SAMBURU CENTRAL DISTRICT

SMART NUTRITION SURVEY REPORT

(Final Report)

Conducted by:

World Vision Kenya
and Ministry of Public Health and Sanitation Services

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Report compiled by:
Martin Meme
Consultant Nutritionist
Department of Foods, Nutrition & Dietetics
Kenyatta University
P.O. Box 43844 (00100)
Nairobi
Cell: 0722-306607
Email: mmmeeme@yahoo.com

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS..... 2
TABLE OF CONTENTS..... 3
ACRONYMS AND ABBREVIATIONS..... 5
EXECUTIVE SUMMARY 6
1.0 INTRODUCTION 11
1.1 Background and Rationale..... 11
1.2 Objectives 11
2.0 METHODOLOGY 13
2.1 Geographic Target Area and Population Group..... 13
2.2 Type of Survey..... 13
2.3 Sampling Methodology and Sample Size 13
2.4 Data Collection Tools and Variables Measured..... 14
2.4.1 The Household Questionnaire..... 14
2.4.2 Child (6-59 months old)..... 14
2.4.3 Child (6-23 months old)..... 14
2.4.4 Child (<6 months old)..... 14
2.4.5 FGD guide..... 14
2.5 Training and Supervision..... 14
2.6 Data Entry and Analysis..... 14
2.7 Nutritional Status Cut-off Points..... 15
2.7.1 Weight-for-height (WFH) and MUAC – Wasting..... 15
2.7.2 Weight-for-age (WFA) – Underweight 15
2.7.3 Height-for-age (HFA) – Stunting 15
2.7.4 Maternal MUAC 15
2.8 Data Quality Control..... 15
3.0 RESULTS AND DISCUSSIONS 17
3.1 General Characteristics of Study Population and Households 17
3.2 Nutritional Status of Children 6-59 Months 17
3.2.1 Prevalence of Global Acute Malnutrition by WFH z-scores..... 17
3.2.2 Prevalence of Acute malnutrition by MUAC..... 18
3.2.3 Prevalence of Underweight by WFA z-scores..... 19
3.2.4 Prevalence of Stunting by HFA z-scores..... 19
3.3 Maternal Nutritional Status and Maternal Health Care 19
3.4 Infant and Young Child Feeding (IYCF) Practices and Care..... 20
3.4.1 Breastfeeding Practices 20
3.4.2 Complementary Feeding Practices 20
3.4.3 Child Immunization..... 21
3.4.4 Vitamin A Supplementation, Deworming and Zinc in Diarrhoeal Management..... 22
3.4.5 Child Morbidity and Health-Seeking Behaviour 22
3.5 Water, Sanitation and Hygiene (WASH) practices..... 22
3.6 Household Food Security Indicators 23
3.6.1 Income and Food Sources 23
3.6.2 Household Meal Frequency 23
4.0 CONCLUSIONS AND RECOMMENDATIONS 25
4.1 Conclusions 25
4.2 Recommendations..... 26

LIST OF TABLES

Table 1: *Summary of main survey findings*..... 6
Table 2: *Age and sex distribution of sample children* ……... 17
Table 3: *Prevalence of acute malnutrition by weight-for-height (WHO-GS)*..... 17
Table 4: *Child nutritional status based on MUAC*…..... 18
Table 5: *Prevalence of underweight by weight-for-height z-scores (WHO-GS)*……..... 19
Table 6: *Prevalence of stunting by height-for-age z-scores (WHO-GS)*……..... 19
Table 7: *Adult nutritional status by MUAC* ……..... 20
Table 8: *Breastfeeding practices*..... 20
Table 9: *Complementary feeding practices*..... 21
Table 10: *Vitamin A supplementation, deworming & zinc in diarrhoeal management*.... 22
Table 11: *Sources and treatment of drinking water*..... 23
Table 12: *Frequency of meals*……..... 24

LIST OF FIGURES

Figure 1: *Overall prevalence of GAM by child age*……... 18
Figure 2: *Distribution of W/H Z-scores for sampled children*..... 18
Figure 3: *Wasting by MUAC and child age* ……..... 19
Figure 4*: Food groups taken by children in the previous 24 hours*..... 21
Figure 5: *Immunization, vitamin A supplementation and deworming coverage* ……... 21
Figure 6: *Child morbidity*..... 22
Figure 7: *Main sources of household income*..... 23

LIST OF APPENDICES

Appendix 1: *Survey clusters*..... 27
Appendix 2: *Child age chart*..... 27
Appendix 3: *Referral form*..... 27
Appendix 4: *Movement plan*..... 27
Appendix 5: *Weighted Samburu County findings*..... 27
Appendix 6: *Household & Anthro combined data*..... 27
Appendix 7: *Child 6-59 months data*..... 27
Appendix 8: *Child 6-23 months data*..... 27
Appendix 9: *Child 0-5 months data*..... 27
Appendix 10: *Survey tool*..... 27
Appendix 11: *FGD tool*..... 27

ACRONYMS AND ABBREVIATIONS

ARI	- Acute Respiratory Infection
BF	- Breastfeeding
CI	- Confidence Interval
EBF	- Exclusive Breastfeeding
ENA	- Emergency Nutrition Assessment
FGD	- Focus Group Discussion
GFD	- General Food Distribution
GAM	- Global Acute Malnutrition
GOK	- Government of Kenya
GS	- Growth Standards
HFA	- Height-for-Age
IMAM	- Integrated Management of Acute Malnutrition
KAP	- Knowledge Attitudes and Practices
KEPI	- Kenya Expanded Programme on Immunization
KII	- Key Informant Interview
MOH	- Ministry of Health
MUAC	- Mid-Upper Arm Circumference
NDMA	- National Drought Management Authority
OPV	- Oral Polio Vaccine
OTP	- Out-patient Therapeutic Programme
PPS	- Probability Proportional to Population Size
SAM	- Severe Acute Malnutrition
SD	- Standard Deviation
SFP	- Supplementary Feeding Programme
SMART	- Standardized Monitoring and Assessment of Relief and Transitions
SPSS	- Statistical Package for Social Scientists
UNICEF	- United Nations Children's Fund
WASH	- Water Sanitation and Hygiene
WFA	- Weight-for-Age
WFH	- Weight-for-Height
WHO	- World Health Organization
WHO-GS	- World Health Organization - Growth Standards
WVK	- World Vision Kenya

EXECUTIVE SUMMARY

Table 1*: Summary of main survey findings*

Characteristic		Prevalence (n and/or %)		
Mean household size		**5.9** (2.2 SD) members		
	Total underfive sample	**808**		
	Males	415 **(51.4%)**		
	Females	393 **(48.6%)**		
	Sex ratio (M/F)	**1.1**		
Number of children eligible for WFH analysis		795		
GAM (WFH <-2 Z score or presence of oedema)		87 **(10.9%)** [8.4-14.2 CI]		
SAM (WFH <-3 Z score or presence of oedema)		11 **(1.4%)** [0.7-2.8 CI]		
Acute malnutrition by MUAC (N= 808):	Moderate acute malnutrition (11.5cm-<12.5cm)	32 **(4.0%)** [2.8-5.5 CI]		
	Severe acute malnutrition (<11.5cm and/or oedema)	7 **(0.9%)** [0.4-1.7 CI]		
	Total wasted (<12.5cm)	39 **(4.8%)** [3.5-6.5 CI]		
	At risk (12.5cm - <13.5cm)	139 **(17.2%)** [14.7-19.9 CI]		
Total underweight (WFA <-2 Z score or presence of oedema) N=798		199 **(24.9%)** [22.1-28.1 CI]		
Severe underweight (WFA <-3 Z score or presence of oedema) N=798		44 **(5.5%)** [4.1-7.4 CI]		
Total stunting (HFA <-2 Z score) N=782		276 **(35.3%)** [31.5-39.3 CI]		
Severe stunting (Height for age <-3 Z score) N=782		44 **(5.5%)** [4.1-7.4 CI]		
Child Morbidity (N= 813):	Proportion of children with ARI in two weeks prior to survey	207 **(25.5%)**		
	Proportion of children with malaria in two weeks prior to survey	97 **(11.9%)**		
	Proportion of children with diarrhoea in two weeks prior to survey	66 **(8.1%)**		
	Zinc supplementation during diarrhoea (N= 808)	240 **(29.7%)**		
Vitamin A supplementation coverage:	**6-11 months (N=151):** None	48 **(31.8%)**		
	Once	54 **(35.8%)**		
	Twice	42 **(27.8%)**		
	12-59 months (N= 657): None	60 **(9.1%)**		
	Once	148 **(22.5%)**		
	Twice	369 **(56.2%)**		
Overall 6-59 months vitamin A supplementation (at least once in the last 1 yr) N=808):		700 **(86.6%)**		
Oral polio vaccination coverage (OPV 3) N=808		750 **(92.8%)**		
Proportion of children dewormed past six months prior to the survey (12-59 months) N=657		295 **(44.9%)**		
Proportion of children immunised against measles (9-59 months) N=736		612 **(83.0%)**		
Proportion of malnourished women < 21.0cm MUAC (N= 694):	Pregnant women (n=62)	5 **(15.2%)** [5.8-30.4 CI]		
	Non-pregnant women (n=192)	8 **(24.2%)** [12.0-40.9 CI]		
	Lactating women (n=440)	20 **(60.6%)** [43.4-76.0 CI]		
	Overall malnourished women	33 **(4.8%)** [3.4-6.5 CI]		
	Maternal iron/folate supplementation (N=694)	394 **(56.3%)**		
	Compliance to Iron/folate supplementation (≥90 days) N= 345	33 **(8.4%)**		
WASH				
Proportion of households treating drinking water appropriately (N=700)		169 **(14.4%)**		
Proportion of households with access to toilets (N=700)		251 **(35.9%)**		
Infant and young child feeding practices (IYCF)				
Breastfeeding Practices:		**Target**	**Prevalence**	**Comment**
Timely Initiation of breastfeeding (within 1hr) (< 6 months N=245)		>80%	228 **(94.3%)**	Satisfactory
Giving of colostrum (< 6 months n=245)		>80%	237 **(96.7%)**	Satisfactory
Exclusive breastfeeding <6 months (<6 months N=245)		>50%	175 **(71.4%)**	Satisfactory
Pre-lacteal feeds given (< 6 months n=245):		N/A	43 **(17.6%)**	Satisfactory
Types of pre-lacteal feeds (< 6 months n=43):	Animal milk/products	20 **(46.5%)**		
	Plain water	19 **(44.2%)**		
	Sugar/Glucose water	4 **(9.3%)**		
Continued breastfeeding at 1 year (12 – 15 months) (n=89)		72 **(80.9%)**		
Continued breastfeeding at 2 years (20 – 23.9 months) (n=85)		49 **(57.6%)**		
Minimum meal frequency:		**Target**	**Prevalence**	**Comment**
Breastfed children 6-8 months who received complementary foods ≥2 times (n=60)			49 **(81.7%)**	
Breastfed children 6-23 months who received complementary foods ≥ 3 times per day (n=310)			231 **(74.5%)**	
Non -breastfed children 6-23 months who received complementary foods a ≥4 times (n=75)			28 **(37.3%)**	
Breastfed children 6-8 months old ≥ 2 times +Breastfed children 6-23 months old ≥3 times + non-breastfed children 6-23 months old ≥ 4 times (n=445)		>80%	308 **(69.2%)**	
Minimum dietary diversity:				
Breastfed children 6-23 months of age who received ≥3 food groups (n=310)			178 **(57.4%)**	
Non-breastfed children 6-23 months of age who received ≥4 food groups (n=75)			50 **(66.7%)**	
Breastfed children consuming ≥3 food groups + non-breastfed children consuming ≥4 food groups (n=385)		>80%	228 **(59.2%)**	Unsatisfactory

Samburu is one of the Counties in the Rift Valley Province of Kenya covering a total area of approximately 21,000 km^2, with a projected population of 243,530 (KDHS 2010)[1]. The County is divided into three administrative districts namely; Samburu Central, Samburu East and Samburu North districts with a total of six administrative divisions (Kirisia, Lorroki, Waso, Wamba, Baragoi and Nyiro). Samburu Central district, curved from the previous larger Samburu district, is among the arid to semi-arid districts of Rift Valley province. It has two divisions (Kirisia and Lorroki) with a total catchment population of 111,018 persons and covers approximately 1,339.4 Km^2. The main livelihood of the people revolves around nomadic pastoralism, with only about one tenth of the population practising agro-pastoralism in Kirisia and parts of Lorroki divisions. Traditional beliefs such as food taboos, strong cultural systems and harsh climatic conditions have conspired resulting in low incomes, food insecurity, reduced potable water, high illiteracy levels, morbidity from preventable diseases and consequent high malnutrition prevalence in the community.

The district has a total of 27 health facilities out of which 20 are GOK health facilities, 6 are faith based and 1 is community-owned. WVK with funding support from UNICEF is currently supporting the 27 health facilities to deliver essential nutrition services through on-the-job training, coaching and mentoring approaches. Since December 2009 WVK has been supporting the Ministry of Health to facilitate delivery of nutrition services in the district. Initially support was towards management of acute malnutrition which then transitioned to support delivery of essential nutrition services from July 2011. Achievements so far have been capacity building for health facilities to manage acute malnutrition, identification and training of CHWs, community sensitization and mobilization, screening and referral of malnourished children, and establishment of reporting systems for IMAM at 23 health facilities. Despite the improvements in establishing these systems, the situation is still poor and the ministry of health still needs support to ensure further improvement in coverage and nutrition service delivery systems. Through funding support from UNICEF, the ministry of health is being supported to strengthen the delivery of high impact nutrition interventions (HINI). The HINI project specifically builds on the on-job training project that started in July 2010 which also incorporates mentoring and coaching of health workers and CHWs. As part of routine monitoring of the situation and need for informed formulation and prioritization of appropriate interventions, nutrition surveys and assessments have been conducted every year. This survey therefore served to assess the nutritional/health situation in the district in light of the on-going and scaled-up high impact nutrition interventions. The overall objective of the survey was to assess food security, health and nutritional status of children between 6 and 59 months old and assess infant and young child feeding and care (IYCF) practices among children 0-23 months old and investigate causes leading to long-standing poor health and nutritional indicators.

This anthropometric survey, which covered the entire Samburu Central district utilized the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology and was also in accordance with both the National Guidelines for Nutrition and Assessments in Kenya and the recommended key UNICEF nutritional survey indicators. A two-stage cluster sampling with probability proportional to size (PPS) design was employed. Anthropometric 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 while the IYCF sample was calculated using the IYCF calculator with relevant indicators derived from the previous SMART survey in the district. The resultant sample sizes were 808 children 6-59 months from 700 households, 245 children below 6 months and 385 children 6-23 months.

On average, households had 5.9 (SD 2.2) members with most (82.0%) being male-headed. The prevalence of global acute malnutrition i.e. GAM (WFH <-2 z-scores or oedema) among the underfives was 10.9% (8.4-14.2 CI), and is rated 'Serious' according to WHO[2] benchmarks while severe acute malnutrition i.e. SAM (WFH <-3 z-scores or oedema) was 1.4% (0.7-2.8 CI). Male children were significantly ($P<0.05$) more wasted than their female counterparts as was also the case during the December 2011 survey. The mid-upper arm circumference (MUAC) indicated lower levels of both moderate malnutrition of 4.8% (3.5-6.5 CI) and severe acute malnutrition of 0.9% (0.4-1.7 CI), with17.2% (14.7-19.9 CI) being at risk of malnutrition. Though slightly higher than the December 2011 level, the prevalence of both global underweight (WFA <-2 z-scores or oedema) of 24.9% (22.1-28.1 CI) and severe underweight (WFA z-scores <-3 or oedema) of 5.5% (4.1-7.4 CI) were not significantly so. The prevalence of both global stunting (HFA <-2 z-scores or oedema) of 35.3% (31.5-39.3 CI) and severe stunting (HFA z-scores <-3 or oedema) of 5.5% (4.1-7.4 CI) were significantly lower than the 40.0% (35.6-48.7 CI) and 16.7% (12.4-22.1 CI), respectively, in the December 2011 survey. This, however, cannot be conclusively verified owing to lack of actual birth-date data to confirm heights against actual

[1]Kenya National Bureau of Statistics (June 2010): Kenya Demographic and Health Survey

[2] WHO (200): Management of Nutrition in Major Emergencies.

ages which consequently led to rounding up child age in months through use of age charts. The prevalence of malnutrition was highest among lactating mothers (60.6% 43.4-76.0 CI). The findings revealed a marginal improvement in maternal iron/folate supplementation from 52.9% in December 2011 to 56.3%. However, compliance to supplementation (for at least 90 days) was very low at only 8.4%.

Commendably high proportions of mothers (94.3%) and 96.7% had initiated breastfeeding appropriately (within 1 hour of birth) and given their new-borns colostrum, respectively. Although exclusive breastfeeding rate (excluding children given pre-lacteals) was relatively high at 71.4%, continued breastfeeding at 2 years had dropped by 23.3% from 80.9% at 1 year to 57.6% at 2 years. This is of concern as 62.7% of the non-breastfed children had not attained the minimum feeding frequency. More than two thirds (69.2%) of the children had attained the expected meal frequency and 59.2% the minimum expected dietary diversity. Sub-optimal IYCF practices are attributed to ignorance-related reasons according to FGDs where giving pre-lacteals was attributed to *'cleaning the digestive system'* or *'to help satisfy a hungry infant after birth'.* The dietary composition of complementary foods was generally lacking in minerals and vitamins, though dietary profiles could easily be improved through increased consumption of some foodstuffs which are locally and readily available such as eggs and vegetables.

Overall, the coverage for all vaccinations was above the WHO threshold of 80% with polio immunization (OPV 3) standing at a high 92.8%, measles (83.0%) and BCG (confirmed by presence of scar) at 90.7%. However, coverage for measles indicates a drop from 90.5% in 2011 to 83.0%. Within the previous one year period, the overall proportion of children (86.6%) who had received vitamin A supplementation at least once was higher than those (76.8%) during the December 2011 survey. The relatively high proportion (27.8%) of children 6-11 months who had received vitamin A supplementation twice is attributed to Malezi Bora Week of November 2012 and also doses administered during routine disease treatment at health facilities. The proportion of children 6-11 months who had received vitamin A supplementation once as recommended was only slightly more than one thirds (35.8%). The coverage for deworming had reduced from 51.4% in December 2011 to 44.9%. Although zinc supplementation during diarrhoea indicated a 6-fold improvement (from 4.7% to 29.7%), the coverage is still low and should be improved to the acceptable 80% minimum threshold. The findings indicate a high morbidity load among half (49.9%) of the children, with the leading reported illnesses during the previous 2 weeks being ARI/cough (25.5%), malaria (11.9%), diarrhoea (8.1%) and eye infections (2.6%). Following child illness, the majority (59.0%) of respondents had sought assistance from formal health facilities, 5.8% from traditional healers with 32.8% seeking no assistance. The findings indicated no improvement in appropriate drinking water treatment which still stood at only 14.4%. The very low proportion (13.5%) of mothers reporting washing their hands after defecation is a major concern.

The food security status in the district was suggestive of a deteriorated and/or deteriorating situation. This was reflected by the high proportion (57.6%) of households mainly dependent on food purchase as their main food source and low proportion (17.0%) dependent on own production. This was further amplified by a significant ($P<0.01$) decrease in the frequency of taking meals from the usual 2.81 (SD 0.8) times to 2.56 (SD 0.7) times per day on the basis of a 24-hour food intake recall.

Conclusions

- The prevalence of GAM of 10.9% (8.4-14.2), though not significantly, had increased from 8.5% (6.0-11.8) in December 2011 and is rated "Serious" as per the WHO benchmarks. The prevalence of acute malnutrition among boys in the district has been consistently and significantly higher than among girls ($P<0.05$). The findings on GAM are interpreted according to this survey's contextual background:
  - the survey was carried out more than 3 months after harvest season which begun in October 2012
  - farm sizes in the district are dismally small with consequent meagre harvests that do not last for long
  - there is a strong sharing culture in the district such that whatever is harvested is shared with relatives/friends. FGD findings showed that this also happens in the case of both SFP and OTP food supplements and the protection ration (PR)
  - FGD findings and a casual market survey (both collaborated by the National Drought Management Authority (NDMA) Bulletin Report) showed that food prices were high in the face of very modest purchasing power in the district
  - there had been no GFA distributed in the year 2012 (only protection rations for SFP and OTP)

- ➢ although this survey did not assess coverage, 19 children eligible for SFP and OTP were identified during the survey and referred to the nearest health facilities
- ➢ increasing trends in SFP and OTP admissions were reported in the district

- The prevalence of underweight at 24.9% (22.1-28.1 CI) in the district was higher than the National rate of 16.1%
- Stunting rate in the district was the same as the National average of 35.3%. The prevalence of stunting in the district indicated a significant decrease from the 40.0% (35.6-48.7 CI) revealed by the December 2011 survey. Although this abrupt observed change is not easy to clarify (in light of the fact that stunting is not subject to change in the short term) it is, however, suspected that inaccuracies in child age determination due to rounding up age figures through the use of a child age chart and the fact that child-age distribution indicated a disproportionate representation of relatively older children could be partly responsible as well as absence of relatively older children in the sample due to school attendance during the survey
- Child morbidity load was high (affecting 50% of the children) mainly due to ARI/cough, malaria and diarrhoea (with 67.8% of the children not receiving zinc supplementation). Diarrhoeal morbidity is partly attributed to ignorance factors such as that revealed by FGDs that boiling drinking water "*makes it tasteless"*
- Relative to the previous survey, there was a very slight improvement of only 5.4% in access to toilets to 36%, with only 14% of the households treating drinking water and a worryingly similar proportion (14%) of mothers reporting washing hands after defecation. It is suspected that the use of bushes is a big disincentive to hand washing since close proximity to a hand-washing facility/materials after defecation encourages hand washing
- Immunization coverage was above the 80% WHO threshold with that of OPV having improved, though coverage for measles had dropped slightly
- Vitamin A supplementation for children 6-11 months (63.6%) had reduced from 74.8% in December 2011. Vitamin A supplementation above once for children below 1 year of age is attributed to the Malezi Bora week which had taken place in November 2012 and routine supplementation for children attending health facilities, both of which are carried out regardless of previous doses administered
- Deworming coverage was at less than half (44.9%) having dropped from 51.4% in December 2011
- BCG coverage was high at 90.7% although a few health cards indicated BCG having been administered but with no visible scars, which requires a repeat. A number of underfives in the pre-test village (Nomotio) had not been taken for immunization which calls for an immunization campaign to cover them
- About two thirds (60.6%) lactating mothers suffered were malnourished while less than 10% complied with iron/folate supplementation for at least 90 days
- Household food security status indicators suggest a deteriorated/deteriorating situation. Despite reported high market food prices (FGDs and ARMP Bulletin Report) the proportion of households relying mainly on food purchase was more than 3 times of those who relied on own production and close to 40% of the households reported taking less than 3 meals/day, with a significant decrease in the prevailing frequency of meal taking ($P<0.01$)
- Some sub-optimal IYCF practices e.g. giving of pre-lacteals is associated with ignorance-related factors such as giving sugar/glucose solutions and gorno (a centrifuged milk ferment cream) to "*clean the digestive system"* and ghee *"to help satisfy a hungry infant after birth"* according to FGD findings
- Timely initiation of BF and BF at 1 year rates were high, but exclusive breastfeeding and continued breastfeeding at 2 years require improvement
- 30% and 40% of the children did not meet the expected minimum meal frequency and dietary diversity, respectively

Recommendations

1. Some HINI indicators fell short of the expected WHO 80% minimum benchmark and need improvement e.g. through up-scaling, more outreaches, nutrition/health campaigns, mobile clinics and enhanced support for CHW activities:
   - ➢ Increase Vitamin A supplementation for children 6-11 months from 63.6% to at least 80% through routine health-facility attendance and community-level screening campaigns
   - ➢ Improve de-worming coverage from 44.9% to 80% through Malezi Bora Weeks and more promotion of more intensified self-referral among childcare givers to facilitate Helminthic screening for underfives
   - ➢ Upscale toilet access from 40% through more intensified support for the on-going WVK's Community-led Total Sanitation Strategy (CLTS)

- Make main drinking water sources safer (e.g. boreholes and protected wells) through fencing and protection from run-offs
- Improve drinking water treatment from 14.4% principally through community-level promotion of boiling and appropriate drinking water storage campaigns
- Further promote appropriate hand washing to universal levels, particularly after defecation through more intensified campaigns in the community
- More efforts required to improve continued breastfeeding at 2 years from 52.6% and achieve optimal complementary feeding to at least 80% from the current 69.2% e.g. during ANC attendance by mothers
- Further improvement on active case-finding for children in need of SFP and OTP in the community

2. There is need to implement initiatives to improved and sustained household food security. These include:
    - Enhancement of small agricultural projects targeting more women including small-livestock keeping and kitchen gardening to directly improve dietary profiles
    - More sensitization of community to improve feeding practices and use of locally available foodstuffs to improve dietary profiles e.g. vegetables and eggs
    - Expansion of FFA activities to ensure all vulnerable HHDs benefit and development of community-specific surveillance strategies to monitor the nutritional situation to identify hunger gaps and take requisite interventions in a more timely manner

3. Enhance and sustain the Community Strategy through building community capacity to participate in nutrition and health activities in the district
4. Improve crop and livestock production and market value chains to encourage expansion of farming to ultimately improve food security and household income in the district
5. Conduct a KAP survey to identify reasons for poor child nutritional status in the district (particularly boys).

1.0 INTRODUCTION

1.1 Background and Rationale

Samburu County is one of the Counties in the Rift Valley Province of Kenya and borders Laisamis district to the East and North East, Isiolo to the South East, Laikipia North to the South, Baringo East to the South West and Turkana South district to the west and North West. The County covers an area of approximately 21,000 km^2, with a projected population of 243,530 (KDHS 2010)[3]. The Samburu County is divided into three administrative districts namely; Samburu Central, Samburu East and Samburu North districts with a total of six administrative divisions (Kirisia, Lorroki, Waso, Wamba, Baragoi and Nyiro). About 85% of the County is a rangeland lowland while the rest is a highland area, where rain-fed agriculture is practiced. Overall, rainfall is scarce and unreliable averaging between 750mm per annum in the highlands to 250mm in the lowlands. The main crops grown are maize, beans, sorghum and cowpeas. Livestock industry is the single most important industry in the County. Pastoral, Agro-pastoral and Formal employment/Business/Petty trade are the three main Livelihood zones in the County with 85% of the population depending on pastoralism (cattle, camels, and shoat keeping). The rest of the population is engaged in formal employment, business or petty trade and are found in major town centres like Maralal, Baragoi, Wamba and Archer's post.

Samburu Central district, curved from the previous larger Samburu district, is among the arid to semi-arid districts of Rift Valley province. It has two divisions namely: Kirisia and Lorroki and borders Laikipia District to the South, Samburu North to the North, Samburu East to the East, and Baringo East to the West. It has a total catchment population of 111,018 persons and covers approximately 1,339.4 Km^2. The main livelihood of the people revolves around nomadic pastoralism, with only about one tenth of the population practising agro-pastoralism in Kirisia and parts of Lorroki divisions. Traditional beliefs such as food taboos, strong cultural systems and harsh climatic conditions have conspired resulting in low incomes, food insecurity, reduced potable water, high illiteracy levels, morbidity from preventable diseases and consequent high malnutrition prevalence in the community.

The district has a total of 27 health facilities out of which 20 are GOK health facilities, 6 are faith based and 1 is community-owned. WVK with funding support from UNICEF is currently supporting the 27 health facilities to deliver essential nutrition services through on-the-job training, coaching and mentoring approaches. Since December 2009 WVK has been supporting the Ministry of Health to facilitate delivery of nutrition services in the district. Initially support was towards management of acute malnutrition which then transitioned to support delivery of essential nutrition services from July 2011. Achievements so far have been capacity building for health facilities to manage acute malnutrition, identification and training of CHWs, community sensitization and mobilization, screening and referral of malnourished children, and establishment of reporting systems for IMAM at 23 health facilities.

Despite the improvements in establishing systems enumerated above, the situation is still poor and the ministry of health still needs support to ensure further improvement in coverage and nutrition service delivery systems. Through funding support from UNICEF, the ministry of health is being supported to strengthen the delivery of high impact nutrition interventions (HINI). The HINI project specifically builds on the on-job training project that started in July 2010 which also incorporates mentoring and coaching of health workers and CHWs. Ultimately, the package of services will be more comprehensive to cover 11 high impact nutrition interventions and geographical scale up to cover all 27 health facilities in Kirisia and Lorroki divisions of Samburu Central district. As part of routine monitoring of the situation and need for informed formulation and prioritization of appropriate interventions, nutrition surveys and assessments have been conducted every year. This survey therefore served to assess the nutrition situation in Samburu in light of the on-going and scaled-up high impact nutrition interventions.

1.2 Objectives

The overall objective of the survey was to assess food security, health and nutritional status of children between 6 and 59 months old and investigate causes leading to long-standing poor health and nutritional indicators.

The specific objectives of the survey were:

1. Assess the prevalence of acute and chronic malnutrition in children aged 6-59 months
2. Assess the prevalence of malnutrition among pregnant and lactating women aged 15-49 years

[3] Kenya National Bureau of Statistics (June 2010): Kenya Demographic and Health Survey

3. Assess care-seeking behaviors and IYCF practices
4. Estimate coverage for OPV, measles & BCG immunization, Zinc supplementation, de-worming and vitamin A supplementation among underfives
5. Estimate iron/folate supplementation among pregnant women
6. Estimate morbidity rates among children 6-59 months
7. Asses household food security situation and GFD coverage
8. Establish water, hygiene and sanitation practices in the community

2.0 METHODOLOGY

2.1 Geographic Target Area and Population Group

The survey covered the entire Samburu Central District comprising of two divisions (Lorroki and Kirisia). The primary respondent to the household and child questionnaires were mothers/primary childcare givers. Children 6-59 months old and mothers/primary caregivers (15-49 years old) were targeted for anthropometric measurements.

2.2 Type of Survey

An anthropometric survey that utilized the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology in accordance with both the National Guidelines for Nutrition and Assessments in Kenya and the recommended key UNICEF nutritional survey indicators was conducted. Qualitative data comprising of focus group discussions (FGDs), Key Informant Interviews (KIIs) and general observations were also collected to complement quantitative data. A mortality survey was not conducted alongside this anthropometric survey owing to the fact that there had been no reported and/or anticipated changes in mortality since the conduct of the previous survey in the district in December 2011.

2.3 Sampling Methodology and Sample Size

Anthropometric sampling was executed in two stages using the cluster sampling methodology and the Emergency Nutrition Assessment (ENA) for SMART software.

In the first sampling stage, sample size was determined using the ENA for SMART software where the estimated GAM rate (8.5 %)[4], desired precision (3), design effect (1.5), average household size (5), percentage underfives (18%) and non-response rate (3%) yielded a household sample of 690 and expected minimum number of children (542). The sub-location-level population data in the 2 administrative divisions of the district were then entered into the ENA for SMART software to select 35 clusters (Appendix 1) according to probability proportion to population size (PPS) design. This gave 20 households and at least 16 children 6-59 months to cover in each of the survey's 35 clusters.

The IYCF calculator was used to determine sample sizes for exclusive breastfeeding (children below 6 months) and complementary feeding (children between 6-23 months) using the relevant indicators from the December 2011 SMART survey for Samburu Central district. The following indicators at a precision of 5 and a design effect of 1 gave a sample of 221 children <6 months and 360 children 6-23 months:

- EBF for under 6 months children (84.3%) = **221** *(7 children <6 months per cluster)*
- Timely initiation of breastfeeding (96.3%) = 60
- Minimum dietary diversity (18.2%) = 249
- Minimum meal frequency (68.7%) = **360** *(11 children 6-23 months per cluster)*

At the second sampling stage at the field level, the improved EPI method 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 used simple random sampling to select the first household to enumerate and moved within a 45^0 radius to obtain the required number of households. All children aged 6-59, 6-23 months and those below 6 months in every household visited were included in the anthropometric and IYCF survey according to SMART Survey Guidelines[5].

A household was defined as a group of people who had 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 ensuring that the male household head was only included once to avoid exaggerating household size. In cases where there was no eligible

[4] WVK (December 2011): SMART Survey for Samburu Central District

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

child, a household was still considered part of the sample, where only household data was collected. If a respondent or eligible child was absent during household visits, the teams left a message and re-visited later to collect data for the missing person, with no substitution of households allowed. 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 less than 20 households.

2.4 Data Collection Tools and Variables Measured

Six household survey and 1 FGD teams participated in data collection. Each of the household survey teams comprised of 1 team leader and 3 enumerators while the FGD team comprised of 2 enumerators. Five sets of questionnaires were used for data collection. These included four sets of structured questionnaires (household, 6-59 months, below 6 months and 6-23 months old children) and a FGD guide.

2.4.1 The household questionnaire

This was used to elicit general household information (demography, income sources, WASH, household food consumption, maternal health care information, maternal MUAC and iron/folate supplementation).

2.4.2 Child (6-59 months old)

Using this questionnaire, the following data were collected: child age, anthropometric measurements, vitamin A and zinc supplementation, deworming, morbidity and immunization.

2.4.3 Child (6-23 month old)

This was used to collect data on complementary feeding and frequency and dietary diversity.

2.4.4 Child (< 6 months old)

This elicited information on timely initiation of breastfeeding, giving of pre-lacteals, and exclusive breastfeeding.

2.4.5 FGD guide

A FGD guide was used to collect relevant qualitative data to complement quantitative data. The FGD clusters were selected from the targeted villages in a manner that ensured adequate representation of socio-economic, ecological and livelihood differentials in the district.

2.5 Training and Supervision

The survey team was trained by a WVK consultant for 5 days (6th to 10th January 2013) at the Cheers Guest House. The team had been selected by WVK in collaboration with MoPHS on the basis of previous survey experience, education and knowledge of local languages of the communities surveyed. Training included familiarization with survey tools, standardization of procedures, standardization and pre-test of the survey tools conducted Nomotio village in Partuk sub-location on 10th January 2013 subsequent to which the entire team met to review and share experiences and the tools were adjusted accordingly before commencement of the definitive survey, which took place from 11th–16th January 2013. During field data collection and entry, the teams were supervised by the consultant, WVK M&E, WVK nutritionists and the deputy District Nutritionist. 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
- practicals in taking anthropometric measurements
- conduction of mock (simulated) interviews
- duties and responsibilities
- survey ethics
- community entry behaviour
- survey logistics

2.6 Data Entry and Analysis

Anthropometric data entry 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 to enable data cleaning and 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 the underfives into various

nutritional status categories using WHO[6] standards and cut-off points and exported back to SPSS for further analysis. All the other quantitative data were entered and analysed in the SPSS (Version 17.0) computer package. Qualitative data were first transcribed, coded and finally common thematic patterns established in order to summarize the data.

2.7 Nutritional Status Cut-off Points

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

2.7.1 Weight-for-height (WFH) and MUAC – Wasting

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 and MUAC indices.

- 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 standards (WHO-GS) or had bilateral oedema were classified as severely wasted (to reflect SAM)
- MUAC cut-off points of 11.5cm - <12.5cm (moderate malnutrition), <12.5cm (GAM) and <11.5cm (SAM) were used for children

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.

2.7.3 Height-for-age (HFA) – Stunting

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 Maternal MUAC

A cut-off of <21cm was used for maternal MUAC to denote malnutrition among women 15-49 years old.

2.8 Data Quality control

Data quality was ensured through:

- thorough training of team members for five days
- 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 languages spoken in the district during training
- standardization of anthropometric measurement procedures
- practical sessions on interviewing and anthropometric measurements taking during survey team standardization
- daily supervision of the teams by their team leaders, the consultant, WVK M&E officer, WVK Samburu office nutritionists and deputy district nutrition officer
- review of questionnaires on a daily basis for completeness and consistency
- 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 and validation of quantitative data using qualitative information

[6] WHO (2005): Anthro 2005 Version 2.02 Standards

- entry of anthropometric data in the SMART/ENA software which enabled on-the-spot identification, cross-checking and correction of any aberrant values
- use of ENA for SMART random table software to generate the actual list of villages (clusters) to cover after selection of sub-locations.

3.0 RESULTS AND DISCUSSIONS

3.1 General Characteristics of Study Population and Households

Out of the households sampled, practically all (98.9%) were permanent residents who had always lived in the district. The resultant survey household and children 6-59 months samples were respectively, 700 and 808 while data on EBF was collected from 245 children (<6 months old) and complementary feeding practices from 385 children (6-23 months). Overall, the sampled households had a cumulative population of 4121 persons where each had on average, 5.9 (SD 2.2) members ranging from 1-14 persons. As expected, most (82%) of the households were male-headed with only 18% female-headed. As shown in Table 2, the anthropometric survey sample comprised of 808 children (51.4% males and 48.6% females) whose overall sex ratio (male/female) was 1:1 (a sex ratio of 0.8-1.2, is reflective of an unbiased survey sample).

Table 2: *Age and sex distribution of sample children*

Age group (Months)	Males		Females		Total	
	n	%	n	%	n	%
6-17	149	54.4	125	45.6	274	33.9
18-29	113	52.3	103	47.7	216	26.7
30-41	62	41.9	86	58.1	148	18.3
42-53	63	50.4	62	49.6	125	15.5
54-59	28	62.2	17	37.8	45	5.6
Total	415	51.4	393	48.6	808	100.0
Overall sex ratio (M/F)						1.1

3.2 Nutritional Status of Children 6-59 Months

The findings on underfive nutritional status are based on the World Health Organization's Growth Standards (WHO-GS)[7] using the Emergency Nutrition Assessment (ENA) for Standardized Monitoring and Assessment of Relief and Transitions (SMART) software. Mid-upper arm circumference (MUAC) index (commonly used to estimate acute malnutrition in emergency situations), is also used to report acute malnutrition.

3.2.1 *Prevalence of Global Acute Malnutrition (GAM) by WFH Z-scores (WHO-GS)*

The weight-for-height (WFH) index reflects the current nutritional status of the community. According to WHO Standards flagging procedures, 13 (1.6%) of the children were excluded from analysis due to aberrant values. As shown in Table 3, the prevalence of global acute malnutrition i.e. GAM (WFH z-scores < -2 standard deviations from the median of the WHO-GS reference population or having oedema) was 10.9% (8.4-14.2 CI), a prevalence higher (though not significantly) than that (8.5% 6.0-11.8 CI) revealed by the December 2011 survey in the district. The current GAM prevalence is rated 'Serious' according to WHO[8] benchmarks. As was the case in December 2011, significantly more boys 13.1% (9.8-17.4 CI) than girls (8.7% 5.6-13.4 CI) suffered from GAM (P<0.05). The prevalence of severe acute malnutrition (SAM) was 1.4% (0.7-2.8 CI). It is noteworthy that the conduct of this survey was delayed by the insecurity flare-up and consequent population displacement in parts of Samburu County following cattle rustling in Baragoi, therefore did not exactly coincide with a prevailing rainy season, as was the case for the December 2011 survey.

Table 3: *Prevalence of acute malnutrition by weight-for-height z-scores (WHO-GS)*

	Males 2013 (n=404)	Females 2013 (n= 391)	December 2011 (N=709)	January 2013 (N= 795)	P Value
	95% CI	95% CI	95% CI	95% CI	
Global acute malnutrition (GAM) W/H <-2 Z scores or oedema	53 13.1* [9.8-17.4]	34 8.7* [5.6-13.4]	60 **8.5** [6.0-11.8]	87 **10.9** [8.4-14.2]	0.106
Severe acute malnutrition (SAM) W/H <-3 Z scores or oedema	6 1.5 [0.6-3.7]	5 1.3 [0.5-3.0]	7 **1.0** [0.4-2.5]	11 **1.4** [0.7-2.8]	0.480

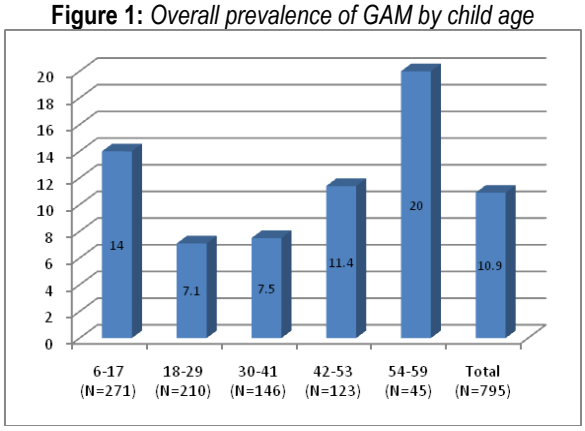
P<0.05 indicates a statistically significant difference

[7] WHO Muliticentre Growth Reference Study Group. WHO Child Growth Standards based on length/height, weight and age. *Acta Paediat* 2006; (Suppl 450): 76-85.

[8] WHO (200): Management of Nutrition in Major Emergencies.

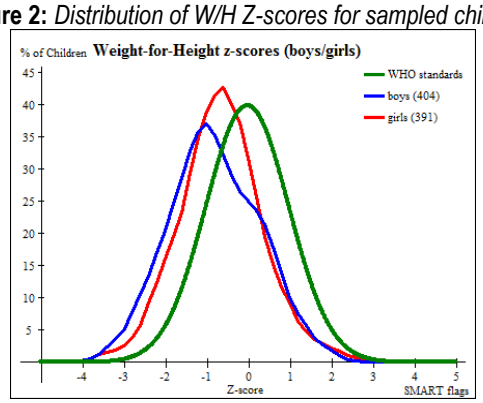
Apart from the 6-17 years age group, the prevalence of GAM indicates a consistent increase with child age which could partly be attributable to the effect of decline in the quality of child care after cessation of breastfeeding on relatively older children (Figure1).

Figure 1: *Overall prevalence of GAM by child age*



The male WFZ scores distribution curve falls to the left of the female curve (with both bowing to the left of the WHO-GS reference) with a mean of -0.73 (SD 1.04), denoting a worse-off status for the overall sample relative to the reference, with boys fairing worse off than girls as also confirmed by the WHZ proportions (Figure 2).

Figure 2: *Distribution of W/H Z-scores for sampled children*



3.2.2 Prevalence of Acute Malnutrition by MUAC

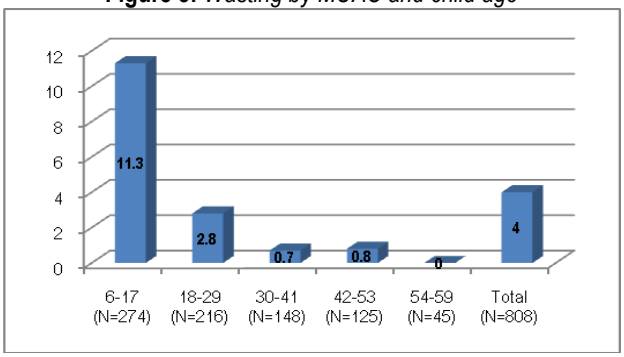
Although MUAC is not as sensitive an indicator of acute malnutrition as WHZ, it is nevertheless useful in community case finding for both SFP and OTP. The indicated GAM by MUAC (Table 4) of 4.8% (3.5-6.5 CI) and SAM (0.9% 0.4-1.7 CI) are both lower than those by WHZ scores, with the findings further showing no significant differences in MUAC findings relative to the December 2011 survey.

Table 4: Child n*utritional status based on MUAC*

		December 2011		January 2013		P value
Criteria	**Interpretation**	**N**	**95% and CI**	**n**	**% and CI**	
MUAC < 11.5cm and/or oedema	Severe acute malnutrition	1	**0.1** [0.0-0.7]	7	**0.9** [0.4-1.7]	0.25
11.5- <12.5cm	Moderate malnutrition	21	**2.9** [1.8-4.3]	32	**4.0** [2.8-5.5]	0.10
Total malnourished (<12.5cm)	GAM	22	**3.0** [2.0-4.5]	39	**4.8** [3.5-6.5]	0.07
12.5- <13.5cm	At risk of malnutrition	145	**20.0** [17.2-23.0	139	**17.2** [14.7-19.9]	0.42

MUAC tends to overestimate GAM among younger children. The findings consequently indicate the highest prevalence of 11.3% among children in the 6-17 months age category (Figure 3).

Figure 3: *Wasting by MUAC and child age*



3.2.3 Prevalence of Underweight by Weight-for-age Z-scores (WHO-GS)

The weight-for-age (WFA) index is used in growth monitoring since it is a composite measure of both recent and previous nutritional/health experience. The prevalence of global underweight (24.9% 22.1-28.1 CI) though slightly higher relative to the December 2011 findings was not significantly so, neither was that (5.5% 4.1-7.4 CI) of severe underweight (Table 5).

Table 5: *Prevalence of **underweight** by WAZ (**WHO-GS**)*

	Males 2013 (n= 360) 95% CI	Females 2013 (n= 354) 95% CI	December 2011 (N= 714) 95%CI	January 2013 (N=798) 95% CI	P Value
Global acute malnutrition (GAM) W/A <-2 Z scores or oedema	119 **29.2%*** [25.0-33.7]	80 **20.5%*** [16.3-25.5]	165 **23.1** [19.2-27.6]	199 **24.9%** [22.1-28.1]	0.407
Severe acute malnutrition (SAM) W/A <-3 Z scores or oedema	25 **(6.1%)** [4.1-9.0]	19 **(4.9%)** [3.0-7.8]	36 **5.0** [3.5-7.3]	44 **(5.5 %)** [4.1-7.4]	0.682

3.2.4 Prevalence of Stunting by HAZ scores (WHO-GS)

The height-for-age (HFA) index measures long-standing or chronic malnutrition and is reflective of the cumulative effects of long-standing nutritional inadequacy and/or recurrent illness episodes. The findings (Table 6) indicate a significant decrease in both global and severe stunting. The global stunting prevalence of 35.3% (31.5-39.3 CI) and severe stunting rate of 5.5% (4.1-7.4 CI) were both significantly (P<0.05) lower than the levels revealed by the December 2011 survey (40.0% 35.6-48.7 CI) and 16.7% (12.4-22.1 CI), respectively. It is, however, instructive that data on actual dates of birth of children (which would have enabled accurate interpretation of the height measurements of children against their actual age data) was not collected during this survey, with consequent rounding up of child age to whole months using child age charts (Appendix 2). It is, however, difficult to establish if inaccuracies in child age determination could explain the indicated decrease in stunting in view of the fact that stunting does not usually change significantly in the short term. It is nevertheless possible that, in view of the disproportionate child age group distribution, inaccuracies in age distribution could have been culpable for the indicated current stunting prevalence. The survey was also conducted during a school session, which might have biased the findings on stunting since computation consequently relied heavily on relatively younger children as older children were attending school during the conduct of this survey as reflected by the disproportionate representation of older children unlike in the last survey which was conducted during a school holiday in December 2011.

Table 6: *Prevalence of **stunting** by height-for-age z-scores (**WHO-GS**)*

	Males 2013 (n=400) 95% CI	Females 2013 (n=382) 95% CI	December 2011 (N= 688) 95%CI	January 2013 (N=782) 95% CI	P Value
Global acute malnutrition (GAM) W/A <-2 Z scores or oedema	149 **(37.3%)** [32.7-42.0]	127 **(33.2%)** (28.7-38.2]	289 **40.0*** [35.6-48.7]	276 **(35.3%)*** (31.5-39.3)	P<0.05
Severe acute malnutrition (SAM) W/A <-3 Z scores or oedema	61 **(15.3%)** [11.7-19.6]	38 **(9.9%)** [7.4-13.3]	115 **16.7*** [12.4-22.1]	44 **5.5 %*** [4.1-7.4]	P<0.05

3.3 Maternal Nutritional Status and Maternal Health Care

For the purposes of maternal nutritional status assessment, mothers were classified as pregnant, non-pregnant and lactating in this survey. Using a cut-off point of <21cm, the findings (Table 7) revealed that 60.6% (43.4-76.0 CI) of the

lactating mothers were malnourished compared to 24.2% (12.0-40.9 CI) non-pregnant women and 15.2% (5.8-30.4 CI) among pregnant women in the sample. Overall, 4.8% (3.4-6.5 CI) of the women were malnourished.

Table 7: *Adult nutritional status by MUAC*

MUAC <21cm	n	95% CI
Pregnant (N=62)	5	15.2 [5.8-30.4]
Non-pregnant (N=192)	8	24.2 [12.0-40.9]
Lactating (N=440)	20	60.6 [43.4-76.0]
Total (N=694)	33	4.8 [3.4-6.5]

There was a marginal improvement in iron/folate supplementation among mothers from 52.9% in December 2011 to 56.3%. However, compliance of taking the supplement (for at least 90 days) was low at only 8.4%.

3.4 Infant and Young Child Feeding (IYCF) Practices and Care

Assessment of IYCF practices mainly relied on the 24-hour recall, an accepted proxy in populations when the main objective is to describe infant feeding practices and care in populations[9].

3.4.1 Breastfeeding Practices

The World Health Organization (WHO) recommends that breastfeeding should be initiated within 1 hour of birth. Among other benefits, it stimulates the onset and maintenance of lactation as well as provision of necessary maternal antigens to the infant. Both the proportions of mothers practising timely initiation of breastfeeding (94.3%) and that of those giving colostrum to their infants (96.7%) met the WHO threshold of 90%. During the first 3 days of birth, less than one fifth (17.6%) of the infants were given pre-lacteals (the National rate of giving pre-lacteals stands at 31.9%[10]). The pre-lacteals given were animal milk products (46.5%), plain water (44.2%) and sugar/glucose water (9.3%). According to FGDs, giving sugar/glucose solution and animal milk products such as *'gorno'* (centrifuged milk ferment cream) was to "*help clean the infants' digestive system"* and ghee to "*help satisfy the hungry infant after birth"*. Exclusive breastfeeding was at a high 71.4% (excluding children who had received pre-lacteals in the first 3 days of birth and those fed on any solid or semi-solid food in the previous 24 hours). The proportion of breastfed children had dropped by more than one fifth (23.3%) from 80.9% at 1 year to 57.6% at 2 years reflecting low compliance to continued breastfeeding up to beyond 2 years in the community (Table 8).

Table 8: *Breastfeeding Practices*

Breastfeeding Practices:	**Target**	**Prevalence**	**Comment**
Timely Initiation of breastfeeding (within 1hr) (< 6 months N=245)	>80%	228 (94.3%)	Satisfactory
Giving of colostrum (< 6 months n=245)	>80%	237 (96.7%)	Satisfactory
Exclusive breastfeeding <6 months (<6 months N=245)	>50%	175 (71.4%)	Satisfactory
Pre-lacteal feeds given (< 6 months n=245):	N/A	43 (17.6%)	Satisfactory
Types of pre-lacteal feeds (< 6 months n=43):			
Animal milk/products	20 (46.5%)		
Plain water	19 (44.2%)		
Sugar/Glucose water	4 (9.3%)		
Continued breastfeeding at 1 year (12 – 15 months) (n=89)	72 (80.9%)		
Continued breastfeeding at 2 years (20 – 23.9 months) (n=85)	49 (57.6%)		

3.4.2 Complementary Feeding Practices

Complementary feeding provides additional nutrients for growth and development that breast milk alone cannot meet after 6 months. Both meal frequency and dietary diversity were based on the 24-hour food intake recall. Overall, only slightly more than two thirds (69.2%) of the children met the minimum meal frequency with even a lower proportion (59.2%) meeting the minimum dietary diversity, with non-breastfed children (out of whom only 37.3% met the minimum meal frequency of ≥4 meals per day) being the most adversely affected group. This calls for more concerted efforts to improve child feeding practices in the community (Table 9).

[9] Engebresten SMI, Wamani H, Karamangi C, Semiyanga N, Tumwine J, Tylleskar T (2007): Low Adherence to Exclusive Breastfeeding in Eastern Uganda: A Community-based Cross-sectional Study Comparing Dietary Recall since Birth with 24-hour Recall. *BMC Paediatrics 2007; 7 (10): 1-12.*

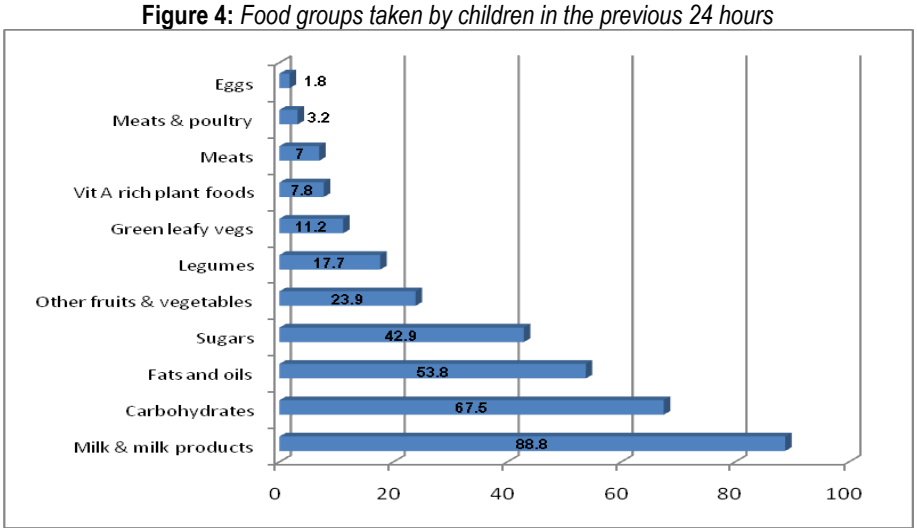
[10] Kenya National Bureau of Statistics (June 2010): Kenya Demographic and Health Survey.

Table 9: *Complementary feeding practices*

Minimum meal frequency:	Target	Prevalence	Comment
Breastfed children 6-8 months who received complementary foods ≥2 times (n=60)		49 (81.7%)	
Breastfed children 6-23 months who received complementary foods ≥ 3 times per day (n=310)		231 (74.5%)	
Non -breastfed children 6-23 months who received complementary foods a ≥4 times (n=75)		28 (37.3%)	
Breastfed children 6-8 months old ≥ 2 times +Breastfed children 6-23 months old ≥3 times + non-breastfed children 6-23 months old ≥ 4 times (n=445)	>80%	308 (69.2%)	Unsatisfactory
Minimum dietary diversity:			
Breastfed children 6-23 months of age who received ≥3 food groups (n=310)		178 (57.4%)	
Non-breastfed children 6-23 months of age who received ≥4 food groups (n=75)		50 (66.7%)	
Breastfed children consuming ≥3 food groups + non-breastfed children consuming ≥4 food groups (n=385)	>80%	228 (59.2%)	Unsatisfactory

An analysis of the actual food groups taken (Figure 4) indicates children were mainly thriving on milk/products (88.8%), carbohydrates (67.5%) and fats/oils (53.8%), with less than half taking other food groups, implying low diversity diets lacking in minerals and vitamins. Of particular concern was the negligible proportion (1.8%) of the children taking eggs, despite the fact that many chicken were reared in the district, which makes nutrition education imperative to improve the dietary profile and ultimately chid health and nutritional status.

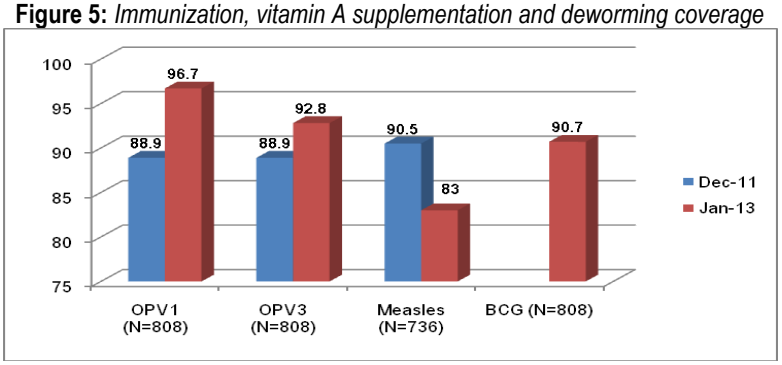
Figure 4: *Food groups taken by children in the previous 24 hours*



3.4.3 Child Immunization

Child immunization prevents and/or reduces the severity of certain diseases in young children. The immunization coverage rate for polio indicates an improvement relative to the findings of the December 2011 survey. Overall, polio immunization (OPV 3) stood at a high 92.8%. The coverage for measles, however, indicates a slight drop from 90.5% in 2011 to 83.0%. BCG coverage (confirmed by presence of scar) was also high at 90.7% (Figure 5). The coverage for all vaccinations was above the WHO threshold of 80%.

Figure 5: *Immunization, vitamin A supplementation and deworming coverage*



3.4.4 Vitamin A Supplementation, Deworming and Zinc in Diarrhoeal Management

Vitamin A supplementation is carried out during Malezi Bora Week twice every year (in February and November) in the district and is also prescribed as part of routine systemic disease treatment in all health facilities in Kenya for underfives. In the previous one year period prior to this survey, the overall proportion of children (86.6%) who had received vitamin A supplementation at least once was higher than those (76.8%) during the December 2011 survey. The relatively high proportion (27.8%) of children below one year who had received vitamin A supplementation is attributed to Malezi Bora

week of November 2012 and also doses administered during routine disease treatment at health facilities. Deworming (a crucial intervention for avoidance of the debilitating effects of helminthic infections among growing children) had reduced from 51.4% in December 2011 to 44.9%. Although zinc supplementation during diarrhoea indicated a 6-fold improvement (from 4.7% to 29.7%), the coverage is still low and should be improved to the acceptable 80% minimum threshold (Table 10).

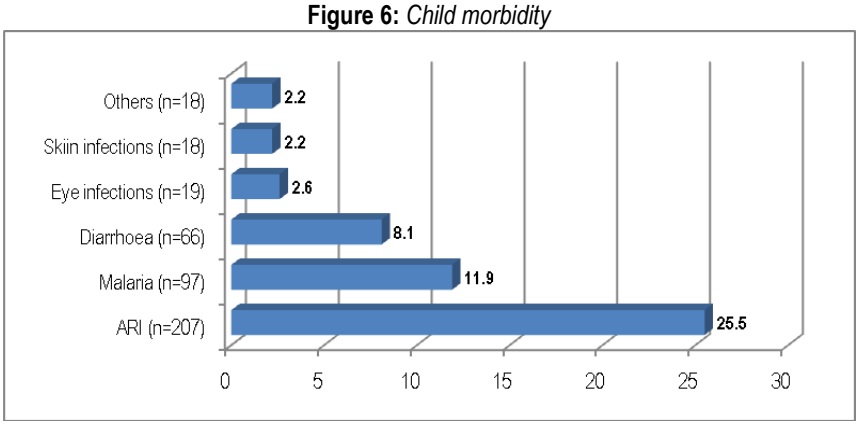
Table 10: *Vitamin A Supplementation, Deworming and Zinc in Diarrhoeal Management*

	No of times	Dec 2011 %	Jan 2013 %
Vitamin A supplementation (6-11 months) (N=151)	Once Twice	54.1 12.6 **[74.8]**	35.8 27.8 **[63.6]**
Vitamin A supplementation (12-59 months) (N=657)	Once Twice	37.6 20.7 **[58.3]**	22.5 56.2 **[78.7]**
Overall vitamin A supplementation 6-59 months (N=808)	At least once	**76.8**	**86.6**
De-wormers (12-59 months) (N= 657)		51.4	44.9
Use of Zinc in diarrhoeal management		4.7	29.7

3.4.5 Child Morbidity and Health-Seeking Behaviour

Assessment of child morbidity was based on a 2-week recall (inclusive of the day of survey). The findings showed that children in the district were faced with a high morbidity load since half of them (49.9%) had reportedly been sick. As shown in Figure 6, the four top illnesses reported were ARI/cough (25.5%), malaria (11.9%) diarrhoea (8.1%) and eye infections (2.6%). These had also been the reported leading causes of child morbidity in the December 2011 survey.

Figure 6: *Child morbidity*



The health-seeking behaviour by mothers of sick children was assessed by asking the respondents what they did the last time their underfive child was sick. During the last episode of illness, the majority (59.0%) reportedly sought assistance from formal health facilities, 5.8% from traditional healers with 32.8% seeking no assistance.

3.5 Water, Sanitation and Hygiene (WASH) Practices

The proportion of households with access to toilets (Table 11) indicated a marginal increase of 5.4% from 30.5% in 2011 to 35.9% during this survey. Rivers were the main source of drinking water 26.3% for the households followed by laga (16.1%), boreholes (15.3%), tap water (12.4%) and unprotected wells (9.4%). The proportion of households treating their drinking water appropriately had stagnated at the same level (14.4%) since the conduct of the previous survey in 2011. The low proportion (13.5%) of the mothers reporting washing their hands after defecation is a major concern. Use of the bush for defecation is the suspected main reason for low hand-washing rate since it acts as a disincentive to hand washing considering unavailability of water at the point of defecation. Promotion of treatment of drinking water through boiling would be a simple, cheap and viable strategy in the district. The high proportion (77.0%) of the mothers reporting using soap and water to wash their hands is, however, encouraging.

Table 11: *Sources and treatment of drinking water*

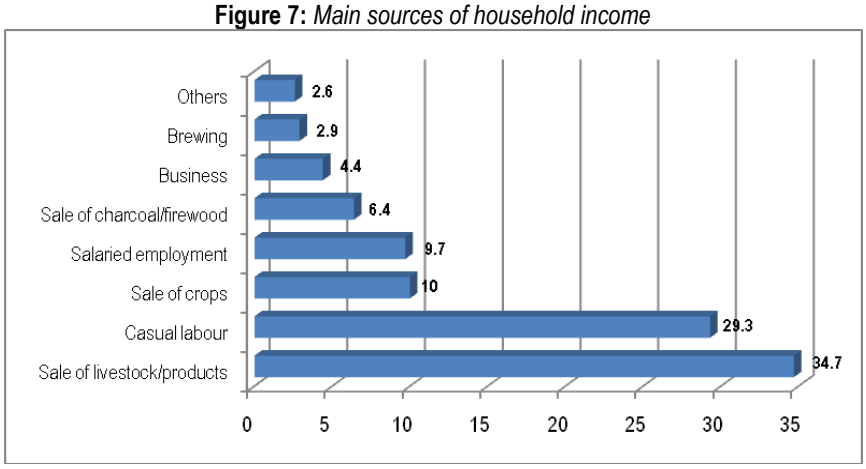
Characteristic		%
Access to toilet facility:	Yes	251 (35.9)
	No	449 (64.1)
Main source of drinking water :	River	184 (26.3)
	Laga	113 (16.1)
	Borehole	107 (15.3)
	Tap	87 (12.4)
	Unprotected well	66 (9.4)
Drinking water treatment:	Appropriate	169 (14.4)
	Inappropriate	531 (75.9)
Hand-washing occasions:	Before eating/food preparation	567 (51.7)
	After defecation	148 (13.5)
	After attending to defecated child	140 (12.8)
	After handling animals	127 (11.6)
What is used to wash hands:	Water and soap	538 (77.0)
	Water only	132 (18.9)

3.6 Household Food Security Indicators

3.6.1 *Income and Food Sources*

During the preceding 1 month to this survey, the sources of income for households in Samburu Central district were varied (Figure 7), ranging from sale of livestock or their products for about one third (34.7%) of the households followed by casual labour (29.3%), sale of crops (10.0%) and salaried employment (9.7%).

Figure 7: *Main sources of household income*



In the 7 days prior to this survey, most (57.6%) of the households had depended on food purchase as their main food source followed by participation in food-for-assets (FFA) activities (24.3%) and own production (17.0%). Food-secure-low-income rural households are in practice expected to be more dependent on own production as a food source than food purchase, the opposite of which is suggestive of a prevailing food shortage for the Samburu community. It is instructive that no food aid was distributed in the district in the year 2012, with only protection rations given to households with children enrolled in supplementary feeding programme (SFP) and outpatient therapeutic feeding programme (OTP). FGD findings, however, indicated the practice of both intra and inter-household sharing of SFP, OTP and protection ration, which reduces both effectiveness and cost-effectiveness of SFP and OTP interventions in the district.

3.6.2 *Household Meal frequency*

The habitual frequency of taking meals in the households was compared with that reported in the preceding 24 hours. The findings indicate that households were taking significantly ($P<0.01$) less (2.56 SD 0.7 meals/day) than usual (2.81 SD 0.8 meals/day) as shown in Table 12. This (in addition to the high proportion of households dependent on food purchase as their main food source) gives further credence to the possibility of an existing food stress situation in the district.

Table 12: *Frequency of meals*

Indicator	December 2011	January 2013
Usual no. of meals taken:		
Mean number of meals	**2.74 (SD 0.5)**	**2.81 (SD 0.8)***
3 meals	71.5%	66.1%
2 meals	24.2%	20.7%
1 meal	2.1%	4.4%
No. of meals taken day preceding survey:		
Mean number of meals	**2.66 (SD 0.6)**	**2.56 (SD 0.7)***
3 meals	64.6%	60.0%
2 meals	30.2%	29.6%
1 meal	2.9%	7.6%

P<0.01

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusions

- The prevalence of GAM of 10.9% (8.4-14.2), though not significantly, had increased from 8.5% (6.0-11.8) in December 2011 and is rated "Serious" as per the WHO benchmarks. The prevalence of acute malnutrition among boys in the district has been consistently and significantly higher than among girls (P<0.05). The findings on GAM are interpreted according to this survey's contextual background:
  - the survey was carried out more than 3 months after harvest season which begun in October 2012
  - farm sizes in the district are dismally small with consequent meagre harvests that do not last for long
  - there is a strong sharing culture in the district such that whatever is harvested is shared with relatives/friends. FGD findings showed that this also happens in the case of both SFP and OTP food supplements and the protection ration (PR)
  - FGD findings and a casual market survey (both collaborated by the National Drought Management Authority (NDMA) Bulletin Report) showed that food prices were high in the face of very modest purchasing power in the district
  - there had been no GFA distributed in the year 2012 (only protection rations for SFP and OTP)
  - although this survey did not assess coverage, 19 children eligible for SFP and OTP were identified during the survey and referred to the nearest health facilities using referral forms (Appendix 3)
  - increasing trends in SFP and OTP admissions were reported in the district

- The prevalence of underweight at 24.9% (22.1-28.1 CI) in the district was higher than the National rate of 16.1%
- Stunting rate in the district was the same as the National average of 35.3%. The prevalence of stunting in the district indicated a significant decrease from the 40.0% (35.6-48.7 CI) revealed by the December 2011 survey. Although this abrupt observed change is not easy to clarify (in light of the fact that stunting is not subject to change in the short term) it is, however, suspected that inaccuracies in child age determination due to rounding up age figures through the use of a child age chart and the fact that child-age distribution indicated a disproportionate representation of relatively older children could be partly responsible as well as absence of relatively older children in the sample due to school attendance during the survey
- Child morbidity load was high (affecting 50% of the children) mainly due to ARI/cough, malaria and diarrhoea (with 67.8% of the children not receiving zinc supplementation). Diarrhoeal morbidity is partly attributed to ignorance factors such as that revealed by FGDs that boiling drinking water "*makes it tasteless"*
- Relative to the previous survey, there was a very slight improvement of only 5.4% in access to toilets to 36%, with only 14% of the households treating drinking water and a worryingly similar proportion (14%) of mothers reporting washing hands after defecation. It is suspected that the use of bushes is a big disincentive to hand washing since close proximity to a hand-washing facility/materials after defecation encourages hand washing
- Immunization coverage was above the 80% WHO threshold with that of OPV having improved, though coverage for measles had dropped slightly
- Vitamin A supplementation for children 6-11 months (63.6%) had reduced from 74.8% in December 2011. Vitamin A supplementation above once for children below 1 year of age is attributed to the Malezi Bora week which had taken place in November 2012 and routine supplementation for children attending health facilities, both of which are carried out regardless of previous doses administered
- Deworming coverage was at less than half (44.9%) having dropped from 51.4% in December 2011
- BCG coverage was high at 90.7% although a few health cards indicated BCG having been administered but with no visible scars, which requires a repeat. A number of underfives in the pre-test village (Nomotio) had not been taken for immunization which calls for an immunization campaign to cover them
- About two thirds (60.6%) lactating mothers suffered were malnourished while less than 10% complied with iron/folate supplementation for at least 90 days
- Household food security status indicators suggest a deteriorated/deteriorating situation. Despite reported high market food prices (FGDs and ARMP Bulletin Report) the proportion of households relying mainly on food purchase was more than 3 times of those who relied on own production and close to 40% of the households reported taking less than 3 meals/day, with a significant decrease in the prevailing frequency of meal taking (P<0.01)
- Some sub-optimal IYCF practices e.g. giving of pre-lacteals is associated with ignorance-related factors such as giving sugar/glucose solutions and gorno (a centrifuged milk ferment cream) to "*clean the digestive system"* and ghee *"to help satisfy a hungry infant after birth"* according to FGD findings

- Timely initiation of BF and BF at 1 year rates were high, but exclusive breastfeeding and continued breastfeeding at 2 years require improvement
- 30% and 40% of the children did not meet the expected minimum meal frequency and dietary diversity, respectively

4.2 Recommendations

1. Some HINI indicators fell short of the expected WHO 80% minimum benchmark and need improvement e.g. through up-scaling, more outreaches, nutrition/health campaigns, mobile clinics and enhanced support for CHW activities:
   - Increase Vitamin A supplementation for children 6-11 months from 63.6% to at least 80% through routine health-facility attendance and community-level screening campaigns
   - Improve de-worming coverage from 44.9% to 80% through Malezi Bora Weeks and more promotion of more intensified self-referral among childcare givers to facilitate Helminthic screening for underfives
   - Upscale toilet access from 40% through more intensified support for the on-going WVK's Community-led Total Sanitation Strategy (CLTS)
   - Make main drinking water sources safer (e.g. boreholes and protected wells) through fencing and protection from run-offs
   - Improve drinking water treatment from 14.4% principally through community-level promotion of boiling and appropriate drinking water storage campaigns
   - Further promote appropriate hand washing to universal levels, particularly after defecation through more intensified campaigns in the community
   - More efforts required to improve continued breastfeeding at 2 years from 52.6% and achieve optimal complementary feeding to at least 80% from the current 69.2% e.g. during ANC attendance by mothers
   - Further improvement on active case-finding for children in need of SFP and OTP in the community
2. There is need to implement initiatives to improved and sustained household food security. These include:
   - Enhancement of small agricultural projects targeting more women including small-livestock keeping and kitchen gardening to directly improve dietary profiles
   - More sensitization of community to improve feeding practices and use of locally available foodstuffs to improve dietary profiles e.g. vegetables and eggs
   - Expansion of FFA activities to ensure all vulnerable HHDs benefit and development of community-specific surveillance strategies to monitor the nutritional situation to identify hunger gaps and take requisite interventions in a more timely manner
3. Enhance and sustain the Community Strategy through building community capacity to participate in nutrition and health activities in the district
4. Improve crop and livestock production and market value chains to encourage expansion of farming to ultimately improve food security and household income in the district
5. Conduct a KAP survey to identify reasons for poor child nutritional status in the district (particularly boys).

LIST OF APPENDICES

Appendix 1: Survey Clusters

Jan 2013 SURVEY CLUSTERS.xls

Appendix 2: Child Age Chart

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Appendix 3: Referral Form

REFFERAL FORM.xls

Appendix 4: Movement Plan

MOVEMENT PLAN.xlsx

Appendix 5: Weighted Samburu Analysis

Weightd Analysis Samburu County Sma

Appendix 6: Questionnaire

Nutrition Survey Questionnaire Tool Ja

Appendix 7: FGD Questionnaire

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Appendix 8: Local Events Calendar

Samburu Local Events Calendar Jan