

**FACTORS ASSOCIATED WITH UNDER NUTRITION IN  
CHILDREN UNDER FIVE YEARS IN BANGALADESH  
PARISH, NAMASALE SUB-COUNTY,  
AMOLATAR DISTRICT**

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**A RESEARCH REPORT SUBMITTED TO THE SCHOOL OF ALLIED  
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UNIVERSITY WESTERN  
CAMPUS**

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### DECLARATION

I, **AWINO SHARON** hereby declare that this report is my original work developed under my own effort and under the guidance of my supervisor.

I am therefore certain that no work of this kind has been produced or submitted; either in partial or full publication in any other university, college or institution for the same or different purpose.

I henceforth present it for the award of a Diploma in clinical medicine and community health at Kampala International University western campus.

Signature:.......... Date:.....10<sup>th</sup>/08/2017.....

### SUPERVISOR'S APPROVAL

This is to certify that this report has been developed under my supervision, and I therefore approve it for submission and other considerations.

Signature:.......... Date:.....18<sup>th</sup> / 08 / 2017.....

**Dr. ODWEE AMBROSE**

## **DEDICATION**

I dedicate this book to my dear parents Mr. Otaka George and Mrs. Stella Otaka and my uncle Mr. Apeto Patrick and the family for their support throughout the course for the three years, may God bless you abundantly.

## ACKNOWLEDGEMENT

I wish to acknowledge with profound gratitude the inestimable contribution of every one that gave me various materials and financial support especially my father Mr. Otaka George and my uncle Mr. Apeto Patrick for their financial assistance and advice given to me during the research and throughout the course.

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Finally and most substantially, Glory and Honor to God almighty for the good health and guardianship ever since my conception.

## Table of Contents

DECLARATION .....	i
SUPERVISOR'S APPROVAL .....	ii
DEDICATION.....	iii
ACKNOWLEDGEMENT .....	iv
LIST OF ABBREVIATIONS.....	viii
LIST OF TABLES .....	ix
ABSTRACT.....	x
CHAPTER ONE: INTRODUCTION.....	1
1.0 INTRODUCTION .....	1
1.1 Background of the study .....	1
1.2 Problem statement.....	3
1.3.0 Objective of the study .....	4
1.3.1 General objective .....	4
1.3.2 Specific Objectives .....	4
1.4 Research questions.....	4
1.5 Significance of the study.....	5
1.6.0 Scope of the Study .....	5
1.6.1 Content scope.....	5
1.6.2 Geographical scope.....	6
1.6.3 Time scope.....	6
1.7 Conceptual framework.....	7
CHAPTER TWO: LITERATURE REVIEW .....	8
2.0 Introduction to literature review .....	8
2.1 Socio-economic factors.....	8
2.1.1 Maternal Education.....	8

2.1.2 Marital Status .....	9
2.1.3 Maternal Occupation.....	10
2.1.4 Poverty and inequality .....	10
2.2 Child care and health related factors.....	11
2.2.1 Child care .....	11
2.2.2 Health related factors .....	11
2.3 Environmental health factors .....	12
CHAPTER THREE: METHODOLOGY .....	13
3.0 Introduction.....	13
3.1 Study design.....	13
3.2 Study area.....	13
3.3.0 Study population .....	14
3.3.1 Inclusion criteria .....	14
3.3.2 Exclusion criteria .....	14
3.4 Sample size determination .....	14
3.5 Study variables.....	14
3.6 Data collection method .....	15
3.7 Data analysis method .....	15
3.8 Data quality control.....	15
3.9 Data presentation methods.....	15
3.10 Ethical consideration.....	15
CHAPTER FOUR: STUDY FINDINGS AND RESULTS .....	16
4.1 Socio-economic factors.....	16
4.2 Child care and health- related factors .....	18
4.3 Environmental factors.....	21
CHAPTER FIVE: DISCUSSION, CONCLUSION, AND RECOMMENDATIONS.....	23

5.1 Discussion of results .....	23
5.2 Conclusion .....	26
5.3 Recommendations .....	26
REFERENCES .....	27
APPENDIX 1: INFORMED CONSENT FORM AND QUESTIONNAIRE .....	30
APPENDIX II A: MAP OF UGANDA SHOWING AMOLATAR DISTRICT .....	34
APPENDIX II B: MAP OF AMOLATAR DISTRICT SHOWING NAMASALE SUB- COUNTY .....	35



## LIST OF ABBREVIATIONS

DEO	District Education Officer
e.g	Exemplia Gratia (for example)
KIU	Kampala International University
MAAIF	Ministry of Agriculture Animal Industry and Fisheries
MOH	Ministry Of Health
MUAC	Mid Upper Arm circumference
PNFP	Private Not For Profit
UBOS	Uganda Bureau of Statistics
UDHS	Uganda Demographic Health Survey
UNICEF	United Nations Immunization children Emergency Fund
VHT	Village Health Team
WHO	World Health Organization

**LIST OF TABLES**

Table 1: Socio-economic factors

Table 2: Childcare and health-related factors

Table 3: Environmental factors

## **ABSTRACT**

### **Introduction**

In Uganda, under nutrition remains a serious health and welfare problem affecting the under-five children to whom it contributes significantly to mortality and morbidity.

### **General objective**

To assess factors associated with under nutrition in children under- five years in Bangladesh parish, Namasale sub-county, Amolatar district.

### **Methodology**

The study was a descriptive cross sectional study to determine the factors associated with under nutrition in children less than five years of age in Bangladesh parish, Amolatar District among 130 respondents who answered a structural questionnaire. Data was collected, analyzed and presented in tables and descriptive words.

### **Study results**

The study revealed that 71% of the respondents were within the age group of 15-34 years, with one mother as young as < 15 years, the standard of education of mothers in the study area was found to be very low; none had attained tertiary level of education. Majority, 59% serve their children communally, 4% wean at 6 months and 75% of mothers don't take their children to a well fare clinic, 13%of the respondents did not have latrines and finally most of the respondents, 66% get water from lakes and 89% do not use any method of water purification.

### **Conclusion**

In conclusion, the study showed that early marriage, low education level, communal serving of children, early weaning, poor attendance of the child welfare clinic, recent infections, lack of water purification practice, lack of latrines, poor child care are the factors associated with under nutrition in children under 5years in Bangladesh parish, Amolatar district.

### **Recommendation**

I therefore recommend that health education should be emphasized on the promotion of girl child education, discouraging early marriages, communal serving of children and early weaning,

prompt treatment of infections, encouraging taking children to welfare clinic, construction of pit latrines, purification of water and improving the quality of services provided.

## **CHAPTER ONE: INTRODUCTION**

### **1.0 INTRODUCTION**

This chapter presents the background, problem statement, objective of the study, research questions, significance of the study, scope of the study and conceptual framework.

#### **1.1 Background of the study**

Malnutrition generally implies both a state of under nutrition and over nutrition (Hiwot Yisak, 2015). Clinically malnutrition is characterized by inadequate intake of protein, energy, and micronutrients such as vitamins, and the frequent infections and disorders that result.

The World Health Organization defines malnutrition as “the cellular imbalance between supply of nutrients and energy and the body’s demand for them to ensure growth, maintenance, and specific functions”.

Under nutrition is defined as the outcome of insufficient food intake and repeated infectious diseases. It includes being underweight for one’s age, too short for one’s age (stunted), dangerously thin for one’s height (wasted) and deficient in vitamins and minerals (micronutrient malnutrition) (UNICEF, 2013).

The World Health Organization (2013) estimates that there are 178 million children that are malnourished across the globe, and at any given moment, 20 million are suffering from the most severe form of malnutrition. Malnutrition contributes to between 3.5 and 5 million annual deaths among under-five children and UNICEF estimates that there are nearly 195 million children suffering from malnutrition across the globe (WHO, 2013).

Worldwide, 165 million children below five years of age are affected by under nutrition, of which 26% are stunted (S.A. Ohnson, 2010) and also globally, an estimated 101 million children below five years are underweight and this accounts for 16% children below 5 years of age (M. De Onis, 2012). The other predictor of under nutrition is wasting. Globally, 51 million children below 5 years of age were wasted and 17 million were severely wasted in 2013 (UNICEF, 2013).

It has been estimated by the global burden of disease study that under-five under nutrition alone has caused approximately half (15.9%) of the global loss of Disability Adjusted Life Years (DALYs) that is the sum of years of life lost from premature mortality years lived with

disability adjusted for severity (Faruque, A.S.G., Shamsir, A.M.A., Tahmeed, A., Munirul, M.I., Iqbal, M.H., Roy, S.K., Nurul, A., Kabir, I., and Sack, 2008). This consequently affects the intelligence level of children, their behavior and school performance.

In Sub-Saharan Africa, 41% of under-five children are undernourished and deaths from malnutrition are increasing on daily basis in the region (Gilbert, 2015). Malnutrition continues to be a significant public health problem throughout the low income countries, particularly in Sub-Saharan Africa and South Asia (Kimokoti, R.W., and Hamer, 2008).

In Uganda, under nutrition remains a serious health and welfare problem affecting the under-five children to whom it contributes significantly to mortality and morbidity. According to Uganda Demographic and Health Survey of 2011, nearly four in ten Ugandan children under-five years of age (33 percent) are stunted (short for their age), six percent are wasted (thin for their height), and 14 percent are underweight (low weight for age) (UDHS, 2011).

Malnutrition in Uganda starts at infancy and rises steeply, peaking at about two years when about 50% of toddlers are stunted and from the UDHS findings, Northern (40%) and South Western Uganda (50%) regions are more affected than other regions (UBOS, 2007).

Undernourished children have lowered resistance to infection; they are more likely to die from common childhood ailments like diarrheal diseases and respiratory infections; and for those who survive frequent illnesses sap their nutritional status, locking them into a vicious cycle of recurring sickness, faltering growth and diminished learning ability. The high levels of under nutrition in children and women in south Asia and sub-Saharan Africa pose a major challenge for child survival and development (UNICEF, 2016).

The Uganda food and nutrition policy focuses on nutrition and childhood development as one of the goals with an aim of improving child health especially among those under-five years. This policy is being formulated to address nutrition priority problems with assistance from international and local agencies like UNICEF, Save the Children, Plan International and TASO. The 2004/2005 Uganda food and nutrition policy reform focuses on policies and guidelines on anemia, breastfeeding, HIV/AIDS and a number of other nutrition related disorders prevalent in the country (MAAIF, 2005).

The Ugandan government has put in place tremendous efforts in reducing the prevalence of under nutrition in the country through effective nutrition programs which act directly on feeding practices. However, the yield would be more significant if the government acted through factors that affect under-five child under nutrition. In addition, addressing the plight of women by strategically targeting their economic, education, and health status can improve nutrition at household level since women are the principle providers and care givers of children at this level.

## **1.2 Problem statement**

Globally under nutrition remains a big burden with nearly half of all deaths in children below 5 years attributed to under nutrition, this translates in unnecessary loss of about 3 million young lives a year (UNICEF, 2016) and 36% stunting in Africa and 27% stunting in Asia, this remain a public health problem, one that often goes unrecognized (UNICEF, 2013).

In Uganda, Data from the previous five Uganda Demographic and Health Surveys (2011, 2006, 2001, 1995, 1989) show that the nutrition indicators have not improved much over the past 15 years and some indicators have even shown a worsening trend (UBOS, 2012) despite government's efforts and interventions to combat under nutrition. For example, an operation framework for nutrition in terms of child survival strategies was developed by the Government of Uganda in 2009. Additionally, the Government also launched the Uganda Vision 2040 and National Development Plan (2010-2015) that focuses also on nutritional wellbeing of children. The government has other several initiatives aiming at reducing under-five under nutrition especially the food and nutrition policy 2003 as well as the implementation of the global Millennium Development Goals (GoU, 2010).

In Bangladesh parish, Namasale sub-county, Amolatar district, there is limited information on the factors associated with under nutrition in the region and it is on this basis that this study has been undertaken and given the fact that a lot of studies on the determinants of under nutrition among under-five children have been conducted in the developing countries, there is need to examine if the same or different factors are responsible for under nutrition among children under-five years in Bangladesh parish, Namasale sub-county, Amolatar district hence forming the research gap.

### **1.3.0 Objective of the study**

#### **1.3.1 General objective**

To assess factors associated with under nutrition in children under- five years in Bangladesh parish, Namasale sub-county, Amolatar district.

#### **1.3.2 Specific Objectives**

1. To identify socio-economic factors associated with under nutrition in children under- five years in Bangladesh parish, Namasale sub-county, Amolatar district.
2. To determine child care and health related factors associated with under nutrition in children under -five years in Bangladesh parish, Namasale sub-county, Amolatar district.
3. To asses environmental factors associated with under nutrition in children under- five years in Bangladesh parish, Namasale sub-county, Amolatar district.

### **1.4 Research questions**

The study was to seek and answer the following questions:

1. What are the socio-economic factors associated with under nutrition in children under -five years in Bangladesh parish, Namasale sub-county, Amolatar district.
2. What are the children cares and health related factors associated with under nutrition in children under-five years in Bangladesh parish, Namasale sub-county, Amolatar district.
3. What are environmental factors associated with under nutrition in children under five years in Bangladesh parish, Namasale sub-county, Amolatar district



## **1.5 Significance of the study**

Nutritional status during childhood is important for human development as it affects every phase of human life and therefore investment in childhood nutrition contributes not only to improving children's current welfare but to enhancing human's capacity in the long run (C.G Victora, L. Adair, 2008).

The study was intended to identify the factors associated with under nutrition in children less than five years in Bangladesh parish, Namasale sub-county, Amolatar district. This study therefore, was able generate information on these and this report informs local leaders, health care providers and the community at large to develop interventions aimed at reducing its occurrence through specific interventions.

Through recommendations from this study, suggestions to policy makers have been made for them to put in place better policies to see that the incidence of under nutrition in children under five years is reduced. Findings of the study highlighted what communities needed in terms of information on under nutrition, health policies, and services in terms of providing food supplements, proper feeding.

It is also for the partial fulfillment of the award of diploma in clinical medicine and community health.

## **1.6.0 Scope of the Study**

### **1.6.1 Content scope**

The content scope of this study was to assess the factors associated with under nutrition in Bangladesh parish, Amolatar district includes the socio-economic factors; age of the mother, education level of mother, marital status of the mother, maternal occupation, poverty and inequality, main source of income, child care and health related factors; number of meals taken by the child per 24 hours, breastfeeding practices, infections and immunization status of the child and environmental factors; hygiene status, presence of latrine, water supply and its purification.

### **1.6.2 Geographical scope**

The study was carried out in Bangaladesh parish, Namasale sub-county, Amolatar district.

Bangaladesh parish has 10 villages, namely; Entebbe, Musoma, Arwotomakotong, Acillidwe, Alwala, Adagarida, Darasalam, Oberokaa, Bangala A and B. It is bordered by Kikondo parish and Nabweyo parish.

The main economic activity done here is peasant farming, fishing, small scale business, and a few are civil servants such as teachers, while others are motor cycle riders.

### **1.6.3 Time scope**

The study was carried out from January 2017 to July 2017

## 1.7 Conceptual framework

### Independent variables

#### Social economic factors

- Age
- Marital status
- Maternal education
- Maternal occupation
- Poverty and inequality

#### Child care and health related factors.

- Feeding practices
- Food taboos
- Immunization status
- Child infections

#### Environmental factors.

- Hygiene status
- Presence of latrine
- Water supply
- Water purification

### Dependent variables

UNDERNUTRITION

### Intervening variables

- Unsafe cultural practices
- Lack of knowledge about under nutrition
- Family planning

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.0 Introduction to literature review**

This chapter outlines the writing, ideas and views of other people on the factors associated under nutrition in children under 5 years of age.

### **2.1 Socio-economic factors**

A lot has been written about the socio-economic determinants of under nutrition among children under-five children by several researchers in both developed and developing countries. The study will focus on maternal education, marital status and maternal occupation. Some other variables like place of residence and region will be applicable since the study will be conducted among people of different cultural, social and economic backgrounds.

#### **2.1.1 Maternal Education**

Mother's education level affects child's nutrition through her choices and health seeking skills related to nutrition, hygiene, preventive care and disease treatment (Qaim, 2010). Mother's responsibility to care for herself during pregnancy and her child through the most vulnerable stages of its life significantly affects under-five child under nutrition (Olwedo, M. A., Mworzi, E. M., Bachou, H., and Orach, 2008). Several studies have found out that mother's education is associated with good nutrition practices and particularly under-five child nutrition (Qaim, 2010). These studies have pointed out the fact most women with low education spend more time in gardens and feed their children on less nutritious foods. It also determines her income and this helps her access proper nutrition for the child as well as health services. With increasing level of mother's education, the proportion of children who are undernourished goes down as found out in the Uganda Demographic and Healthy Survey of 2006 (UBOS, 2007). This implies that educated mothers are better aware about the nutrition requirements of their children by providing improved health care (Qaim, 2010).

In a similar study in Bangladesh, children of mothers with no education and primary education were 28% and 33% respectively more stunted than children of mothers with secondary or higher education, wasted and underweight children also showed similar results. Children whose mother had no education or had primary education were more times significantly stunted and underweight than children whose mothers had secondary or higher

level. However for wasting, children whose mothers had primary or secondary education had 0.87 times lower odds of wasting than those of mothers with higher education (Nure, A. S., Nuruzzaman, H., Abdul, 2011).

More to note is that mother's education is associated with more efficient management of limited household resources, greater utilization of available health care services, better health promoting behaviors, lower fertility as well as child centered caring practices. All this consequently results into a reduction in malnutrition among under-five children (Nguyen, N.H., 2008).

### **2.1.2 Marital Status**

On the study about mothers' marital status and under-five child nutrition, findings in Ethiopia reveal that child's under nutrition is significantly associated with marital status. It was found out that under nutrition in children less than 5 years is higher among unmarried rural and divorced/separated women compared to married ones (Teller, H., and Yimar, 2000). Similarly, being a married mother was positively associated with good nutritional status among children under five years in the Volta region of Ghana (Appoh LY, 2005). Contrary to the above, a study in Tanzania revealed that mothers who are married were more likely to have undernourished children unlike those that were unmarried perhaps because of the cost of maintaining families hence sometimes these families fail to produce nutritious supplements to the under-five children (Nyaruhucha, C.N.M., Msuya, C.N.M., Mamiro, P.S., and Kerengi, 2006).

### **2.1.3 Maternal Occupation**

Previous studies have found out that mother's occupation is one of the determinants of under-five under nutrition in most developing countries. A study in Vietnam revealed that children from mothers who were laborers or farmers and housewives had a greater prevalence of stunting, underweight and wasting than those from mothers who worked in office or were housewives (Nguyen, N.H., 2008). This is because working mothers rarely get time to take care of their children. They also leave their children at home with other siblings who may neglect feeding them following the right frequency and this sometimes worsens the problem of under-nutrition (Olwedo, M. A., Mworozzi, E. M., Bachou, H., and Orach, 2008).

In a study done in Botswana on the effect of maternal occupation on under-five under-nutrition, it was found out that underweight occurred to a lesser extent among children whose mothers worked in agriculture (7.5% in livestock and 28.6% for those working in crops) than among children (40.0%) whose mother were involved in informal business (Nnyepi, 2006).

### **2.1.4 Poverty and inequality**

Poverty is one of the main reasons to under nutrition, malnutrition and child's deaths in all over the world (UNICEF, 2013). Poverty is a condition in which a person or the community is lacking the essentials for a minimum standard of living (Rose A .Inguitia, 2009).

The poverty situation compels families to sell off their crop produce leaving nothing for home consumption. Nothing is kept in the granaries and any money realized from crop sell is spent on alcohol consumption in the poor communities and leaving no coin for the mother to prepare for recommended daily meals(UNICEF, 2013).

## **2.2 Child care and health related factors**

### **2.2.1 Child care**

The dimensions of child care include continued breastfeeding, appropriate timing of introduction of complementary foods, and optimum quantity and quality of the foods consumed (WHO, 2013).

Optimal feeding practices and child care are essential to meet the nutritional needs of children in the first years of life (UNICEF, 2013). Poor nutrition among infants and young children results primarily from inappropriate feeding practices where the timing, quantity and quality of foods given to infants are often inadequate. Suboptimum breastfeeding still accounts for an estimated 1.4 million deaths in children under five annually (Lancet, 2008). Optimal breastfeeding practices, especially exclusive breastfeeding up to 6 months of age, has the single greatest potential impact on child survival, with the potential to prevent 1.4 million under-5 deaths in the developing world (Lancet, 2008). Other dimensions of optimum feeding, such as responsive feeding and adequate texture of food, are not yet included as they require more complex measurement approaches (AbdibariMa'alin, DerejeBirhanu, Samuel M., Daniel T., Yusuf M., 2016).

### **2.2.2 Health related factors**

**Infections:** these may reduce appetite, increase energy and nutrient utilization (e.g. to fight infection) and limit the ability to absorb or retain nutrients (e.g. as a consequence of diarrhea and/or intestinal parasites) (WHO, 2011). Many diseases can alter or increase nutritional requirements, cachexia, characterized by a dramatic weight loss, is a characteristic in disease such as cancer, chronic heart failure, and kidney disease (Bachmann *et al.*, 2008). Increased loss of nutrients or impaired digestion and absorption are also causes of under nutrition (Dunne, 2008). These symptoms mainly occur in patients with gastrointestinal disease (UBOS, 2007).

**Immunization:** According to (AbdibariMa'alin, DerejeBirhanu, Samuel M., Daniel T., Yusuf M., 2016), immunization status was the only variable associated with all forms of malnutrition including under nutrition. Non immunized children were 2.5 times more likely to become underweight than their counterparts in Ethiopia.

### **2.3 Environmental health factors**

In developing countries citizens suffer from lack of safe drinking water, this leads to consumption of impure and infected drinking water. Unsafe water along with inadequate sanitation and poor hygiene causes nearly 90 percent of the children's deaths to diarrhea. According to WHO In 2010, 72% of the population in Uganda was using improved drinking water sources (UNICEF, 2013).

Studies show that hand washing with water and soap is the most effective, affordable, way to reduce on illnesses among the under-fives such as diarrhea and pneumonia. Sanitation and improvement of overall household hygiene and open disinfections are vitally important (UNICEF, 2013). According to WHO (2010), 34 per cent of the population in Uganda was using improved sanitation facility.

According to WHO (2010), nutritional status is compromised where people are exposed to high level of infection due unsafe and insufficient water supply and inadequate sanitation. Nutrition status is the result of the complex interaction between the food we eat, our overall state of health and the environment in which we live (Rice *et al*, 2010).

More than three million children under five years die each year from environment-related causes and conditions; this makes the environment one of the most critical contributors of to the globe toll of more than ten million child deaths annually(UNICEF, 2013).



## **CHAPTER THREE: METHODOLOGY**

### **3.0 Introduction**

This section includes information about study design, area of study, population of study, sample size determination, sample selection, methods of data collection, data analysis, and problems that the researcher was encountered during the study.

### **3.1 Study design**

This was a cross-sectional descriptive study to assess factors associated with under nutrition in children less than 5 years in Bangladesh parish, Amolatar district.

### **3.2 Study area**

The study was carried out in Bangladesh Parish, Namasale sub-county, Amolatar district. Amolatar District is in Northern Uganda and with a population of 131,000 people. The District has 13 Health facilities (1 HC IV; 3 HCIII; 8 HC IIs and 1PNFP Hospital).

Namasale sub-county has seven parishes of; Olyaka, Awibori, Bangladesh, Acii, Nabweyo, Kikondo and Izigwe while Bangladesh parish has 10 villages of; Entebe, Musoma, Arwotomakotong, Acilidwe, Alwala, Adagrida, Darasalam, Bangala A and B, Oberokaa.

Many people live in semi-permanent houses sparsely located with few living in permanent houses and mostly from town. Few of the people live in temporary houses far deep in the village.

Radio networks are available both local and national where most people use radio as the major means of receiving information. Most people use lake water but also springs and wells are available. The quality of water is bad where sometimes water take a brown color due to under purification and also spring water is not protected as expected.

The main economic activity done here is peasant farming, fishing, small scale business, and a few are civil servants such as teachers, while others are motor cycle riders.

### 3.3.0 Study population

Namasale sub-county has a population of 20226 with 4040 children under -five years, and Bangladesh has a population of 5214 with 1035 children under -five years. Mothers with children under five years who were available at the time of the study were sampled out from the general population of Bangladesh parish and were enrolled in the study.

### 3.3.1 Incision criteria

All children who were under five years in Bangladesh parish, Amolatar district were enrolled in the study and only those whose parents consented took part in the study

### 3.3.2 Exclusion criteria

Children under five years who were mentally unwell and those who were not at home at the time study in Bangladesh parish, Amolatar district didn't take part in the study.

### 3.4 Sample size determination

Sample size was determined by Kish and Leslie formula (kish 1965)

Calculation of sample size; formula  $n = (Z^2PQ)/d^2$

Where **Z** is population 95% confidence level =1.96

**P** = the proportion of under-five children in Bangladesh parish =0.174 (Uganda Demographic Health Survey, 2011)

**Q** = the proportion of the unaffected population in the parish =1-p =0.826

**D** = the degree of accuracy =5%

Therefore sample size  $n = ((1.96)^2(0.174) (0.826))/ (0.05)^2 =220$

However due limited resources and limited time, 130 participants were selected for the study.

Hence sample size; n=130

### 3.5 Study variables

The independent study variables include, maternal age, marital status, maternal education, occupation, poverty and inequality, feeding practices, food taboos, immunization status, child infections, hygiene status, presence of latrines, water availability and purification and the dependent variable is under nutrition

### **3.6 Data collection method**

Questionnaire method with a set of questions were prepared in English and interpreted to the respondents in the language they best understood for those who didn't know English and this was both self and researcher administered.

### **3.7 Data analysis method**

Data analysis was done manually by counting, tallying and using a simple electronic calculator.

### **3.8 Data quality control**

Checking all missing data in the questionnaires was done and questionnaire missing data were returned to the respondent and asked for clarification if not filled completely.

### **3.9 Data presentation methods**

Data was presented precisely in tables while other data were presented in descriptive statements.

### **3.10 Ethical consideration**

A letter of approval was obtained from the KIU research and ethics committee as well as an introduction letter to the officials of Bangladesh parish, Namasale sub-county, Amolatar district where research was carried out.

Verbal consent to participate in the study was also obtained from mothers (care giver) to affirm their willingness to participate in the study and Confidentiality was assured to all participants

## CHAPTER FOUR: STUDY FINDINGS AND RESULTS

A cross-sectional study to identify the factors associated with under nutrition in children less than five years was carried out in Bangladesh parish, Namasale sub-county, Amolatar district in April, 2017. The study involved a sample of 130 women with children less than five years of age. The findings were presented in figures, tables, and interpreted in percentages.

### 4.1 Socio-economic factors

The study revealed that three quarters 93 (71%) of the respondents were 15-34 years of age with 1 (1%) mother below 15 years. Most of the respondents 111 (86%) were married, none of the respondents 00 (00%) attained tertiary education while 33 (25%) never attained any formal education, 114 (87%) were house wives, 08 (7%) were business women, 01 (1%) was a civil servant, 07 (5%) were casual laborers. Slightly more than three quarters 100 (76%) of the respondents were peasant farmers, only 1 (1%) earns salary, 15 (12%) get wages, 14 (11%) get income through small scale business and no other source of income was identified.

**Table 1: socio-economic factors**

VARIABLE	FREQUENCY	PERCENTAGE
<b>Age n (%)</b>		
<15	01	1
15-34	93	71
35-44	13	10
>45	23	18
<b>Marital status n (%)</b>		
Single	03	2
Married	111	86
Divorced	04	3
Widow	12	9
<b>Level of education (%)</b>		
Primary	83	64
Secondary	14	11
Tertiary	00	00

No formal education	33	25
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**Occupation n (%)**

Casual labor	07	5
--------------	----	---

Civil servant	01	1
---------------	----	---

Small scale business	08	7
----------------------	----	---

House wife	114	97
------------	-----	----

**Source of income n (%)**

Peasant farming	100	76
-----------------	-----	----

Salaries	01	1
----------	----	---

Wages	15	12
-------	----	----

Business	14	11
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## 4.2 Child care and health- related factors

The study showed that 77(59%) of the respondents practice communal serving, 125 (96%) the respondents have no food taboos. Majority of the respondents 84 (64%) feed their children three times a day, 41 (32%) feed their children for more than 3 times a day, 97 (75%) of the respondents breast feed their children up to 2 years and most of the respondents 84 (64%) wean their children at 1 year and 78 (60%) wean their children with porridge of either millet, cassava, or maize. All the respondents 130 (100%) immunized their children. Majority of the respondents 114 (88%) had their child's immunization cards available, 94 (73%) of the respondents said their children had malaria and 9 (7%) diarrhea, 95 (73%) of the respondents are at most 1km from the nearby health Centre, three quarters 98 (75%) of the respondents don't take their children to a welfare clinic and finally three quarters 104 (80%) of the children were well nourished, 16 (12%) were moderately undernourished and 10 (8%) were severely undernourished.

**Table 2: childcare and health-related factors**

Variable	Frequency	Percentage
<b>Serving children food n (%)</b>		
Communal serving	77	59
Personal plate	48	37
With mother/care taker	03	2
With siblings	03	2
<b>Presence of food taboos n (%)</b>		
Yes	05	4
No	125	96
<b>Feeding times in a day n (%)</b>		
< 3	5	4
3	84	64
>3	41	32
<b>Breastfeeding duration n (%)</b>		
4 months	01	1
6 months	07	5
2 years	97	75

>2 years	25	19
<b>Weaning age n (%)</b>		
3 months	01	1
6 months	05	4
1 year	84	64
>1 years	40	31
<b>Weaning foods n (%)</b>		
Cow milk	08	6
Millet porridge	58	45
Cassava porridge	05	4
Millet/cassava bread	35	27
Maize porridge	12	9
Millet with soya	05	4
Others	07	5
<b>Child immunization n (%)</b>		
Yes	130	100
No	00	00
<b>Immunization cards present n (%)</b>		
Seen	114	88
Lost	08	6
Others	08	6
<b>Recent infection n (%)</b>		
Malaria	94	73
Diarrhea	9	7
Cough	13	10
Worm infestation	10	7
Others	4	3
<b>Welfare clinic visit n (%)</b>		
Yes	32	25
No	98	75
<b>Distance to nearest H/C n (%)</b>		

< 1km	42	32
1km	53	41
2km	35	27

**Children's nutritional status n (%)**

Well nourished	104	80
Moderately undernourished	16	12
Severely undernourished	10	8

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### 4.3 Environmental factors

The study also showed that majority of the respondents 113 (87%) have latrines, most of the respondents who have latrine 96 (85%) have it at least 10km from the main house, and all the respondents who had latrines 113 (100%) had it more than 30m from the water source and 15 (90%) of the respondents who have no latrine dispose their refuse in the neighbors' pit, 02 (10%) in other places such as neighboring bush. Most of the respondents 87 (66%) collect water from lakes, 116 (89%) of the respondents don't use any method of water purification, 08 (6%) filter and 06 (5%) boil their water.

**Table 3: Environmental factors**

VARIABLE	FREQUENCY	PERCENTAGE
<b>Availability of latrines n (%)</b>		
Yes	113	87
No	17	13
<b>Distance from main house n (%)</b>		
<10km	17	15
10km	10	9
>10km	86	85
<b>Distance from water source n (%)</b>		
<30m	00	0
30m	00	0
>30m	113	100
<b>Place of refuse disposal n (%)</b>		
Dust bin	00	0
Rubbish pit	00	0
Neighbor's pit	15	90
Others	02	10
<b>Main water source n (%)</b>		
Lakes	87	66
Borehole	41	32
Tap	02	02

**Water purification method n (%)**

Boiling	06	5
Filtering	08	6
None	116	89

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## CHAPTER FIVE: DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

### 5.1 Discussion of results

#### 5.1.1 Socio-economic factors

The study revealed that 71% (93) of the respondents were within the age group of 15-34 years, with one person as young as < 15 years. These are young mothers with very low socio-economic status coupled with lack of knowledge about under nutrition hence poor nutrition to their children. The survey also revealed that 86% (111) of the respondents were married, and only 9% (12) were widows, 3% (04) divorced and 2% (03) single parents. The presence of both parents results into good care of children and could be the reason why most of the children 104 (80%) were well nourished. However the less percentage of single mothers, widows, and the divorced may contribute to poor nutrition among children less than five years in this community. This was similar with a study carried out in southern Ethiopia (Teller, H., and Yimar, 2000) and was also in consistence with a study done in the Volta region of Ghana (Appoh LY, 2005)

The standard of education in the study area was found to be very low, none of the respondents had attained tertiary level of education, 14 (11%) had attained secondary level, 83 (64%) had attained primary level while 33 (25%) never attained any formal education. This could be due to the belief that girl child education is not considered important and probably influencing their understanding of child care/feeding. This finding is in line with the report in study carried out in Kwara states, Nigeria (Qaim, 2010). It is also in line with report from plan Uganda (NGO) which showed high prevalence of under nutrition among the uneducated.

Majority of the respondents 114 (87%) were house wives, only one (1%) was a civil servant. This was because women in the study area couldn't access employment opportunities as a result of low education levels. The study also showed that 100 (76%) get their income from peasant farming, only 1(1%) through salary, and 14 (11%) through small scale business and 15 (12%) through wages. This is still due to low level of education hence they cannot get employment opportunities and lack business skills. This is in consistence with a study carried out in northern Uganda (Olwedo, M. A., Mworozzi, E. M., Bachou, H., and Orach, 2008)

### 5.1.2 Child care and health-related factors

Majority of the respondents 77 (59%) serve their children under five communally, 6 (4%) with either mother (care taker) or other siblings, 48 (37%) serve them personal plates. This can contribute to under nutrition since the young children cannot eat at the same speed with the older children hence they don't get enough food therefore WHO emphasizes that optimal feeding practices are essential to meet the nutritional needs of children (UNICEF, 2009). Nearly all the respondents 125 (96%) have no food taboos. This is important because the children are fed on nutritious food without any restriction. However few of the respondents 5 (4%) have food taboos such as; pregnant mothers should not breast feed, women should not eat game meat and Muslims should not eat pork. This limits/compromises the nutritional status of the child hence leading to under nutrition.

Majority of the respondents 84 (64%) feed their children three times a day, 41 (32%) feed their children for more than 3 times a day and 5 (4%) feed for less than 3 times a day. The less percentage of mothers who feed their children for less than 3 times a day could be the reason for a few cases 10 (8%) of severe under nutrition among children less than five years in this community. Most of the respondents 97 (75%) breast feed their children up to at least 2 years. This is because they are informed about breast feeding; however the minorities who breast feed up to 6 months do exclusive replacement due to their HIV status. This is in line with a study carried out by UNICEF (UNICEF, 2013).

The study revealed that 84 (64%) of the respondents wean their children at 1 year, and 40 (31%) wean their children at above 1 year, 05 (4%) at 6 months and only 01 (1%) at 3 months. Those who wean at 3 months said they do so when they feel the breast milk is not enough for the child. The respondents used porridge, cow milk, and bread to wean their children. The most commonly used 125 (96%) is porridge of cassava, maize or millet and only few of them 05 (4%) mix millet with soya bean to make porridge for their children. Others used potatoes and rice to wean their children.

Although others had not completed immunization, all the respondents 130 (100%) took their children for immunization. This is because the service is near them and they understand the importance of immunization to their children. However some of the respondents 09 (7%) lost the immunization card, and 09 (7%) who were care takers (grandmothers) said the card was with the parents, but 128 (86%) had their immunization cards available. This was in line with a study carried out in Ethiopia (AbdibariMa'alin, DerejeBirhanu, Samuel M., Daniel T., Yusuf M., 2016).

Malaria was the most common recent infection 94 (73%) in this area and others include cough 13 (10%), diarrhea 9 (7%), worm infestation 10 (7%) and 4 (5%) who never had any infections. These infections reduce appetite, decrease energy and nutrient utilization and limit the ability to absorb or retain nutrients. This has similarity with a study done by WHO in 2011 and a study done in Ethiopia ((WHO, 2011), (Dunne, 2008)). Three quarters 98 (75%) of the respondents don't take their children to a well fare clinic and only 32 (25%) do take their children to the well fare clinic. This finding shows that well fare of the children will continue to be poor unless serious intervention through health education and counseling about attending well fare clinic is carried out in this area. The result of the study shows that the greater proportion 95 (73%) of the respondents are at most 1 km from the health Centre. This meant that the services were available though of limited range of choice. About three quarters 104 (80%) of the respondents' children were well nourished, 16 (12%) were moderately undernourished and 10 (8%) were severely undernourished. This is in line with the WHO report of 2013 on the prevalence of malnutrition(WHO, 2013).

### **5.1.3 Environmental factors**

Despite the emphasis put by the health team on construction of the latrines, small percentage of the respondents 17 (13%), did not have latrines and disposed their refuse in the neighbors' latrine or in the nearby bush, however majority of the respondents 113 (87%) had latrines. Most of the respondents who had latrines had it at least 10m from the main house and more than 30m from the water sources. This could be due to the health education and monitoring done by VHT.

Most of the respondents, 87 (66%) get water from lakes, 41 (32%) get water from borehole and a small percentage 02 (2%) collect from a tap. However, majority of the respondents 116 (89%) do not use any method of water purification and only 06 (5%) boils water, 08 (6%) purifies their water by filtering. This result shows that their health status continues to be at risk unless interventions are done and mainly to those who get water from the lake and doesn't use any method for purification hence compromising their nutritional status and this has a great similarity with WHO report of 2010 (WHO, 2010).

## **5.2 Conclusion**

In conclusion, it was found that early marriage, low education level leading to lack of employment and low income, communal serving of children below 5 years, poor attendance of the child welfare clinic, lack of water purification practice, lack of latrine, poor child care and lack of food are the factors associated with under nutrition in children under 5 years in this community.

## **5.3 Recommendations**

The ministry of health (MOH) in conjunction with the ministry of education should promote girl child education and fight against early marriages and girl child abuse practices such as rape, defilement and also taking children to welfare clinic through health education and mass media while improving the quality of services provided should be emphasized.

The district education officer (DEO) together with other district leaders such as district health educator should educate the community about girl child education and also emphasis should be put to discourage communal serving of children, early weaning and also to encourage construction of pit latrines.

Training and empowering the VHT to carry out mobilization and dissemination of information about infant feeding, water purification, unsafe cultural practices, child welfare clinics and girl child education should be emphasized.

## REFERENCES

- AbdibariMa'alın, DerejeBirhanu, Samuel M., Daniel T., Yusuf M., K. G. (2016). Magnitude and factors associated with malnutrition in children 6-59 months of age in Shinille Wareda, Ethiopia Somalia regional state.
- Appoh LY, K. S. (2005). Maternal knowledge and child nutritional status in the Volta region of Ghana.
- C.G Victora, L. Adair, C. F. et al. (2008). Maternal and child undernutrition. *Consequences for Adult Health and Human Capital*, 371, 340–357.
- Faruque, A.S.G., Shamsir, A.M.A., Tahmeed, A., Munirul, M.I., Iqbal, M.H., Roy, S.K., Nurul, A., Kabir, I., and Sack, D. A. (2008). Nutrition: Basis for healthy children and mothers in Bangladesh. *Journal for Health and Population Health*, 26(3), 325-339.
- Gilbert, H. (2015). An investigation on factors associated with malnutrition among under five children in Nakaseke and Nakasongola districts, Uganda.
- GoU. (2010). Growth, employment and socio-economic transformation for prosperity. *National Development Plan (2010/11-2014/15) for the Republic of Uganda, National Planning Authority. Kampala, Uganda.*
- Hiwot Yisak, T. G. and F. M. (2015). Prevalence and risk factors for undernutrition among children under five at Haramoya District , Eastern Ethiopia.
- Kimokoti, R.W., and Hamer, D. H. (2008). Nutrition, health and aging in sub-Saharan Africa. *Nutrition Reviews*, 66(11), 611-623.
- Lancet. (2008). No Title.
- M.De Onis, D. B. and E. B. (2012). *Levels and trends in child malnutrition. UNICEF-WHO. The world Bank Joint child malnutrition Estimates, UNICEF, . New York, NY,USA.*
- MAAIF, M. and. (2005). . (Ministry of Health and Ministry of Agriculture, Animal Industry and Fisheries),. *The Uganda Food and Nutrition Strategy, Kampala: Uganda.*
- Nguyen, N.H., and K. S. (2008). Nutritional status and the characteristics related to malnutrition

- in children under-five years of age in Nghean, Vietnam. *Journal of Preventive Medicine and Public Health*, 41(4), 232-240.
- Nnyepi, S. and. (2006). socio-economic factors and physical activity affecting the nutritional status of young children under five years.
- Nure, A. S., Nuruzzaman, H., Abdul, G. (2011). Malnutrition of underfive children: Evidence from Bangladesh. *Asian Journal of Medical Sciences*, 2,113-119.
- Nyaruhucha, C.N.M., Msuya, C.N.M., Mamiro, P.S., and Kerengi, A. . (2006). Nutritional status and feeding practices of under-five children in Simanjiro district, Tanzania. *Tanzania Health Bulletin.*, 8,3.
- Olwedo, M. A., Mworozzi, E. M., Bachou, H., and Orach, C. . (2008). Factors associated with malnutrition among children in internally displaced person's camps, Northern Uganda. *Journal of Africa Health Sciences*, 8(4), 244-252.
- Qaim, B. and. (2010). . Prevalence and Determinants of malnutrition among under five children of family households in kwara state, Nigeria.
- Rose A .Inguitia, K. . Z. I. and M. M. H. (2009). Analysis of relation between rural poverty, malnutrition and hunger and interlinks with agricultural production growth and productivity growth with special reference to Mozambique and Bangladesh.
- Teller, H., and Yimar, G. (2000). Levels and determinants of malnutrition in adolescent and adult women in southern Ethiopia. *Ethiopian Journal of Health Development*, 14, 57–66.
- UBOS. (2012). *Uganda Bureau of Statistics (UBOS) and ICF International Inc. (2012). Uganda Demographic and Health Survey 2011*. Kampala, Uganda:
- UBOS, M. I. (2007). *Uganda Demographic and Health Survey 2006*. Calverton, Maryland, USA: UBOS and Macro International Inc.
- UNICEF. (2013). Improving child Nutrition. *The Achievable Imperative for Global Progress, United Nations Children's Funds.*
- UNICEF. (2016). *Undernutrition contributes to nearly half of all deaths in children under 5*



*years of age and is widespread in Asia and Africa.*

WHO. (2013). Improving maternal, newborn, infant and young child health and nutrition. WHO Document Publications Services. *Essential Nutrition Actions*.

**APPENDIX 1: INFORMED CONSENT FORM AND QUESTIONNAIRE**

**PART A: INFORMED CONSENT FORM**

DEAR SIR/MADAM,

I am AWINO SHARON, a student at Kampala international University carrying out a research project for the award of Diploma in Clinical medicine and community health. The research aims to determine the factors associated with under nutrition in children under five in Bangladesh Parish Namasale sub-county. I kindly request your help in this process, your participation is voluntary and the information you give is confidential. You might also stop the interview at any time you wish and hope this information will be used in improving the nutritional status of children. Your contribution is highly appreciated.

**Benefits**

The data you will provide will be helpful in generating factors associated with under nutrition in children below five years in this area of study and also provide information to guide ministry of health and other development partners to provide the necessary assistance to improve the nutritional status of children below five years.

**Risks**

No risks are involved in the study, however if during the process of the study you want to leave, you shall be free.

If you agree then Tick Yes ..... No (if you don't agree).....

Respondent's signature ..... Date .....

**Thank you very much**

## PART B: QUESTIONNAIRE

The Questionnaire aims to determine the factors associated with under nutrition in children under five in Bangladesh Parish, Namasale sub-county. The information attained will only be used for the purpose of this study and therefore will be held confidential. (Please do not write your name), your participation is voluntary.

NB: tick the correct answer and write where necessary.

Respondent's code ..... Date .....

### SECTION A: SOCIO-DEMOGRAPHIC DATA OF THE MOTHER (CARE GIVER).

1. Age.....

2. Current marital status

a] Single ☐    b] Married ☐    c] Divorced ☐    d] widow ☐

3. Educational status

a] Primary ☐    b] Secondary ☐    c] Tertiary ☐    d] No formal education ☐

4. Occupation

a] Casual labor ☐    b] Civil servant ☐    c] Small scale business ☐    d] House wife ☐  
e] Others specify.....

5. Main source of income

a] Peasant farming ☐    b] salaries ☐    c] wages ☐    d] Business ☐  
e] Others specify.....

## SECTION B: CHILD CARE AND HEALTH RELATED FACTORS

6. How do you serve children who are below 5 years of age with food?

- a] Communal serving ☐    b] Personal plate ☐    c] With the mother/care taker ☐  
d] With siblings

7[i]. Do you have any food taboo?

- a] Yes ☐    b] No ☐

[ii] If yes, what are they?.....

8. How many times do you feed your child a day?

.....

9. For how long do you breastfeed your baby?

- a] 4 months ☐    b] 6 months ☐    c] 2 years ☐    d] >2 years ☐

10[i]. At what age do you introduce weaning food?

- a] 3 months ☐    b] 6 months ☐    c] 1 year ☐    d] >1 year ☐

[ii] What food do you use for weaning?.....

11. Are your children immunized?

- a] Yes ☐    b] No ☐

[ii] If yes, show me the card.

- a] seen ☐    b] Lost ☐    c] others specify .....

[iii] If no, why?.....

12. Has your child suffered any recent infection?

- a] Yes ☐    b] No ☐

[ii] If yes, specify.....

13. Do you take your child at a child welfare clinic?

- a] Yes ☐    b] No ☐

14. How far is your nearest health unit?

- a] <1km ☐    b] 1km ☐    c] 2km ☐    d] >2km ☐

15. Nutritional status of the child using MUAC measurements in cm

- a] >13.5 ☐    b] 12-13.5 ☐    c] < 12.5 ☐

## SECTION C: ENVIRONMENTAL HEALTH FACTORS

16. Do you have a latrine?

a] Yes ☐ b] No ☐

17. If yes, what is the distance from the main house?

a] <10m ☐ b] 10m ☐ c] >10m ☐ d] I don't know ☐

[ii] What is the distance from the water source?

a] <30m ☐ b] 30m ☐ c] >30m ☐ d] I don't know ☐

18. If no, how do you dispose your refuse?

a] Dust bin ☐ b] Rubbish pit ☐ c] Within the compound ☐ d] Others ☐

specify.....

19. What is your main source of water?

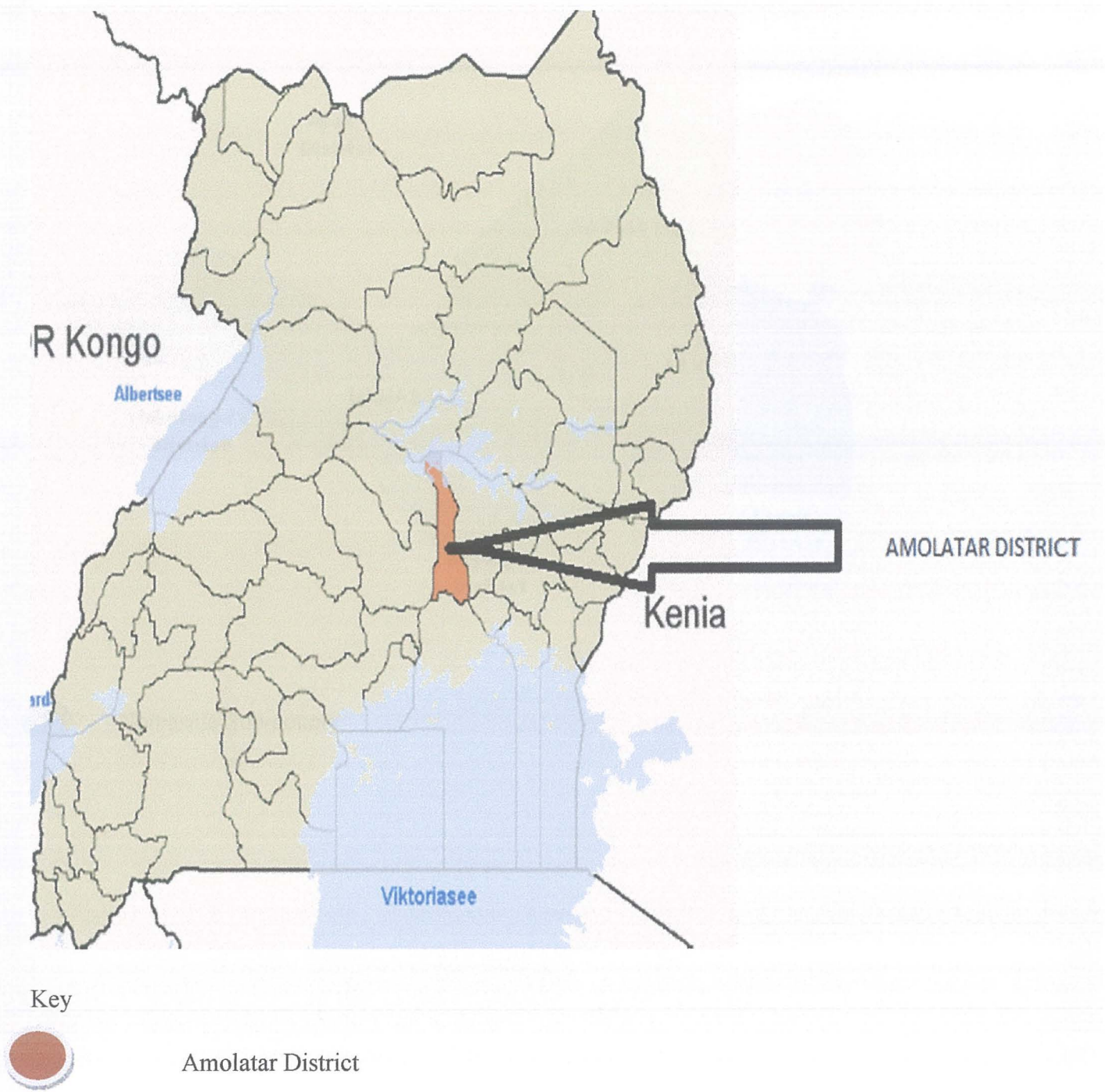
a] Lakes ☐ b] Borehole ☐ c] Tap ☐ d] protected spring ☐

e] Unprotected spring

20. How do you make your water safe for drinking?

a] Boiling ☐ b] Filtering ☐ c] others specify.....

APPENDIX II A: MAP OF UGANDA SHOWING AMOLATAR DISTRICT







KAMPALA  
INTERNATIONAL  
UNIVERSITY  
TEACHING HOSPITAL

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**OFFICE OF THE ADMINISTRATOR –SAHS**

18<sup>th</sup> April 2017

The Chairperson Bangala Desh Parish  
Namasale sub-county  
AMOLATAR DISTRICT

Dear Sir,



*Apilli Kenneth*  
*0771428144*  
*granted -*

**SUBJECT: DATA COLLECTION**

Academic research project is an Academic requirement of every student pursuing a 3 year Diploma in Clinical Medicine & Community Health (DCM) of Kampala International University- Western Campus (KIU-WC). DCM program is housed in the School of Allied Health Sciences (SAHS).

The students have so far obtained skills in Proposal writing especially chapter one, Three & Questionnaire design. The student's topic has been approved by SAHS Research Unit and is therefore permitted to go for data collection alongside full proposal & dissertation writing. As you may discover the student is in the process of full proposal development. However, the student MUST present to you her questionnaire and her research specific objectives that she wishes to address. We as academic staff of Allied Health Sciences are extremely grateful for your support in training the young generation of Health Professionals. I therefore humbly request you to receive and allow the student **AWINO SHARON** Reg.No. **DCM/0164/143/DU** in your area to carry out her research. Her topic is hereby attached. Again we are very grateful for your matchless support and cooperation.

Topic: **FACTORS ASSOCIATED WITH UNDER NUTRITION IN CHILDREN UNDER FIVE YEARS IN BANGALA DESH PARISH, NAMASALE SUB-COUNTY, AMOLATAR DISTRICT.**

Sincerely yours,



**Christine Kyobuhaire, Administrator- SAHS**

CC: Dean SAHS  
CC: Associate Dean SAHS  
CC: Coordinator, Research Unit- SAHS  
CC: H.O.D Dept. Public Health  
CC: H.O.D Laboratory Sciences  
CC: Coordinators; TLC & DEC