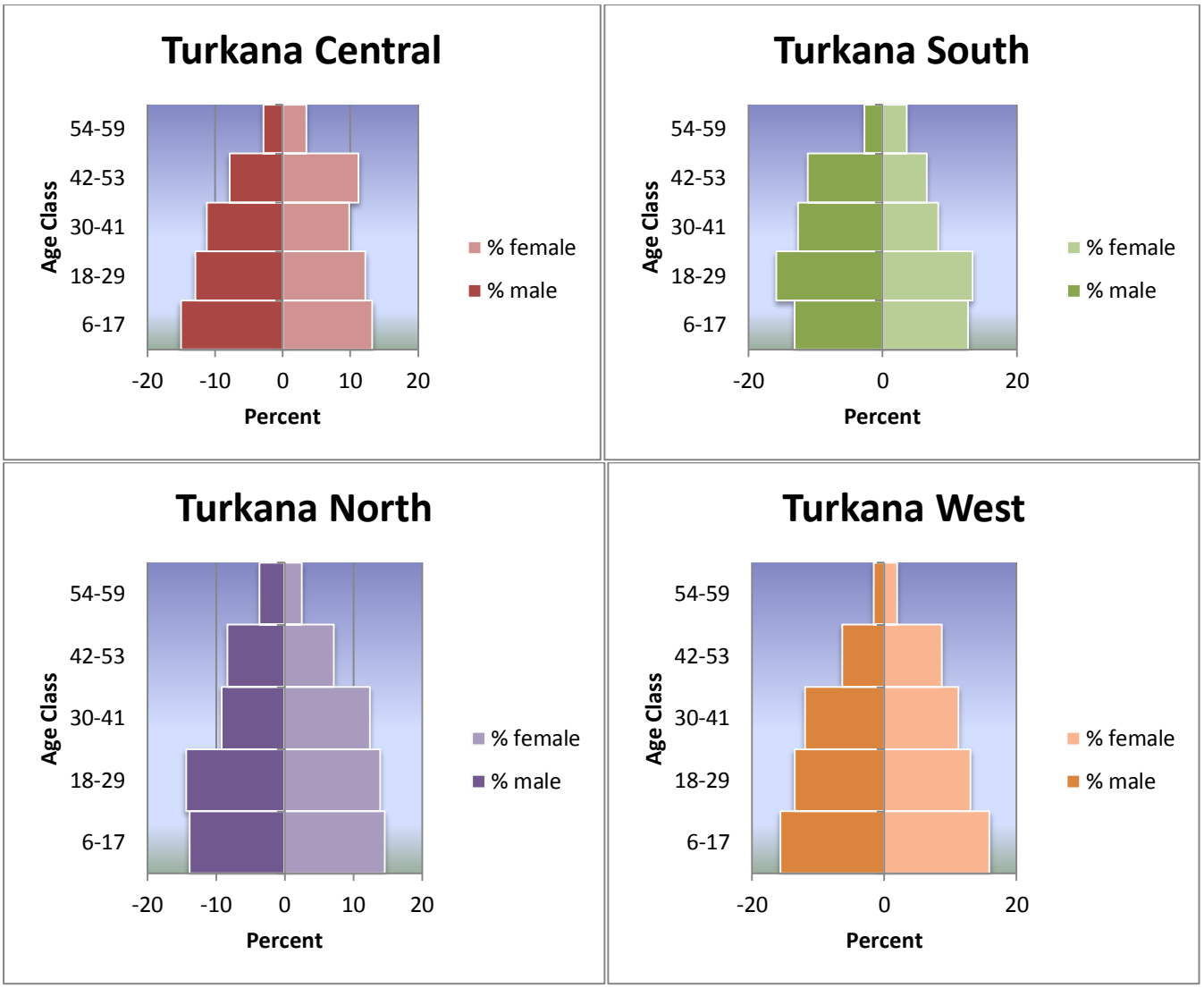
| | Turkana Central | | Turkana South | | Turkana North | | Turkana West | |
|---|---|---|---|---|---|---|---|---|
| | **Total (%)** | **Ratio Boy : girl** | **Total (%)** | **Ratio Boy : girl** | **Total (%)** | **Ratio Boy : girl** | **Total (%)** | **Ratio Boy : girl** |
| **6-17** | 28.3 | 1.1 | 25.9 | 1.0 | 28.4 | 1.0 | 31.6 | 1.0 |
| **18-29** | 25.1 | 1.1 | 29.2 | 1.2 | 28.3 | 1.0 | 26.6 | 1.0 |
| **30-41** | 21.1 | 1.1 | 20.9 | 1.5 | 21.6 | 0.7 | 23.1 | 1.1 |
| **42-53** | 19.1 | 0.7 | 17.7 | 1.7 | 15.6 | 1.2 | 15.0 | 0.7 |
| **54-59** | 6.4 | 0.8 | 6.3 | 0.7 | 6.2 | 1.5 | 3.6 | 0.8 |
| **Total** | 100.0 | **1.0** | 100.0 | **1.2** | 100.0 | **1.0** | 100.0 | **1.0** |

Table 10 illustrates the distribution of the sexes between 5 age group categories. Despite the fact that the was an relatively equal gender distribution (except Turkana South), the overall sex ratios were within the recommended range of 0.8 – 1.2[55] demonstrating an unbiased sample as a whole. However, it is also important to note that the U5 population in Turkana County may have slightly more boys than girls, as there were more boys than girls in all the survey zone samples in 2012[56].

[55] Assessment and Treatment of Malnutrition in Emergency Situations, Claudine Prudhon, Action Contre la Faim (Action Against Hunger), 2002.
[56] Turkana SMART Surveys Report- July 2012

The age and sex distribution of the study group is shown below:

*Figure 2: Distribution of age and sex of sample-Population age/sex Pyramids*




From the figure above, it is clear that there is an under-representation of the older age groups, such as the 50-59 months group as well as 42-53 months group. The sample may reflect a higher mortality in this subgroup, but may also reflect the fact that these children were not present on the day of the survey- with numerous older children being in ECD centres or having migrated (they are perceived as less vulnerable than the younger children). An over-representation of 36 and 48 age-groups may be representative of age determination bias, using recall-Calendar of Events (CoE).

## 3.0 Nutritional Status of Children 6-59 Months

The use of the National Centre for Health Statistics (NCHS) references has been phased out and replaced with the WHO growth standards (WHO-GS). TheWHO-GS are structured as a standard rather than a reference, and are therefore better in the assessment of the nutritional status of U5s regardless of child feeding differentials that characterize children in the community. However, the findings on weight-for-height percentage of the median (WFHM) are based on the NCHS references since percentage median estimates weight deficits in children more accurately and is a better predictor of mortality than z-scores.

### *3.0.1 Overall Prevalence of Global Acute Malnutrition by WFH Z-scores (WHO Standards)*

The WFH index is the most appropriate index to quantify wasting in a population and reflects the current nutrition/health status of the community. Other than having a true statistical meaning, the use of z-scores (standard deviation scores) conveys malnutrition rates very precisely and allows for inter-study comparisons. The information presented here is based on the analyzable sample of eligible children whose plausible anthropometric data were collected. Between 1.1% -2.3% of the children for the WHZ analysis were excluded according to WHO-GS due to flagged values.

*Table 11: OVERALL Prevalence of acute malnutrition by weight-for-height z-scores (WHO 2006 standards)*

| | **TURKANA CENTRAL July 2013** | TURKANA CENTRAL July 2012 | **TURKANA SOUTH July 2013** | TURKANA SOUTH July 2012 | **TURKANA NORTH July 2013** | TURKANA NORTH July 2012 | **TURKANA WEST July 2013** | TURKANA WEST July 2012 |
|---|---|---|---|---|---|---|---|---|
| **Wasting (WHO 2006)** | **N=583** | N=704 | **N=733** | N=691 | **N=585** | N=655 | **N=795** | N=615 |
| **Global Acute Malnutrition (GAM)** | **17.2 % (13.2-21.9)** | 11.6 % (9.4 -14.3) | **16.5 % (13.6-19.9)** | 17.1 % (13.7-21.1) | **25.6% (21.1-30.8)** | 15.3 % (11.7-19.6) | **9.70 % (7.7 – 12.1)** | 14.3 % (11.4-17.9) |
| **Severe Acute Malnutrition (SAM)** | **3.9 % (2.5 -6.1)** | 0.7 % (0.3 -1.7) | **2.7 % (1.8 - 4.0)** | 4.2 % (2.7 - 6.5) | **7.4% (5.2-10.2)** | 2.3 % (1.3-4.1) | **2.0 % (1.1 - 3.6)** | 2.1 % (1.2 - 3.7) |

Table 11 shows that the prevalence of Global Acute Malnutrition (GAM) among all children in the county was between 9.7- 25.6 **%** indicative of a poor (Turkana West) and Critical (Turkana South, Central and North) nutritional situation based on the WHO standards[57]. The prevalence of Severe Acute Malnutrition (SAM) in Turkana Central, South and West suggests SAM, that falls short of emergency levels[58]. Turkana South SAM at 7.4% is above emergency levels.

*Figures 3: Distribution of W/H Z-scores for Sampled Children*

*Turkana Central*

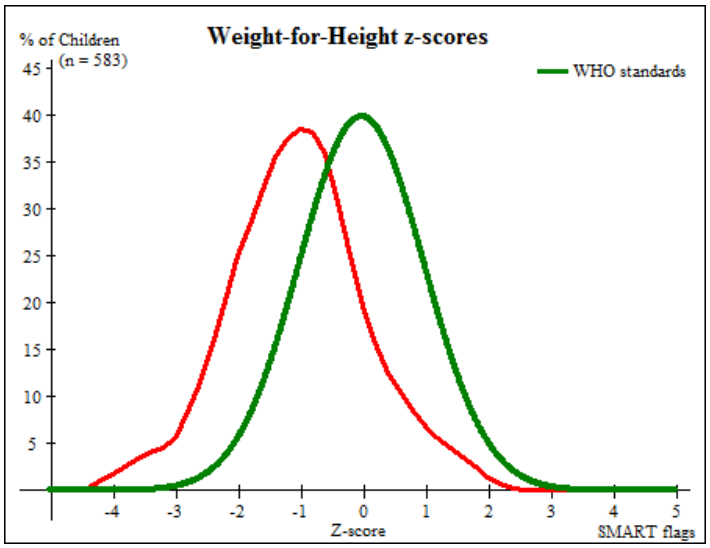



Figure 3 depicts the WFH z-score distribution curve of the survey sample relative to the WHO-GS curve. The findings indicate a shift to the left of the sample curve, with a mean score of -1.03 and a standard deviation of 1.09, which indicates that overall, the population exhibits a poorer nutritional status compared with the WHO reference population.

*Turkana South*

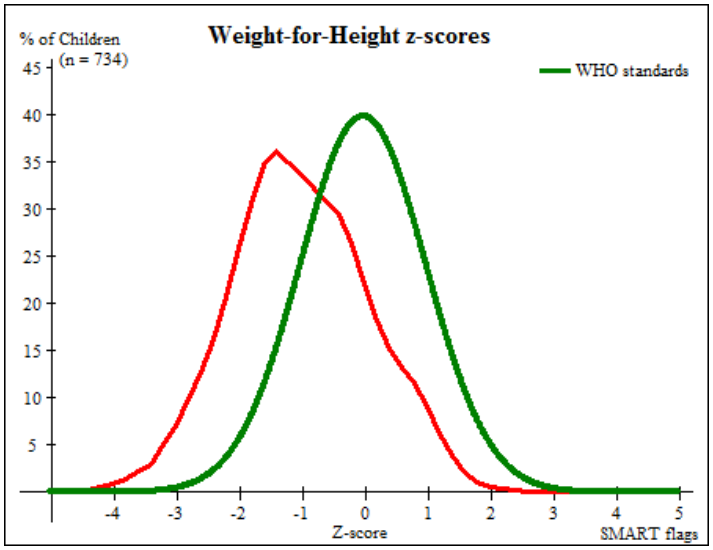



Figure 3 depicts the WFH z-score distribution curve of the survey sample relative to the WHO-GS curve. The findings indicate a shift to the left of the sample curve, with a mean score of -1.02 and a standard deviation of 1.08, which indicates that overall, the population exhibits a poorer nutritional status compared with the WHO reference population.

[57] WHO cut off points for wasting using Z scores (<-2 Z scores in populations: <5% acceptable; 5-9% poor; 10-14% serious; >15% critical).
[58] Emergency Level SAM >4%

*Turkana North*

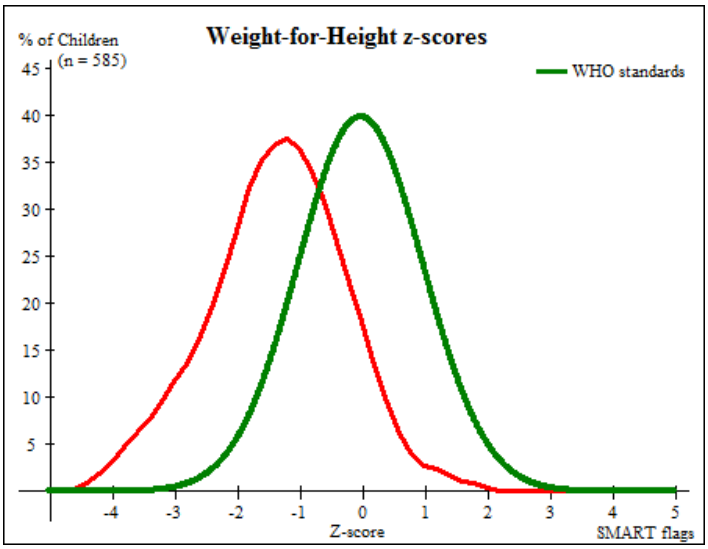



Figure 3 depicts the WFH z-score distribution curve of the survey sample relative to the WHO-GS curve. The findings indicate a shift to the left of the sample curve, with a mean score of -1.35 and a standard deviation of 1.07, which indicates that overall, the population exhibits a poorer nutritional status compared with the WHO reference population.

*Turkana West*

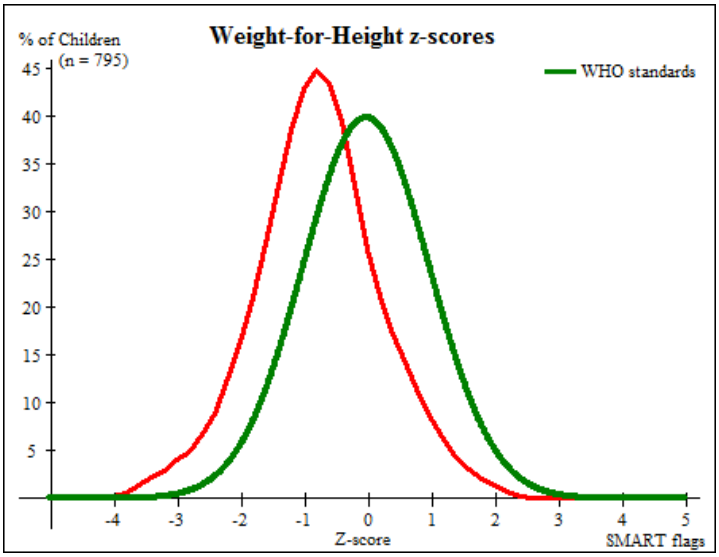



Figure 3 depicts the WFH z-score distribution curve of the survey sample relative to the WHO-GS curve. The findings indicate a shift to the left of the sample curve, with a mean score of -0.77 and a standard deviation of 0.98, which indicates that overall, the population exhibits a poorer nutritional status compared with the WHO reference population.

***Table 12: Distribution of acute malnutrition and oedema based on weight-for-height z-scores***

| | **Turkana Central N=** | | **Turkana South N=** | | **Turkana North N=** | | **Turkana West N=** | |
|---|---|---|---|---|---|---|---|---|
| **z-score** | **<-3 z-score** | **>=-3 z-score** | **<-3 z-score** | **>=-3 z-score** | **<-3 z-score** | **>=-3 z-score** | **<-3 z-score** | **>=-3 z-score** |
| **Oedema present** | Marasmic kwashiorkor No. 0 (0.0 %) | Kwashiorkor No. 0 (0.0 %) | Marasmic kwashiorkor No. 0 (0.0 %) | Kwashiorkor No. 0 (0.0 %) | Marasmic kwashiorkor No. 0 (0.0 %) | Kwashiorkor No. 0 (0.0 %) | Marasmic kwashiorkor No. 0 (0.0 %) | Kwashiorkor No. 1 (0.1 %) |
| **Oedema absent** | Marasmic **No. 27 (4.5 %)** | Not severely malnourish No. 699 (99.3 %) | Marasmic **No. 28 (3.8 %)** | Not severely malnourish No. 718 (96.2 %) | Marasmic **No. 44 (7.4%)** | Not severely malnourish No. 554 (92.6 %) | Marasmic **No. 19 (2.4 %)** | Not severely malnourish No. 784 (97.5 %) |

Table 12 shows:
Turkana Central- 27 children (4.5%) are severely wasted (marasmus). No oedema cases were observed.
Turkana South- 28 children (3.8%) are severely wasted (marasmus). No oedema cases were observed.
Turkana North- 44 children (7.4%) are severely wasted (marasmus). No oedema cases were observed.
Turkana West- 19 children (2.4%) are severely wasted (marasmus); 1 child (0.1%) with kwashiorkor. No oedema cases observed.

**Prevalence of acute malnutrition (GAM) by sex, based on weight-for-height z-scores (and/or oedema)**

*Table 13: Prevalence of acute malnutrition by sex, based on weight-for-height z-scores (and/or oedema)*

| | Turkana Central N=583 | Turkana South N=734 | Turkana North N=585 | Turkana West N=796 |
|---|---|---|---|---|
| **Sex** | Prevalence of global malnutrition (<-2 z-score and/or oedema) | Prevalence of global malnutrition (<-2 z-score and/or oedema) | Prevalence of global malnutrition (<-2 z-score and/or oedema) | Prevalence of global malnutrition (<-2 z-score and/or oedema) |
| **Boys** | **(58) 20.4 % (15.9 – 25.6 C.I.)** | **(72) 17.7 % (13.5 – 22.9 C.I.)** | **(79) 27.1 % (21.5 - 33.5 C.I.)** | **(48) 12.4 % (9.4 – 16.2 C.I.)** |
| **Girls** | **(42) 14.1 % (9.5 – 20.4 C.I.)** | **(49) 14.6 % (10.9 - 20.2 C.I.)** | **(71) 24.2 % (19.0 - 30.4 C.I.)** | **(28) 6.9% (4.8 – 9.8 C.I.)** |

Analysis of the data by sex shows that a higher proportion of boys (9.4-33.5 C.I.) is malnourished than girls (4.8-30.4 C.I.). However the overlapping confidence limits and chi-square analysis indicated that the difference in malnutrition between the boys and girls was NOT statistically significant (p>0.05) i.e. both genders are at equal risk of malnutrition.

**Prevalence of acute malnutrition (weight-for-height z-scores) by comparison of age groups**

*Table 14: Prevalence of acute malnutrition based on weight-for-height z-scores and by age group*

| | Turkana Central | | Turkana South | | Turkana North | | Turkana West | |
|---|---|---|---|---|---|---|---|---|
| Age (months) | SAM | MAM | SAM | MAM | SAM | MAM | SAM | MAM |
| 6-11 | (1)9.1% | (15)19.7% | (8)25.8% | (11)12.5% | (6)28.6% | (17)20.7% | (7)30.4% | (10)13.9% |
| 12-23 | (5)45.5% | (5) 36.8% | (9)29.0% | (28)31.8% | (10)47.6% | (26)31.7% | (4)17.4% | (28)38.9% |
| 24-35 | (3)27.3% | (14)18.4% | (4)12.9% | (22)25.0% | (3)14.3% | (13)15.9% | (3)13.0% | (15)20.8% |
| 36-47 | (2) 18.2% | (9) 11.8% | (6)19.4% | (15)17.0% | (2)9.5% | (14)17.1% | (4)17.4% | (11)15.3% |
| 48-59 | (0) 0.0% | (10)13.2% | (4)12.9% | (12)13.6% | (0)0.0% | (12)14.6% | (5)21.7% | (8)11.1% |
| Total | (11)100% | (76) 100% | (31)100% | (88)100% | (21)100.0% | (82)100.0% | (23)100.0% | (72)100.0% |

To analyse the effect of age on nutritional status, the whole sample was disaggregated into age-groups. Analysis was done on the sub-sample that would coincide approximately with the weaning period in a child's life cycle (6-29months) and thus highlight the effect of infant-feeding practices.

*Table 15: Differences in GAM/SAM prevalence in younger and older age group*

| | GAM | | SAM | | p-value | Inference |
|---|---|---|---|---|---|---|
| Zone | 6-23m | 24-59m | 6-23m | 24-59m | | |
| Turkana Central | (51)48.6% | (54)51.4% | (19)70.4% | (8)29.6% | >0.05 | Non-significant difference |
| Turkana South | (56)43.4% | (73)56.6% | (12)42.9% | (16)57.1% | >0.05 | Non-significant difference |
| Turkana North | (68)44.4% | (85)55.6% | (26)59.1% | (18)40.9% | >0.05 | Non-significant difference |
| Turkana West | (35)43.2% | (46)56.8% | (12)60.0% | (08)40.0% | >0.05 | Non-significant difference |

The GAM of the older children was higher than the overall GAM but the burden of severe wasting (SAM) higher in the younger age group. However, there is NO statistical significance in difference between acute malnutrition rates observed among children aged 6-29 months and the whole sample (p>0.05). Thus in this sample, age is NOT a risk factor for malnutrition.

**Prevalence of acute malnutrition based on the percentage of the median and/or oedema**

*Table 16: Prevalence of acute malnutrition based on the percentage of the median and/or oedema*

| | Turkana Central | Turkana South | Turkana North | Turkana West |
|---|---|---|---|---|
| Prevalence of acute malnutrition (Percentage median NCHS 1977) | **N = 591** | **N = 738** | **N = 589** | **N = 801** |
| **Prevalence of Global Acute Malnutrition (<80% and/or oedema)** | (98) **16.6 %** (12.9 - 21.1) | (128) **17.3 %** (14.2 - 21.1) | (141) **23.9 %** (19.2 - 29.4) | (82) **10.2 %** (8.3 - 12.6) |
| **Moderate Acute Malnutrition(<80% and >= 70%, no oedema)** | (83) **14.0 %** (10.8 - 18.1) | (109) **14.8 %** (11.9 - 18.3) | (110) **18.7 %** (14.9 - 23.1) | (74) **9.2 %** (7.4 - 11.5) |
| **Severe Acute Malnutrition (<70% and/or oedema)** | (15) **2.5 %** (1.5 - 4.3) | (19) **2.6 %** (1.7 - 3.8) | (31) **5.3 %** (3.3 - 8.2) | (8) **1.0 %** (0.5 - 1.9) |

Compared to WHO-GS, the WFH z-scores index, the weight-for-height percentage median (WFHM) index (NCHS references) gave the expected lower rates for both GAM (8.3-29.4%) and fewer children detected for SAM (0.5-8.2%). However, percentage median estimates weight deficits in children more accurately and are a better predictor of mortality than z-scores.

### *3.0.2 Prevalence of Acute Malnutrition by MUAC*

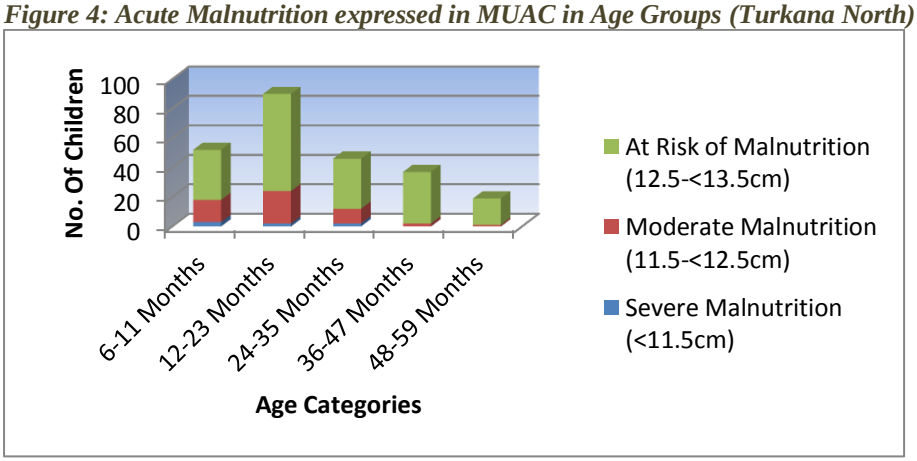
Compared to WFH z-scores, the mid-upper arm circumference (MUAC) is not a very sensitive indicator of acute malnutrition and tends to overestimate acute malnutrition for children below one year of age. It is, however, used as a rapid screening tool for admission into nutrition intervention programmes. Overall, MUAC usually tends to indicate lower GAM levels compared to WFH z-scores. The use of MUAC in screening for admission into feeding programmes is currently in a phase-out process for eventual replacement with WFH z-scores in accordance with the WHO Technical Guidelines Recommendations, which have since been adopted by the MoH. However, MUAC is still in use in many nutrition intervention programmes in Kenya (including in the SFP and OTP programmes in Turkana County) since it is still a criteria for admission in the national IMAM guidelines.

*Table 17: Distribution of MUAC by Nutritional Status*

| | Turkana Central | Turkana South | Turkana North | Turkana West |
|---|---|---|---|---|
| **Prevalence of Acute malnutrition MUAC** | **N=597** | **N=746** | **N=597** | **N=803** |
| **Severe under nutrition < 115 mm** | 0.8% (0.4-2.0) | 1.1% (0.4-3.2) | 1.5% (0.8-2.9) | 0.7% (0.3-1.6%) |
| **Moderate ≥115–<125 mm** | 6.2% (4.3-8.9) | 6.8% (5.1-9.2) | 13.4%(9.5-18.5) | 3.5% (2.3-5.1) |
| **Global ≤125 mm** | 7.0% (4.9-10.1) | 7.9% (5.9 – 10.5) | 14.9%(10.6-20.5) | 4.2% (3.0-6.0) |

According to the MUAC index, prevalence of malnutrition i.e. GAM (MUAC<12.5cm) in 597 children was 14.9% and severe malnutrition (SAM) (MUAC<11.5) at 1.5%, with 32.4% being at risk of malnutrition (MUAC 12.5cm-<13.5cm).

*Figure 4: Acute Malnutrition expressed in MUAC in Age Groups (Turkana North)*




From Figure 4, it is evident that the younger children have a higher rate of MAM than those 24-59 months.

Overall, the younger age group(6-23m) seem more affected than the older age groups. However, this may be attributed to the fact that a higher proportion of younger children were surveyed (resulting in a skewed age-distribution in all zones).

### *3.0.3 Prevalence of Underweight by Weight-for-age Z-scores (WHO-GS)*

The weight-for-age (WFA) index provides a composite measure of wasting and stunting and is commonly used to monitor the growth of individual children in Mother-child booklet since it enables mothers to easily visualise the trend of their children's increase in weight against age. A low WFA is referred to as underweight. The prevalence of underweight is shown in Table 18. As was the case for acute malnutrition, more boys than girls suffered from global underweight as well as severe underweight.

*Table 18: Prevalence of underweight by weight-for-age z-scores (WHO standards)*

| | Turkana Central | Turkana South | Turkana North | Turkana West |
|---|---|---|---|---|
| **Underweight (WHO 2006)** | **N=589** | **N= 742** | **N=590** | **N=789** |
| **Prevalence of global underweight** | (179) 26.8 % (22.2 - 32.0 C.I.) | (230) 31.0 % (27.7 - 34.5 C.I.) | (169) 28.6 % (24.0 - 33.7 C.I.) | (107) 13.6 % (10.9 - 16.8 C.I.) |
| **Prevalence of moderate underweight** | (116) 19.7 % (15.5 - 24.6 C.I.) | (175) 23.6 % (20.6 - 26.8 C.I.) | (116) 19.7 % (17.0 - 22.6 C.I.) | (85) 10.8 % (8.5 - 13.5 C.I.) |
| **Prevalence of severe underweight** | (52) 7.8 % (5.9 - 10.1 C.I.) | (55) 7.4 % (5.5 - 9.8 C.I.) | (53) 9.0 % (6.2 - 12.8 C.I.) | (22) 2.8 % (1.8 - 4.4 C.I.) |

### *3.0.4 Prevalence of Chronic Malnutrition (Stunting) by Height-for-age (HFA) Z-scores (WHO-GS)*

Height for age (stunting) is an indicator of chronic (long-term) malnutrition arising from deprivation related to persistently poor food security situation, micronutrient deficiencies, recurrent illnesses and other factors which interrupt normal growth. Unlike wasting, it is not affected by seasonality but is rather related to the long-term effects of socio-economic development and long-standing food insecurity situation. A low height-for-age reflects deficits in linear growth and is referred to as stunting.

Table 19 indicates no significant difference in the level of stunting between the boys and girls, as judged by the overlap in C.Is.

*Table 19: OVERALL Prevalence of stunting by height-for-age z-scores (WHO standards)*

| Stunting (WHO 2006) | **Turkana Central** | **Turkana South** | **Turkana North** | **Turkana West** |
|---|---|---|---|---|
| Chronic Malnutrition (CM) | **N = 619** | **N = 701** | **N = 583** | **N = 771** |
| **Prevalence of global stunting (<-2 z-score)** | (136) **22.0** % (17.7 – 27.0 C.I.) | (211) **30.1 %** (26.5 - 34.0 C.I.) | (111) **20.6 %** (16.9 - 25.0 C.I.) | (141) **18.3 %** (15.1 - 21.9 9 C.I.) |
| **Prevalence of Moderate Stunting (<-2 z-score and >=-3 z-score)** | (95) 17.4 % (13.6 - 22.0 C.I.) | (142) 20.3 % (17.4 - 23.5 C.I.) | (84) 15.6 % (12.8 - 19.0 C.I.) | (109) 14.1 % (11.5 - 17.3 C.I.) |
| **Prevalence of severe stunting (<-3 z-score )** | (31) **5.0 %** (3.3 - 7.5 C.I.) | (69) **9.8 %** (7.6 - 12.7 9 C.I.) | (27) **5.0 %** (3.2 - 7.8 C.I.) | (32) **4.2 %** (2.9 - 5.9 C.I.) |

*Table 20: Mean z-scores, Design Effects for WHZ and excluded subjects*

| | Turkana Central | Turkana South | Turkana North | Turkana West |
|---|---|---|---|---|
| Weight-for-Height (WHZ) Indicator | **N=583** | **N=734** | **N=585** | **N=795** |
| Mean z-scores ± SD | -1.03±1.09 | -1.02±1.08 | -1.35±1.07 | -0.77±0.98 |
| Design Effect (z-score < -2) | 1.87 | 1.41 | 1.71 | 1.01 |
| z-scores not available* | 0 | 0 | 0 | 1 |
| z-scores out of range | 14 | 12 | 13 | 8 |

* contains for WHZ and WAZ the children with oedema.

The Weight for Height standard deviation of 1.0 was within the acceptable range of 0.8-1.2 in Turkana Central, South and West. However in Turkana North a standard deviation of 1.35 is larger. Whereas the greater variance in SD could be an indicator of random error in the measurements, it may describe the true nature of a heterogeneous distribution. The design effect was acceptable (1.0-2.0) in all survey zones indicated homogeneity in the sample selected.

The table above indicated the flagged values due to aberrant values

## 4.0 Mortality Indices and Results *(retrospective over 109 days prior to interview)*

The crude death rate (CDR) is defined as the number of people in the total population who die over a specified period of time, as elaborated in the Mortality Indices. In the formula, total population is the population present at the midpoint of the time interval. The time interval is the length of time within which the respondents are asked to state if any deaths have occurred; this is usually referred to as the "recall period." The units for the formula are deaths per 10,000 per day when the "time interval" is expressed in days. In this survey the "recall period" was 109 days (31st March -18th July 2013), with the recall event being Easter. This is ≈90 days, as recommended for use in developing countries. The same formula was used for calculating Underfive Death Rate (U5DR).

*Table 21: Mortality Results*

| **MORTALITY** | Turkana Central | Turkana South | Turkana North | Turkana West |
|---|---|---|---|---|
| **Crude Death Rate (CDR)** | 0.52 (0.25-1.08) | 0.59 (0.36-0.96) | 0.70 (0.47-1.04) | 0.83 (0.54-1.27) |
| **Under-five Death Rate (U5DR)** | 0.32 (0.07-1.37) | 0.74 (0.32-1.69) | 0.32 (0.12-1.86) | 1.00 (0.50-2.00) |

The crude death rates (CDR) for all zones were within acceptable levels for emergency situations(<2 deaths/10,000 people/day) as per the SPHERE Standards 2004. The highest crude death rate was observed in West at 0.83 (0.54-1.27)deaths/10,000/day, followed by Turkana North at 0.70 (0.47-1.04).

The underfive death rates (U5DR) for all the zones were within acceptable levels (<4 deaths/10,000 people/day). The highest rate of U5DR was observed in Turkana West at 1.00 (0.50-2.00), followed by South at 0.74 (0.32-1.69).

Both the mortality rates are within the acceptable levels for emergency situations.

*Table 22: Causes of Death*

| TURKANA CENTRAL | | | | |
|---|---|---|---|---|
| **S/NO.** | **CAUSE CODE** | **CODE ELUCIDATION** | **U5** | **OVER 5** |
| 1 | 1 | **Diarrhoea** | 0 | 0 |
| 2 | 2 | **Fever** | 3 | 6 |
| 3 | 3 | **Difficulty Breathing** | 0 | 0 |
| 4 | 4 | **Malnutrition** | 0 | 0 |
| 5 | 6 | **Accident** | 0 | 0 |
| 6 | 7 | **Violence** | 0 | 1 |
| 7 | 8 | **Birth Complications** | 0 | 0 |
| 8 | 66 | **Other(Specify):AIDS (2); TB (2); Brucellosis; Old Age; Snakebite; Unknown** | 0 | 8 |
| | TOTAL | **18** | **3** | **15** |
| TURKANA SOUTH | | | | |
| 1 | 1 | **Diarrhoea** | 1 | 2 |
| 2 | 2 | **Fever** | 4 | 2 |
| 3 | 3 | **Difficulty breathing** | 2 | 1 |
| 4 | 4 | **Malnutrition** | 0 | 2 |
| 5 | 6 | **Accident** | 0 | 1 |
| 6 | 7 | **Violence** | 0 | 4 |
| 7 | 8 | **Birth Complications** | 0 | 0 |
| 8 | 66 | **Other (specify): Unknown (3); Anaemia** | 0 | 4 |
| | TOTAL | **24** | **8** | **16** |
| TURKANA NORTH | | | | |
| 1 | 1 | **Diarrhoea** | 0 | 4 |
| 2 | 2 | **Fever** | 0 | 7 |

| | | | | |
|---|---|---|---|---|
| 3 | 3 | **Difficulty breathing** | 3 | 2 |
| 4 | 4 | **Malnutrition** | 0 | 4 |
| 5 | 5 | **Measles** | 1(Unconfirmed) | 0 |
| 6 | 6 | **Accident** | 0 | 2 |
| 7 | 7 | **Violence** | 0 | 2 |
| 8 | 8 | **Birth Complications** | 0 | 0 |
| 9 | 66 | **Other (specify): Unknown(3); TB; Long illness; Old Age(2); Anaemia (3); Leprosy** | 0 | 10 |
| | TOTAL | **35** | **4** | **31** |
| TURKANA WEST | | | | |
| 1 | 1 | **Diarrhoea** | 3 | 1 |
| 2 | 2 | **Fever** | 2 | 2 |
| 3 | 3 | **Difficulty breathing** | 2 | 2 |
| 4 | 4 | **Malnutrition** | 0 | 2 |
| 6 | 6 | **Accident** | 0 | 1 |
| 7 | 7 | **Violence** | 0 | 3 |
| 8 | 8 | **Birth Complications** | 2 | 1 |
| 9 | 66 | **Other (specify): Swelling of the body; T.B; Unknown(6); Long illness; Old Age(2);HIV/AIDS** | 2 | 10 |
| | TOTAL | **39** | **11** | **28** |

The main presumed causes of death among children under-five years were 'fever', diarrhoea and 'difficulty breathing'.
The deaths over 5 years, occurred from Fever/malaria, ARIs('difficulty breathing') and diarrhoea mainly, and also violence and hunger (malnutrition). Qualitative data from FGDs gave the most common causes of mortality among children U5 years were specifically chronic malaria, anaemia, cholera and severe acute malnutrition during dry seasons. They attribute this to lack of immunization, complications arising during home deliveries, not seeking medical attention (due to cost and inaccessibility), lack of food, belief in witchdoctors and curses from relatives

### 4.1 Children's Morbidity

*Table 23: Prevalence of reported illness in children in the two weeks prior to interview*

| | TURKANA CENTRAL | TURKANA SOUTH | TURKANA NORTH | TURKANA WEST |
|---|---|---|---|---|
| Child morbidity (6-59 months old) | **N= 602** | **N= 747** | **N= 601** | **N= 809** |
| Prevalence of reported illness | **(274)45.5%** | **(409) 54.8%** | **(296)49.3%** | **(341) 42.2%** |
| **Fever /Malaria(alone or combined with other symptoms)** | 43.4% | 44.7% | 31.5% | 44.5% |
| **ARIs (cough and cough with difficult breathing)** | 32.3% | 32.2% | 40.1% | 26.9% |
| **Watery Diarrhoea** | 20.8% | 18.0% | 22.5% | 22.4% |
| **Bloody Diarrhoea** | 0.7% | 1.6% | 0.7% | 1.2% |
| **Others** | 2.8% | 3.4% | 5.2% | 5.0% |
| **Diarrhoea=Yes** | | | | |
| | n=60 | n=81 | n=54 | n=90 |
| **Zinc supplementation for Diarrhoea cases** | (45) 75.0% | (54) 66.7% | (31) 57.4% | (45) 50.6% |

'Other' symptoms included eye/ear infection; skin/fungal; scabies; oral thrush. There was 1 case of unconfirmed measles (Turkana North) reported.

A 2-week child morbidity recall (inclusive of the day of survey) was assessed to establish the prevalence of common illnesses among the children. A high proportion (45.5%; 54.8%; 49.3%; 42.2%) of U5s was reported to have been sick (Table 23). The most prevalent illnesses were malaria suffered by 32-45%. Qualitative data gave a range of 03-50% (mean-20.4%) of children sleeping under mosquito nets. The reasons given for some children not sleeping under mosquito nets were: not being beneficiaries of hospital nets provided; insufficient money/access to commercial mosquito nets; incorrect treatment-not treating the net with the tablet provided because of lack of knowledge; not having enough nets for the family members (the head of the HH is the first priority person to sleep under a net), they are 'too warm' at night and social hindrance (an older child cannot sleep with parents at night). The other significant illnesses are ARIs (26.9%-40.1%), diarrhoea and others. Data from the MoMS (Lodwar district hospital) also confirmed these as leading causes of child morbidity in the district in 2011[59]. In addition, upper respiratory tract infection, malaria and diarrhoea are endemic during this time of year (dry cool season)[60]. Caretakers reported that the most

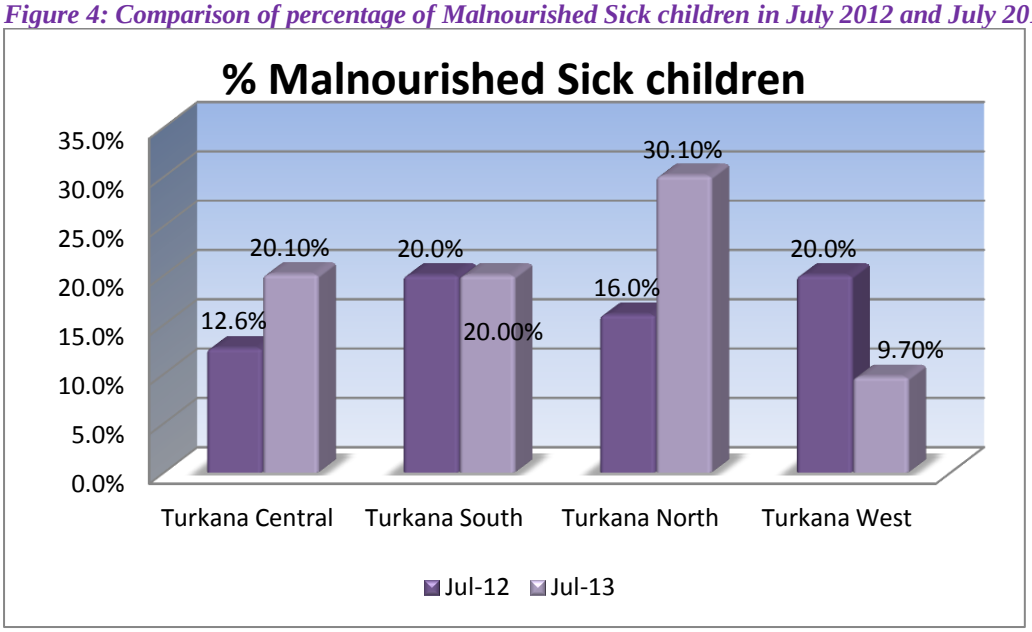
[59] Turkana County Top Ten Leading Causes Of Morbidity, 2012
[60] DPHO (Turkana)

common causes of morbidity are malaria, ARIs and diseases caused by poor sanitation/hygiene, contaminated food, lack of safe drinking water and balanced diet, exposure to cold at night(insufficient clothing), inter-uterine infection of foetus and cross-contamination between children. of An analysis of the relationship between morbidity and nutritional status established that GAM prevalence was significantly higher among those reported to have been sick compared to those who were not.Chi-square analysis done to determine whether there was any association between sickness and malnutrition (Table 24) showed that there was significant association ($p<0.01$).

***Table 24: Relationship between morbidity and malnutrition***

| | TURKANA CENTRAL | TURKANA SOUTH | TURKANA NORTH | TURKANA WEST |
|---|---|---|---|---|
| Child morbidity (6-59 months old) | **N= 274** | **N= 409** | **N= 296** | **N= 341** |
| **Children ill during the recall period who were also acutely malnourished (<-2 Z-scores)** | **(55)20.1%** | **(82)20.0%** | **(89)30.1%** | **(33)09.7%** |
| p-value | **0.000** | **0.000** | **0.000** | **0.000** |

***Figure 4: Comparison of percentage of Malnourished Sick children in July 2012 and July 2013***



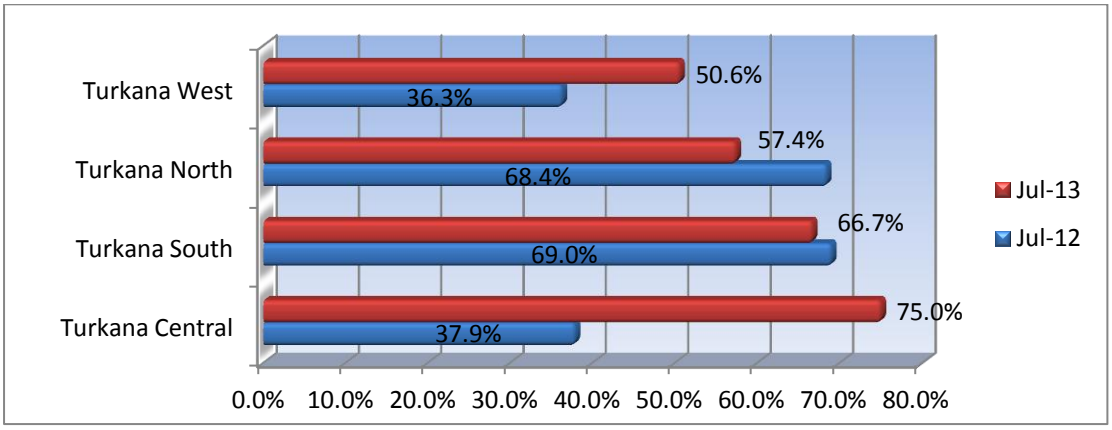

The practice of feeding during illness was investigated using FGDs with all responding that, the child should continue to breastfeed because to provide the baby with energy and natural immunity to fight the diseases". They suggested that meat is not a suitable food during illness *because some clans believe that "Eduarak" (bad omen) may worsen the condition of sickness*. Whereas increasing of fluids like soup from goats' meat to replenish the lost fluids, prevents dehydration. All FGD groups had a good awareness of the importance of breastfeeding and other fluids to increase fluid content in the sick child, even when there is little or no appetite for food. Qualitative data also indicated that health-seeking practices included seeking medical attention from the nearest health facility as a first resort (except in Turkana West, where the community first seeks medical attention by looking for herbs from witchdoctors). This is because *"in health facilities, there are experts who can diagnose and give right medicine for the illness"*. Witchdoctors ('*ngakatwak'*) or herbalists as a second resort if hospital fails to provide a cure and because of a strong belief in their ability to cure some diseases coupled by their drugs being cheap. Some Christians go to church for prayers. They also go to local massagers when having all body or stomach problems

### 4.2 Therapeutic zinc supplementation for diarrhoea management

Zinc supplementation has been shown to be effective for preventing diarrhoea in children. When used as a therapy for acute or persistent diarrhoea, zinc reduces the duration of the episode as well as its severity and complications. WHO/UNICEF[61] recommends use of zinc for 10-14 days for all episodes of diarrhoea among children U5. Zinc supplementation paired with low osmolality ORS have been recognized as important approaches to tackle childhood diarrhoeoa[62]. One of the HiNi intervention targets is to increase therapeutic zinc supplementation for diarrhoea management to 50%. During the survey, if the caretaker confirmed that the index child had been ill with diarrhoea, they were shown a sample and asked whether the zinc tablets were administered to the child for 10 days for treatment, since it began. This yielded positive responses from caretakers, as illustrated in Figure 5 below. With implementation of the HINI project which targets 50% zinc supplementation, all zones have commendably achieved this in July 2013.

[61] WHO/UNICEF Joint Statement: Clinical Management of Acute Diarrhoea, 2004.
[62] Best Practice Paper-Micronutrient Supplements for Child Survival (Vitamin A and Zinc) (2008)

*Figure 5: Therapeutic zinc supplementation for diarrhoea management*




## 4.3 Vaccination Results

*Table 25: Vaccination coverage: OPV 1, OPV 3 for 6-59 months and Measles for 9-59 months*

| | Turkana Central | Turkana South | Turkana North | Turkana West |
|---|---|---|---|---|
| **Immunization of children 6-59 months old** | **N=601** | **N= 746** | **N= 597** | **N= 632** |
| **OPV1 (card and recall)** | (583)96.9% | (732)98.9% | (570)95.5% | (714)90.5% |
| **OPV3 (card and recall)** | (555)92.7% | (686)92.7% | (550)93.2% | (652)82.8% |
| **Measles(children ≥9-59 m)** | (510)92.9% | (630)91.4% | (499)89.9% | (546)77.7% |

When estimating measles coverage, only children 9 months of age or older were taken into consideration as they are the ones who were eligible for routine vaccination. The vaccination coverage was calculated as children immunized based on records and recall. Using both card and confirmation, child immunization for polio (OPV), (≈90%) and measles (≈85%) was commendably high-above the recommended KEPI coverage cut-off point of 80%[63]in all zones. Coverage has improved in 2013 through outreach by the World ew3eVision, the Diocese of Lodwar, Merlin and other public benefit organizations in collaboration with the ministry of health and education. Improvement is also attributed to increased vaccination campaigns, supplementation at Early Childhood Development (ECD) centers and *Malezi Bora* weeks. [64].

## 4.4 Vitamin A Supplementation/ Deworming

*Table 26: Vitamin A supplementation (VAS) and deworming coverage*

| | Turkana Central N=602 | Turkana South N=747 | Turkana North N=590 | Turkana West N=785 |
|---|---|---|---|---|
| **Vitamin A supplementation 6-59months Once** | n=602 (490) **81.4%** | n=721 (608) **84.3%** | n=590 (590) **89.5%** | n=785 (629) **80.1%** |
| **Vitamin A supplementation 6-11months Once** | n=111 (90) **81.1%** | n=95 (73) **76.8%** | n=90 (71) **78.9%** | n=148 (98) **66.2%** |
| **Vitamin A supplement 12-59months More than once in last year** | n=491 (234) **47.7%** | n=626 (173) **27.6%** | n=500 (253) **50.6%** | n=637 (229) **35.9%** |
| **Deworming once in the last 6 months(12-59 months)** | (237) **48.8%** | (339) **54.9%** | (204) **39.9%** | (286) **44.4%** |

Vitamin A supplementation (VAS) starts at 6 months, and subsequently at 6 months interval until a child reaches age of 5 years[65]. In the previous six months prior to this survey, there was an overall improvement of U5s who were reported to have received vitamin A supplementation- comparable to July 2012 survey coverage (59.2%; 73.4%; 89.7%; 83.7%). In the previous year, the proportion of children over 12 months old who had received it more than once as recommended was 29%-59% reportedly having received more than once- this is slightly better than the reported rate in July 2012 in Turkana North and West (58.5%; 56.9%; 38.8%; 28.9%). The overall vitamin A coverage among children aged <1yr was 66%-81%, comparable to July 2012 survey results (77.6%; 64.0%; 81.1%; 69.9%).

De-worming is crucial in warding off the debilitating effects that helminthic infections cause among growing children. Using card and confirmation, only 40%-55% of the children had received de-wormers during the 6-month period prior to this survey. A comparable rate of deworming was reported by July 2012 survey, with only an improvement in Turkana central and West (30.1%; 51.9%; 54.0%; 59.9%). There have been slight improvements in some zones in July 2013 and supplementation and deworming still falls short of the KEPI optimum cut-off of ≥80%, and HiNi programme targets. This is a worrying trend as adequate micronutrient supplementation is crucial in the reduction of chronic malnutrition.

[63] For the population to be protected against epidemics.
[64] KFSSG Turkana Long Rain Assessment Draft Report (August 2013)
[65] WHO

## 5.0 FOOD UTILIZATION

This section explored the consumption patterns of infants, 6-23months and persons >5years (caregivers). The data was collected based on 24-hour recall. Unusual feeding patterns (both greater and reduced consumption) were excluded from this recall method, so as to evaluate the 'normal' consumption patterns.

### 5.0.1 Infant and Young Child Feeding (IYCF) and Care Practices

Information on infant and young child feeding practices was obtained based on a 24-hour recall, in line with the WHO guidelines to minimize recall bias and thus obtain more valid information.

*Table 29: Summary of Breastfeeding Practices (Comparison of **July 2012** and July 2013)*

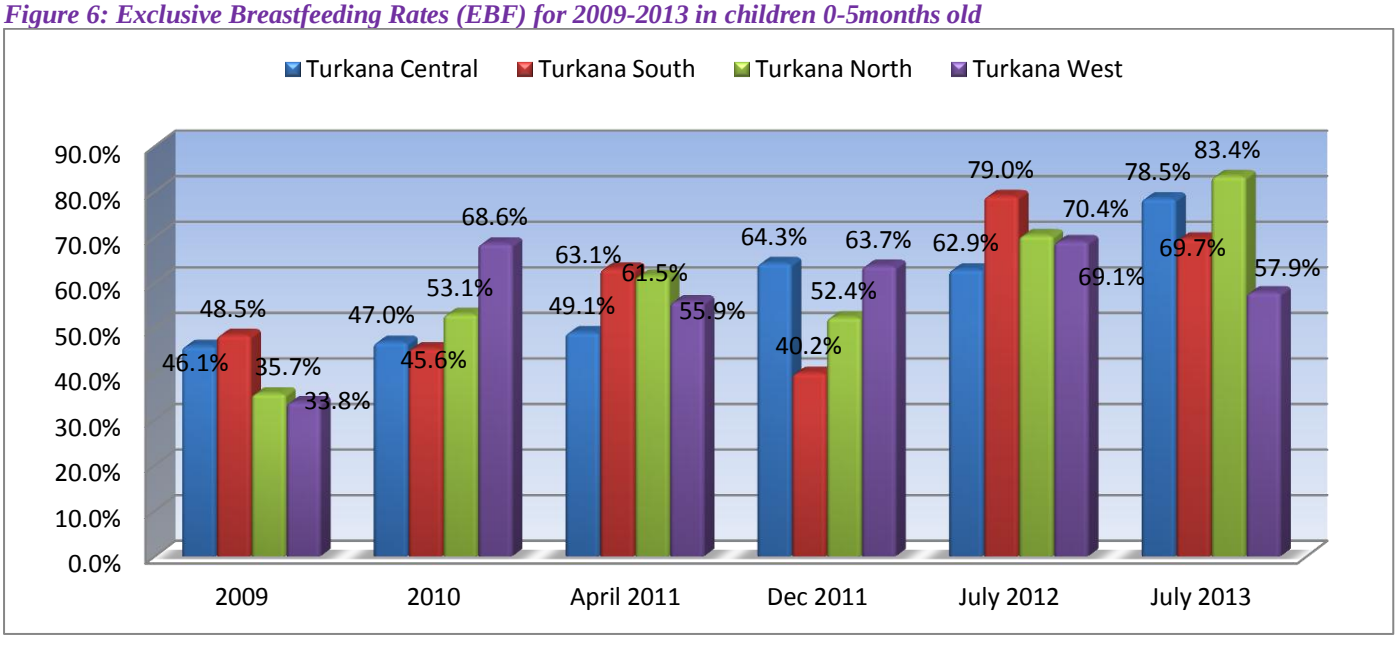
| **Breastfeeding Practices** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Initiation of breast feeding:** | | | | | | | |
| | Age Group | Turkana Central N=247 N=522 | Turkana South N=274 N=595 | Turkana North N=253 N=560 | Turkana West N=235 N=583 | **Target** | **Comment** |
| **Ever breastfed** | 0-23m | (516)**98.9%** | (561)**97.0%** | (557)**99.0%** | (572)**98.4%** | **>80%** | ✓ |
| **Ever breastfed** | 0-23m | (539)**99.4%** | (561)**99.4%** | (498)**99.2%** | (475)**98.4%** | **>80%** | ✓ |
| **Given colostrum** | 0-5m | (243)**98.4%** | (258)**94.2%** | (226)**89.3%** | (217)**92.3%** | **>80%** | ✓ |
| **Given colostrum** | 0-5m | (211)**94.2%** | (247)**99.6%** | (220)**94.4%** | (212)**96.4%** | **>80%** | ✓ |
| **Given pre-lacteals within 3 days of birth**<br><br>**Main Pre- lacteals:**<br>**Powder/fresh milk**<br>**Plain Water**<br>**Sugar/glucose water** | 0-23m | (35)**14.2%**<br><br>(11)04.5%<br>(10)04.0%<br>(10)04.0% | (42)**15.5%**<br><br>(40)02.6%<br>(34)08.1%<br>(23)04.4% | (07)**03.2%**<br><br>(6)02.4%<br>(1)00.4%<br>(1)00.4% | (42)**17.9%**<br><br>(21)08.9%<br>(10)04.3%<br>(09)03.8% | **n/a** | **Unsatisfactory** |
| **Given pre-lacteals within 3 days of birth**<br><br>**Main Pre-lacteals:**<br>**Powder/fresh milk**<br>**Plain Water**<br>**Sugar/glucose water** | 0-23m | (54)**24.1%**<br><br>(63)11.6%<br>(19)03.5%<br>(34)06.3% | (31)**12.5%**<br><br>(40)02.3%<br>(34)01.9%<br>(23)01.3% | (47)**20.2%**<br><br>(33)02.2%<br>(26)01.7%<br>(10)00.7% | (40)**18.2%**<br><br>(54)03.7%<br>(20)01.4%<br>(17)01.2% | **n/a** | **Unsatisfactory** |
| **Early introduction to complementary foods** | 0-5m | (25)**10.1%** | (51)**18.6%** | (39)**15.4%** | (65)**27.7%** | **n/a** | **Unsatisfactory** |
| **Early introduction to complementary foods** | 0-5m | (12)**05.4%** | (11)**04.4%** | (11)**04.7%** | (32)**14.6%** | **n/a** | **Unsatisfactory** |
| ***Key Indicator 1*** **Timely Initiation of Breastfeeding** (within1 hr.) | 0-23m | (398)**76.3%** | (398)**67.3%** | (440)**78.7%** | (287)**49.8%** | **>80%** | **Significant improvement in Central and North** |
| ***Key Indicator 1*** **Timely Initiation of Breastfeeding** | 0-23m | (282)**52.1%** | (403)**71.6%** | (317)**63.4%** | (231)**48.2%** | **>80%** | ✓ |
| ***Key Indicator 2*** **Exclusive Breastfeeding** | 0-5m | (194)**78.5%** | (191)**69.7%** | (211)**83.4%** | (136)**57.9%** | **>50%** | **Significant improvement in Central and North** |
| ***Key Indicator 2*** **Exclusive Breastfeeding** | 0-5m | (141)**62.9%** | (196)**79.0%** | (164)**70.4%** | (152)**69.1%** | **>50%** | **Satisfactory** |
| ***Key Indicator 3*** **Currently Breastfeeding** | 6-23m | (469)**90.4%** | (519)**88.3%** | (487)**88.1%** | (499)**87.4%** | **>80%** | **Static** |
| ***Key Indicator 3*** **Currently Breastfeeding** | 6-23m | (475)**87.8%** | (494)**87.7%** | (431)**86.2%** | (408)**85.2%** | **>80%** | ✓ |

Almost all of the children 0-23 months in Turkana County are reported to have ever breastfed (≈100%). The majority (≈85%) of the children were still being breastfed at the time of the survey. This is confirmed by women FGDs in all livelihoods which unanimously agree on breastfeeding up until 1-2 years, with the exception of women who are casual laborers and those without knowledge of family planning- they introduce other complementary feeds at six months. Also, a strong cultural influence of the Naming ceremony doesn't allow breastfeeding until the baby is named (i.e. after 24 hours). This may explain the use of pre-lacteals across survey zones. The circumstances that the mother does not breastfeed are during pregnancy- *"the secondary colostrum for the other unborn baby can affect the other, causing sickness, malnutrition, and sometimes death";* in the presence of diseases such as HIV/AIDS and very young girls who may find breastfeeding painful. Timely initiation of breastfeeding has improved in 2012, but none of the zones reached the target of at least 80% to put the infant to the breast within one hour after birth as recommended by WHO[66]. The low timely initiation of breastfeeding has been linked to again to the cultural significance of the naming ceremony of children that is given priority before breastfeeding. A significant majority of FGD women participants confirmed that after delivery, the mothers will breastfeed the following day to allow preparations for the naming ceremony. A small proportion of FGDs expressed another reason for delay of initiation for will be breastfed is lack of milk. Participants from Loima, Kaeris and Nakwamekwi have been trained to put the child on the breast within 30 minutes, to boost the child's immunity. ≈95% of the children had been given nutritious, immune-boosting colostrum-which is an important breastfeeding practice, while 03-18% had been given pre-lacteals, a practice that is not recommended because it interferes with the establishment of nbreastfeeding. A pre-lacteal is anything given to a child other than or in addition to breast milk, in the first three days after birth. Among infants given pre-lacteals, the most frequently given items were powder/fresh animal milk-by the highest ratio of the respondents, followed by plain water and animal milk sugar/glucose water. ≈95% of children in all zones were put on the breast within 3 days, and thus consumed colostrum. *From FGDs a common practice is giving 'small' animal milk ('Euchirian') or glucose and water to supplement breast milk. A proportion of respondents said they do not provide the child with other feeds apart from 'akidietet- (oil from sheep tail) helps to loosen stools and also help the child grow healthy.* From Table 29 above, 53-83% of the children less than 6 months of age had been exclusively breastfed. Exclusive breastfeeding was computed among infants who had not received pre-lacteals and were not on other foods or liquids, and had breastfed within previous 24 hours. The findings revealed that a much higher number of the infants were exclusively breastfed compared to a national average of 31.9%[16] according to the Kenya Demographic and Health Survey (KDHS) report. Figure 6 shows trends of EBF among 0-5m children over a five year period. This is commendable from a baseline EBF of ≈30%, and a national and HINI target of 50%. The proposed reasons for this commendable rate of EBF (and current increase in comparison to 2012) are positive cultural norms: newly-delivered mother is relieved from household duties for 40 days after delivery (from FGDs) - and thus have a better opportunity for EBF. Also there was increased caretaker-health staff contact points in 2011 (BSFP distribution points, targeting a larger population, in addition to IMAM). There was mixed reactions among FGD participants to the assertion that the baby can survive on breast milk alone without even water. Out of those who were not exclusively breastfed, 10-28% had been weaned early. The FGD participants that disputed the statement said, *"Children require additional source of balanced diet like milk, Akidietet, and Glucose".* Early weaning increases the risk of infections in young children, with the foods given being nutritionally inferior to breast milk, which ultimately aggravates malnutrition. The qualitative data from all livelihood FGDs backs up the quantitative data indicating both knowledge and practice of BF practices.

*'The child is given only breast milk. This is because the child can absorb every food a mother eats ("Ng'akile nakon bon enaki ikoku")*

*Colostrum boosts natural immunity of the child; It provides a lot of energy required growth and also provide fluids i.e. water. "Colostrum can provide diversified nutritional ingredients since it is a whole meal"*

***Figure 6: Exclusive Breastfeeding Rates (EBF) for 2009-2013 in children 0-5months old***




[66] WHO (1989): Protecting, promoting and supporting breastfeeding: special role of maternity services: a joint WHO/UNICEF Statement. Geneva, WHO.
[16] Kenya National Bureau of Statistics (June 2010): Kenya Demographic and Health Survey.

**Complementary feeding practices** *(Comparison of July 2012 and July 2013)*

*Table 30: Summary of Complementary Feeding Practices*

| Complementary Feeding Practices | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Turkana Central | Turkana South | Turkana North | Turkana West | | |
| | 6-23m | N=275 | N=321 | N=307 | N=348 | | ✓ |
| ***Key Indicator 4*** **Introduction to solid and semi-solid food** | 6-8m | (62) **89.9%** | (47) **83.9%** | (57)**90.5%** | (71) **93.4%** | **n/a** | **Improvement** |
| ***Key Indicator 4*** **Introduction to solid and semi-solid food** | 6-8m | (27) **50.0%** | (44) **88.0%** | (22)**64.7%** | (39) **79.6%** | **n/a** | ✓ |
| ***Key Indicator 5*** **Minimum Dietary Diversity (Total)** | 6-23m | (140) **50.9%** | (158)**49.2%** | (150)**48.9%** | (86)**24.7%** | **>80%** | **Improvement** |
| ***Key Indicator 5*** **Minimum Dietary Diversity** | 6-23m | (27) **08.5%** | (03) **01.0%** | (27)**10.1%** | (33)**12.7%** | **>80%** | **Unsatisfactory** |
| **Dietary Diversity for BF children(+3)** | 6-23m | (120)**53.8%** | (121)**47.8%** | (122)**51.9%** | (73)**26.5%** | | |
| **Dietary Diversity for NBFchildren(+4)** | 6-23m | (20) **39.2%** | (37)**56.1%** | (28) **40.6%** | (13)**18.3%** | | |
| ***Key Indicator 6*** **Minimum Meal Frequency** | 6-23m | (181) **65.8%** | (223)**69.5%** | (210)**68.4%** | (180) **51.9%** | **>80%** | **Improvement** |
| ***Key Indicator 6*** **Minimum Meal Frequency** | 6-23m | (71) **22.4%** | (87) **27.6%** | (90)**33.7%** | (67) **25.9%** | **>80%** | **Unsatisfactory** |
| Children 6-23m (non-breastfed)mean no. of times/day(Mean SD) | 6-23m | 2.43( SD±0.9) | 3.18(SD±1.5) | 2.58(SD±0.7) | 1.82( SD±1.1) | **4** | **Unsatisfactory** |
| Children 6-23m (non-breastfed)mean no. of times/day(Mean SD) | 6-23m | 2.38( SD±1.5) | 2.21(SD±1.0) | 2.80(SD±1.3) | 2.32( SD±1.4) | **4** | **Unsatisfactory** |
| **% 6-23m (non-breastfed)** | **6-23m** | n=51 **(5) 09.8%** | n=66 **(25) 37.9%** | n=71 **(09) 12.7%** | n=71 (04) **05.6%** | | |
| **% 6-23m (non-breastfed)** | **6-23m** | n=65 **(9) 13.8%** | n=64 **(15) 23.4%** | n=49 **(4) 08.2%** | n=56 **(7) 12.5%** | | |
| Children 6-8m (breastfed)mean times/day(Mean SD) | 6-8m | 1.99( SD±1.1) | 2.55(SD±1.9) | 2.20(SD±1.2) | 1.74( SD±1.5) | **2** | **Unsatisfactory** |
| Children 6-8m (breastfed)mean times/day(Mean SD) | 6-8m | 1.30( SD±1.8) | 1.76(SD±1.2) | 1.74(SD±1.8) | 2.48( SD±2.1) | **2** | **Unsatisfactory** |
| **% 6-8m (breastfed)** | **6-8m** | n=69 **(48) 69.6%** | n=56 **(36) 64.3%** | n=63 **(42) 66.7%** | n=76 **(37) 48.7%** | | |
| **% 6-8m (breastfed)** | **6-8m** | n=54 **(16) 29.6%** | n=49 **(30) 61.2%** | n=32 **(18) 56.3%** | n=42 **(27) 64.3%** | | |
| Children 9-23 m(breastfed)mean times/day (Mean SD) | 9-23m | 2.17( SD±1.0) | 2.89(SD±1.6) | 2.55(SD±0.9) | 1.97( SD±1.3) | **3** | **Unsatisfactory** |
| Children 9-23 m(breastfed) mean times/day (Mean SD) | 9-23m | 1.88( SD±1.7) | 2.22(SD±1.3) | 2.73(SD±2.0) | 2.30( SD±1.5) | **3** | **Unsatisfactory** |
| **% 9-23m (breastfed)** | 9-23m | n=200 (5)**02.4%** | n=256 (98) **38.3%** | n=240 (94) **32.9%** | n=219 (49) **18.3%** | | |
| **% 9-23m (breastfed)** | 9-23m | n=254 (73)**28.7%** | n=251 (72) **28.7%** | n=184 (78) **42.4%** | n=154 (43) **27.9%** | | |
| ***Key Indicator 7*** **Minimum Acceptable Diet** | 6-23m | (115) **41.8%** | (123)**38.3%** | (119) **38.8%** | (61)**17.5%** | | **Improvement** |
| ***Key Indicator 7*** **Minimum** | 6-23m | (19) **06.0%** | (2) **00.6%** | (13) **04.9%** | (12) **04.6%** | | **Unsatisfactory** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Acceptable Diet** | | | | | | | |
| ***Key Indicator 8*** **Consumption of iron-rich or iron-fortified foods** | 6-23m | (103) **37.6%** | (10532.7% | (180) **58.6%** | (81) **23.3%** | | **Improvement** |
| ***Key Indicator 8*** **Consumption of iron-rich or iron-fortified foods** | 6-23m | (22) **06.9%** | (16) **05.1%** | (44) **16.5%** | (78) **30.1%** | | **Unsatisfactory** |

*Introduction to solid and semi-solid food*

This indicator is one of the two parts of the previous composite indicator for timely complementary feeding. The previous indicator included living infants 6–9 months in the numerator and denominator. A narrower age range of 6-8months has been chosen so as not to include infants first receiving foods as late as 9 months in the numerator. Because the indicator has a very narrow age range of 3 months, estimates from small sample sizes surveys have wide confidence intervals.

The 6-23m survey questionnaire asked the caretakers of the number of solid and semisolid food other than breast milk, given to the child (24-hr recall). The introduction to complementary foods should happen at 6-8months of age. This is because breast milk alone is not sufficient to provide all the required nutrients for the child's optimal growth from this age onwards. It is also important to consider that the child is not capable of digesting solid food before 6 months and is therefore at risk of not being able to acquire enough energy if breast-feeding is not maintained. According to the WHO Indicator Modules (2009), "Solid, semi-solid or soft foods include family foods, and also many special dishes prepared for infants and young children. Thick soups and stews and porridges are included. Very thin, watery soups and gruels should not be included because infants and young children do not get enough calories from this. Introduction of solid and semi-solid foods to infants 6-8months was reported to be good at 75.6%.

This is a widely used indicator by Kenya Demographic and Health Surveys (KDHS), UNICEF and WHO. >80% of children 6-8 months old had solid and semi-solid foods introduced at the optimum time of ≥24 weeks old, and this is commendable. A significant proportion of children were introduced to complementary foods too early, which also poses a threat to optimum nutrition. The FGDs provided some insight to this practice as breast milk was considered to be insufficient from about 4 months, while conversely harder 'food' was reported to be introduced to children after 6 months-1 year old, when they had developed teeth to chew. The first foods introduced were milk (ngakile), meat soup, porridge with milk and blue band-(nang'aria) , bananas, potatoes, beans animal fat (akididet), because they are easily digestible and they help child to develop strong and health to protect the children against diseases.

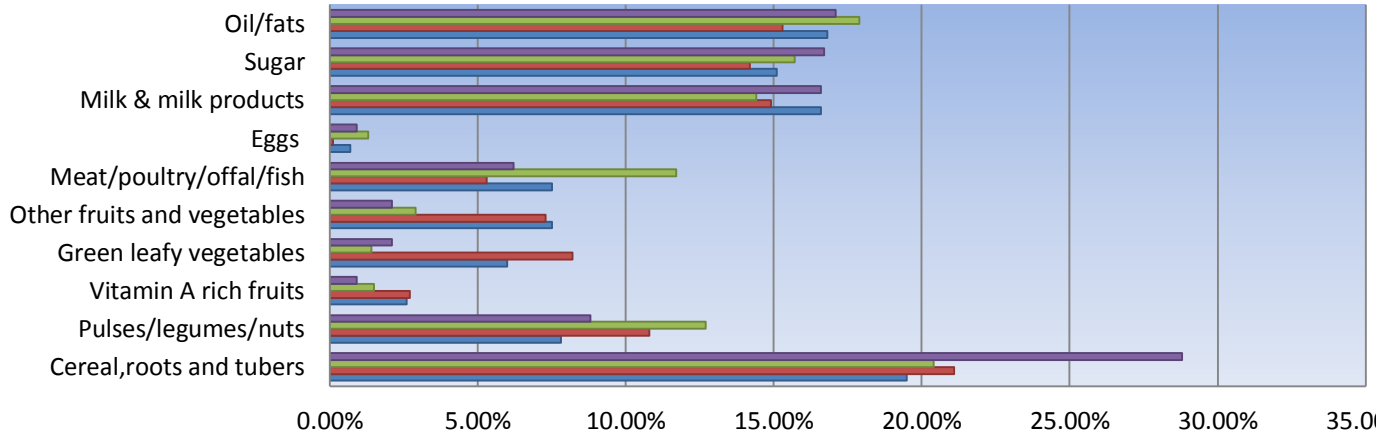
*Dietary diversity score (DDS) and Minimum Dietary Diversity*

The dietary diversity indicator is based on the premise that the more diverse the diets are the more likely they are to provide adequate levels of a range of nutrients. For this indicator, the caretaker was asked what the child had eaten/drank in the last 24 hours. The following food groups are summed, with each of the groups scored "1" if the child had the food group yesterday, and "0" if not. Minimum dietary diversity is defined as proportion of children 6-23 months who receive foods from 4 or more food groups. The 8 food groups used for calculation of this indicator are:

◆ Grains, roots and tubers◆ Legumes and nuts◆ Dairy products (milk and milk products)◆ Flesh foods (meat, fish, poultry and liver/organ meats)◆ Eggs◆ Vitamin-A rich vegetables ◆Fruits and vegetables

This results in a diversity score ranging from 0 to 7 for each child. Higher scores correspond to a more adequate range in the diet.

***Figure 7: Dietary Diversity for Children 6-23 months old***




| | Cereal,roots and tubers | Pulses/legumes/nuts | Vitamin A rich fruits | Green leafy vegetables | Other fruits and vegetables | Meat/poultry/offal/fish | Eggs | Milk & milk products | Sugar | Oil/fats |
|---|---|---|---|---|---|---|---|---|---|---|
| Turkana West | 28.80% | 8.80% | 0.90% | 2.10% | 2.10% | 6.20% | 0.90% | 16.60% | 16.70% | 17.10% |
| Turkana North | 20.40% | 12.70% | 1.50% | 1.40% | 2.90% | 11.70% | 1.30% | 14.40% | 15.70% | 17.90% |
| Turkana South | 21.10% | 10.80% | 2.70% | 8.20% | 7.30% | 5.30% | 0.10% | 14.90% | 14.20% | 15.30% |
| Turkana Central | 19.50% | 7.80% | 2.60% | 6.00% | 7.50% | 7.50% | 0.70% | 16.60% | 15.10% | 16.80% |

The minimum dietary diversity score for those children who had received foods/drinks based on the 24-hour recall was 24.7% (T. West)-50.9% (T. Central). This implies that more than half of all the children's meals in all survey zones did not have an adequate range of food groups and is thus likely to be limited in the diversity of nutrients supplied by the meals. From the figure above, it is evident that the least consumed category of foods was eggs, meat and fish, vegetable and fruits, while the greatest is carbohydrate foods (composing of cereals, oils/fats and sugar-added in tea). Though sugar is an energy-giving, it has little nutrific value, thus it is not considered as a significant food group, contributing to dietary diversity. This also compares well with the reported favoured weaning foods during the FGD-light ugali/porridge ('nang'aria'), fish, meat, ng'akibuk (mala), Edung, Erut, animal fat and cheese 'akuring', potatoes, rice, chapatti and eggs. Fruits and vegetables were only given if the caretaker could afford them- they were inaccessible to the majority of caretakers (with the exception of the mukoma fruit). Of concern is the lack of eggs in the weaning diet- constituting the least utilized food group despite the relative accessibility of eggs,(especially in the urban and agro-pastoral livelihood zones) and their value as a cheap source of animal protein.

The findings showed that ≈50% of the children from the survey sites (except Turkana West) attained the minimum dietary diversity of 4 or more food groups. This is much higher than DD in July 2012 (08.5%; 01.0%; 10.1%; 12.7%). This may be attributed to increased caretaker awareness with MtMSGs and an improved food availability after the long rains .

*Minimum Food Frequency*

For the average healthy breastfed infant, meals of complementary foods should be a minimum of 2 times per day at 6–8 months of age and 3 times per day at 9–23 months of age, respectively and 4 times for non-breastfed children 6–23 months [67] with additional nutritional snacks offered 1–2 times per day as desired (FANTA, 2003, WHO, 2003). Thus, the child should feed at least 3-5 times a day. As a whole, those children (6-23 months of age) received meals 1.55-2.11times. This confirms the FGD findings which gave 1-2meals a day as the feeding frequency of children under 24months. Only 52-70% children 6-23 months achieved the minimum food frequency of 4 or more meals.

*Minimum Acceptable Diet*

This is a composite indicator that is defined as the proportion of *breastfed* children 6-23 months of age who had at least the minimum dietary diversity and the minimum meal frequency during the previous day. It also includes non-breastfed children who have achieved the same, and in addition, 2 milk feedings. Of the 6-23m children analysed, less than 45% achieved this.

*Consumption of iron-rich or iron-fortified foods*

Proportion of children 6-23 months old who receive an iron-rich food or iron-fortified food that is specially designed for infants and young children, or that is fortified in the home. Suitable iron-rich or iron-fortified foods include flesh foods, commercially fortified foods specially designed for infants and young children which contain iron(infant formulas), or foods fortified in the home with a micronutrient powder containing iron or a lipid-based nutrient supplement containing iron(e.g. Plumpy Nut). The overall outcome for all children 6-23m indicated that a large range of children received iron-rich foods. The least in T. West at 23.3% and highest in T. North at 58.6% (this is expected as a result of availability of Plumpy Nut). Overall, this low rate of iron-rich food consumption is unusual for a community that has a predominantly animal-protein diet.

## 6.0 Primary Child Caregiver Indicators

### 6.0.1 Adult Nutritional Status

*Table 32: Nutrition Status of caregivers of 6-59 month old children*

| | Turkana Central N=426 | Turkana South N=518 | Turkana North N=416 | Turkana West N=601 |
|---|---|---|---|---|
| **% Caretakers with MUAC < 21cm** | **(46) 10.8%** (41) 8.2% | **(38) 7.3%** (59) 10.9% | **(64) 15.4%** (39) 8.9% | **(38) 6.3%** (26) 5.9% |
| **% women pregnant and lactating** | **(303) 71.3%** (395) 77.6% | **(401) 77.3%** (447) 82.0% | **(367) 88.6%** (377) 84.3% | **(464) 77.2%** (367) 83.4 % |
| **Maternal Malnutrition** | **N=132** | **N=172** | **N=131** | **N=183** |
| **Pregnant and Lactating mothers of U6 by MUAC: Wasted <21 cm** | **10(7.6%)** 11(7.5%) | **12(7.0%)** 16(10.2%) | **24(18.3%)** 12(9.5%) | **14(7.7%)** 12(6.9%) |
| **% of female caretakers at risk of malnutrition (MUAC<23.0)** | **44(33.3%)** 38(25.9%) | **53 (30.8%)** 56(35.7%) | **(42) 32.1%** 35(27.8%) | **57 (31.1%)** 51(29.5%) |

The mid-upper arm circumference (MUAC) was measured to assess the nutritional status of the eligible caretakers (primary caretaker of child 6-59months, 15-49 years old), that were wasted. The results compared well with July 2012 with deterioration in North-this may be attributed to poor nutrition status and deteriorating food security situation in pastoralist livelihoods.

The survey findings also showed that of the pregnant and lactating women (PLW) ratio, ≈7% of pregnant and U6-months breastfeeding caretakers had MUAC <21cm (except Turkana North) meaning that they are acutely malnourished/have chronic energy deficiency (CED)[68]. However, more than ¼ of all caretakers are at risk of malnutrition (MUAC<23.0cm). The admission criteria into SFP is adult MUAC<21.0 for pregnant and lactating mothers of children <6 months old. Pregnancy imposes a big nutrient-need load on mothers, which in the absence of adequate extra nutrients leads to utilization of body nutrient reserves leading to malnutrition. 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.

[67] WHO Indicators for assessing infant and young child feeding practices, Part 1-Definitions (2009)

[68] Cut off points for pregnant mothers and lactating mothers- MUAC < 21.0 for severe risk and <23.0 For moderate risk.
Cut off points for non- pregnant and non-lactating mother –MUAC < 18.5 for severe risk and <21.0 moderate risk.

Poor adult nutritional status is a key indicator to household food insecurity. High figures of malnourished PLWs carry a risk of growth retardation of the foetus and consequently low birth weight. If the situation deteriorates, both U5 children and caretakers from the same household are vulnerable to malnutrition, a common scenario during nutrition emergency levels.

### 6.0.2 Micronutrient Supplementation for Caretakers

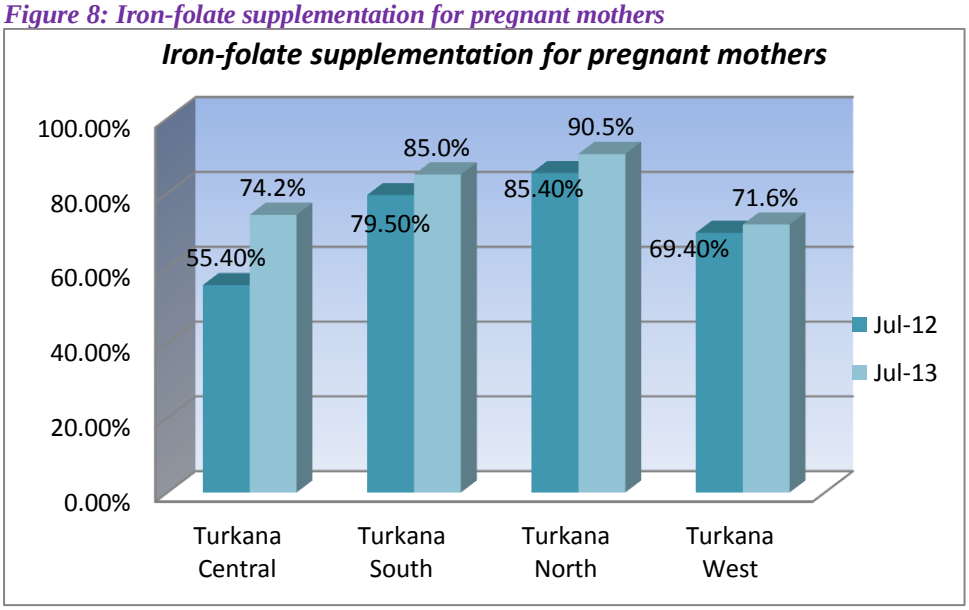
*Table 33: Iron-folate supplementation for pregnant mothers*

| | Turkana Central | Turkana South | Turkana North | Turkana West |
|---|---|---|---|---|
| **Iron Supplementation** | **N=418** | **N=513** | **N=389** | **N=525** |
| **Iron supplementation among pregnant women** | **310 (74.2%)**<br>274 (55.4%) | **436 (85.0%)**<br>407 (79.5%) | **352(90.5%)**<br>(380)85.4% | **376(71.6%)**<br>(289)69.4% |

Iron supplementation in pregnancy has been advocated as a means of controlling anaemia and routine iron supplementation is the current cornerstone of efforts to reduce iron-deficiency anaemia. WHO recommends a 6-month regimen of a daily supplement containing 60 mg of elemental iron along with 400 µg of folic acid for all pregnant women. In rural Kenya where anaemia prevalence is high (>40%), WHO recommends postpartum treatment for three additional months[69].

A question addressing whether the caregiver had taken any form of iron supplementation during her last pregnancy yielded responses, as shown in Table 33 above. HINI project target is at least 80% supplementation coverage; there has been a substantial improvement towards this in iron supplementation for PLW since July 2012.

*Figure 8: Iron-folate supplementation for pregnant mothers*




## 7.0 Water, Sanitation and Hygiene Practices

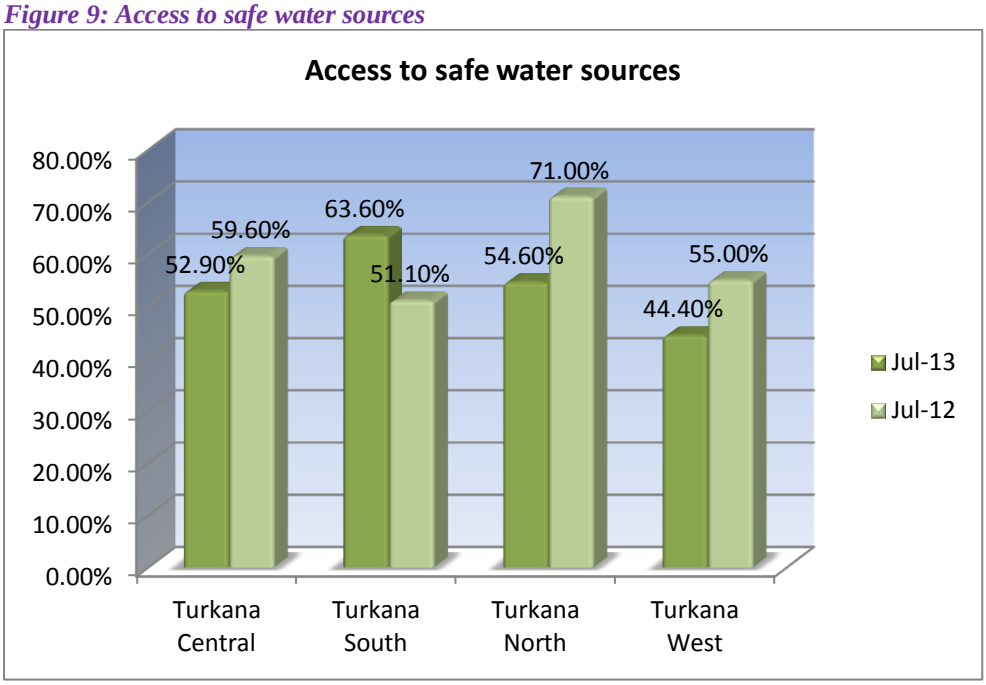
*Table 34: Sources of drinking water*

| | Turkana Central | Turkana South | Turkana North | Turkana West |
|---|---|---|---|---|
| | N= 489 | N= 640 | N=589 | N= 599 |
| **River** | 13.7% | 11.1% | 14.2% | 10.8% |
| **Water tap** | 25.2% | 24.4% | 12.5% | 23.4% |
| **Borehole** | 16.8% | 32.7% | 30.5% | 20.5% |
| **Unprotected well** | 21.1% | 14.2% | 13.4% | 5.6% |
| **Protected well** | 2.9% | 0.3% | 5.3% | 0.3% |
| **Tanker** | 2.7% | 0.3% | 5.5% | 1.9% |
| **Water Kiosk** | 0.2% | 0.00% | 0.00% | 0.00% |
| **Dam** | 7.8% | 6.3% | 6.3% | 1.2% |
| **Laga** | 8.8% | 10.6% | 9.1% | 36.3% |
| **Other(Lake & Spring)** | 0.8% | 0.2% | 3.3% | 0.00% |

There were several sources of water for household use reported by respondents. From the survey responses, those indicated in the green rows from Table 34 above were using drinking water from safe sources like boreholes, water tankers, water taps and protected wells. The rest were using drinking water from unsafe sources [70]like public pan and unprotected wells. Unsafe water sources are contaminated due open defecation, crude solid and liquid waste disposal methods, livestock and birds droppings, direct bathing and washing at open water sources i.e. pans and dams, seepage on shallow wells. Use of safe water sources has decreased compared to July 2012 (especially in pastoral livelihoods-North and West, but borehole and water taps (including water kiosks), as safe sources, remained the main source of drinking water. This is expected with recharge of boreholes, after good long rains. HH are likely to revert to using more unsafe sources as it becomes drier. Use of safe water sources is indicated in Figure 9:

[69] UNICEF, WHO & UNU. 2001. Iron deficiency anemia: assessment, prevention, and control: a guide for programme managers. WHO/NHD/01.3.
[70] Unsafe water sources are defined from the household questionnaire as: River, Lake, Springs, Unprotected well, Public pan, Dam and Laga.

*Figure 9: Access to safe water sources*



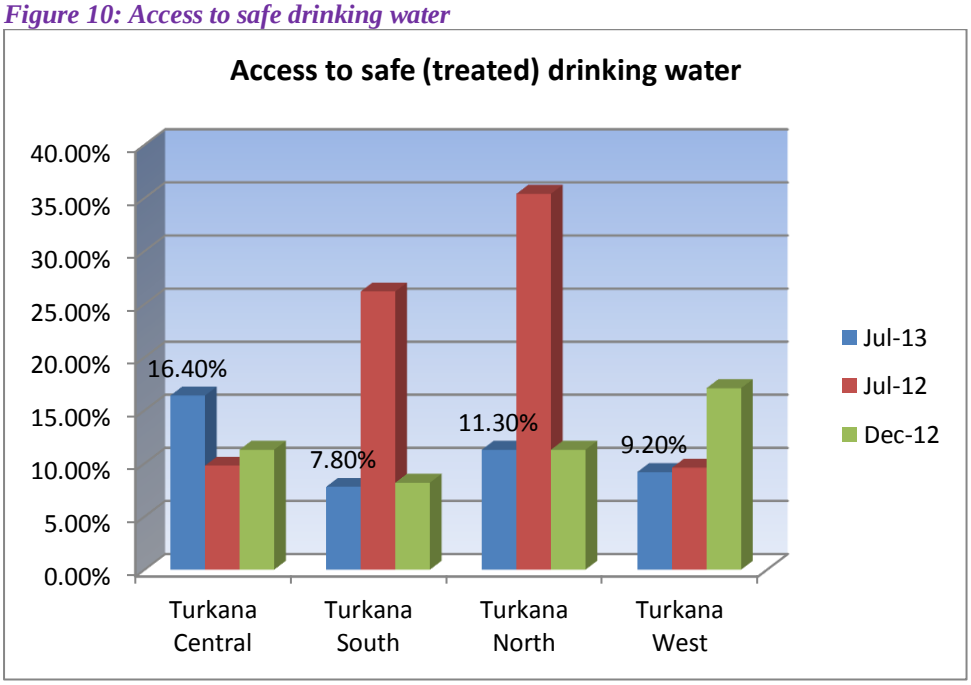

Turkana Central (16.4%) and North (11.3%) had a much higher rate of utilization of treated water for drinking than South (7.8%) and West (9.2%). From Table 35 below, boiling was the method of treatment most used as effective treatment, followed by adding chemicals. Access to safe water was computed from HH who treat drinking water by boiling and using water treatment chemicals. Trend analysis shows however, shows that while there has been some improvement in water treatment since 2011, this has deteriorated again in in 2013(Figure 10). Availability of water treatment chemicals is minimal for majority of households due to unreliable availability of water treatment chemicals and the fact that households dislike the taste of the treatment chemicals and thus do not use them.

*Table 35: Treatment of Drinking water*

| | Turkana Central | Turkana South | Turkana North | Turkana West |
|---|---|---|---|---|
| | **N= 488** | **N= 640** | **N= 589** | **N= 599** |
| **Nothing** | 83.2% | 85.9% | 88.7% | 89.8% |
| **Boiling** | 11.1% | 6.6% | 10.4% | 6.7% |
| **Filtering with cloth** | 0.2% | 0.0% | 0.0% | 0.7% |
| **Let it settle** | 0.2% | 2.3% | 0.0% | 0.2% |
| **Adding chemicals(Purr/Waterguard)** | 5.3% | 1.3% | 0.9% | 2.7% |
| **Adding traditional Herbs** | 0.0% | 3.9% | 0.0% | 0.0% |

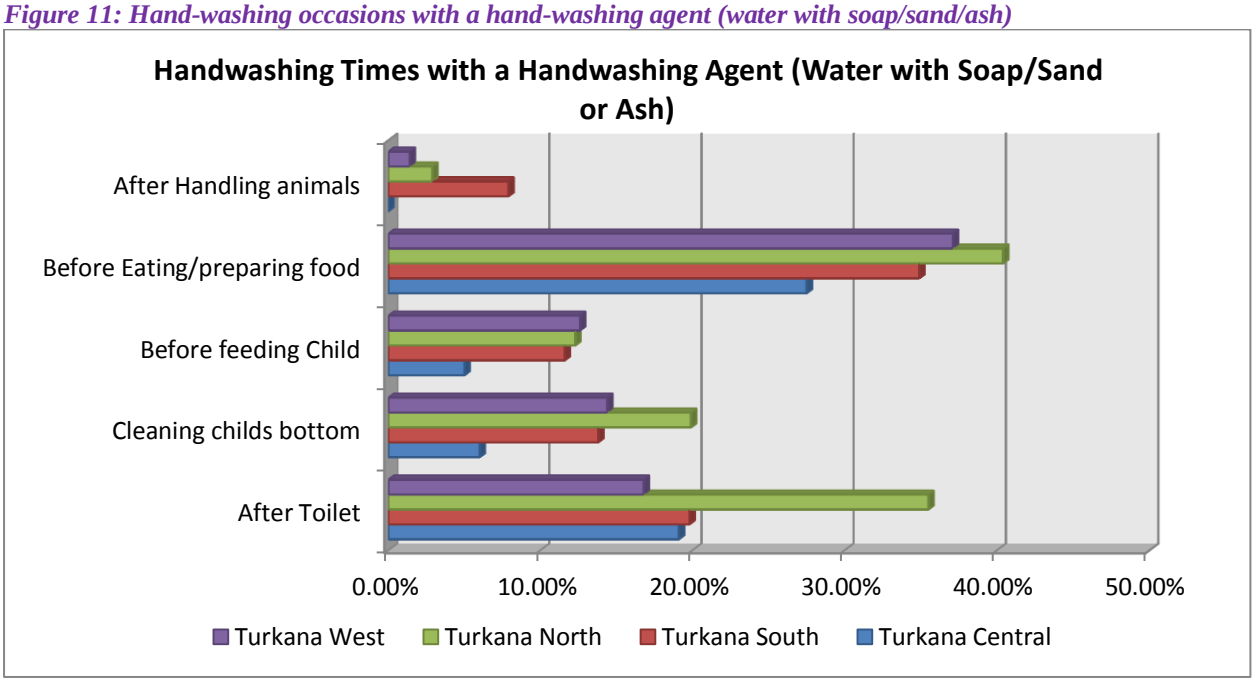
Figure 10 below indicates that there has been a very significant decrease in safe drinking water in Turkana South and North. However, access has increased in Central and West.

*Figure 10: Access to safe drinking water*



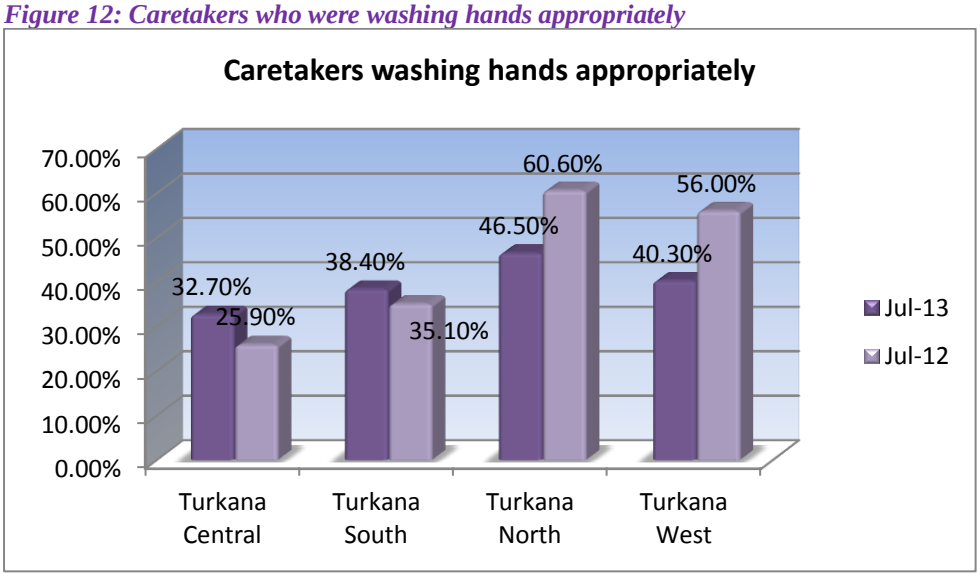
### 7.0.3 Hand-washing

*Figure 11: Hand-washing occasions with a hand-washing agent (water with soap/sand/ash)*




As indicated in Figure11**,** all caretakers practiced basic hygienic hand washing practices, with most responses based on washing after visiting the toilet, eating and preparing food and after cleaning child's bottom. Water only was reportedly the main washing agents used. 35-45% of the respondents used water and soap or ash/sand. In order to prevent the spread of disease through contamination, SPHERE standards (2004) recommend hand washing always after defecation and before eating and food preparation and the users should have the means to wash their hands after defecation with soap or an alternative. Only <20% of the caretakers said that they wash their hands after cleaning a child's bottom and <15% before feeding the child. This is a significant decrease from July 2012 and is likely to have a profound effect on cross-contamination. HINI targets > 50% should have hand washing station at home.

*Figure 12: Caretakers who were washing hands appropriately*




### 7.0.4 Environmental Sanitation

*Table 36: Toilet Use and Disposal of Children's Waste*

| Type of Toilet Used by HH | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | N= 487 | Turkana Central | N= 667 | Turkana South | N= 589 | Turkana North | N=590 | Turkana West |
| **Traditional pit latrines** | 67 | 13.8% | 85 | 12.7% | 37 | 6.3% | 25 | 4.2% |
| **Ventilated improved pit latrines (VIPs)** | 30 | 6.2% | 88 | 13.2% | 33 | 5.6% | 43 | 7.3% |
| **Flush toilet** | 1 | 0.2% | .0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| **Open field** | 369 | 75.8% | 437 | 65.5% | 449 | 76.2% | 404 | 68.5% |
| **Near the river** | 19 | 3.9% | 55 | 8.2% | 25 | 4.2% | 105 | 17.8% |
| **Behind the house** | 1 | 0.2% | 2 | 0.3% | 45 | 7.6% | 13 | 2.2% |

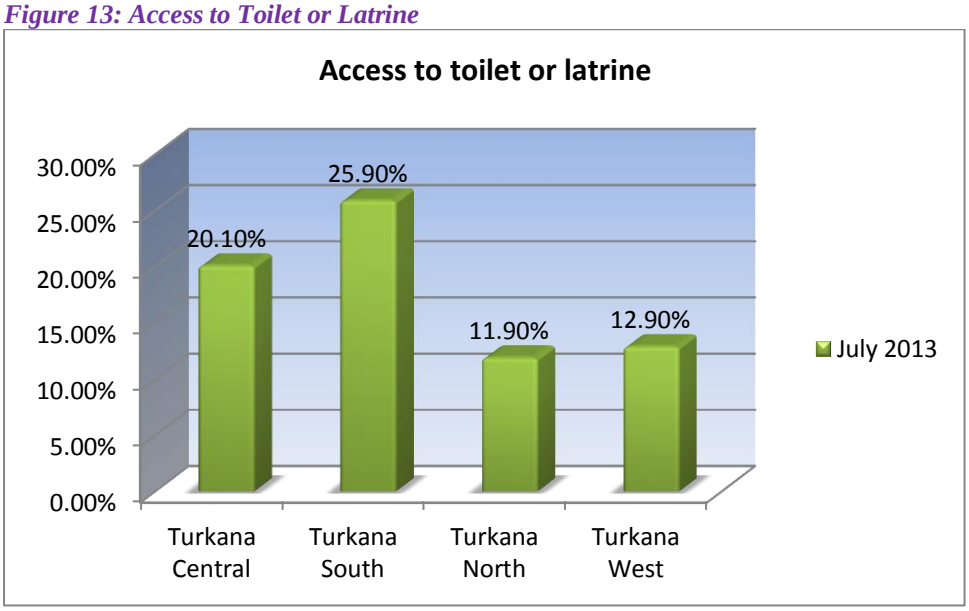
| Disposal of Children's Faeces | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | N=488 | Turkana Central | N=64 | Turkana South | N=584 | Turkana North | N=599 | Turkana West |
| **Disposed off immediately and hygienically** | 114 | 23.4% | 126 | 19.7% | 52 | 8.9% | 53 | 8.8% |
| **Disposed off immediately in the nearby bushes** | 369 | 75.6% | 428 | 66.9% | 515 | 88.2% | 504 | 84.1% |
| **Not disposed (scattered in the compound)** | 0 | 0.00% | 82 | 12.8% | 6 | 1.0% | 10 | 1.7% |
| **Use of dogs** | 4 | 0.8% | 4 | 0.6% | 11 | 1.9% | 28 | 4.7% |
| **Other-Near the river** | 1 | 0.2% | 0 | 0.0% | 0 | 0.0% | 4 | 0.7% |

11.9%-25.9% of HH had access to toilet facilities, as shown in Table 36 above. This is consistent with the most current data on latrine access in the county in the assessment done in July 2012, and the LRA which estimates latrine coverage in the county to be 23.5%. Turkana South latrine access at 25.9% is now consistent with the current data- July 2012 figure of 11.9% was most likely a misrepresentation due to incorrect framing of the question. Access was considered to be use of toilet (whether owned/community/neighbor) by most members of the HH. Those without access are predisposed to related diseases. The most common (>75%) sanitation measures used by these HH were open field and near the laga/river. Low latrine coverage is attributed to the migratory and socio-cultural lifestyles of the predominantly pastoralist communities resident in these areas, cultural issues and weak soil in the county whereby during wet season most of them do collapse[71]. FGD data indicated that nearby bush ('natirae, namoi, nan'gol'), using the burying 'cat' method and defecating along the river were the most common practice of disposing faeces. In addition, only a small proportion of all FGD respondents indicated knowledge of hand-washing after defacation. It was also confirmed through observation that a significant proportion of children's feaces are also disposed of un-hygienically-scattered in the compound, anywhere in the village or nearby bush. Children's bottom was cleaned using sand ("akinyunyu"), and for the few that can afford it- water and soap. Other methods used to clean the child were use of use cypress leaves, old cloths and barks of a tree (ngakabuki), surrounding papers, dry donkey faeces. As well as dogs licking the baby's bottom (increasing the risk of zoonotic infection e.g. hydatid disease) [72].

This is yet another avenue of infection and contamination. The use of open field/bush for faecal disposal coupled with consumption of water from open sources poses a risk of contamination of drinking water, a pre-disposing factor to diarrhoeal diseases and acute malnutrition. This finding is corroborated by FGD responses where all livelihoods reported that they clean their hands after defecation with leaves, stones, barks, dry animal droppings or pieces of paper/cloth. Water scarcity was given as a reason for not washing hands-with priority for drinking and cooking. However, negligence/carelessness and ignorance on handwashing by some caretakers is acknowledged. Some carry spoons in their pockets to consume food, without touching it[73].

For those who had access to toilets, the types of toilet facilities available in the district were mostly traditional pit latrines , and improved pit latrines with a small proportion using flush toilets.

***Figure 13: Access to Toilet or Latrine***




[71] KFSSG Turkana Long Rain Assessment Draft Report (August 2013)
[72] FGD-All livelihoods
[73] FGD Lopur

## 8.0 Household Food Security Indicators

### 8.0.1 Household Food Consumption, Dietary Diversity and Livelihoods *(Comparison of July 2012 and July 2013)*

*Table 37: HH Meal Frequencies for usual and 24-hr recall consumption*

| Meal Frequencies for household members | Turkana Central | | Turkana South | | Turkana North | | Turkana West | |
|---|---|---|---|---|---|---|---|---|
| **HH Meal Frequency Yesterday (24 hour recall)** | | | | | | | | |
| Other members (> 5 years) mean number of times/day (Mean SD) | 1.61 | ±0.69 | 1.74 | ±0.73 | 1.66 | ±0.64 | 1.42 | ±0.62 |
| Other members (> 5 years) mean number of times/day (Mean SD) | 1.58 | ±0.75 | 1.64 | ±0.74 | 1.81 | ±0.68 | 1.58 | ±0.68 |
| Meal Frequency: At least 3+ times a day | N=488 | (55) 11.4% | N=640 | (98) 15.0% | N=584 | (46) 07.8% | N=599 | (29) 04.9% |
| Meal Frequency: At least 3+ times a day | N=560 | (66) 11.8% | N=538 | (67) 12.5% | N=489 | (76) 15.5% | N=478 | (42) 08.8% |
| Meal Frequency: 2 times a day | | (189) 38.7% | | (285) 44.5% | | (299) 51.2% | | (200) 33.4% |
| Meal Frequency: 2 times a day | | (190) 33.9% | | (214) 39.8% | | (244) 49.9% | | (195) 40.8% |
| Meal Frequency: 1 times a day | | (243) 49.8% | | (250) 39.1% | | (233) 39.9% | | (363) 60.6% |
| Meal Frequency: 1 times a day | | (297) 53.0% | | (249) 46.3% | | (169) 34.6% | | (237) 49.6% |
| Meal Frequency: 0 times a day | | (1) 0.02% | | (7) 01.1% | | (6) 01.0% | | (7) 01.2% |
| Meal Frequency: 0 times a day | | (7)1.3% | | (8)1.5% | | 0% | | (4)0.8% |
| **Usual HH meal Frequency** | | | | | | | | |
| No. of meals usually consumed(Mean SD) | 1.72 | ±0.69 | 1.98 | ±0.78 | 2.06 | ±0.62 | 1.55 | ±0.62 |
| No. of meals usually consumed(Mean SD) | 1.58 | ±0.69 | 1.88 | ±0.74 | 1.94 | ±0.73 | 1.72 | ±0.70 |
| Usual meal Frequency: At least 3+ times a day | N=488 | (62) 12.7% | N=640 | (183) 28.6% | N=584 | (126) 21.6% | N=599 | (37) 06.2% |
| Usual meal Frequency: At least 3+ times a day | N=560 | (58) 10.4% | N=538 | (115) 21.4% | N=489 | (113) 23.1% | N=478 | (58) 12.1% |
| Usual meal Frequency: 2 times a day | | (230) 47.1% | | (259) 40.5% | | (367) 62.8% | | (259) 43.2% |
| Usual meal Frequency: 2 times a day | | (207) 37.0% | | (243) 45.2% | | (235) 48.1% | | (236) 49.4% |
| Usual meal Frequency: 1 times a day | | (194) 39.8% | | (197) 30.8% | | (90) 15.3% | | (299) 49.9% |
| Usual meal Frequency: 1 times a day | | (295) 52.7% | | (180) 33.5% | | (140) 28.6% | | (176) 36.8% |
| Usual meal Frequency: 0 times a day | | (1) 00.2% | | (1) 00.2% | | (1) 00.2% | | (4) 00.7% |
| Usual meal Frequency: 0 times a day | | 0% | | 0% | | 1(0.2%) | | 8(1.7%) |

On the whole, the reported usual/normal frequency of taking meals by households was 1.55(West)-2.06(North) times while the one reported for the previous day was 1.42(West)-1.74(South). This indicates that most households in Turkana County were consuming 1-2meals /day, the preceding day, and usually. Households that took 1 meal on the preceding day were (49.8%; 39.1%; 39.9%; 60.6%). Those consuming 2 meals were (38.7%; 44.5%; 51.2%; 33.4%). A comparison of means analysis showed NO significant variance between the frequency for the means of normal/usual intake and that of the previous 24 hours ($P > 0.05$). These results are also comparable to July 2012. An analysis of difference between proportions shows that there was a significant difference between the proportion of households reporting having taken 3 meals the previous day and the usual/normal proportion of members taking three meals a day ($P<0.05$)- with Turkana West showing the worst prognosis. This strongly suggests a current prevailing food deficit situation in the community.

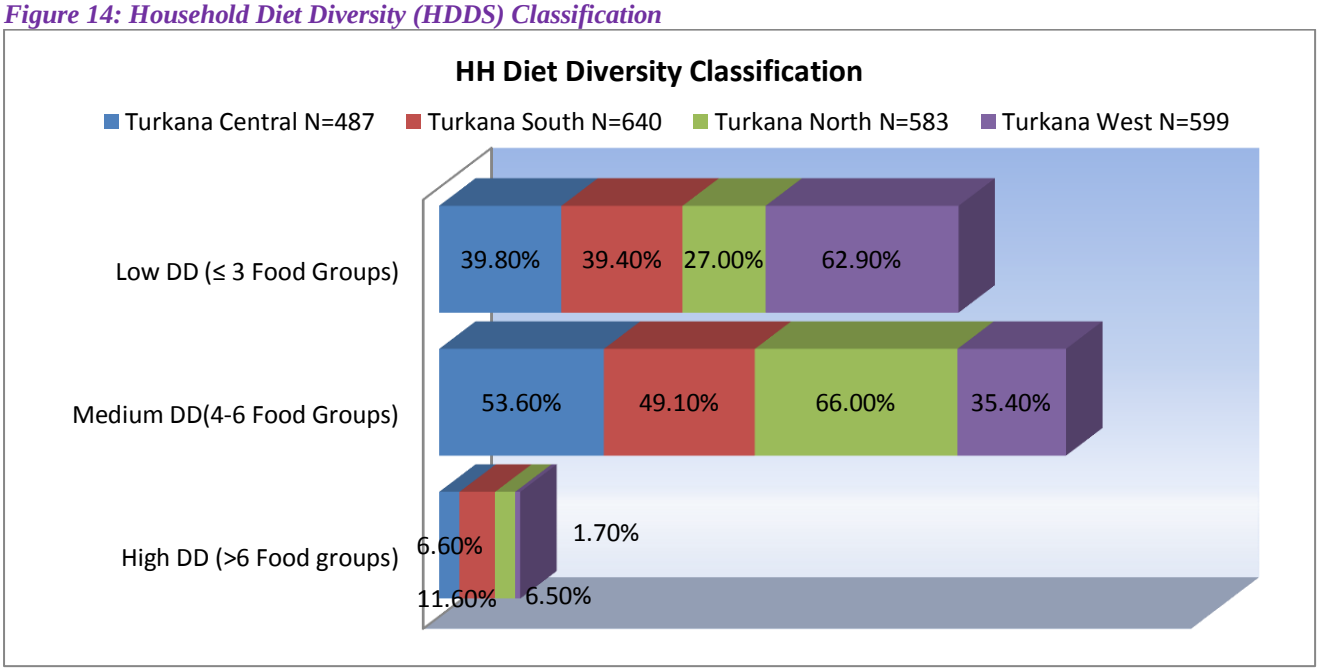
**HH Dietary Diversity (HDDS)** ***(Comparison of July 2012 and July 2013)***

***Table 38: HH Dietary Diversity Descriptives***

| | Turkana Central N=487 | Turkana South N=640 | Turkana North N=584 | Turkana West N=599 |
|---|---|---|---|---|
| ***Mean*** | *3.98* | *4.08* | *4.38* | *3.19* |
| ***Mean*** | *3.04* | *3.38* | *3.45* | *3.61* |
| ***Median*** | *4.00* | *4.00* | *5.00* | *3.00* |
| ***Median*** | *3.00* | *3.00* | *3.00* | *3.00* |
| ***Mode*** | *5.00* | *5.00* | *5.00* | *3.00* |
| ***Mode*** | *2.00* | *1.00* | *4.00* | *3.00* |
| ***Std. Deviation*** | *1.68* | *0.32* | *1.63* | *1.53* |
| ***Std. Deviation*** | *1.62* | *1.93* | *1.46* | *1.78* |

The previous 24-hours' food intake by over-5s was used as a proxy to assess household dietary diversity in this surveys. Food intake by this sub-group is a good estimation of the variety of what other members of the households took (excluding the U5s). The dietary diversity questionnaire is a simple qualitative measure of food intake at household or individual level. At the household level, the dietary diversity score (DDS) is indicative of the access or ability to acquire a variety of foods, including foods that may not have high nutrient value such as beverages and condiments. The reference period for the DDS may be one, three, or seven days[74]. This survey used the 24-hour recall method to obtain information on the type and of food consumed, using a slightly modified version of the FAO[75] tool. The dietary diversity section of the questionnaire assessed the variety of the diet by summing the number of food groups eaten by household members in the 24 hours prior to the interview. The 14 major food groups inquired about are cereals, tubers, vegetables, fruits, meat, fish, eggs, legumes/pulses, milk and milk products, fats and oils, sugary foods and drinks and beverages (coffee/tea)

***Figure 14: Household Diet Diversity (HDDS) Classification***




The analysis of findings was conducted using the FAO classification framework[76]. A diverse diet was indicated by consumption of four or more food groups. Analysis of aggregate data in each survey zone is indicates a mean Household Diet Diversity Score (HDDS) of 3.19-4.38 (SD 1.53-1.63) and median of 4.0 for the number of food groups consumed (Table 38). There has been a slight improvement in HDDS in all zones, except Turkana West. A diverse diet was indicated by consumption of four or more food groups. Analysis of aggregate data in each survey zone is indicates a mean Household Diet Diversity Score (HDDS) of 3.19-4.38 and median of 3.0 for the number of food groups consumed. Overall, majority responded that they consumed at least four food groups in the previous 24 hours (within the threshold for an adequate/medium diverse diet of at least 4 food groups). Turkana Central (60.2%), Turkana South(60.6%) and Turkana North (73.0%) have a diet diversity score of ≤ 4, which highlights a better food security situation compared to July 2012. However, all zones still have a significant population (>25%) with poor dietary diversity of ≤3food groups, indicating a critical DD situation. Turkana West is worst off with 62.9% of population with poor DD.

[74] Household Dietary Diversity Score (HDDS) for Measurement of Household Food Access: Indicator Guide, VERSION 2, 2006,
[75] FAO Guidelines for measuring dietary diversity, March 2007.
[76] Guidelines for measuring household and individual dietary diversity (April 2011)

*Figure 15: Foods consumed in 24-hour recall*

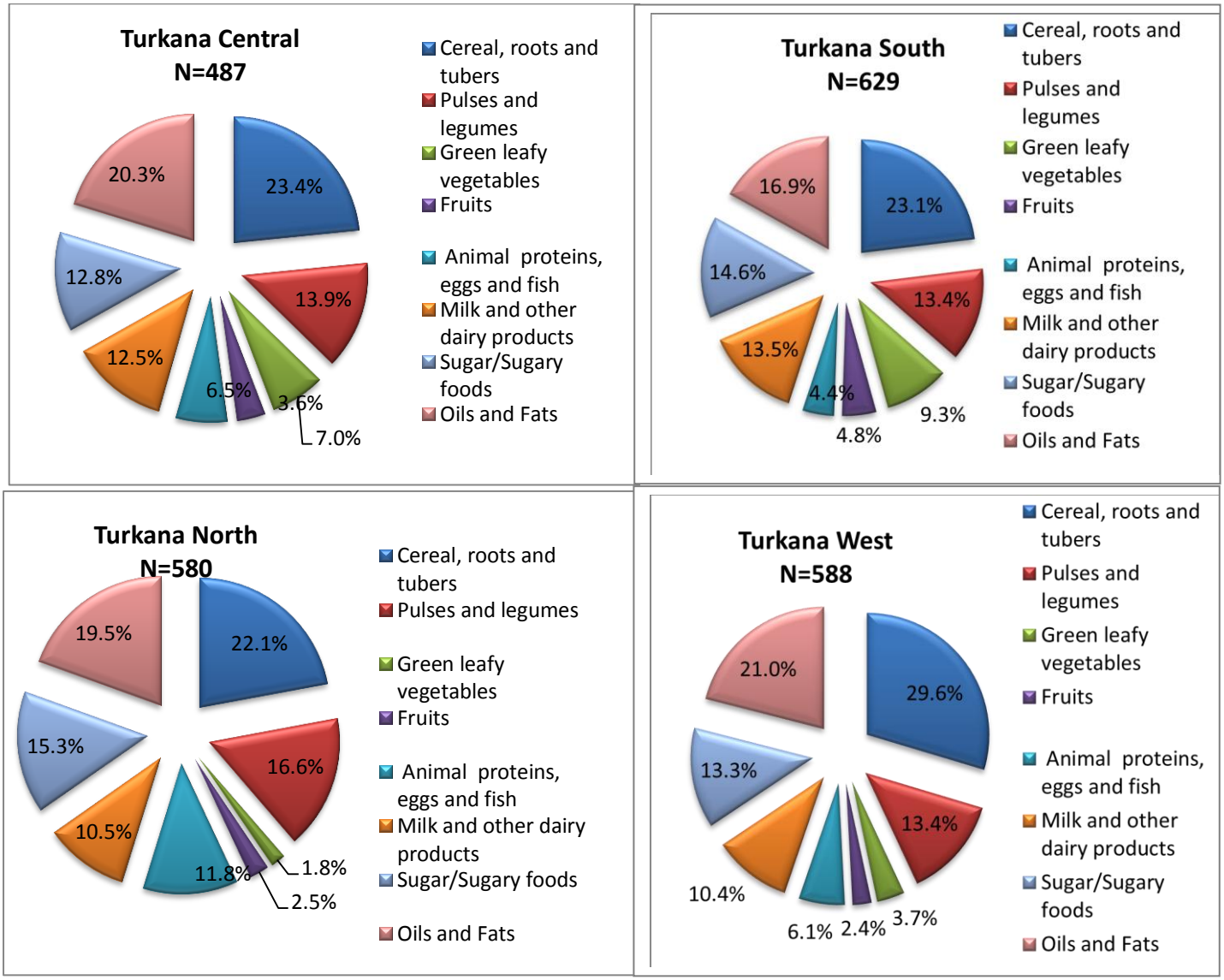
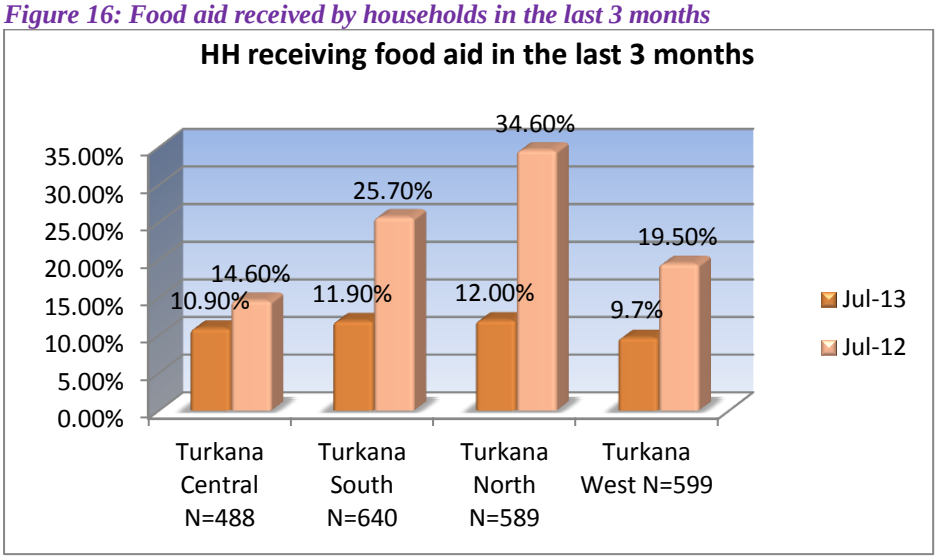



Figure 15 shows that the most common food consumed by the households was cereal based food items (mainly maize, maize-meal-posho, and sorghum), oils and fats, sugar (tea) and pulses/legumes (beans). In all the surveyed zones, the major sources of protein are pulses/legumes (beans), followed by milk/milk products. A very small proportion of HHs consumed meat/fish, eggs, vegetables and fruits. The uncharacteristic low consumption of milk and meat among pastoral HH was explained in FGDs and the LRA, with shoats kidding at time of survey, there was lower milk availability. Shoats are rarely slaughtered for consumption, because they are a source of livelihood. Vegetables and fruits were inaccessible because of access and high prices. This is backed up by LRA data outlining foods being consumed as maize, maize meal, milk, beans and wild fruits for both the pastoralists and agro pastoralists. In addition, lack of sufficient nutritional knowledge on the importance of the consumption of food groups such as vegetables, fruits, eggs due to traditional protein- based diet that shape food selection habits, also attributed to the low consumption of these food groups. With regard to caloric provision, sugar, cereals, and oil/fats still remain the important sources of calories in the district. KFSSG long rains assessment (August 2013), outlines that the food security situation is likely to continue declining in most of the pastoral livelihood zones until at the onset of the short rains. High cereal prices are likely to increase in these areas due to poor market supplies and the resultant benefits may not be significant because of livestock migrations and declining livestock prices. Distances or waiting time at water sources are likely to continue increasing translating to significant shortfalls in food consumption. Milk availability at household level is significantly below normal across the county. On average only 2% of HH are accessing 0.25-1.0/day in the pastoral livelihood zone, below the usual 3L/day. The below normal livestock milk availability is attributed to most animals being pregnant, and the few lactating ones have to walk far to access fodder. Milk prices are above average and range from Ksh 45-80/L compared to the normal Ksh 30-45 in the pastoral livelihood zones. Pastoralist purchasing power is also diminished with cereal: meat ratio of 1.03[77]. Overall, this indicates a poor diet in most households, with deteriorating food security situation. The Food Aid food basket (Maize, CSB, pulses and oils) contributes significantly to a balanced diet. Without it, food diversity would be generally much poorer in the county at the time of the survey.

[77] NDMA EWB-July 2013

### 8.0.2 Food Aid

*Figure 16: Food aid received by households in the last 3 months*




All zones are lower than the same time last year. Beneficiary numbers had recently been decreased as per KFSSG SRA recommendations in April 2013.With the sub-normal of the long rains, the coverage is again set to be reviewed upwards, according to the Long Rains Assessment Report (August 2013)

*Table 39: GFD Food Basket (March 2013)*

| Commodity | Ration Sizes |
|---|---|
| Cereals | 10.35kgs |
| Pulses | 1.80 kgs |
| CSB | 1.20 kgs |
| Vegetable Oil | 0.60 kgs |

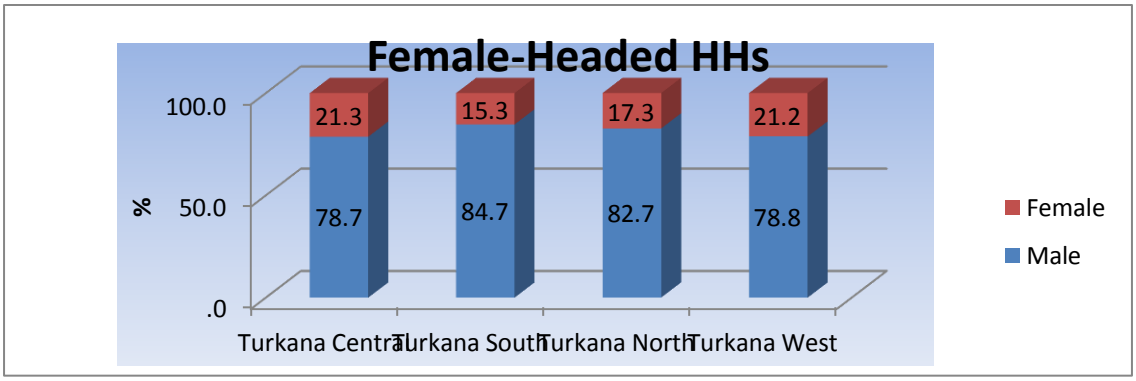
The lead implementing agencies (Oxfam/World Vision) indicated that each person residing in a targeted household received a 75% ration size for 30-day duration; that included; 10.35kg of cereals, 0.6kg of oil, 1.2kg of CSB, and 1.8kg of pulses. These amounts were adequate to provide required daily kilocalories[78]. Table 39 shows estimated ration received per person, per month.

*Table 40: Estimated actual ration per person per month*

| **Type o f food** | | | |
|---|---|---|---|
| | | **Expected /person(75% ration)** | |
| Maize | | 8.4kg | |
| Pulses (lentils) | | 1.5kg | |
| CSB | | 1.8kg | |
| Oil | | 0.6kg | |
| Salt | | 0.075kg | |

Proportional piling during FGD discussions concerning food aid across livelihoods of Turkana County was used to determine the utilization of food aid/supplementary food. Across all livelihoods, 30-60% was used for HH consumption. Inter-household sharing of the GFD is not only common but encouraged due to strong social culture. Families who receive food ratio and supplementary food share with the other extended family and friends who didn't receive the ration (20-30%), ≈20% to pay debts, while about 20% is sold 'to pay school fees and buy shoes for children'. Some participants also cited selling food aid to settle medical bills, using maize to prepare the local brew (busaa) and barter trade in exchange for with bullets which are used to offer security to the people and livestock[79]. These utilization pattern matches quantitative data that has been collected on the same, in 2011.

### 8.0.3 Household Demographics, Livelihoods and Livestock



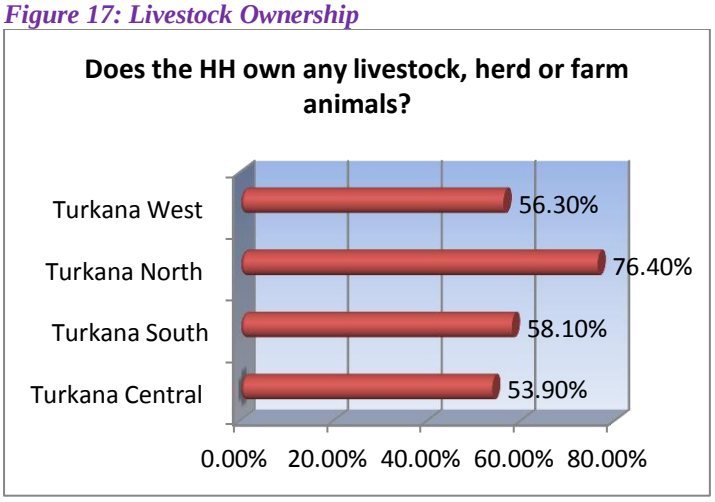

[78] Based on UNHCR/UNICEF/WFP/WHO Guidelines for Food and Nutrition Needs in Emergencies
[79] FGD findings- all livelihood zones

Overall, the inhabitants of Turkana County (Table 41) depended on five main sources of income during the previous 3 months namely; sale of charcoal/firewood (19.3% 37.0% 29.1% 61.1%)Casual wage labour (18.9% 11.3% 12.2% 07.5%), brewing (5.5% 15.5% 12.0% 4.8%), small business (7.8% 4.7% 9.4% 6.0%) and sale of livestock (5.5% 5.3% 5.5%6.5%). This pattern of livelihood is similar to July 2012, except for an increase in the sale of livestock- which is a coping mechanism. Another significant source of livelihood, specifically for women in Turkana Central and South, is basketry/weaving (≈5%). As expected in Turkana South agropastoral zone, the sale of crops a significant source of livelihood after charcoal/firewood, at 9.4%. Sale of fish is only found in Turkana Central (1.4%) and North (8.0%) as these are both fisheries zone and markets for fish business. As expected, the majority of salaried employment is found in Turkana Central (4.9%). Herding and gathering of wild fruits (9.2%-Turkana North) and kin support (1.2% 2.2% 1.4% 1.8%) are coping mechanisms and demonstrate weakened support structures, respectively. Other sources of income, not listed in questionnaire included gold mining, HSNP/administrative support and collecting wild fruit. The mix in income sources may be a reflection of the shift of the traditional occupation of a pastoral community have settled near the urban centres and have resorted to charcoal /firewood selling, wage labour and petty trade as a source of income. Poorer households engage in low-value labour-based activities such as collecting and selling firewood-the highest livelihood activity in all zones. This suggests that the majority of HH in Turkana County are wealth-ranked as poor. The fact that remittances/kin support is reflected in income source, rather than formal employment, indicates that the population is likely to have only one bread-winner or is currently female-headed. The dominance of charcoal/firewood selling and brewing livelihoods contribute to environmental degradation and lack of manpower productivity.

***Table 41: Livelihoods Profile***

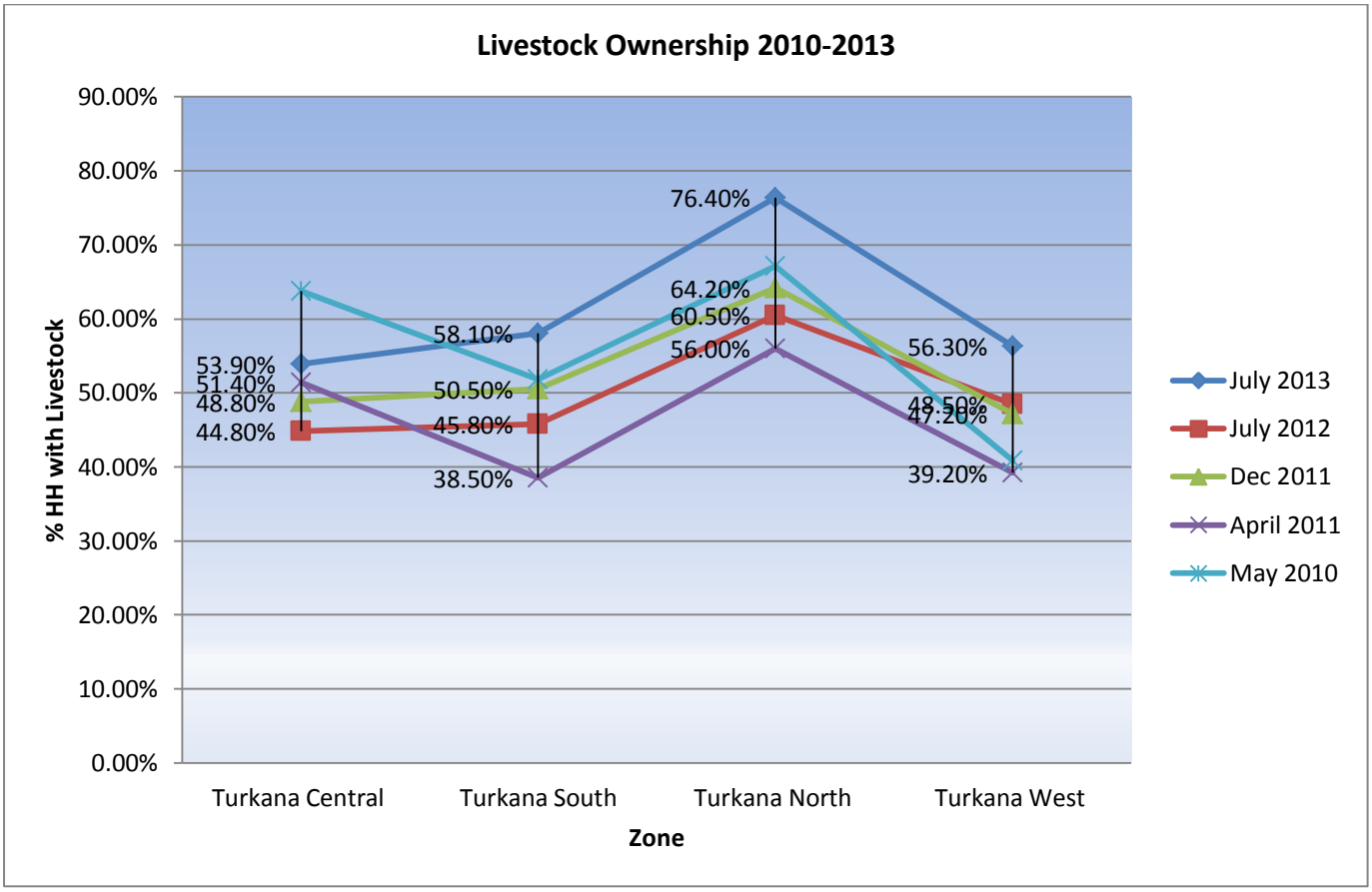
| | Turkana Central N=488 | Turkana South N=640 | Turkana North N=589 | Turkana West N=599 |
|---|---|---|---|---|
| **Sale of crops** | 2.0% | 9.4% | 1.4% | 3.0% |
| **Sale of livestock** | 5.5% | 5.3% | 5.5% | 6.5% |
| **Sale of animal products** | 3.5% | 2.7% | 4.1% | 0.2% |
| **Brewing** | 5.5% | 15.5% | 12.0% | 4.8% |
| **Sale of fish** | 1.4% | 0.0% | 8.0% | 0.0% |
| **Sale of firewood/charcoal** | 19.3% | 37.0% | 29.1% | 61.1% |
| **Sale of food aid** | 0.0% | 0.3% | 0.3% | 0.5% |
| **Casual labour** | 18.9% | 11.3% | 12.2% | 07.5% |
| **Basketry/weaving** | 4.9% | 4.7% | 2.7% | 0.0% |
| **Skilled labour** | 0.0% | 0.0% | 0.2%(volunteer teacher) | 0.0% |
| **Employed (salaried)** | 4.9% | 3.3% | 3.3% | 1.3% |
| **Petty trading** | 1.4% | 3.1% | 1.4% | 6.2% |
| **Small business** | 7.8% | 4.7% | 9.4% | 6.0% |
| **Family support** | 1.2% | 2.2% | 1.4% | 1.8% |
| **Other(specify)** | 3.1% (Gold mining) | 0.6%(HSNP/mining) | 9.2%(Herdsman/gathering of wild fruits) | 1.0%(Administration support, aid from well-wishers/mining) |

***Figure 17: Livestock Ownership***



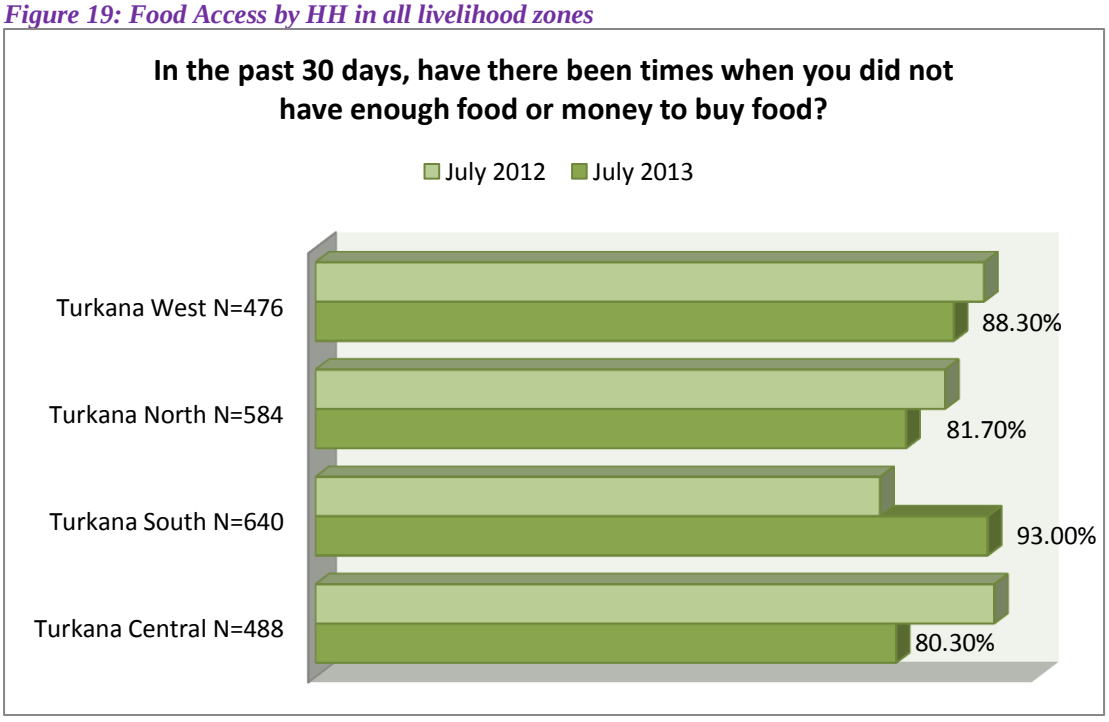

Livelihood diversification has been essential to spread the risk of food insecurity and cope with the changing nature of hazards in pastoral areas. Though livelihood profiles indicate that charcoal/firewood selling and informal employment are the main sources of livelihood, pastoralism remains the mainstay of much of Turkana County. Figure 18 indicated that more households from all survey sites owned livestock compared to July 2012. With the good rains and kidding season of the shoats, this is likely to increase. These findings imply that there was higher pastoralist purchasing power than in July 2012. However, these gains must be balanced against the increasing food prices.

*Figure 18: Livestock ownership trends in Turkana County: 2010-2013*



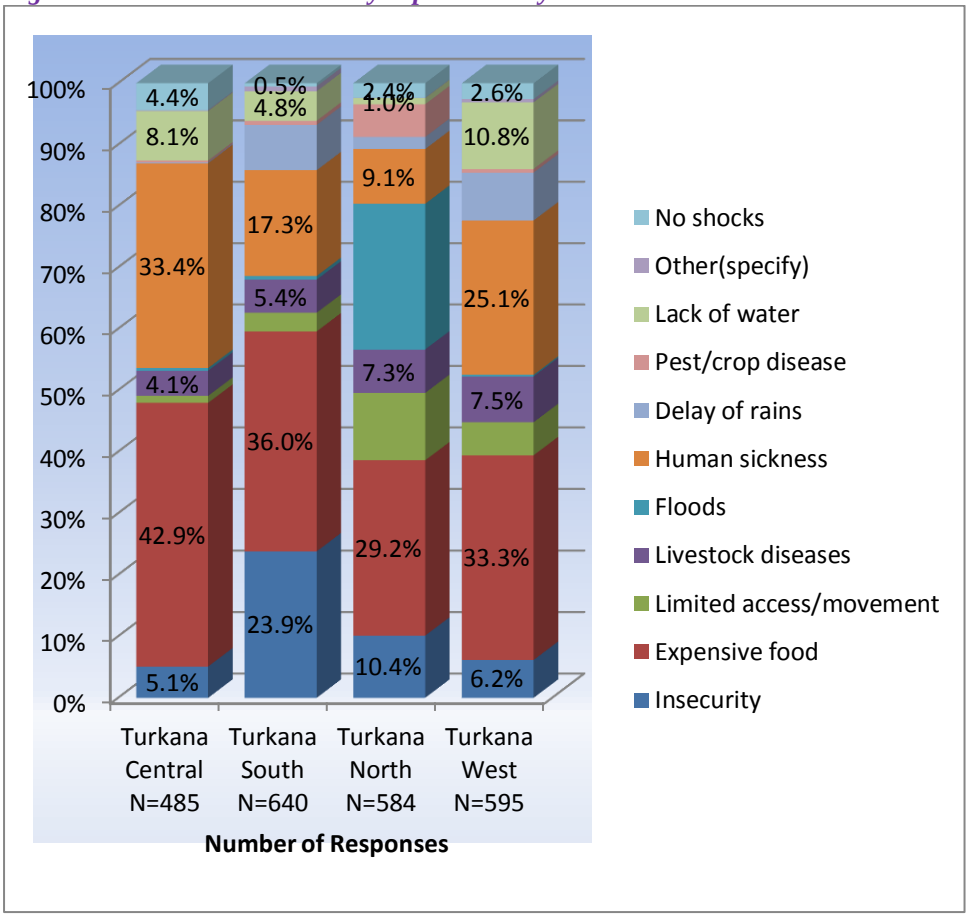

### 8.04 Food Access, Shocks, and Coping Strategies

*Figure 19: Food Access by HH in all livelihood zones*




One of the primary indicators of food security is assessment of food access. The question was posed to caregivers whether there had been a time within the last month, when there was no food available or money to buy food. These proportions are similar to July 2012, but slightly lower. However, there was a high proportion of positive responses (80.3%; 93.0%; 81.7%; 88.3%)- particularly in Turkana South, indicates a very precarious food security situation. Where food insecurity is the main cause of malnutrition, livelihoods analysis establishes links between seasonality and nutrition and permits prediction (early warning) of periods when malnutrition is likely to increase. This emphasizes longer-term investment of resources over late and inappropriate short-term emergency interventions.

*Figure 20: Main Shocks currently experienced by HH*



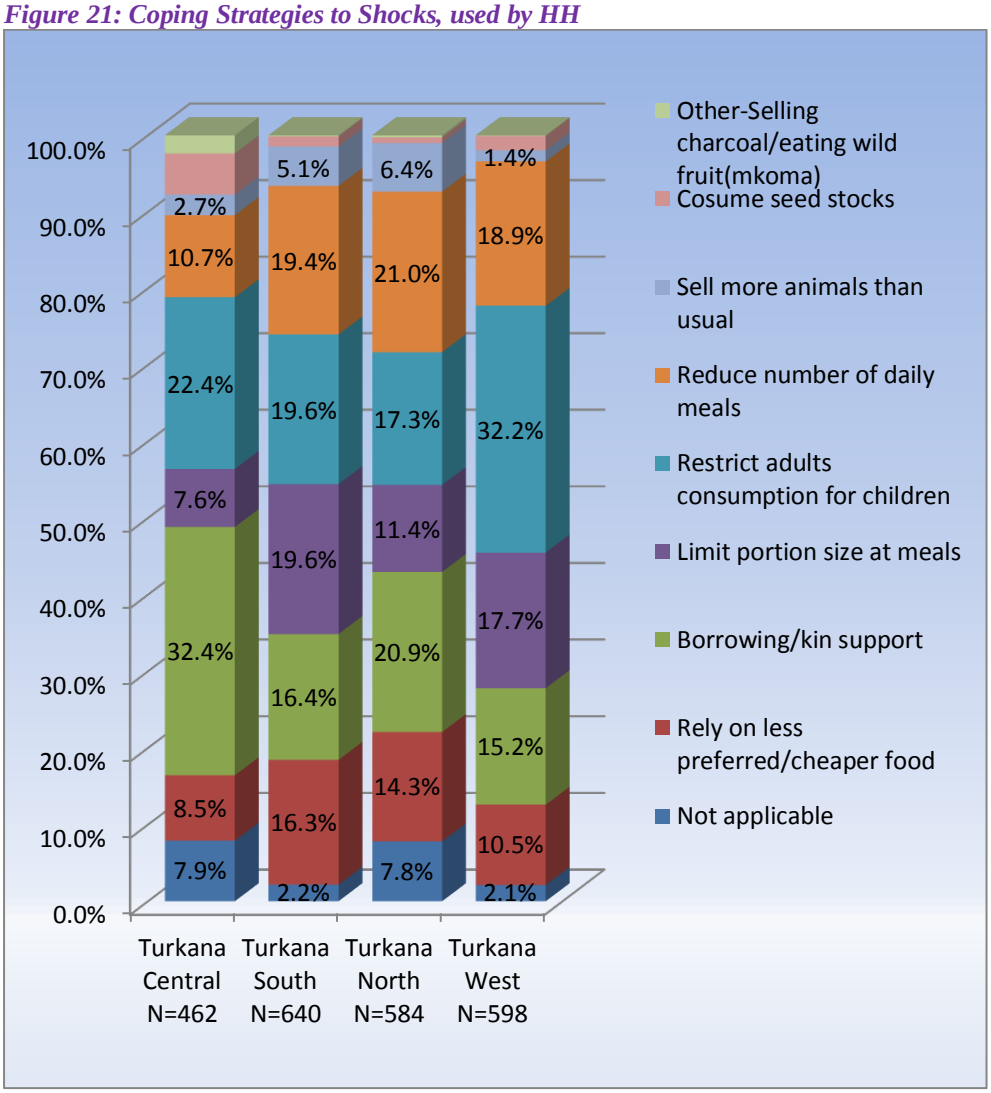

Vulnerability is the degree to which households depend on food and income sources that are affected by shocks, and the available options to mitigate the effects through existing or new livelihood strategies[80]. Understanding vulnerability in food security assessments is important to effectively tackle the negative coping strategies that undermine the long-term sustainability of livelihoods. Vulnerability denotes the lack of resilience to the occurrence of these uncertain events (risks), including long-term and seasonal trends. A very marginal proportion of HH reported having no shocks affecting them (4.4%; 0.5%; 2.4%;2.6%).These are most probably representative of the wealthier/well-off HH that are more resilient to shocks. The most prominent shocks are expensive food (42.9%, 36.0%; 29.2%; 33.3%), predictably affecting Turkana Central the most, where a large proportion of food access is through markets. Human sickness is the next major shock (33.4%; 17.3%; 09.1%; 25.1%) affecting Turkana Central most. Turkana North was affected by flooding (9.1%). Insecurity affected Turkana South most (5.1%; 23.9%; 10.4%; 6.2%) and water stress has started to become a shock element in most zones (8.1%; 4.8%; 1.0%; 10.8%), as a result of limited access and movement. Livestock diseases also seem to be on the upswing (4.1%; 5.4%; 7.3%; 7.5%).

**Coping Strategies**

From Figure 21 below, the highest proportion of households all survey zones reported that coping strategies are based on food restriction. These are reducing the number of daily meals, borrowing/debts, limiting portion size at meals, relying on less preferred/cheaper food and selling more animals than usual. These coping mechanisms employed have a negative effect on nutrition status are implicit on the deteriorating food security situation. This is supported by the KFSSG long rains assessment draft report which states that coping strategy index stood at 2.67 with increased charcoal burning, livestock sales and usual meal numbers and portion sizes having reduced across all livelihood zones. This was an increase from 2.065 recorded in during the short rains assessment (SRA 2013). Turkana Central and North had a higher proportion of HHs not yet employing coping strategies- these are most probably representative of the wealthier/well-off HH. However, in Turkana Central, a major coping strategy being used was borrowing/kin support (32.4%)-indicative of the resilience of social support systems, which serve as an important coping mechanism. However, where purchase is the main source of food, this is indicative that purchasing power has reduced dramatically. With rising inflation, this is further reinforced by the main shock manifestation being expensive food. The impact of livelihoods and income cannot be underestimated because food accessibility is both asset and food-based. Where HH are reliant on their own food production, household food security is affected by seasonality changes. This phenomenon is more severe amongst HH dependent on livestock production and natural-resource as their main source of both food and income. Across the board, the current food security situation was attributed to sub-normal rains, lack of sufficient harvest, migration of livestock as well as increased food prices that reduced purchasing power.

[80] Humanitarian Policy Group Synthesis Paper: Getting it right Understanding livelihoods to reduce the vulnerability of pastoral communities (April 2009)

*Figure 21: Coping Strategies to Shocks, used by HH*




FGD qualitative information offered different perspectives on the food security situation. Pastoralist and fisheries livelihood participants reported that the current situation is moderate-poor (in comparison to the beginning of the year) due to adequate supply of food. The agropastoralist and urban/casual labour felt that the situation was much worse and unpredictable, from a self-sustenance viewpoint, because they still depended on food aid and thus food access remained a problem(direct and indirect). Insecurity has become a threat as *"raids are the main causes of the malnutrition currently. This means that when the livestock are being are taken by the raiders , the people remain starving due to lack of food as this is the only economic activity"*. Most significantly in these livelihoods, the effect of population movement on nutrition is raised- *" In the past , the settlement pattern was not as crowded as today therefore there was less transmission of communicable diseases among the community members hence the malnutrition was lower"*

According to FGDs the main coping strategies and new livelihoods introduced to increase food security in the different livelihood zones are:

**Urban/ Casual Labour Livelihood:**

- Weaving
- Growing subsistence crops along the river for HH use
- burning of charcoal
- Skipping one meal a day

**Agropastoralist Livelihood:**

- Selling of firewood, burning of charcoal,.
- practising small scale farming at Lotubae Irrigation scheme
- selling livestock, mending makuti, brooms and mikeka from Ng'angolea, burning of charcoal, practising basketry and practising small scale farming
- Seeking help from their family and friends

**Fisheries Livelihood:**

- Selling fish; charcoal-burning; collecting firewood
- Increasing price of foodstuffs from shops

**Pastoralist Livelihood:**

- Forego or skip some meals
- Casual jobs, working in rich people houses.
- Gathering and eating wild fruits
- Forming trading groups
- Selling of firewood, burning of charcoal
- Doing 'echuchuka' (aloe vera) business

The main suggestions for addressing the problems outlined above are:

- Eating of diversified food which provide balance diet
- Boiling of water to avoid waterborne diseases
- Covering food after cooking to avoid diseases causing vectors from contaminated food
- Involvement in business activities so as to generate income, which could be used to purchase food
- They need help from government to employ PHOs so that they can sensitise sanitation in the area
- They need to go back to their normal livelihood like pasturing instead of living in the town.
- They are seeking NGOs to intervene by supplying with nutritional feeds
- They are seeking farming inputs in their farms because they lack them e.g. water pipes
- Motivation of the CHWS would improve the situation since they would work tirelessly to identify malnourished children from the community
- Empowering them through education and small scale business
- They should be trained about agricultural issues by specialists
- They should be given loans for their groups which they have formed for trading activities
- Doing fishing practises to generate money
- Practising proper hygiene to avoid outbreak of disease causing organisms

Community contributions:

- They should start chamas inorder to improve their source of income for starting their own trading
- They should go around villages in their own teaching and sensitizing people about good usage of water.
- The Turkana community they should be trained businesses skills and ideas, financial, education and investment.
- The community can improve the situation by engaging into small scale business, agriculture and livestock rearing thus empowering them economically.
- One mother said that they should follow advices from CHWs about health issues in their area.
- They should be active in their Aloe Vera business to acquire money for food
- They should be trained about agricultural issues since most of their farms have dried so as to increase their food supply
- Following advises from CHWs about health issues in their area
- They should be trained about agricultural issues since most of them do not have skills about farming
- Encouraging hygiene to the members of the community through local leaders

## 9. DISCUSSION

### 9.1 Nutritional status of 6-59months old in Turkana County (WHO 2006)

*Table 42: Summary of Nutritional Indicators of 6-59 Months Old Children*

| | TURKANA CENTRAL | TURKANA SOUTH | TURKANA NORTH | TURKANA WEST |
|---|---|---|---|---|
| Wasting (WHO 2006) Weight-for-length/height | **N=583** | **N=733** | **N=585** | **N=795** |
| **Global Acute Malnutrition(GAM)** | **17.2 % (13.2 -21.9)** | **16.5 % (13.6-19.9)** | **25.6 % (21.1-30.8)** | **09.7% (7.7 – 12.1)** |
| **Severe Acute Malnutrition (SAM)** | **3.9% (2.5 -6.1 C.I.)** | **2.7 % (1.8 – 4.0)** | **7.4 %(5.2 – 10.2)** | **2.0% (1.1 - 3.6)** |
| Underweight (WHO 2006) Weight-for-Age | **N=589** | **N= 742** | **N=590** | **N=789** |
| **Prevalence of global underweight** | (179) **26.8 %** (22.2 - 32.0 C.I.) | (230) **31.0 %** (27.7 - 34.5 C.I.) | (169) **28.6 %** (24.0 - 33.7 C.I.) | (107) **13.6 %** (10.9 - 16.8 C.I.) |
| **Prevalence of severe underweight** | (52) **7.8 %** (5.9 - 10.1 C.I.) | (55) **7.4 %** (5.5 - 9.8 C.I.) | (53) **9.0 %** (6.2 - 12.8 C.I.) | (22) **2.8 %** (1.8 - 4.4 C.I.) |
| Stunting (WHO 2006) Length/Height for Age | **N = 619** | **N = 701** | **N = 583** | **N = 771** |
| **Prevalence of global stunting (<-2 z-score)** | (136) **22.0** % (17.7 – 27.0 C.I.) | (211) **30.1 %** (26.5 - 34.0 C.I.) | (111) **20.6 %** (16.9 - 25.0 C.I.) | (141) **18.3 %** (15.1 - 21.9 9 C.I.) |
| **Prevalence of severe stunting (<-3 z-score )** | (31) **5.0 %** (3.3 - 7.5 C.I.) | (69) **9.8 %** (7.6 - 12.7 9 C.I.) | (27) **5.0 %** (3.2 - 7.8 C.I.) | (32) **4.2 %** (2.9 - 5.9 C.I.) |

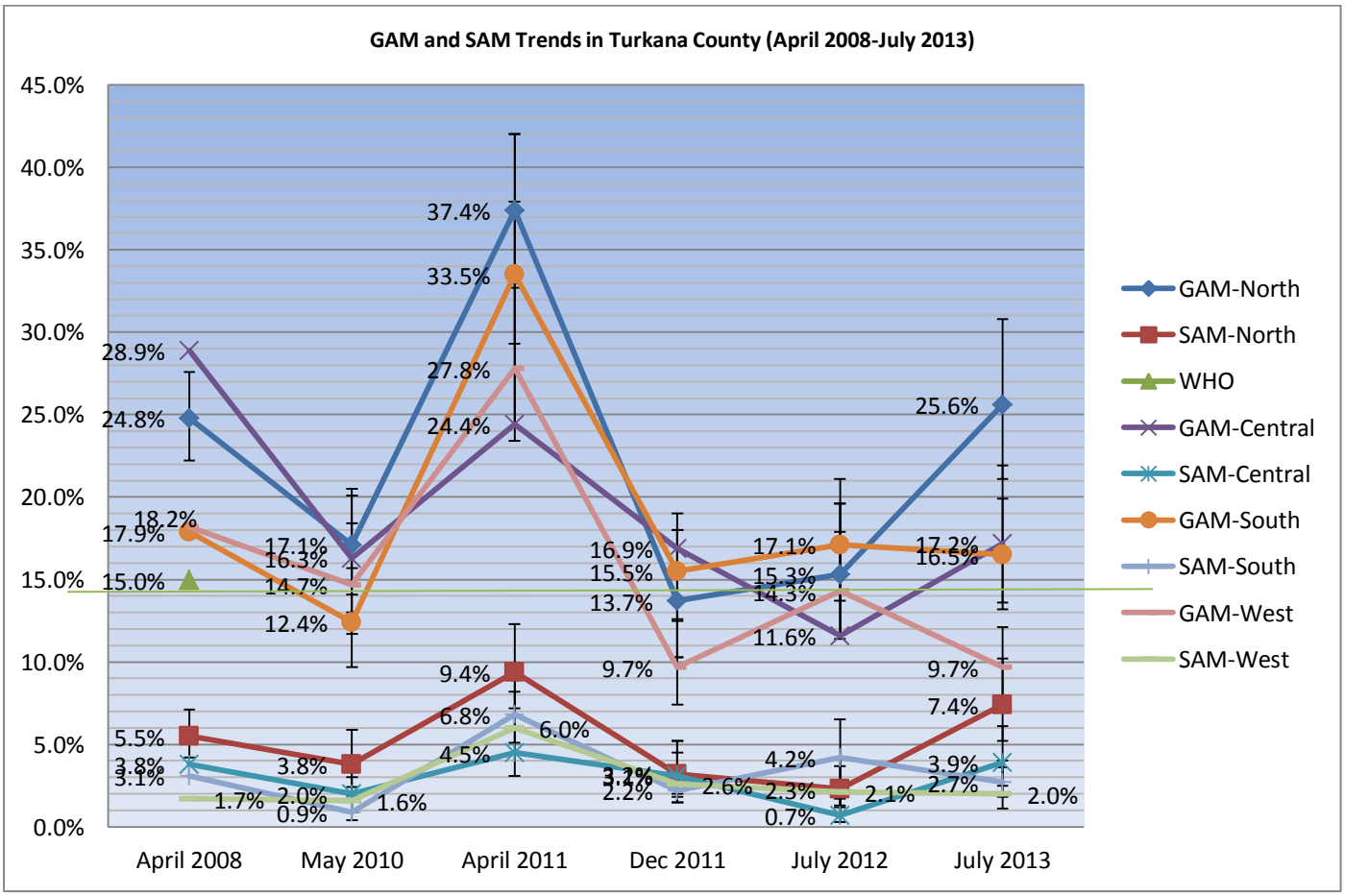
The overall sex ratio of the surveys sample was 0.9-1.2 which indicates that boys and girls were equally represented as a whole. The sample was also within the acceptable ranges between all age groups and thus this survey used a valid and unbiased sample.

In Turkana West, the results indicate **poor levels of acute malnutrition** and are below the WHO critical levels set at 15% for GAM [81]. The SAM level is 2.0% below the emergency levels of >4%.

In Turkana South, Central and North, the results indicate **critical levels of acute malnutrition** and are above the the WHO threshold set at 15% for GAM[82]. The SAM levels are 2.7%, 3.9% and 7.4% respectively. Turkana North SAM has very high levels of >4% SAM.

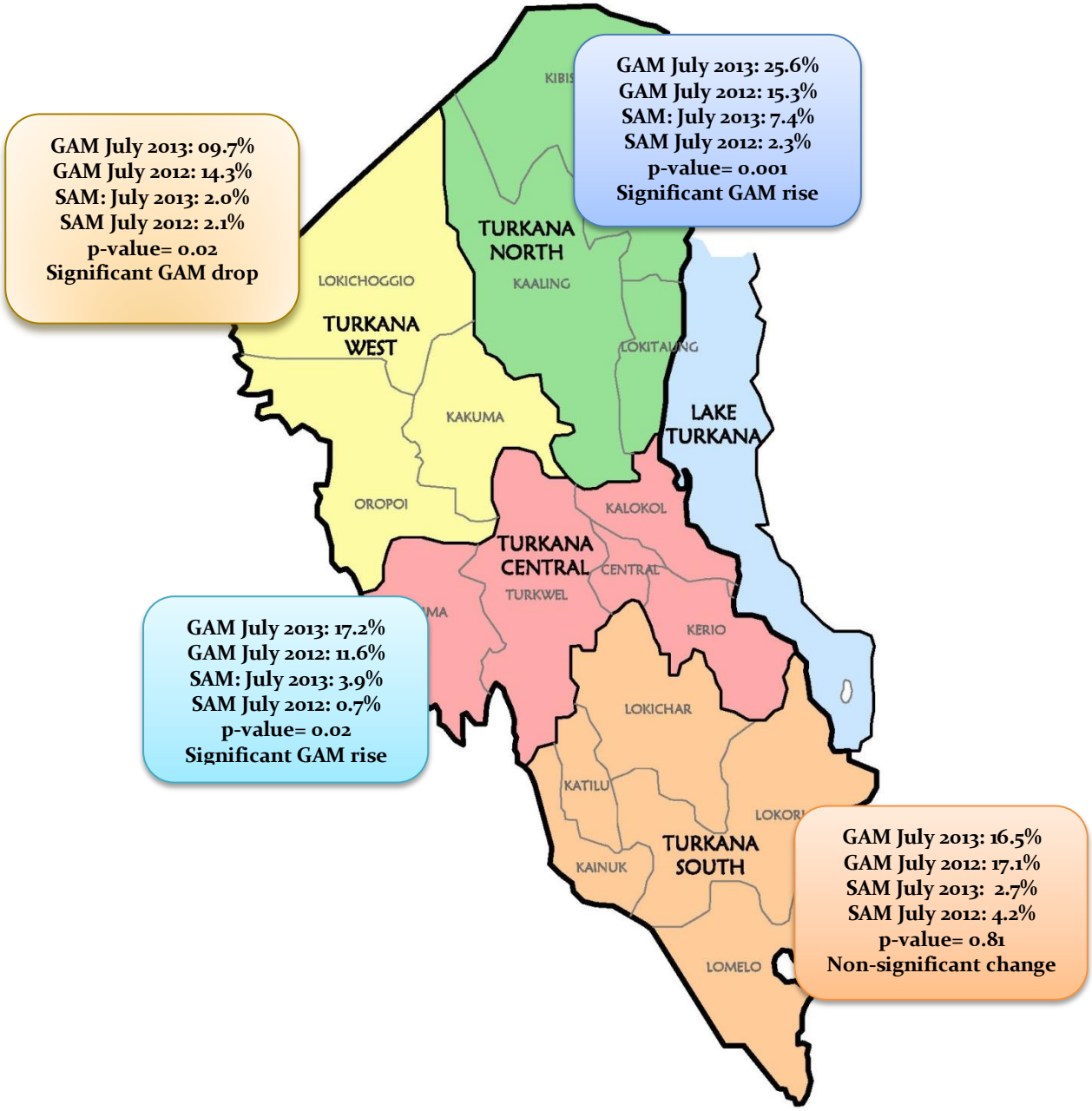
The levels of underweight in all zones and stunting- (highest in Turkana South) are very high. The reported high rate of stunting shows the effects of cumulative chronic food insecurity and recurrent illnesses overtime. No incidence of oedema was reported.

**Trends of Malnutrition**




[81] Global Acute Malnutrition (GAM): prevalence of GAM <5% termed as acceptable, 5-9% poor, 10-14% serious and >15% critical.
[82] Global Acute Malnutrition (GAM): prevalence of GAM <5% termed as acceptable, 5-9% poor, 10-14% serious and >15% critical.

There has been a deterioration, and a significant increase in acute malnutrition levels (Weight for Height Z-score) compared to the 2012 survey of Turkana County in July 2012, shown below. These surveys were carried out two months after the end of the long rains, after good but unevenly-distributed long rains, when elevated malnutrition rates may be expected to rise.




## 9.2 Mortality

The crude death rates (CDR) for all zones were within acceptable levels for emergency situations (<2 deaths/10,000 people/day) as per the SPHERE Standards 2004. The highest crude death rate was observed in West at 0.83 (0.54-1.27)deaths/10,000/day, followed by Turkana North at 0.70 (0.47-1.04). This CDR is lower than that observed in July 2012.

The underfive death rates (U5DR) for all the zones were within acceptable levels (<4 deaths/10,000 people/day). The highest rate of U5DR was observed in Turkana West at 1.00(0.50-2.00), followed by South at 0.74 (0.32-1.69). This U5DR is lower than that observed in July 2012.

Nutrition surveillance data in Turkana since 2011 indicate CRM and U5MR is decreasing and still now below emergency levels (1.0CMR). There has been a trend of higher CMR than U5MR in Turkana surveys, in most zones (2011-2013). This may be related to insecurity.

Malnutrition rates do not seem to relate directly to mortality as reflected from May 2011 U5DR which were still at 'alert' levels for North and West, despite the high GAM(37.4%) and SAM (9.4%) rates.

## 9.3 Causes of Malnutrition

This survey was carried out in July, after unevenly-distributed, but good long rains in 2013, with pasture and browse still available for livestock. However, flooding was experienced in in areas covering the River Turkwel and towards the Lake Turkana, and there has been a locust infestation that affected Lopur and Lokichar districts most. Thus, while reduced rates of malnutrition can be expected at this time, there are some areas where the effect of the additional shocks is likely to affect malnutrition vulnerability for

at least three months after their occurrence[83]. It is worth noting that the majority of the population in Turkana County are pastoralists and hence rely heavily on healthy herds as well as availability of pasture and water for livestock. At the time of the survey, many of the surveyed areas had not yet started experiencing water stress and there was still low migration of livestock. However, Milk availability at household level is significantly below normal across the county. On average only 2% of HH is accessing 0.25-1.0/day in the pastoral livelihood zone, below the usual 3L/day. The below normal livestock milk availability is attributed to most animals being pregnant, and the few lactating ones have to walk far to access fodder. Milk prices are above average and range from KES 45-80/L compared to the normal KES 30-45 in the pastoral livelihood zones. Malnutrition rates of U5s are likely to be on the increasing trend with the declining food security situation. This impacts milk availability for young children, pregnant and lactating mothers. High cereal prices (i.e. high cereal: meat ratio) are likely to increase in pastoral areas due to poor market supplies; the resultant benefits may not be significant because of livestock migrations and declining livestock prices. Distances or waiting time at water sources are likely to continue increasing. Coupled with high food prices (impacting the formal/casual labour and agro pastoral livelihoods), households are likely to continue experiencing significant shortfalls in food consumption. The food security situation is predicted to continue declining in most of the pastoral livelihood zones until at the onset of the short rains.

***Contextual Analysis:***

Contextually, there are significant factors that indicate that the ***situation could deteriorate/is worse than prevalence shows***:

1. Age-verification has been a major challenge in the 2012/2013 surveys, despite the use of Local calendar of events since memorable events vary across the survey zones. This is also exacerbated by a large majority of home births and low incidence of accurate birth registration documents. This is reflected in all surveys with poor data quality of overall age distribution (significant difference in p-value)
2. The statistical analysis of surveyed children (plausibility test) and graphical data below shows that there was a significant difference in age distribution (p=0.000), which suggests that there are currently less children in some age groups than expected. This may be indicative of incorrect age given and/or the impact of migration of older children 24-59 months, due to reduce food insecurity in the HH and to attend school.
3. Migrating of the older age-groups of U5 also has an impact on age distribution of children surveyed, with a n excess younger age-group (6-29m) in all surveys
4. Turkana South recorded an excess of boys surveyed.
5. Nutrition surveillance data in Turkana since 2011 indicate CRM and U5MR is decreasing and still now below emergency levels (1.0CMR). There has been a trend of higher CMR than U5MR in Turkana surveys, in most zones. This may be related to insecurity.
6. Poisson distribution WHZ -2, showed a slight significant difference (p=0.000) in cluster heterogeneity which matched the clusters/villages in North zone that have never previously been surveyed and those with IMAM outreach cover. A large significant difference in cluster heterogeneity was recorded in Central zone. There were clusters with high rates of malnutrition.

**High GAM and SAM Prevalence in Turkana North- Contextual Analysis:**

Backdrop of situation:

There has been a significant rise in malnutrition indicators since July 2012. No linear correlation can be attributed to high SAM in Turkana North (i.e. U5MR is lowest among the 4 zones, as well). Though high SAM does not necessarily result in high mortality, where there is high MAM, high SAM is also expected (Turkana North has highest MAM [18.2%] and SAM, of all 4 zones).

Thus proposed factors (indirect) that may have an effect on high MAM and SAM are:

1. The significant rise in both GAM and SAM in Turkana North in July 2013, in comparison to July 2012, can be partially attributed to the fact that a significant proportion of Kibish division was excluded for SMART assessment due to insecurity in 2012 while 6 of the clusters assessed currently having no facility-based or outreach IMAM services . MUAC GAM is also double that of other zones, standing at 14.9% (10.6-20.5).
2. The trend analysis of nutrition program admissions in Turkana North (2012-2013) show that though OTP admissions have been similar, SFP admissions for U5 and PLWs has been significantly lower in May-June 2013, compared to the same period in 2012, when BSFP was phased out in May 2012 . A significant number of malnourished children were found in the SMART survey (see table below). This is in contradiction with what the program data suggests.
3. Supportive evidence: Maternal malnutrition is also highest in North, with 15.4% caregivers 15-49 with MUAC < 21cm (up from 8.9% in 2012) and 18.3% PLWs of U6 children wasted (MUAC < 21cm). This is more than double the rate of maternal malnutrition than any other zone.
4. According to the Turkana County Coverage report coverage the point coverage is estimated at 50.7 %( 37.6% - 63.4%), a point above the recommended SPHERE standard of 50% in rural areas. Overall coverage of the program is thus acceptable. The coverage report did not assess Kibish division, which is not covered by the IMAM program. However, it should be noted that among the barriers cited in the integration of the nutrition programme in Turkana North areas is

[83] CLO-Turkana County

work overload of the nursing staff and low remuneration of CHWs. Analysis of the IMAM implementation shows that active case finding by CHWs may not be as effective because of activity-based motivation: CHWs in this area are only motivated during outreach days. They

5. Though prevalence of illness was lower in North (49.3%), compared to South (54.8%), association between illness and malnutrition showed that 30.1% of children ill, were also malnourished- a significant association (p=0.000). This is the highest ratio of all zones.

Overall, though Community Strategy has been rolled-out in Turkana County, establishment of CUs and training of HF staff and volunteers is still on-going.

The operational challenges of North zone include:

a. Inaccessibility of IMAM services in Kibish division
b. Lower integration of nutrition services in HCs due to high staff workload
c. Low-impact outreach activities
d. Activity-based (outreach days) and inconsistent remuneration of CHWs which has a direct effect on active case-finding.

In total, this impacts the number of children identified, enrolled and treated for MAM and SAM.

Food Security factors:

Pastoralist areas were placed at 'Alert' warning stage and deteriorating trend using the EWS. De-stocking has begun (beginning of the dry spell), impacting availability of milk and migration (NDMA EWB-June 2013). However, in the northeast and eastern pastoral livelihood zones, food insecurity has increased, significantly after the second successive poor season coupled with poor terms of trade, increased conflicts and increasing malnutrition rates. Access to food is limited by migration of livestock to distant locations and very poor terms of trade, while households are increasingly employing negative coping strategies such as excessive consumption of wild fruits and charcoal burning. The rates of child malnutrition in parts of the northeast are among the highest in the county.

An adequate hunger 'safety net' is crucial so the situation does not deteriorate further. Partners from all sectors need to coordinate effectively to buffer the community until the start of the short rains. So far, the concerted efforts that are currently in place, by partners are:

- **On-going nutrition intervention & outreach** by WVK, IRC and Merlin has increased early detection and capture of beneficiaries(mass screening), thus lowering the potential malnutrition rate expected under prevailing conditions
- **Collaboration with other actors**:
  -FFA from Oxfam, World Vision, ChildFund and Turkana Relief program ;OXFAM and World Vision piloting HSNP: livelihood support programs complement emergency interventions, are sustainable and offer viable coping strategies during lean times.
  -Outreach support from Diocese of Lodwar and World Relief
- Families with recently discharged SFP individual are linked to GFD (WFP, Oxfam World Vision)

Looking beyond the seasonal shifts, it is important to address the causes of chronic malnutrition (stunting). To put it in context 1 in every 4 children is stunted (≈20-30%GLM), in Turkana County. Adequate food alone does not result to improved nutritional status if child care practices such as hygiene and child feeding practices are poor. Malnutrition has been found to be present in food secure households[84]. The Z-score findings of the survey did not support 6-29 age-group as the most vulnerable, with chi-square analysis indicating no significant difference (p>0.05) between the younger (6-23 m) and whole (24-59) sample. Also, the high levels of malnutrition among all the age groups(with very high SAM in North) demonstrates the influence of factors beyond poor child caring practices on the nutritional status of the children. Given that the availability and accessibility of water in Turkana is below the SPHERE standards, the problem is also likely related to hygiene practices and inadequate sanitation.

**Morbidity:**

Moderately high morbidity rates (**45.5%; 54.8%; 49.3%; 42.2%)** were reported in the county, in the two weeks prior to the survey. The high incidence of reported malaria/ARI/diarrhoea.

These levels were consistent with seasonal morbidity patterns recorded from the health facilities in the district. In addition, acute diarrhoea, URTIs and malaria are endemic during this time of year (rainy season)[85]. An analysis of the relationship between morbidity and nutritional status established that GAM prevalence was significantly higher among those reported to have been sick compared to those who were not. The association between illness and malnutrition was significant in all surveys (and very high in Turkana North) with **20.1% (Central); 20% (South); 30.1% (North) and 9.7% (West)** of children ill during the recall period also acutely malnourished (<-2 Z-scores). Qualitative data confirmed that in health-seeking practices, majority of the population utilized medical services as a first resort. However, the population also utilizes traditional medicines due to easier access and strong cultural beliefs in their efficacy. This is likely to interfere or delay the effects of timely medical treatment. It is important

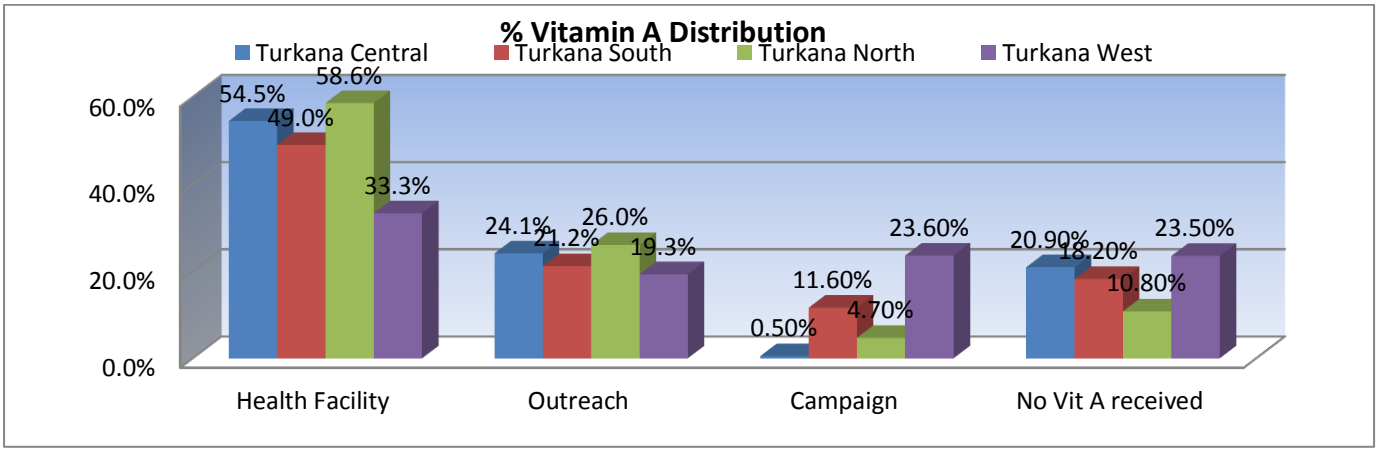
[84] International Food Policy Research Institute (IFPRI), 2000, The Constraints of good child care in Accra: Implications for programmes.
[85] DPHN-Turkana

to note that with the current serious nutritional situation (especially Turkana North SAM), malaria and diarrhoea can prove fatal. There is urgent need to upscale and continue treatment of malaria and infectious disease particularly. Utilization of therapeutic zinc supplementation for diarrhoeal episode has improved dramatically from 2011 with **(75.0%; 66.7%; 57.4%; 50.6%** due to health facilities that have received supplies from KEMSA kit (zinc sulphate and ferrous-folate supplements). The main challenge currently is that there are pockets of malnutrition-particularly in Turkana North and Central which are caused by seasonal vulnerability, access to health services and poor integration of existing services. At the community level, a very small minority of HH have access to safe drinking water **(16.4%; 07.8%; 11.3%; 09.2%)** and less than quarter of the population **(20.1%; 25.9%; 11.9%; 12.9%)** have toilet/latrine access. The implication is that infection levels are set to increase in these conditions, impacting on malnutrition levels.

**Programme Coverage:**

Immunization and vitamin A/deworming coverage are basic health services and are a reflection of how the population accesses health services. The high immunization coverage rate (over 80-90%) is commendable. However, Vitamin A Supplementation (VAS) and deworming coverage was very low (<50%), below >80% HINI target. SMART results below show that only HF and outreach have been utilized as vitamin A distribution modes (≈75%), with ≈20% of U5 not having received Vitamin A at all.

KIIs showed that there was poor mobilization of the caregivers to take the children to health facilities or outreaches for micronutrient Supplementation. Mothers will make efforts to have the children immunized but after completion of immunization, they will visit a health facility either when the child is sick or if the child in a beneficiary of OTP or SFP




The SQUEAC IMAM coverage in Turkana County was calculated at ≈50% which is inadequate as SPHERE[18] recommends a minimum 60% coverage for community nutrition intervention programmes, and this should be the target for the HINI program currently being implemented for both SFP and OTP. Areas without access, poor integration and outreach services directly impacts programme coverage. High programme coverage has been achieved mainly through sustainable methods of community mobilisation. In addition to Community volunteers and Community Health Workers (CHWs) role in routine health facility outreach activities, inclusion of key sources of referral TBAs (specifically for referral of PLWs) and traditional healers would play a significant role in community mobilisation, absentee and defaulter tracing[86]. The identification of new SFP/OTP referrals in all zones (and particularly in the 'pockets of malnutrition' in Turkana North and Central) during the survey period indicates that CHWs need to intensify their efforts in continuous case identification at the community level.

**Infant and Young Child Feeding and Care practices:**

Poor child care and feeding practices persist in Turkana County and have been associated with high levels of malnutrition. While there has been an improvement in IYCF indicators, 5 out of 8 breastfeeding and complementary key indicators are **unsatisfactory** in Turkana County as shown below:

| *Breastfeeding Practices* | | | |
|---|---|---|---|
| | Age Group | % target | Comment |
| • Given pre-lacteals[87] | 0-23m | > **10%** | Unsatisfactory |
| • Early introduction to complementary foods | 0-5m | > **10%** | Unsatisfactory |
| 1. Timely Introduction of Breastfeeding (within 1 hour) | 0-5m | < **80%** | Unsatisfactory |
| *Complementary Feeding Practices* | | | |
| 2. Minimum Dietary Diversity | 6-23m | < **80%** | Unsatisfactory |
| 3. Minimum Meal Frequency | 6-23m | < **80%** | Unsatisfactory |
| 4. Minimum Acceptable Diet | 6-23m | < **80%** | Unsatisfactory |
| 5. Consumption of iron-rich foods | 6-23m | < **80%** | Unsatisfactory |
| Main composition of diet | 6-23m | **7 foodgroups** | Maize, Milk, Oil, Tea |

[18] The SPHERE Project Handbook (2004). Humanitarian Charter and Minimum Standards in Disaster Response.
[86] NSO- Turkana County
[87] Determined by the proportion of children who were given anything other than breastmilk in the first 3 days after birth

Key breastfeeding indicators that require strengthening are timely initiation of BF, giving of pre-lacteals and early introduction to complementary feeding. Delayed breastfeeding is dehydrates the infant, and opens the opportunity to introduce prelacteals. Giving of oil or any other feed at this time is likely to be done under unhygienic conditions considering water scarcity in the county- increasing chances of infection, hence morbidity and mortality of the infant[88]. Cultural practices that should be discouraged include not initiating BF until child's naming ceremony has been carried out and Sheep tail fat(which is administered under unhygienic conditions) is given to infants is believed to rinse the gut. A positive cultural practice to be encouraged is the newly-delivered mother is relieved from household duties for 40 days after delivery[89]- mothers have a better opportunity to exclusively breastfeed. In addition to MTMSGs, TBAs are instrumental at passing appropriate IYCF messages as they are well respected.
Moderately poor diversity and reduced food intake among the children can be attributed to high food prices in the market and the reduced availability of milk and animal products due to current kidding of goats, and high price of milk.
IYCF Dietary Diversity (DD) and meal frequency has improved dramatically in the last year in 3 zones and this indicates efficacy of MtMSG and operational CUs strategies to improve these indicator statistics. Only Turkana West lags behind in poor DD and meal frequency. DD impacts on nutrition status of children less than 24 months particularly stunting, and there has been a reduction in the stunting rate in 2012. The agropastoral zone has introduced new crop species traditional vegetables; legumes; new fruit species- but utilization of the same has not been assessed[90]. MtMSG scale-up, where mothers can obtain knowledge and strategies to improve DD in their HH, may have an impact.

### Water and Sanitation

Poor sanitation and lack of safe drinking water could explain the high prevalence of diarrhoeal diseases in the children assessed, despite relative availability of water currently. Caretaker hygiene practices were investigated revealing that minority used recommended hand-washing practices **(32.7%; 38.4%; 46.5%; 40/3%)** but this was restricted to 1 hand-washing occasion. This was, before eating/preparing food. **Less than 20%** of caretakers washed hands after the other critical hand-washing times i.e. after using the toilet, after handling animals, after cleaning the child's bottom and before feeding the child hence- predisposing them to being agents of transmitting infections and thereby increasing the risk of water borne diseases. Children's faeces were not disposed hygienically, further exacerbating the problem. The main mode of faecal disposal is use of bushes/open field with very few community members indicating knowledge and practice of the importance of hand-washing during the four critical times.

## 10. CONCLUSION

Overall the key underlying factors of nutrition status are morbidity, inadequate health programme coverage, IYCF practices- poor breastfeeding practices; poor hygiene and lack of adequate and safe drinking water. Integrated approaches should be undertaken to reduce risk factors such as sub-optimal childcare and feeding practices, unsafe drinking water and low access to essential nutrition services. A high rate of SAM may be indicative of either a shortfall in the identification and treatment of children with SAM. Emergency SAM **(7.4%)** in Turkana North is a critical situation requiring active case-finding and immediate intervention, to save lives.
Measures to improve coverage of nutrition programmes (i.e. IMAM, vitamin A and deworming) would play a critical role in both preventing and treating morbidity and malnutrition. U5 illnesses are moderately high and should be stemmed. Morbidity and malnutrition rates likely to increase with depletion of water levels from safe sources, thus health interventions are imperative.

In spite of the current situation, it is important to note the role of chronic food insecurity, increased food prices and deteriorating water and pasture situation which have affected the animal sales and milk availability (hence directly affecting the milk availability and income of the households) in Turkana County. Food insecurity remains a big challenge that cannot be ignored and is likely the direct cause of inadequate food intake in the households. A prevailing food deficit situation that is set to deteriorate further, pending the performance of the short rains.

## 11. RECOMMENDATIONS

Intervention efforts that address both immediate needs for the acute malnutrition cases and chronic malnutrition in the vulnerable population should be mobilized. In addition, developing longer term strategies to enhance the provision of basic services, sustainable strategies for livelihood support and social protection mechanisms are recommended. Specific recommendations include:

### Immediate Recommendations

***Nutrition and Health***

- Strengthen continuous nutrition surveillance through regular nutrition assessments and ongoing MUAC screening for both U5s and PLWs (active case-finding), with special emphasis in Turkana North zone. With the anticipated deterioration of food security, a short-rain season survey is indicated for preparedness and planning purposes.
- A high rate of SAM may be indicative of a shortfall in the identification and treatment of children with SAM. With 7.4% SAM rates in Turkana North, the short-term recommendation of establishment of additional stabilization centres in

[88] Turkana CPHN
[89] Women FGDs- All livelihood Zones
[90] Ministry of Agriculture (Turkana County)

Turkana North is justified and should be retained. In addition, inadequate detection and referral of cases may also contribute to this high SAM.

- Establishment of accessible health and IMAM facilities in Kibish Division, which has no services.
- Timely monthly dissemination of stock summaries and distribution plans, for the supply chain, by the sub-zone nutrition officers is required to reduce the persistent stock-outs of therapeutic and supplementary stock.
- Observing the trends of malnutrition over the past 5 years, Turkana County is still recommended for targeted SFP and OTP for children age 6 to 59 months to address the micro-nutrient and macronutrient food gap, justified by the poor (West) and critical (South/Central/North) rate of GAM. In addition, flexibility in programming to address areas hit by seasonal vulnerability (e.g. flooding, pests and insecurity), to avoid missing rations. This will reduce the development of pockets of malnutrition.
- Scaling-up of both SFP and OTP interventions is currently ongoing with the Enhancing Nutrition Surveillance and Resilience project in Turkana West, Central and South/ East and Up-scaling of High Impact Nutrition Interventions in Turkana North/ Kibish. However, stronger active case-finding at the community level is required. Good practice that can be emulated by implementation in Turkana West zone includes increasing the number of outreaches (especially in Turkana North and East), and the partner support of MoH nutritionists in each HF.
- With regards to chronic malnutrition, poor uptake of Growth Monitoring Promotion should be addressed. This is evidenced by the poor use of CHANIS across the county. In addition to IMAM, health workers in facility and outreach must sensitize caregivers to have the weight of the children monitored every month up to 5 years of age.
- Following the establishment of 52 CUs, Quarterly mass screening in all zones to reinforce effective active case-finding is recommended.
- Following the critical GAM and SAM rates in Turkana North, South and Central, coverage assessment recommendations and SMART survey qualitative data point to the benefit of including key sources of referral including Traditional healers and TBAs, who have greater access and community confidence.
- While the Turkana County outreach strategy stipulates the minimum package is to be offered at an outreach, Vitamin A and deworming coverage is still sub-optimal. Poor coverage of Vitamin A (currently ≈75%) and deworming (currently ≈45%) needs to be addressed:

✓ Caregivers should be sensitized on the importance of taking the children to health facilities or outreaches for micronutrient Supplementation.

✓ Vitamin A Supplementation in the ECDs has rolled out, with the potential of reaching a high of number of children aged 12-59 months through targeting the 101,000 ECDs[91]. The ECDs are supported with the School Meals Program therefore enrolment or number of children at the ECDs at meals times is very high. SMART results captured only 3 responses from caregivers aware of VAS from ECDs. There needs to be an appropriate monitoring and documentation structure for children receiving VAS from ECDs so that caregivers are aware.

✓ Addressing the high morbidity load among U5s and access to essential health and nutrition services by strengthening the integrated outreach component- primarily focusing on regular medical outreach camps/mobile clinic to improve access to the migrating populations, especially as the dry season approaches.

- Strengthen programmes and strategies currently addressing infant and young child nutrition (IYCN) with a view to improving the protection, promotion, and support of optimal IYCF. Viable action points include:

✓ Systems strengthening would ensure facility and community level care for pregnant women and lactating mothers**.** This would ensure key support for timely initiation of breast feeding and iron-folate/Vitamin A supplementation, as well as identification of wasted/anaemic PLWs. Efforts such as the MtMSG, Baby Friendly Community Initiative, Community Strategy, Malezi Bora as well as outreach efforts should continue to optimize the care for maternal, infant and young child nutrition.

✓ As the HINI program is rolled out there is need for continual monitoring of both facility and community based interventions to track progress while also documenting the process to assess the trends in the outcomes as well as impact indicators. According to KIIs, a gap area in HMIS is inadequacy in collection of data from the community for local analysis and dissemination.

✓ Use of all available change agents (in addition to CHWs) e.g. TBAs mentorship of PLW women to promote better nutritional practices and effect positive behavioural change.

✓ To discourage inappropriate BF cultural practices, there needs to be involvement of the family in the naming process of the child i.e. the mother and the in-laws, to carry out the naming process immediately. Alternatively, having role models- those who did not wait for naming before breastfeeding to prove that, there is nothing wrong with breastfeeding before naming a child. This process requires a lot of community interaction for change to be effected. Community-based promotion through CHWs, peer-led MtMSGs, TBAs, traditional healers, community groups/meetings and religious leaders is critical. Trained TBAs would be critical in encouraging immediate BF and discouraging the use of prelacteals (e.g. sheep fat) due to risk of infection. The critical group of change, as also evidenced in other health indicators, is the young mothers who are educated at least up to primary-level. They are more likely to change than the older guards.

[91] County Department of Education (CDoE)

- ✓ Training on IYCF counselling and support for HC staff to provide IYCF education to mothers at nutrition service points. Facility-based promotion would include- strengthening mother support groups in facilities and delivery of context and culturally specific IYCN messages. These messages will address key barriers for improved feeding practices as well as improved nutritional recommendations. Strengthening of the programme is recommended, based on poor IYCF practices. Recommended areas for key messages include: elimination of pre-lacteals, time of introduction of complementary foods, risks of early or late introduction of complementary foods, food choices and preparation of appropriate complementary foods. Use of national tools/job aids and local adaptation of community mobilization and sensitization strategies (including community level materials), for BCC.
- ✓ To further improve complementary feeding targets, assessing the market access and utilization of newly-introduced crop species (especially traditional vegetables, fruits, pulses and legumes) is recommended, using combined KAP/market analysis assessment, to address complementary food access and subsequently reduce the current chronic malnutrition and improving access for beneficiaries.

***Water and Sanitation***

- As evidenced by hand-washing and sanitation results, further strengthening of hygiene practices to reduce the incidence of diarrhoeal disease associated with contaminated water in the household, is still required. A KAP for BCC has been carried out in Turkana West. Dissemination of the results would help to give direction to the community health education required and the appropriate channels.
- Recharge at water points was good following long rains. However, water stress is likely to heighten as boreholes dry up in the coming months. Maintenance of Gen-sets, submersible pumps and fuel subsidy for borehole supplies should continue for community owned boreholes to support free water distribution to communities as well as schools and health facilities.
- Implementation of mechanisms for regular water treatment at water points and establishment of a rota-system to separate human and animal use of earth pans concurrently. This will improve access to safe water in all areas.
- Continue to support water-harvesting and conservation equipment, training and technology
- Strengthen awareness-creation of total sanitation through cascading trainings of community management committees.
- Continue strengthening community-led total sanitation training and support timely and consistent provision of water purification chemicals for water treatment at Household level

***Food Distribution, Food Security and Livelihoods Rehabilitation***

- Continue GFD until start of short rains and upscale the food aid targets as recommended by KFSSG long rains assessment. In addition, WFP, through World Vision/Oxfam can support the use of CSB Plus to ensure optimal micronutrient fortified foods for young children.
- Grain/fodder storage should be encouraged in wealthier households to prevent seasonality shortages
- Social Support systems are positive coping mechanisms for vulnerable households, and these should be facilitated.
- Migration has begun in search of pasture and water. The feasibility of providing fodder for the core breeding animals at these sites would be appropriate in the short term. In the medium-term, increase of fodder production and conservation to replace lost access to dry-season grazing areas, should be implemented in pastoralist areas
- For fisheries zones, training of sustainable fishing and maintenance of equipment (in addition to supply of equipment) should be strengthened. insecurity should be mitigated at targeted fish markets so as to enhance supply.
- Placing livelihoods at the centre of emergency preparedness and planning is a critical base for the design of timely and appropriate programmes and policy responses that mitigate hazards. This shift is already being implemented in the county. FFA implementation is recommended continue as this provides positive coping mechanisms in lean times. HSNP should be scaled-up, to enable timely responses that protect livelihoods.

***Long-Term Interventions(Remain the same as July 2012)***

***Nutrition and Health***

- Regular coverage assessments (SQUEAC) will maintain the effectiveness of IMAM programmes as well market analysis assess the impact of introduction of new food crops in Turkana County.
- Using livelihoods analysis for preparedness and response planning means that household coping strategies are more readily supported when a shock becomes evident. Analysing livelihoods also ensures that the underlying causes of food insecurity are addressed before and even during a crisis, and that targeting is effective and interventions are appropriate. Examples include livelihoods-based early warning systems employing Household Economy Analysis (HEA).
- Focus on programmes by relevant actors that improve and sustain dietary diversity and consumption of micronutrient.-rich foods. This can be led by assessing the viability of introducing market voucher system (that has been implemented in other ASAL districts). This would address improved complementary food access for children six months to two years.
- Establish regular nutrition surveillance through nutrition surveys-at both short and long rain periods.

***Water and Sanitation***

- To address the issues of limited access to safe water, there is a need for rehabilitation/protection of water systems including the unprotected wells (e.g. capping of wells), to upscale water storage.
- Orderly and efficient resource utilization should be championed by water-use management committees (members selected by the community) to regulate and reduce conflicts at water points, especially during shortage periods.
- Advocacy/public health campaigns on domestic water treatment such as boiling of drinking water and use of purification chemical to minimise risks of water-borne diseases, should be carried out.

- KAP studies to determine the barriers to utilization of latrines and other negative sanitation practices

***Food Distribution, Food Security and Livelihood Rehabilitation***

- Implementation of drought preparedness strategies as well as surveillance- data collection, monitoring and evaluation should be comprehensively done
- Effective linkages and collaboration between the community and the DSG, an effective feedback system and coordination so as to enhance drought preparedness strategies
- Strengthening by relevant actors of sustainable management of rangelands. During rainy/abundant season, priority activities should be re-seeding of fodder species, controlled grazing and making hay in preparation for downturn.
- Grazing committees to reinforce building reserves during abundant periods and ordered management of rangeland
- Support by relevant stakeholders to develop and sustain breeding herds and market other stock to increase resilience
- Since traditional animal husbandry is very vulnerable to drought, building of alternative and sustainable livelihoods to enhance resilience to drought, with a focus on gender empowerment should be encouraged. This is primarily targeted at increasing the household food security. Initiatives that have shown promise in Turkana include bee-keeping and poultry-keeping. This has the additional benefit of increasing HH dietary diversity diversity (e.g. consumption of eggs).
- The agropastoralist zones/sedentary farmers requires strengthening of training for mixed cropping and enhanced varieties (drought-tolerant; early-maturing). Species diversification and splitting in dry season is also necessary to maintain vibrant crop market and food security.
- Livelihoods programmes like FFA and HSNPs should continue to strengthen sustainable coping strategies during the lean times.
- Improve the road infrastructure to open up markets

**APPENDICES**

APPENDIX 1: PLAUSIBILITY REPORTS

| Indicator | Acceptable values/range | CENTRAL | SOUTH | NORTH | WEST | Comments |
|---|---|---|---|---|---|---|
| **Digit preference - weight** | <10 | 4 | 4 | 5 | 4 | Excellent |
| **Digit preference - height** | <10 | 8 | 5 | 6 | 10 | Good |
| **WHZ ( Standard Deviation)** | 0.8-1.2 | 1.09 | 1.08 | 1.07 | 0.98 | Excellent |
| **WHZ (Skewness)** | -1 to +1 | 0.07 | 0.06 | -0.14 | -0.03 | Excellent |
| **WHZ (Kurtosis)** | -1 to +1 | -0.26 | 0.06 | -0.04 | 0.25 | Excellent |
| **Percent of flags WFH** | <3% | 2.3% | 1.6% | 2.2% | 1.1% | Excellent |
| **Percent of flags HFA** | <10% | 8.7% | 6.0% | 10.0% | 3.7% | Good |
| **Percent of flags WFA** | <5% | 1.3% | 0.5% | 1.3% | 1.6% | Excellent |
| **Age distribution (%)** | | | | | | |
| Group1 6-17 mo | 20%-25% | 28.5% | 25.9% | 28.4% | 31.7% | Problematic (Excess) |
| Group 2 18-29 mo | 20%-25% | 24.8% | 29.2% | 28.3% | 26.5% | Problematic (Excess) |
| Group 3 30-41 mo | 20%-25% | 22.6% | 21.0% | 21.6% | 23.3% | Acceptable(Upper Limit) |
| Group 4 42-53 mo | 20%-25% | 18.2% | 17.3% | 15.6% | 14.9% | Problematic(Deficient) |
| Group 5 54-59 mo | Around 10% | 5.9% | 6.3% | 6.2% | 3.6% | Problematic(Deficient) |
| **Age Ratio : G1+G2/G3+G4+G5** | Around 1.0 | 1.14 | 1.23 | 1.31 | 1.39 | Large 'Younger' group |
| **Sex Ratio** | 0.8-1.2 | 1.0 | 1.2 | 1.0 | 1.0 | Acceptable |
| **General acceptability** | | 15% | 14% | 12% | 12% | Acceptable (Data quality distorted by skewed age ratio) |

APPENDIX 2: CLUSTER ALLOCATION LIST

## TURKANA *CENTRAL* NUTRITION SURVEY QUESTIONNAIRE CHECK LIST

| | Division | Date | Village | Cluster No | Team Leader Name | Team No. | QN.B | No. HH done (Mortality) | Children Assessed (Qnn C) | No. of 6-23 IYCF (Qnn D) | No. of 0-5 IYCF Children(Qnn E) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LODWAR TOWNSHIP | 17/07/2017 | KAMBI MOTO | 1 | ALICE CHELIMO | 1 | 14 | 17 | 17 | 6 | 6 |
| | LODWAR TOWNSHIP | 17/07/2013 | NABUTE | 2 | RUTH AREMAN | 2 | 13 | 16 | 19 | 7 | 6 |
| | LODWAR TOWNSHIP | 17/07/2013 | ELUKTOLIASI | 4 | SCHOLARSTICA EKOROT | 4 | 16 | 17 | 16 | 7 | 6 |
| | LODWAR TOWNSHIP | 17/07/2013 | SOWETO A | 3 | ELIUD EBEI | 3 | 14 | 16 | 14 | 8 | 6 |
| | LODWAR TOWNSHIP | 17/07/2013 | NGIDIRKONYEN | 5 | CONSOLATA ATABO | 5 | 11 | 16 | 15 | 7 | 6 |
| | LODWAR | 19/07/2013 | NAWOITORONG | 11 | ALICE CHELIMO | 1 | 12 | 17 | 17 | 9 | 6 |
| | NAPETET | 18/07/2013 | IPELU | 6 | ALICE CHELIMO | 1 | 10 | 15 | 19 | 6 | 6 |
| | LODWAR | 19/07/2013 | NACHURO | 38 | RUTH AREMAN | 2 | 12 | 16 | 17 | 9 | 6 |
| | LODWAR | 19/07/2013 | NAMUNYEN KIRION | 39 | ELIUD EBEI | 3 | 14 | 16 | 19 | 9 | 6 |
| | LODWAR | 18/07/2013 | KAMBI MPYA | 8 | ELIUD EBEI | 3 | 14 | 15 | 19 | 8 | 6 |
| | LODWAR TOWNSHIP | 18/07/2013 | NATOTOL | 7 | RUTH AREMAN | 2 | 13 | 16 | 17 | 8 | 6 |
| | LODWAR | 19/07/2013 | NAKWAMUNYEN | 40 | SCHOLARSTICA EKOROT | 3 | 13 | 15 | 19 | 7 | 6 |
| | LODWAR | 18/07/2013 | KANAM A & B | 9 | SCHOLARSTICA EKOROT | 4 | 13 | 18 | 19 | 6 | 6 |
| | LODWAR | 19/07/2013 | NAKWAPOO | 37 | CONSOLATA ATABO | 5 | 8 | 15 | 13 | 6 | 6 |
| | LODWAR | 18/07/2013 | CANAAN | 10 | CONSOLATA ATABO | 5 | 11 | 16 | 13 | 6 | 6 |
| | LODWAR | 20/07/2013 | NAKWAMEKWI | 32 | CONSOLATA ATABO | 5 | 9 | 15 | 13 | 6 | 6 |
| | TURKWEL | 21/07/2013 | NAPETET 1 | 34 | SCHOLARSTICA EKOROT | 4 | 13 | 15 | 24 | 6 | 7 |
| | TURKWEL | 22/07/2013 | NAPETET 2 | 33 | ELIUD EBEI | 3 | 14 | 15 | 20 | 6 | 6 |
| | LORUGUM | 20/07/2013 | NAOYAREGAE | 35 | ALICE CHELIMO | 1 | 17 | 19 | 23 | 6 | 6 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | NAMORUPUTH | 21/07/2013 | NANONOMOR | 28 | RUTH AREMAN | 2 | 11 | 15 | 18 | 6 | 6 |
| | LORUGUM | 21/07/2013 | LOCHER-EKUYEN | 27 | ALICE CHELIMO | 1 | 10 | 15 | 12 | 6 | 6 |
| | LORUGUM | 20/07/2013 | KIMUKOE | 36 | RUTH AREMAN | 2 | 12 | 15 | 15 | 6 | 6 |
| | LOCHER-ALOMALA | 21/07/2013 | KANGIKUKUS | 30 | ELIUD EBEI | 3 | 15 | 15 | 23 | 6 | 6 |
| | LOKIRIAMA | 21/07/2013 | NAWOYATIIRA | 29 | SCHOLARSTICA EKOROT | 4 | 12 | 15 | 24 | 9 | 6 |
| | LOKIRIAMA | 21/07/2013 | NGOROKIPI | 31 | CONSOLATA ATABO | 5 | 14 | 15 | 15 | 6 | 6 |
| | KAPUA | 22/07/2013 | NACHAMAE | 20 | ALICE CHELIMO | 1 | 13 | 17 | 14 | 8 | 6 |
| | KANGATOTHA | 23/07/2013 | KANGAGETEI | 17 | ALICE CHELIMO | 1 | 11 | 15 | 16 | 9 | 6 |
| | LOMOPUS | 23/07/2013 | LOMOPUS | 26 | RUTH AREMAN | 2 | 11 | 15 | 18 | 6 | 6 |
| | ELIYE | 24/07/2013 | NABEI | 24 | SCHOLARSTICA EKOROT | 4 | 11 | 15 | 19 | 6 | 7 |
| | NAMUKUSE | 25/07/2013 | LOTUKUMOE | 23 | CONSOLATA ATABO | 5 | 7 | 15 | 13 | 6 | 6 |
| | NAOROS | 26/07/2013 | NAOROS | 25 | ELIUD EBEI | 3 | 12 | 15 | 17 | 7 | 7 |
| | KALOKOL | 22/07/2013 | NATANGI | 19 | ELIUD EBEI | 3 | 16 | 20 | 20 | 6 | 6 |
| | NAMUKUSE | 22/07/2013 | ACHILET | 22 | SCHOLARSTICA EKOROT | 4 | 11 | 15 | 19 | 7 | 6 |
| | KALOKOL | 22/07/2013 | MAENDELEO | 18 | RUTH AREMAN | 2 | 10 | 15 | 20 | 8 | 6 |
| | KALOKOL | 22/07/2013 | AKATORONGOT | 21 | CONSOLATA ATABO | 5 | 10 | 15 | 13 | 6 | 6 |
| | NADOTO | 24/07/2013 | NADOTO | 16 | CONSOLATA ATABO | 5 | 10 | 15 | 13 | 6 | 6 |
| | KERIO | 24/07/2013 | LEPERIO | 12 | ALICE CHELIMO | 1 | 16 | 20 | 19 | 7 | 7 |
| | NAKURIO | 24/07/2013 | NARIAMAWOI | 13 | RUTH AREMAN | 2 | 11 | 15 | 15 | 7 | 6 |
| | NAKURIO | 24/07/2013 | LAINI MOJA | 14 | ELIUD EBEI | 3 | 15 | 16 | 15 | 7 | 6 |
| | NADOTO | 24/07/2013 | NANGITONY | 15 | SCHOLARSTICA EKOROT | 4 | 11 | 15 | 18 | 6 | 8 |
| | | | | | **TOTALS** | | **490** | **618** | **671** | **268** | **238** |

## TURKANA *SOUTH* NUTRITION SURVEY QUESTIONNAIRE CHECK LIST

| | Division | Date | Village | Cluster No | Team Leader Name | Team No. | Qnn B | No. Households done (Mortality) | ChildrenAssessed (Qnn C) | No. of 6-23 IYCF (Qnn D) | No. of 0-5 IYCF (Qnn E) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | KALAPATA | 17-7-2013 | NAKALEI | 21 | JACOB EURIEN | 1 | 16 | 18 | 20 | 6 | 6 |
| | LOCHWAA | 17-7-2013 | LOCHWAA | 23 | MAUREEN | 2 | 19 | 19 | 24 | 7 | 8 |
| | LOCHWAA | 17-7-2013 | KAROGE | 24 | FLORA | 3 | 16 | 16 | 18 | 8 | 6 |
| | LOCHWAA | 17-7-2013 | EKALALE EGIRON | 13 | FRIDAH EKAUD | 4 | 16 | 16 | 18 | 6 | 7 |
| | KATILIA | 18-7-2013 | LOPEDOR | 9 | JACOB EURIEN | 1 | 16 | 19 | 20 | 9 | 7 |
| | ELELEA | 18-7-2013 | ELELEA | 11 | MAUREEN | 2 | 16 | 16 | 15 | 7 | 6 |
| | KATILIA | 18-7-2013 | KANAKIPE | 10 | FLORA | 3 | 17 | 17 | 18 | 9 | 8 |
| | LOTUBAE | 18-7-2013 | LOTUBAE | 4 | PATRICK | 4 | 16 | 16 | 20 | 8 | 6 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LOCHAKULA | 18-7-2013 | KAKULIT | 12 | FRIDAH EKAUD | 5 | 17 | 19 | 20 | 8 | 8 |
| | MORULEM | 19/7/2013 | KANGITIT | 3 | JACOB EURIEN | 1 | 16 | 17 | 15 | 8 | 6 |
| | LOKORI | 19-7-2013 | KAMBI MOI | 2 | MARSHEL | 2 | 19 | 19 | 19 | 7 | 6 |
| | LOTUBAE | 19-7-2013 | NAMORUTUNGA | 6 | FLORA | 3 | 17 | 17 | 20 | 7 | 7 |
| | LOTUBAE | 19-7-2013 | LOTUBAE | 5 | PATRICK | 4 | 16 | 16 | 20 | 6 | 6 |
| | LOTUBAE | 19-7-2013 | NADOTO | 7 | FRIDAH EKAUD | 5 | 17 | 17 | 19 | 8 | 9 |
| | KALAPATA | 20-7-2013 | LOPEROT | 20 | JACOB EURIEN | 1 | 17 | 17 | 22 | 7 | 6 |
| | KALAPATA | 20-7-2013 | KANGAKIPUR | 19 | MAUREEN | 2 | 16 | 16 | 15 | 6 | 7 |
| | LOKWAMOSING | 20-7-2013 | MORULEM | 1 | FLORA | 3 | 16 | 16 | 19 | 8 | 6 |
| | LOKICHAR | 20-7-2013 | LOKICHAR | 14 | PATRICK | 4 | 16 | 16 | 13 | 7 | 6 |
| | KALAPATA | 20-7-2013 | NALEMKAIS | 18 | FRIDAH EKAUD | 5 | 14 | 17 | 19 | 9 | 8 |
| | LOKICHAR | 21-7-2013 | KAPESE | 15 | JACOB EURIEN | 1 | 16 | 16 | 20 | 7 | 6 |
| | KAPESE | 21-7-2013 | KAPESE | 16 | MAUREEN | 2 | 17 | 17 | 21 | 8 | 6 |
| | KAPESE | 21-7-2013 | NARENGELUP | 17 | FLORA | 3 | 16 | 16 | 20 | 6 | 6 |
| | LOCHWAA | 21-7-2013 | NAGETEI | 25 | PATRICK | 4 | 17 | 18 | 22 | 6 | 6 |
| | LOKICHAR | 21-7-2013 | LOKABURU | 22 | FRIDAH EKAUD | 5 | 16 | 16 | 20 | 7 | 7 |
| | KALEMOROK | 22-7-2013 | NAMAKAT | 38 | JACOB EURIEN | 1 | 16 | 16 | 15 | 8 | 8 |
| | KALEMOROK | 22-7-2013 | KALEMOROK | 39 | MAUREEN | 2 | 16 | 16 | 17 | 8 | 7 |
| | KATILU | 22-7-2013 | NGABAKAN | 32 | FLORA | 3 | 16 | 16 | 20 | 8 | 7 |
| | KATILU | 22-7-2013 | LOPUR | 33 | PATRICK | 4 | 16 | 21 | 19 | 11 | 7 |
| | KALOMWAE | 22-7-2013 | NAWUYAREGAE | 29 | FRIDAH EKAUD | 5 | 14 | 16 | 20 | 14 | 7 |
| | KAPUTIR | 23-7-2013 | NAKWAMORU | 30 | JACOB EURIEN | 1 | 16 | 16 | 19 | 9 | 7 |
| | KAINUK | 23-7-2013 | LOTONGNA | 26 | MAUREEN | 2 | 18 | 18 | 15 | 6 | 6 |
| | KAINUK | 23-7-2013 | NALIBAMUN | 27 | FLORA | 3 | 16 | 16 | 16 | 9 | 6 |
| | KAPITIR | 23-7-2013 | JULUK | 31 | PATRICK | 4 | 15 | 18 | 19 | 6 | 6 |
| | LOYAPAT | 23-7-2013 | LOYAPAT | 28 | FRIDAH EKAUD | 5 | 14 | 16 | 20 | 9 | 10 |
| | KATILU | 24-7-2013 | LOKAPEL | 36 | JACOB EURIEN | 1 | 13 | 16 | 16 | 8 | 8 |
| | KATILU | 24-7-2013 | NADIRIKONYEN | 34 | MAUREEN | 2 | 15 | 16 | 17 | 8 | 8 |
| | KATILU | 24-7-2013 | SIMAILELE | 35 | FLORA | 3 | 13 | 16 | 18 | 8 | 6 |
| | KATILU | 24-7-2013 | KANAODON | 40 | PATRICK | | 14 | 16 | 18 | 6 | 6 |
| | LOKAPEL | 24-7-2013 | LOMONYANG | 35 | FRIDAH EKAUD | 5 | 16 | 16 | 19 | 10 | 7 |
| | KOCHODIN | 17-7-2013 | LOPII | 8 | PATRICK | 4 | 17 | 17 | 22 | 9 | 8 |
| | | | | | **TOTALS** | | **640** | **673** | **747** | **312** | **274** |

## TURKANA *WEST* NUTRITION SURVEY QUESTIONNAIRE CHECK LIST

| | Division | Date | Village | Cluster # | Team Leader Name | Team No. | Qnn B | No. HH for (Mortality) | Children Assessed (Qnn C) | No. of 6-23 IYCF (Qnn D) | No. of 0-5 IYCF Children(Qnn E) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | LOPUR | 18/7/2013 | LOCHOREDOME | 15 | FRANCIS KITAI | 1 | 17 | 20 | 16 | 9 | 5 |
| 2 | KAKUMA | 17/7/2013 | NALEMSEKON | 13 | JUTE | 2 | 16 | 19 | 23 | 10 | 6 |
| 3 | LOKIPOTO | 18/7/2013 | LOKIPOTO | 5 | AJIKON | 3 | 17 | 18 | 16 | 8 | 6 |
| 4 | LETEA | 18/7/2013 | KAMUNYAEP | 12 | ANNE MURAYA | 4 | 11 | 19 | 16 | 7 | 7 |
| 5 | KAKUMA | 18/7/2013 | NGIMUNYANA KIRIONOK | 11 | NAMUNYU | 5 | 16 | 19 | 18 | 7 | 6 |
| 6 | LORAU | 18/7/2013 | NATAMAK | 33 | NAMUNYU | 5 | 15 | 20 | 18 | 8 | 5 |
| 7 | OROPOI | 18/7/2013 | NASEKONA | 4 | JUTE | 2 | 13 | 18 | 15 | 8 | 7 |
| 8 | LOPUR | 19/7/2013 | KALEMCHUCH | 16 | FRANCIS KITAI | 1 | 18 | 20 | 27 | 14 | 7 |
| 9 | LETEA | 19/7/2013 | NAKOROS | 2 | AJIKON | 3 | 15 | 20 | 17 | 9 | 6 |
| 10 | KAKUMA | 20/7/2013 | LOCHOR-ANGIRENGO | 18 | ANNE MURAYA | 4 | 15 | 21 | 19 | 6 | 6 |
| 11 | KAKUMA | 20/7/2013 | LOPUSIKI | 23 | FRANCIS KITAI | 1 | 17 | 20 | 25 | 8 | 6 |
| 12 | KALOBEYEI | 20/7/2013 | LOMUNYANAKIRIONOK | 10 | ROBERT EIPA | 2 | 17 | 20 | 23 | 9 | 6 |
| 13 | KAKUMA | 20/7/2013 | NAMON | 24 | FRANCIS KITAI | 1 | 17 | 20 | 25 | 13 | 6 |
| 14 | LETEA | 20/7/2013 | LOITO | 6 | CLEMENT AJIKON | 3 | 13 | 20 | 18 | 8 | 6 |
| 15 | LETEA | 19/7/2013/ | NGIMUKOKAIS | 1 | JUTE KOLA | 2 | 15 | 20 | 24 | 10 | 8 |
| 16 | LOKANGAE | 19/7/2013 | EMILAIT | 34 | ANNE MURAYA | 4 | 18 | 20 | 25 | 10 | 6 |
| 17 | KAKUMA | 21/7/2013 | LOTAKAA | 22 | FRANCIS KITAI | 1 | 17 | 20 | 24 | 9 | 5 |
| 18 | OROPOI | 21/7/2013 | NAWUONTOS | 8 | ROBERT EIPA | 2 | 15 | 20 | 23 | 9 | 6 |
| 19 | KAKUMA | 21/7/2013 | AWARNAPARAN | 21 | FRANCIS KITAI | 1 | 15 | 20 | 19 | 5 | 5 |
| 20 | LOPUR | 21/7/2013 | ATIRAE | 14 | CLEMENT AJIKON | 3 | 14 | 20 | 17 | 7 | 5 |
| 21 | NANAM | 21/7/2013 | LONGOR | 38 | VICTOR NAMUNYU | 5 | 16 | 20 | 24 | 10 | 6 |
| 22 | NANAM | 21/7/2013 | NGIWOYASIKE | 40 | ANNE MURAYA | 4 | 16 | 22 | 17 | 10 | 6 |
| 23 | NANAM | 21/7/2013 | NGIDOCHA | 39 | VICTOR NAMUNYU | 5 | 16 | 20 | 19 | 8 | 7 |
| 24 | KAKUMA | 22/7/2013 | NAREGAE | 17 | FRANCIS KITAI | 1 | 16 | 20 | 23 | 11 | 6 |
| 25 | KAKUMA | 22/7/2013 | NADAPAL | 20 | JUTE KOLA | 2 | 17 | 20 | 21 | 6 | 9 |
| 26 | KAKUMA | 22/7/2013 | NAPOPONGOIT | 35 | VICTOR NAMUNYU | 5 | 16 | 20 | 25 | 11 | 6 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 27 | MOGILA | 22/7/2013 | KOBWIN | 26 | CLEMENT AJIKON | 3 | 18 | 20 | 22 | 7 | 6 |
| 28 | NAKALALE | 22/7/2013 | KAPETADIE | 36 | ANNE MURAYA | 4 | 13 | 20 | 17 | 8 | 6 |
| 29 | NAKALALE | 23/7/2013 | NAKALALE | 25 | CLEMENT AJIKON | 3 | 14 | 20 | 18 | 7 | 6 |
| 30 | KAKUMA | 23/7/2013 | NGIKWAKAIS | 19 | FRANCIS KITAI | 1 | 16 | 20 | 23 | 9 | 7 |
| 31 | LOKANGAE | 23/7/2013 | NGIKWASINYEN | 32 | JUTE KOLA | 2 | 18 | 20 | 28 | 15 | 6 |
| 32 | KALOBEYEI | 24/7/2013 | LONYUDUK | 9 | CLEMENT AJIKON | 3 | 12 | 20 | 20 | 14 | 6 |
| 33 | KALOBEYEI | 24/7/2013 | NALAPATUI | 7 | JUTE KOLA | 2 | 18 | 20 | 27 | 8 | 7 |
| 34 | LOKICHOGGIO | 23/7/2013 | RUKRUK | 27 | VICTOR NAMUNYU | 5 | 14 | 20 | 21 | 6 | 6 |
| 35 | LOKICHOGGIO | 23/7/2013 | NACHUCHUKAIT | 28 | ANNE MURAYA | 4 | 16 | 20 | 20 | 8 | 6 |
| 36 | LOKICHOGGIO | 23/7/2013 | LOKARIWON | 29 | VICTOR NAMUNYU | 5 | 17 | 20 | 23 | 8 | 6 |
| 37 | LOKARIWON | 23/7/2013 | NATIR 1 | 30 | ANNE MURAYA | 4 | 14 | 20 | 19 | 10 | 7 |
| 38 | SONGOT | 24/7/2013 | ECHOR EERENG | 31 | VICTOR NAMUNYU | 5 | 10 | 20 | 15 | 7 | 6 |
| 39 | MOGILA | 24/7/2013 | LOPIDING | 37 | ANNE MURAYA | 4 | 14 | 20 | 19 | 10 | 6 |
| | | | | | **TOTALS** | | **602** | **756** | **809** | **347** | **241** |

**Integrated anthropometric, death rate, iycf survey questionnaire**

**HOUSEHOLD MORTALITY FORM**

***This page must be filled in for every household**

| | | |
|---|---|---|
| **COUNTY:_____** | **CLUSTER NO. [ ][ ]** | **NAME OF TEAM LEADER:_____** |
| **ZONE:_____** | **TEAM NO. [ ][ ]** | **INTERVIEWER:_____** |
| **LOCATION_____** | **VILLAGE** | **HOUSEHOLD NUMBER [ ] [ ]** |

**DATE OF INTERVIEW [ D ][ D ]/[ M ][ M ]/ [ Y ][ Y ]**

| DR01 | DR02 | DR03 | DR04 | DR05 | DR06 | DR07 | DR08 |
|---|---|---|---|---|---|---|---|
| **No.** | **Name** | **Sex 1=Male 2=Female** | **Age (yrs)** | **Born since 1st April** | **Arrived since 1st April** | **Reason for leaving** | **Cause of death** |
| **a) Starting with the youngest, how many members are present in this household? List them.** | | | | | | | |
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| b) How many members have left this household (out migrants) since 1st April? List them | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
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| | | | | | | | |
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| **c) Do you have any member of the household who has died since 1st April? List them** | | | | | | | |
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**Summary**

| Details | U5 | Total |
|---|---|---|
| Current HH Members | | |
| Arrivals during the Recall period | | |
| Number who have left during Recall period | | |
| Births during recall | | |
| Deaths during recall period | | |

**HH definition: Group of people living under same roof & sharing food from the same pot for a period of at least 6 months. In home with multiple wives, those living and eating in different houses are considered as separate HHs. Wives living in different houses and eating from same pot are considered as one HH.**

**Reason for Death: 1 = Diarrhoea; 2 = Fever; 3 = Difficulty breathing; 4 = Malnutrition; 5 = Measles; 6 = Accident; 7 = Violence 66 = Other (specify)**

**Reason for Leaving: 1. Work 2. School 3. Instability/insecurity 5.Long Visit (More than 3 months) 4 Nomadic Pastoralism**

QUESTIONNAIRES B(FOOD SECURITY); QUESTIONNAIRE C(ANTHROPOMETRY); QUESTIONNAIRE D (IYCF 6-23MONTHS); QUESTIONNAIRE E(IYCF 0-5MONTHS);QUESTIONNAIRE F( SUMMARY MORTALITY SHEET):

Survey Questionnaires.xls

APPENDIX 5: CALENDAR OF EVENTS (JULY 2013)

| | Annual | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|
| January | -School opening | | **54**<br>Woman kills a merile in Kokuro | **42**<br>Sun eclipse<br>Marich bridge collpases | **30** | **18**<br>Happy New Year | **6**<br>IEBC vetting Verification of voters |
| February | **(Hot season)** | | **53** | **41**<br>Floods in Lokori<br>Redcross rescue<br>Cholera outbreak | **29**<br>Ekaru a voucher<br>WVK Kaputir food security | **17** | **IYCF (Qnn. E)**<br>**5** |
| March | **(Hot season)** | | **52** | **40**<br>Start of voters registration | **28**<br>Ordination of bishop Kimengich | **16**<br>Ngamia One Oil Exploration | **IYCF (Qnn. E)**<br>**4**<br>Election |
| April | **(long rains)** | | **51**<br>Councilllor Aule arrested<br>Dry grass relief | **39**<br>Voters registration | **27**<br>Tondonyang Massacre<br>Raila visits Todonyang | **15**<br>Safcom in Kaikor<br>Kakuma Voluntary Circumcision | **IYCF (Qnn. E)**<br>**3**<br>Swearing in of county Governor |
| May | | | **50** | **38**<br>End of voters registration | **26**<br>End of the world prophesy by Haron<br>Death-Osama bin Laden | **14**<br>Ekaru Asuru Angikeng<br>Shooting of vehicle in Loitanit | **IYCF (Qnn. E)**<br>**2**<br>Suicide of Father Manze<br>Flooding in Lodwar |
| June | | | **49**<br>Nginokakim Ngatuk angidongiro(fire burns) | **37**<br>End of Nutrition Survey 2010 | **25**<br>RDU settlement in Todonyang,,MSF food distribution,Ekaru atinga,Death of police inspectors(baiba) | **13**<br>Saitoti/Ojode Helicopter crash<br>Nutrition Survey<br>Dayah Bus Accident in Kamatina | **IYCF (Qnn. E)**<br>**1**<br>Homecoming of Speaker of the Senate |
| July | **(Cool cloudy season)** | | **48** | **36**<br>Killing of Napeitom Chief | **24**<br>Emahindi a RCEA | **12**<br>Ocampo 6<br>Polio Campaign | **IYCF (Qnn. E)**<br>**0**<br>**(Enter Age in DAYS)** |
| August | | **59**<br>Floods killed a PHO<br>Napeitom Massacre | **47**<br>Census | **35**<br>Referendum | **23**<br>Kenya 4 Kenyans<br>BSFP Naburo<br>Raila Visits Morulem<br>Oxfarm cash transfer | **11**<br>MP Turkana South Suicide<br><br>St. Leo School Bus Accident | |
| September | | **58**<br>Kangitit sec school bus accident | **46**<br>Cholera outbreak in Kerio | **34**<br>Release of councillor Ebenyo | **22**<br>Teachers strike<br>Kenya Army car swept at Nakiria,Eld express accid | **10**<br>Trachoma Campaign<br><br>Teacher's Strike | |
| October | **(short rains)** | **57** | **45**<br>Ndapal lokichogio border conflict | **33**<br>Alleged dog eating | **21**<br>Op. Linda Nchi<br>Fundrasing at lokitaung and Kataboi | **9**<br>Baragoi Massacre<br><br>Oxfam HH Registration | |
| November | | **56**<br>Obama becomes president | **44**<br>Councillors die in Nakuru road accident | **32** | **20**<br>DC car swept<br>Kinyanjui canter swept<br>Samaritans purse | **8**<br>VoterRegistration<br>Obama Wins<br>KakumaAtanaeche<br>Measles Campaign | |
| December (Christmas) | | **55**<br>Lorengipi massacre | **43**<br>Pokot massacre at Lorengippi | **31** | **19**<br>Nutrition survey<br>Man stoned to death | **7**<br>HNSP Mass Regist.<br>50Yrs Archdiocese of Lodwar-Jubillee | |

APPENDIX 6: FOCUS GROUP DISCUSSION LIVELIHOODS AND TRANSLATIONS (JULY 2013)

1. ***Mixed FGD Casual Labour Livelihood-Turkana Central: NAPETET***
2. ***Mixed FGD Fisherfolk Livelihood-Turkana Central: ELIYE***
3. ***Mixed FGD Pastoral Livelihood-Turkana North: MLIMA TATU***
4. ***Mixed FGD Fisherfolk Livelihood-Turkana Central: KATABOI***
5. ***Mixed FGD Agropastoral Livelihood-Turkana South: LOTUBAE***
6. ***Women FGD Casual Labour Livelihood-Turkana Central KANAMKEMER***
7. ***Women FGD Casual Labour Livelihood-Turkana Central NAKWAMWEKWI***
8. ***Women FGD Agropastoral Livelihood-Turkana South: LOIMA***
9. ***Mixed FGD Pastoral Livelihood- Turkana West: LOPUR***
10. ***Women FGD Fisherfolk Livelihood- Turkana North: NAKWASINYEN***
11. ***Women FGD Pastoral Livelihood- Turkana North: LOKORE***
12. ***Women FGD Pastoral/Urban Livelihood- Turkana North: KAERIS TOWN***

**Turkana Language Translation**

***PlumpyNut- "Chocolate"*** ***OTP-"ngachokileta",***

**SFP; *uji mix -"adicho"*** ***Blanket supplementary feeding programme - "nakatuman"***

***Cash for Work- 'ngitapakituki'*** ***Donated food- 'Angarasit'***

***Begging- 'akilipa'***

***Drought "akamu"*** ***Hunger- "eboot"***

***Diseases.-"edeke"*** ***Breast Abscess/Mastitis- "amoding "***

***Illiteracy "Erayananu"*** ***Situation is fair- 'eyei kiding'***

***Money for the aged -'nakaskou'*** ***Nearby bush- "natira"***

***No market for fish-"akara ngikolia".*** ***Less fish in the lake- "atona anaam"***

***Insufficient Breast Milk- "Auchirianut"***

***Little/Small milk "Euchirian"*** ***Breast milk is bitter for older child- "eduwar"***

***Children malnourished "luerogo bon".*** ***HIV/AIDS- "Lokwakel".***

***Immunization of children- "Echanjo"*** ***Rub their buttocks against the sand- "nanginya"***

***They rub their buttocks against the sand -"akinginyngikin abor nalop"***

***Animal fat -"akimet"*** ***Animal milk -"ngakile"***

***Traditional cheese- Akididet*** ***Ugali-'epocho jik'***

***Uji with milk- 'nang'aria'*** ***Githeri- 'emoroge ke emaidi'***

***Witchdoctors- "lomuruk"*** ***Elders- "agatakin***