

**Mapping and assessing nutritional supplementation programmes.
A case study from the Lower Manya-Krobo District in Eastern Ghana.**

A thesis submitted to
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Acknowledgement

I am nothing without God; I thank the Lord God Almighty, for His grace, unfailing greater love, the peace and protection over my life. All that I am today and will forever be is because there is a God who sees after the ways of man. Praise be His name!

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I am very grateful to my entire family, Nicholas Kwabena Amoako, Francis Owusu who fully supported me throughout my study in the Netherlands; not forgetting my best-friend, and lovely fiancé, Emmanuel Ahoa for the love and care throughout my study.

Dedication

To Simeon Bekoe and Samuel Yaw Awoonor Nyadzro; I esteem you greatly.

Preface

My grandparents live in a small town called Kpong which is located in the Lower Manya-Krobo district (LMK) of Ghana. I had gone on a usual visit to my grandparents for vacation away from work in May 2016; when a woman who is a neighbour to my grandparents came to my grandmother with a strip of tablets in her hand. She showed them to my grandmother and said in the local language ‘these small girls (referring to community health workers) who came to my house want me to stop giving birth so they gave me this medicine to take and they claim it will keep me healthy. Did they come here also?’

My grandmother took the strip and seeing confusion in her face, I went over to take a look at the strip. The strip of tablets was not contraceptive pills but iron tablets which was meant to provide iron as supplementation to diets to prevent anaemia. I explained to the woman and convinced her it was not meant to prevent her from giving birth, but to provide nutrients which were essential for the body which were sometimes lacking in the diets we eat. She then accepted to drink them knowing that I was the grandchild of her neighbour. In this small town (Kpong), women are respected for the number of children they have. Women in this town considering the respect from child bearing may not resort to any form of family planning despite the known benefits.

The woman (grandmother’s neighbour) perhaps may not have been well informed about the iron tablets and the benefits to her wellbeing for her to be motivated to drink it. She accepted to drink them even though I cannot emphatically say she did; since I did not follow-up, perhaps because she knew me to be a grandchild of her neighbour and I am not likely to deceive her. This incident from my personal experience may be just one of such cases that may exist regarding people’s perception about micronutrient supplements provided through NGOs, or government public health services for specific groups of people. Inadequate information and knowledge regarding the benefits and necessity to micronutrient supplementation may be a major cause for people to have a wrong perception as I have described in the incident above.

My encounter with the woman some months ago served as my motivation to undertake this research for the Local Development Agency on Reproductive and Maternal Health (LODARMAH). I work as the nutrition programme facilitator for Information Training Outreach Centre for Africa (ITOCA) whose aim is: ‘to build capacity amongst women in rural communities in the latest methods of fortification of local staples and advocate for the adoption of new technologies that drive nutrition and food security’. ITOCA partners with other non-governmental organisations (NGOs) in the implementation of nutrition related programmes and interventions; one of such NGOs is LODARMAH.

Abstract

Several interventions have been and are being implemented by both government and non-governmental bodies to address malnutrition amongst different populations in Ghana. However, the outcomes from the implementation of these interventions could be higher or lower than expected. An investigation to understand the underlying factors for the little improvement in the nutritional status of beneficiaries (children below five) under the micronutrient supplementation by LODARMAH in the Lower Manya-Krobo district of Ghana became necessary when the outcomes of a LODARMAH project was lower than expected. This involved a field study with 27 caregivers of beneficiaries of the project, interviews with key informants and focus group discussions in Atua and Akuse where the project had been evaluated. The study also involved observations by the researcher in households and the community with minimum interference by the researcher. The factors identified to have led to the low improvement of the nutritional status of beneficiaries are; the non-involvement of the targeted population sub-groups to identify the most urgent intervention needed to address the malnutrition situation within the LMK district; inadequate resources to match up the demands of the intervention; flaws in the nutrition behaviour-change communication; and beliefs, perceptions and food habits that exist amongst sub-groups which undermines good nutrition and nutritional well-being. Results from the study have shown that the problem of malnutrition is a multifaceted one which requires a multi-sectoral and integrated approach. The Atua and Akuse study confirmed findings of other authors who conclude the need for organizations implementing nutrition related interventions to involve community members in the planning and implementation of the intervention. The study concludes that targeted sub-groups are to be given the opportunity to be made aware of their nutritional needs and be fully involved in the entire designing and planning of appropriate interventions that could go a long way to improve their nutritional situation. The findings also highlight the need to understand the root causes of malnutrition and deal with those ones rather than dealing with the symptoms of malnutrition.

Keywords: malnutrition; intervention; supplements; beneficiaries

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List of abbreviations

LMK	Lower Manya-Krobo
ITOCA	Information Training Outreach Centre for Africa
LODARMAH	Local Development Agency on Reproductive and Maternal Health
NDPA	Nutrition Program Design Assistant
GSS	Ghana Statistical Service

CHAPTER ONE INTRODUCTION

1.1 Background

Malnutrition is one of the problems that affect both developing and developed countries. The problem of malnutrition can either be undernutrition (manifested as underweight, stunting, and wasting) and over-nutrition usually in the form of obesity (UNICEF, 2017). The first form of malnutrition described in the 1920s according to Bain et al., (2013) was the Protein-Energy Malnutrition (PEM). PEM was evident in two forms; Kwashiorkor and Marasmus. The former was characterised by the presence of edema whilst the latter was characterised by the absence of edema. Kwashiorkor involved insufficient protein intake as against fair-to-normal calorie intake, Marasmus on the other hand involved inadequate intake of both protein and calories by children. After several studies and development in child nutrition, it was realised that children could be affected by micronutrient deficiencies (lack of essential vitamins and minerals in the body) (Bain et al., 2013). This led to a shift from PEM alone to undernutrition and over-nutrition to make room for both deficiencies in macronutrients (carbohydrate, protein, fats) and micronutrients (minerals and vitamins). The effect of malnutrition is predominant in children under age five who live in poor rural areas (Bain et al., 2013).

Malnutrition contributes significantly to the poor nutritional status of individuals in nations which affects economic development and growth (WHO, 2015). The prime cause of malnutrition globally is food and nutrition insecurity according to WHO (2015). Food and nutrition security according to the FAO 'exists when all people at all times have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary preference for an active and healthy life'. This implies the issue of malnutrition can be related to the insufficient or lack of access to safe, sufficient and nutritious food that will promote a healthy and an active life. Recent statistics show that overweight and obesity in adults stands at 1.9 billion and 600 million respectively globally according to the UNICEF (2017). For children under five, severe wasting stands at 16 million, overweight 41 million and stunting at 159 million.

Sub-Saharan Africa (SSA) is faced with problems of malnutrition like other parts of the world. In West Africa alone which is a region of Sub-Saharan Africa, the pooled prevalence of the manifestations of malnutrition among children as at 2015 according to the WHO were; stunting 31.8%; wasting 10%; and underweight 20.1%. The persistent prevalence of malnutrition especially in Africa according to FAO (2002) is attributed to illiteracy, poverty, climate change, large family/household size, lack of proper agricultural policy and infrastructure, wars/conflicts and corruption.

Ghana as a country in West Africa (SSA) has made steady progress in addressing the issue of malnutrition amongst children. For example, the number of children suffering from severe undernutrition in Ghana dropped from 25 percent in 1998 to 13 percent in 2011. As at 2015, the number of children in Ghana suffering from malnutrition was less than 5 percent according to the Global Nutrition Index 2015. This made the WHO and UNICEF declare Ghana as one of the countries in Sub-Saharan Africa that has achieved success in fighting child malnutrition. Despite the success made through various interventions in reducing the overall cases of undernutrition at national level, marked regional disparities in undernutrition persist. For example, the highest stunting rates are in the Upper East (36%), Northern (32%), Eastern (38%), and Central (34%) regions of Ghana (GDHS, (2010), USAID, (2012) Ghana Nutrition Profile). One out of ten children die before their fifth birthday according to the Ghana CFSVA, 2009 within the mentioned regions.

Presently, micronutrient deficiencies affect over two billion people globally (UNICEF, 2017). These deficiencies, as stated by UNICEF, (2017) are the principal causes of maternal death during childbirth (due to iron deficiency), intellectual incapacity in children (due to iodine deficiency), severe and frequently fatal birth defects known as neural tube defects (folic acid deficiency) and preventable blindness (due to vitamin A deficiency). Reduced mental ability leads to lower academic achievement with lifelong consequences; with malnutrition being an underlying cause of one third of all child deaths. The LMK district is one of the areas in the Eastern region of Ghana with the highest prevalence (17%) of micronutrient deficiencies in children and women; this can be attributed to poor dietary diversity, as well as other cultural and food habits within the region (Ghana Health Service, 2013). Based on these and other reasons, government bodies, NGOs and other humanitarian agencies introduce interventions in areas/regions who are at risk or have severe cases of malnutrition. According to CFSVA (2009), nutrition interventions are geared towards controlling or preventing the effects of malnutrition amongst the most at risk groups (children, pregnant and lactating women).

The Local Development Agency on Reproductive and Maternal Health (LODARMAH) is an NGO which is operational in rural areas where maternal and child undernutrition persists. The LODARMAH pursues its vision through strategic interventions that are founded on strong social scientific evidence; combining community ethics and values; and practical need-based interventions to alleviate the burden of malnutrition amongst vulnerable groups in communities. LODARMAH as an NGO launched the nutrition project 'Born to Survive, Free to Grow' in the Lower Manya-Krobo (LMK) district of Ghana in December 2014. In this project, the organisation provides micronutrient supplements in the form of powders (sprinkles and water soluble), and tablets to address micronutrient deficiencies among women (pregnant

and lactating) and children under five years (LODARMAH, 2014b). After a monitoring and evaluation in March 2017, the expected outcomes of significant improvement in the nutritional status (micronutrient sufficiency) amongst the beneficiaries (especially children under five) of the project was low. This gave room for the need to investigate the reasons for the little improvement in the nutritional status amongst beneficiaries in the LMK district.

1.2 Problem statement

Nutritional supplements in the form of powders, lipids or tablets have been said according to (Black et al, 2013) to help meet and sustain the dietary needs of vulnerable groups and thereby address malnutrition, under-nutrition and diseases associated with nutritional deficiencies. In view of this, efforts have been made by LODARMAH to reach 1500 households with micronutrient supplements in the LMK district under their project 'Born to Survive, Free to Grow'. However, a monitoring and evaluation of the project after 27 months showed less than 5% of beneficiaries (especially children under five years) of the project were micronutrient sufficient (LODARMAH, 2017). The reasons for the little improvement is not known. LODARMAH therefore seeks to understand what the underlying factors for the little improvements are, as against the anticipated results of the project. This study is commissioned in this regard to provide knowledge which may help identify and correct gaps in the organisation and the implementation of such projects in the LMK district of Ghana.

1.3 Research objective

To understand the underlying factors for the little improvement in the nutritional status of beneficiaries (children below five) under the micronutrient supplementation by LODARMAH in the Lower Manya-Krobo district of Ghana and provide synthesised guidelines for making relevant changes in the supplementation programme.

1.4 Main research question

What are the underlying factors for the little improvement in the nutritional status of children below five in the LMK district after micronutrient supplementation intervention by LODARMAH?

1.5 Sub-research questions

1. How was the intervention and implementation process organised by LODARMAH?
2. What was the nature of involvement of community members and/or public participation in the planning and implementation of the intervention?
3. What beliefs, assumptions and perceptions exist among community members on their nutritional wellbeing and supplements promoted by LODARMAH in their project?
4. What is the level of knowledge of community members (beneficiaries) on the use of nutritional supplements in the Lower Manya-Krobo district?

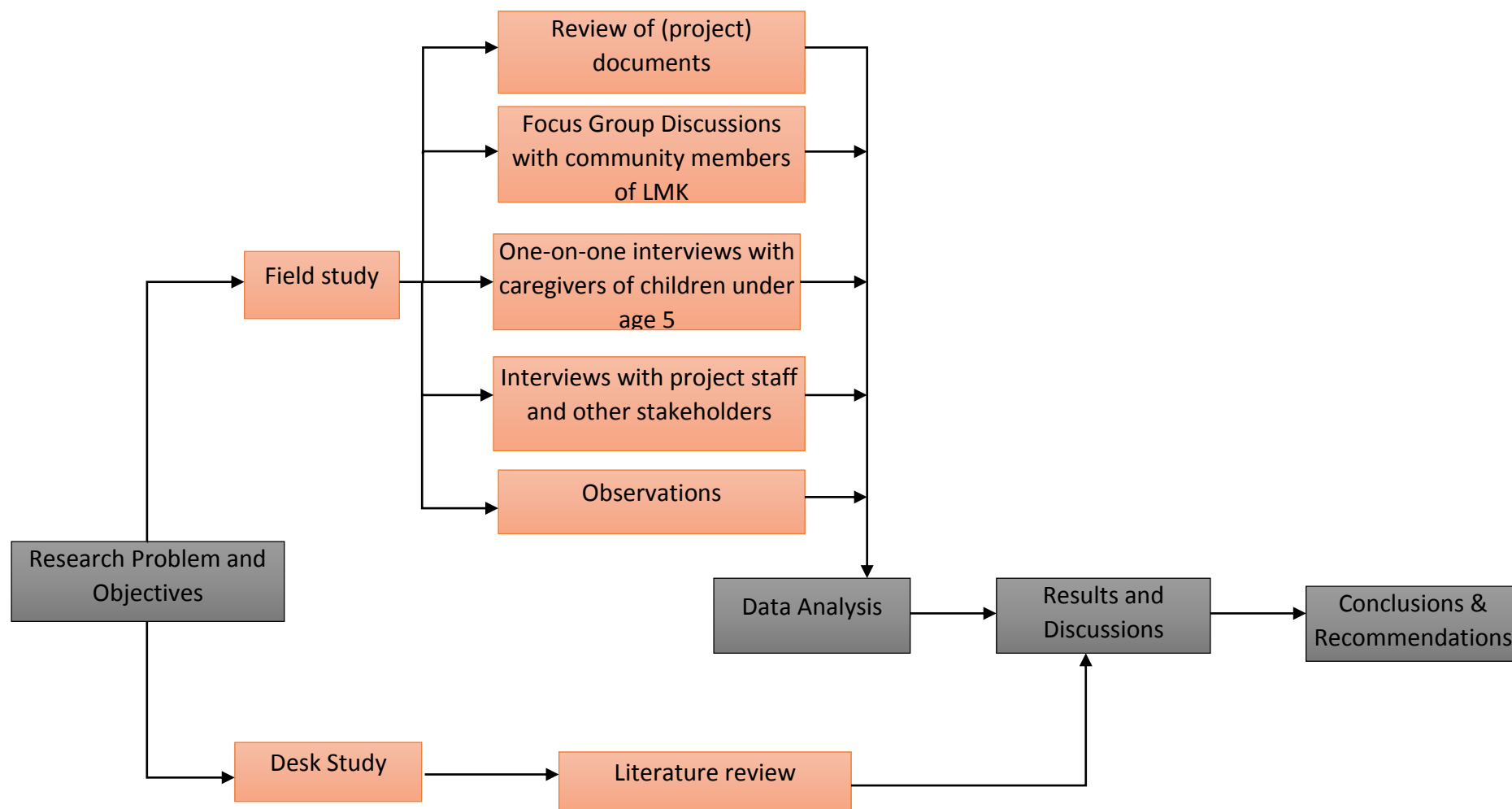
1.6 Research framework

A research framework is a visual illustration of the research objective and the description of the research phases that the researcher goes through in order to achieve the objective of answering the research question according to Verschuren and Doorewaard (2010). The research framework in this study (see Figure 1.1) consists of research problem and objective definition, data collection, desk study, data analysis, results and discussions, conclusions and recommendations.

Literature study: existing literature on the designing, implementation process, acceptance and importance of micronutrient supplementation programmes as a nutritional intervention will be reviewed which will provide insight into the issue under study.

Field work: the data from interviews, focus group discussions, observations and review of grey literature (project brief, monitoring and evaluation report of LODARMAH) will provide insight into the overall situation regarding the micronutrient supplementation programme in the LMK district.

Figure 1.1: Research framework



Source: Author (2017)

1.7 Outline of the thesis

The thesis has six chapters. Chapter 1 details the introduction of the entire report. It also includes sections on the background of the study, the problem statement, research objective and research questions. Chapter 2 captures the theoretical underpinnings of the study. Concepts on child malnutrition, the types of nutritional supplements and a special focus on the different stages of organisation and implementation of nutritional programmes/interventions will be reviewed.

Chapter 3 details the methodology used in the study. It captures the study area, the stakeholders and participants involved in the study, and the modalities of the study. The ethical considerations, and a reflexivity paragraph concludes the chapter.

Presentation of the findings has been put together in chapter 4. In this chapter, findings from the field study have been presented without any form of analysis.

Chapter five which is the analysis and discussion is where the researcher interprets the findings and refer to secondary literature to validate findings where necessary. Discussions and analysis are made based on the sub-research questions in chapter 1.

The final chapter (6), provides the conclusion to the study as well as recommendations for the commissioner on the improvement of the nutritional supplementation programme within the LMK district. The chapter concludes with reflection on the lessons learnt for the researcher's organisation.

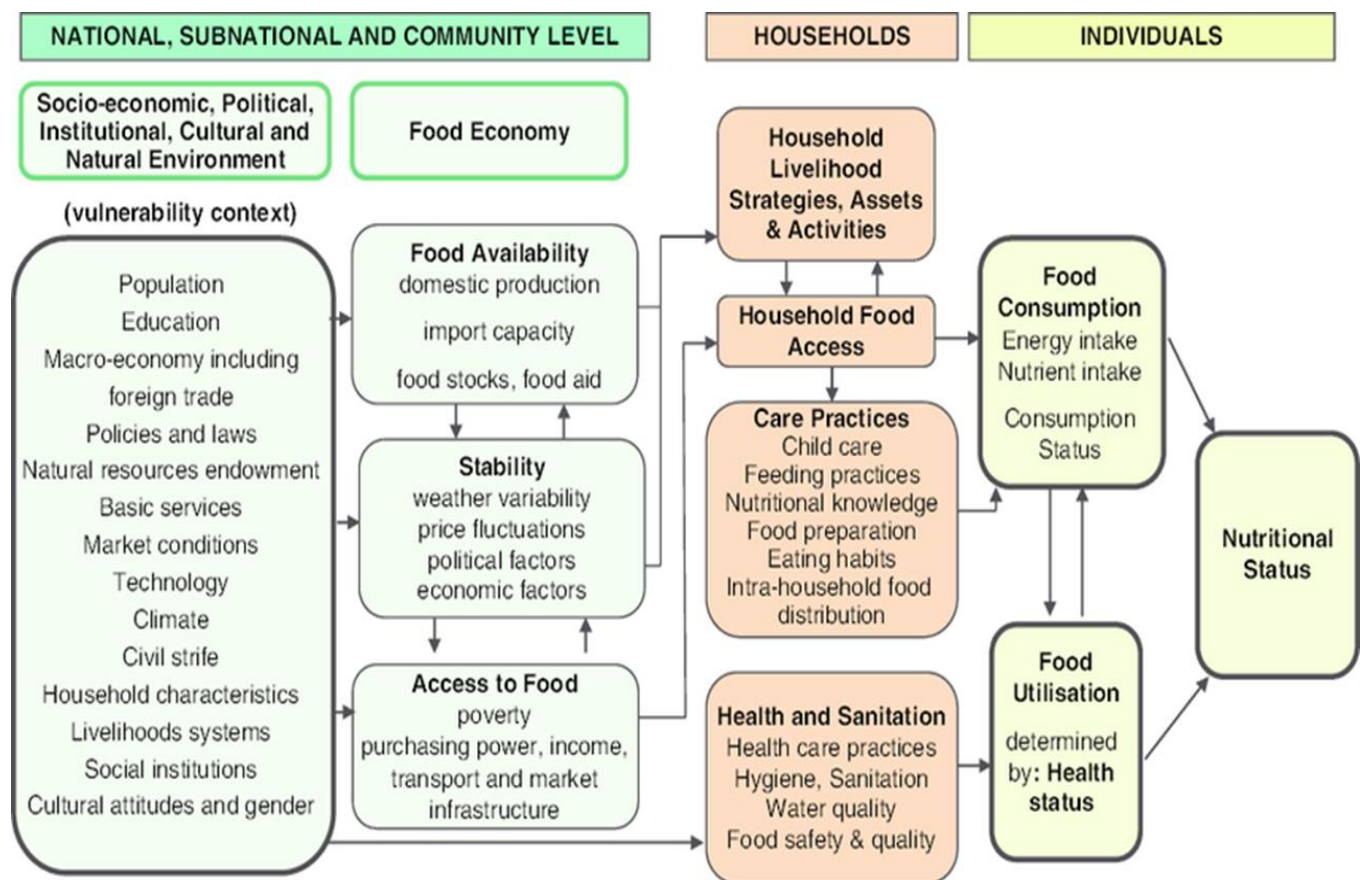
CHAPTER TWO THEORETICAL UNDERPINNINGS OF THE STUDY

Ending entirely all forms of malnutrition (undernutrition, over-nutrition, micronutrient deficiencies) by 2030 is one of the key aims of the sustainable development goals (Global Nutrition Report 2015). Young children and older toddlers are at the highest risk for malnutrition, mostly in the forms of reduced/poor development and micronutrient deficiency. The fight against child malnutrition is a great concern for both the government and other stakeholders (national and international organisations). The governments of countries including Ghana in collaboration with international bodies (UNICEF, WHO, FAO) and private non-governmental bodies have implemented, and continue to implement nutrition programmes (intervention, education for behaviour change) to address the issue of malnutrition by improving the nutritional status of population sub-groups who are at risk of undernutrition.

2.1 Conceptualisation of determinants of nutritional status

According to Maxwell (2013), a conceptual framework in a research is important as it clarifies concepts and propose relationships among concepts; it also provides a context for interpreting findings; and to explain observations. For the purposes of this study, the conceptual framework (see Figure 2.1) adopted is the FAO-FIVIMS framework. The FAO-FIVIMS (Food Insecurity Vulnerability Information and Mapping Systems) framework combines the UNICEF malnutrition framework and DFID sustainable livelihood framework (SLF) and its implications on the four pillars of food security. The FAO-FIVIMS framework therefore explains the determinants of the nutritional status of an individual by considering the assets and vulnerabilities of people and how this affects their access and use of food to promote their nutritional well-being. The conceptual framework will guide and provide a context for interpreting findings, and to explain observations.

Figure 2.1: Conceptual framework for understanding determinants of nutritional status



Source: FAO, 2002

The determinants of the nutritional status of an individual can be grouped into three main headings and three different levels. These headings and levels are:

- Socio-economic, institutional, political, natural and cultural environment (Community level)
- Livelihood strategies, assets and activities (Household level)
- Food consumption and utilization (Individual level).

Socio-economic, institutional, political, cultural and natural environment

The FIVIMS framework highlights the necessity to envisage underlying socio-economic, institutional, political, natural and cultural factors, as they influence different dimensions of food security (food availability, food access, stability, food utilization), in addition to conditions related to health and sanitation, while also affecting care practices. Individual's ability to access food is highly dependent on age, gender, food habits and cultural dynamics that may exist in a given location.

Livelihood strategies, assets and activities

The assets and livelihood strategies adopted by a household affects the food and nutrition security of the given household. Activities within the household from food preparation methods, to care practices (cultural practices and knowledge related to food preparation and intra-household food allocation), and eating habits may affect the quality of foods consumed in the household.

Food consumption and utilization

Food consumption is presented as being determined by access to food at household level and care practices whilst food utilization is the effective and efficient use of food by the body which is highly dependent on a person's health status. The health status is in turn dependent on the general sanitation and health conditions at the household, and community levels at large.

The nutritional status of an individual is dependent on the food intake (in terms of energy and nutrients) and the utilization of the food (dependent on individual's health status).

Effects of malnutrition on economic growth

The effects of malnutrition cannot be underestimated as it affects the next generation of the human resource. First of all, according to the UNDP Human Development Index (2015), malnutrition in childhood years is identified to have lasting effects on the intellectual and work capacity of adults in their later years. Health consequences of inadequate nutrition are huge which affects the GDP of every country battling with malnutrition. For example, for every 1% reduction of iron status equals 1% reduction in productivity; as iron is needed to transport oxygen throughout the body to improve concentration and reducing fatigue (Cesar et al. 2008). Malnutrition according to FAO (2014) costs \$3.5 trillion dollars per year to the global economy. Hoodinott (2010) gave the economic benefit of addressing micronutrient deficiencies and chronic undernutrition in one of his publications. The findings from that research stated that every dollar (\$1) spent on iodizing salt, iron supplements for mothers and children (6-24 months) and vitamin A generates economic benefits of \$30, \$24 and \$40 respectively. This is to emphasize the cost of malnutrition in the development and growth of a nation. Malnutrition is generally considered as a poverty indicator, hence countries with high burden/prevalence of malnutrition are considered poor (FAO, 2014). The World Bank identified that countries are likely to lose 2-3% of their GDP due to undernutrition, this has been described as a vicious cycle between malnutrition and poverty.

Education and malnutrition

To reduce the malnutrition related mortality, the enhancement of the educational status of parents, especially mothers (they are usually the care givers and in charge of child feeding) on nutrition, sanitation and basic disease prevention strategies have been identified by Bain et al., (2013) as key to a success story. Food choices, its quality and quantity eaten by children are at the will of the caregiver or mother. Education (both formal and informal) of girls who grow to become women (caregivers) is very crucial to Infant and Young Child Feeding Practices (IYCFP). According to Cesar et al., (2008); and Bain et al., (2013), the link between education and poverty is close as formal education improves chances of employment which in turn improves access to income. Education according to Ruel et al., (2013) could help women better access family planning options which will lead to fewer birth rates in households to meet the food and nutritional needs of the family in the face of limited resources. Bain et al., (2013) emphasized that the lack of education and ignorance contributes to malnutrition in the following ways:

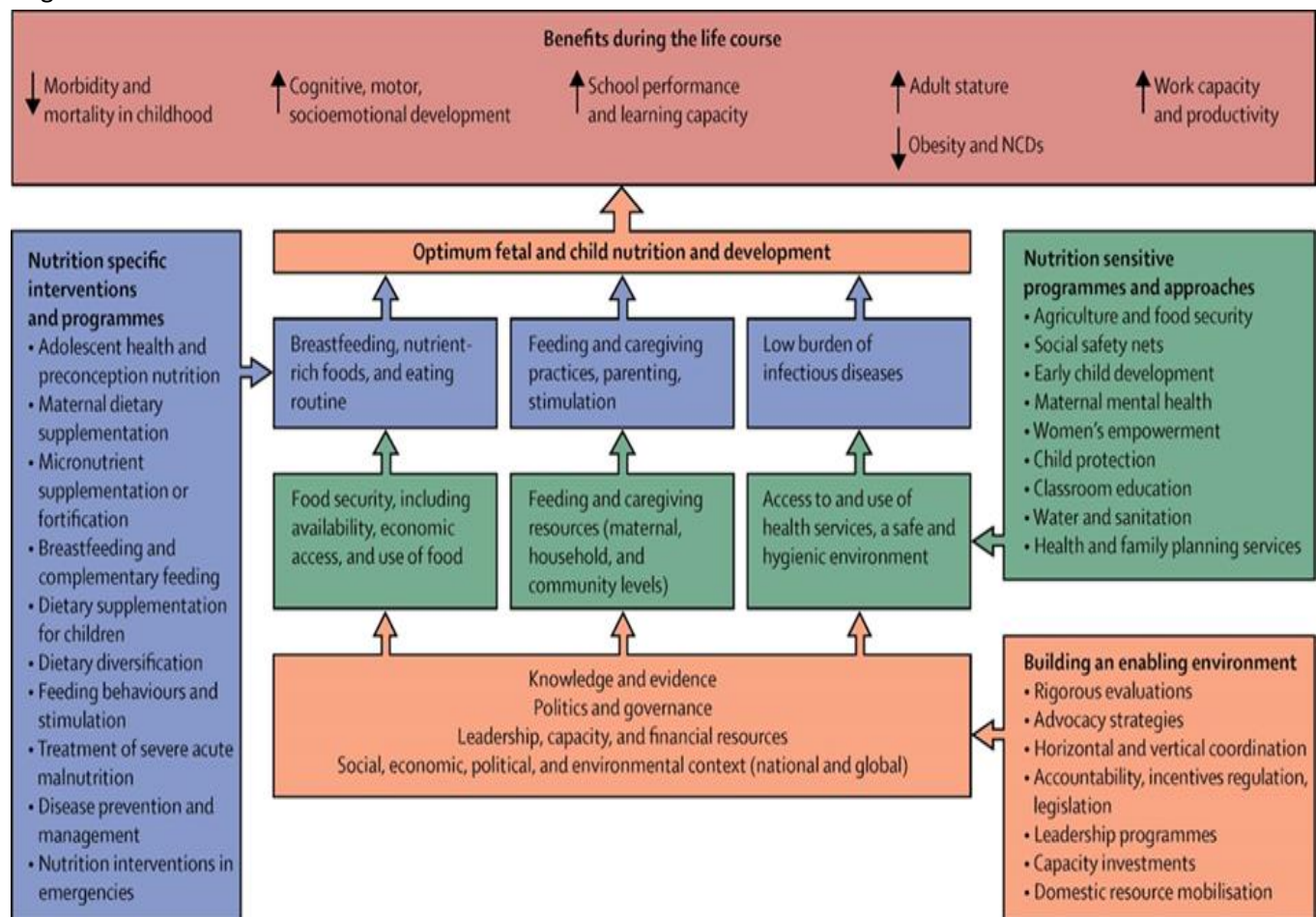
- little/no knowledge on the availability and importance of vitamins and minerals in food items (fruits and vegetables) leading to failure to eat them even when they are available and cheap
- little/no knowledge on the prevention, causes and consequences of hygiene and sanitation diseases which may lead to severe health decline and even death
- little/no knowledge on healthy childcare practices (breastfeeding, introducing of nutrient-rich weaning foods).

Maternal nutrition education is said to have contributed by far to 43% reduction in child malnutrition as against 26% for per capita food availability improvement according to Smith and Haddad (2010).

Interventions to address Malnutrition

A proposed number of interventions to address the causes of malnutrition at different levels (see Figure 3) by Black et al (2013) was published in the Lancet series under the issue 'Maternal and Child Undernutrition'. In their publication, they discussed different approaches and interventions that may be required to achieving the goal of reducing micronutrient deficiencies, stunting and child deaths. These approaches are based on evidences from different studies in different countries and context. Key among the approaches discussed in the publication include; fortification or supplementation with zinc and vitamin A, counselling and improvement of breastfeeding and complementary feeding, and safety net programmes. In their framework (see Figure 2.2), identifying the causes of the child or maternal undernutrition will inform the type of nutrition intervention/programme which will be more likely to address the situation.

Figure 2.2: Potential nutrition interventions to address malnutrition



Source: Black et al, 2013 (Lancet series)

Micronutrient supplementation is proposed as one of the appropriate interventions if the cause of child/maternal undernutrition is an immediate cause of inadequate dietary intake. Inadequate intake means the food eaten may not be sufficient in quantity or quality to meet the nutritional needs of the individual. Hence, the supplements will provide specific nutrients which the insufficient food ingested by the individual may be lacking. It could also mean the provision of adequate food of good quality and quality will nullify the need for supplements. The problem of malnutrition is seen by many authors as a multifaceted one which requires multi-sectoral and an integrated approach. Hence Ruel et al. (2013), in their special edition of 'nutrition programmes' concluded that:

Implementing nutrition-specific interventions solely is not enough to achieving a sustainable decrease in malnutrition rates. Therefore, there is a need for an integrated response.

2.2 Types of products used in Nutrition Programmes

There are different types of food products and tablets used in nutrition programmes to address undernutrition and micronutrient deficiencies. The definitions of the types of the food products are from the World Food Programme (2012).

Ready-to-Use foods (RUF): foods that do not require cooking, or additional preparation. RUFs are usually made with vegetable oils, milk powder, peanuts, sugar, and vitamins & minerals, and other commodities.

RUFs come in two forms:

- a. **Ready-to-Use Therapeutic Food (RUTF):** is an energy-dense mineral and vitamin-enriched RUF, designed specifically to treat severe acute malnutrition (SAM) without medical problems at community level.
- b. **Ready-to-Use Supplementary Food (RUSF):** this type is made for the treatment of moderate acute malnutrition in children 6-59 months of age usually fortified with micronutrients, quality protein and essential fatty acids.

Fortified blended foods (FBFs): mix of cereals and other ingredients (such as pulses or soy beans) that have been powdered, by roasting or extrusion, and enriched with a premix and range of minerals and vitamins.

Lipid-based nutrient supplement (LNS): this product type usually come as paste or lipid-based spread.

Micronutrient powders (MNPs): these are a combination of several micronutrients used in nutrition programmes to prevent micronutrient deficiencies among children 6-59 months, and school-age children in school feeding programmes. MNPs come in small sachets and can be added to semi solid or solid foods prior to consumption after preparation.

Micronutrient tablets: these are solid tablets that may contain a single vitamin or mineral (e.g. Vitamin A tablet, Iron tablet) or multivitamins in one single dose. Tablets are usually for older adults (e.g. folic acid tablet for pregnant women) or older children (e.g. Vitamin A tablet).

Micronutrient Syrups: usually concentrates of micronutrients which comes in varying thickness suitable for children 6 to 24 months of age.

2.3 Importance of Micronutrient Supplementation

Micronutrient supplementation or fortification has remained in use within recent years in assessment of the security of overdose and the sustainability of programs. Food/nutritional supplements as defined by UNICEF (2017) are nutrient concentrates taken as a nutritive/dietary add-on. They include a complete list of vitamins (from A-K), minerals like iron to help prevent anaemia, folic acid which is essential for pregnant women and the development of the foetus, and fish oils which have been shown to benefit the heart (UNICEF, 2017). Supplements contain amounts of nutrients which are more readily available to the body than nutrients found in most foods. The composition of food/nutritional supplementation intervention for a target group depends largely on the major deficiencies among the targeted population. In some cases, there is provision of Vitamin A tablets, Folic acid tablets, Multivitamin tablets among the most susceptible groups to malnutrition (children under five, pregnant and lactating women).

2.4 Organisation and Implementation of Nutrition Programmes

According to the FAO framework for nutrition programmes (Smith, 1992), the preliminary stage of every nutrition intervention is the identification of the nutrition issue affecting sub-groups of the population. The issue identified should be centred on records obtained by regular monitoring of nutritional status of the population and national surveillance. The NDPA (2010) goes further to include in the preliminary stages of organising a nutrition programme/intervention a number of additional activities organisations need to do. These activities include: (a) determine whether carrying out of a community-based nutrition program is justified in the location; (b) recognize probable causes of undernutrition and crucial intervention areas; and (c) resolve whether the program will focus on prevention-only or prevention and improvement. Since there may be multiple causes of undernutrition within population sub-groups according to the UNICEF malnutrition framework, there is a need for assessing all potential causes of the identified nutrition issue before programmes or interventions are developed. Assessing social, environmental and economic factors that may contribute to nutritional status is key to informing the type of nutrition programme to develop. These social, environmental and economic factors include, income level of households, sanitation and hygiene of households and communities, educational status, gender, age among others. These factors may affect gaining access to adequate nourishment as argued by Smith and Smitasiri (1992) and hence may be significant to the designing of nutrition programmes. After identifying the main nutritional problem and all feasibility study done, then the most appropriate programme/intervention can be planned and designed.

The implementation process of a nutrition programme cannot be underestimated as it is key to the achievement of the goal of the programme. According to the NPDA (2010), and the WFP nutrition sensitive programming (2014), staff competence and knowledge in the field of the project, involvement of other stakeholders and local members of the community, medium of communication and follow-ups to monitor behavioural change and compliance is key to the success of nutrition programmes. Smitasiri (1992) stated that change agents and organisations who implement nutrition interventions especially micronutrient supplementation programmes need to reach out to the right sub-groups faced with the nutritional issue. The change agents need to encourage and monitor compliance to achieve set targets (reducing malnutrition of sub-groups to minimal levels). The WFP (2014) and Ruel et al. (2013) suggests; targeting based on nutritional vulnerability, identification of nutrition goals to exploit opportunities and integrating interventions from different sectors are some ways to ensure nutrition-sensitive programmes contribute to nutrition outcomes (preventing or improving malnutrition).

In order for public and private organisations to achieve their objective and goal in designing and implementing programmes, public participation and involvement of the sub-groups in the designing of nutrition programmes is vital. Public participation according to Andre et al. (2006) is

the involvement of individuals and groups that are positively or negatively affected by a proposed intervention (e.g., a project, a program, a plan, a policy).

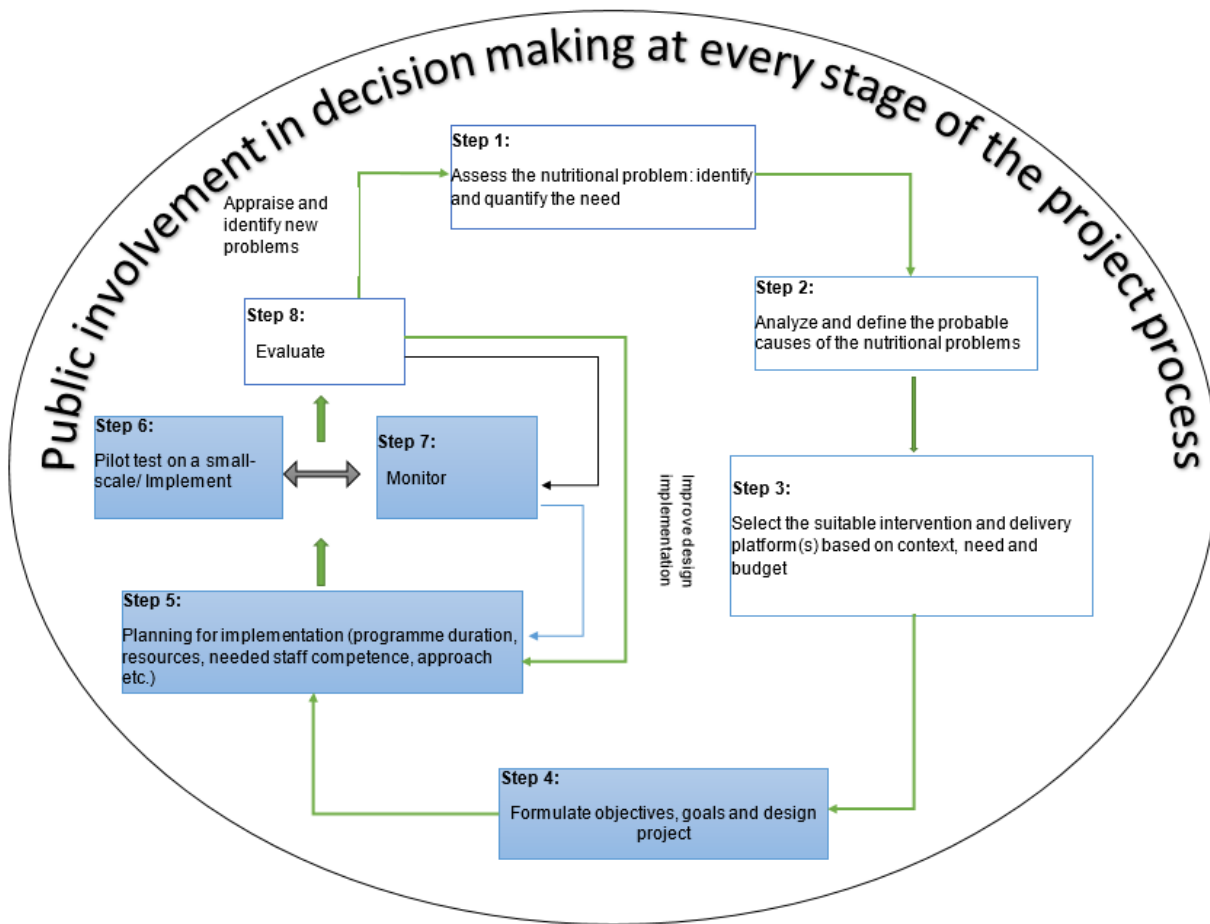
One of the basic principles of public participation is the recognition of the right of the public to be 'educated in a meaningful way of plans/proposals/programmes/policies that may affect their lives or livelihoods' (Andre et al., 2006). According to Pinto et al (2012) and FAO (2015), the perception of a specific sub-group of its own nutrition urgencies and their participation in identifying the main nutrition problems will contribute meaningfully to the effective design of programmes. Programmes are much more possible to be operative if the issues of utmost significance to the group are addressed and they are involved in the design, running, and ownership of the programme. A major success of involving of population sub-groups in the entire programme design and implementation is for continuity and longevity.

The aim of nutrition programmes (nutritional supplementation) is to complement the traditional dietary provisions of target communities to control malnutrition among those who are at risk/ most vulnerable groups: pregnant and lactating women; and children under five years of age (Pinto et al., 2012; FAO, 2015). Most organisations who implement such nutritional interventions have been faced with challenges where community members have differing perceptions about their nutritional needs, and the quality and

intentions of the nutritional supplements for the targeted sub-groups (CFSVA, 2009). This challenge according to (Pinto et al., 2012; Ruel et al., 2013 and WFP 2014) can be attributed to the non-involvement of community members, insufficient knowledge about the use and importance of supplements given to the target sub-groups, and lack of monitoring of the compliance to the use of supplements on the part of the intervening organisations among other reasons.

From review of literature (Pinto et al., 2012; Ruel et al., 2013; WFP 2014; FAO, 2015) the steps in the organising and implementing of nutrition interventions can be operationalised as shown in Figure 4 below. It is assumed if these steps are followed, and the target populations are involved in the identification of the nutritional problems as well as the possible ways of resolving the identified problems, there will be a successful outcome. Nevertheless, in severe or emergency cases such as in refugee camps, there is little or no room for involvement of affected sub-groups, hence interventions are introduced by agencies to keep the situation under control for a period of time. Specific nutrition interventions (example, micronutrient supplementation) can be embedded in nutrition education programmes. According to McNulty (2013), the prime goal of nutrition education is to educate people who will become skilled, motivated and nutritionally informed to choose better and right nutrition options. What this means for organisations who implement specific nutrition interventions is that, there is a need for proper nutrition education for the sub-groups or population earmarked to be beneficiaries of the intervention/programme.

Figure 2.3: Proposed steps in organising and implementing nutrition interventions



Source: Researcher's own construction, based on literature referred to above

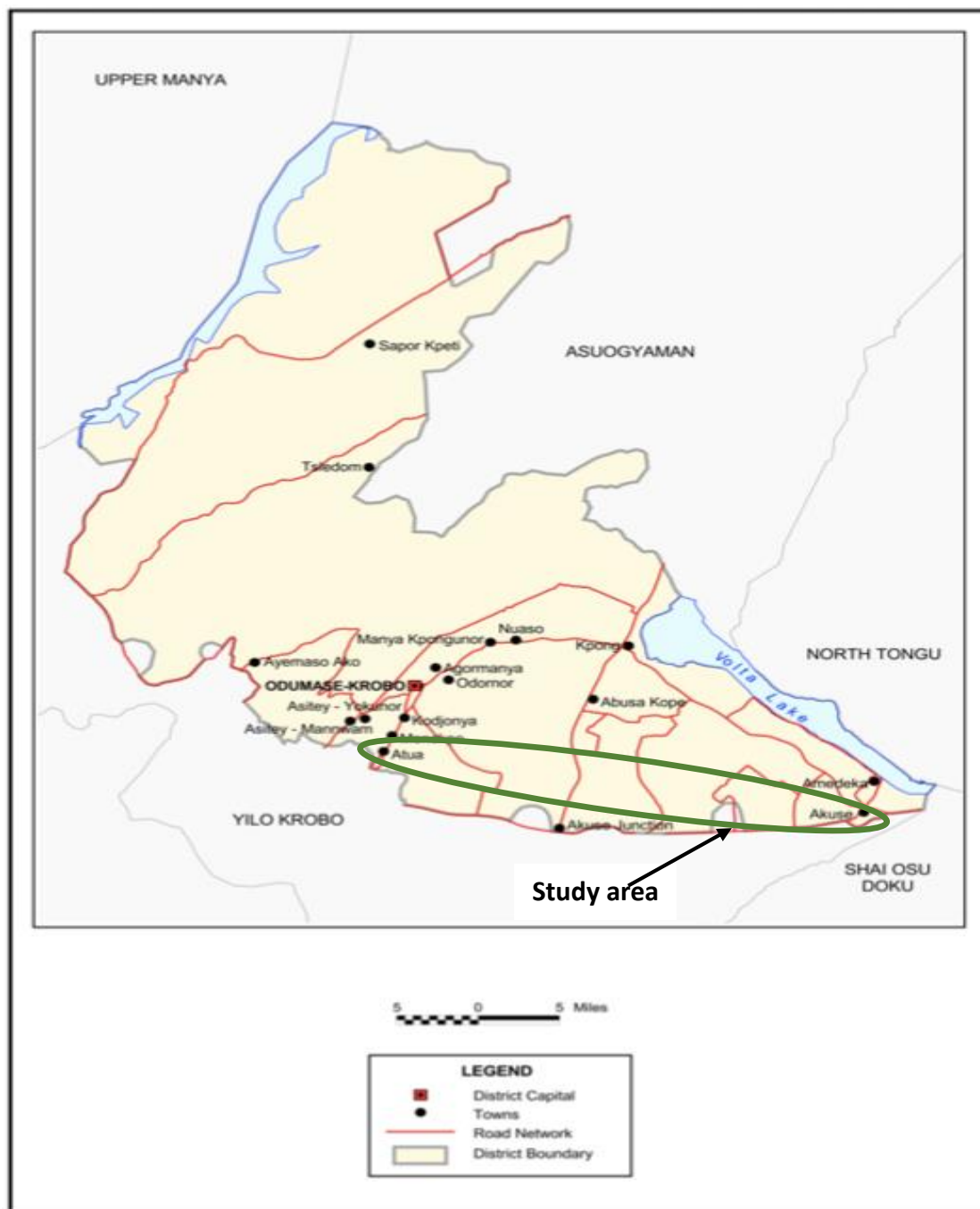
CHAPTER THREE METHODOLOGY

This chapter presents the methodology used in the data collection, the study area, the sampling procedure, ethical issues and the unit of analysis. I also reflect on research ethics and dilemmas on the field and how I reconciled some noticeably difficult events and issues on the field in this chapter.

3.1 Study Area

Lower Manya-Krobo district is located in the western part of the Eastern Region of Ghana. It covers an area of 873sq km representing 8.6% of the total land area of the region. The population of the district is close to 99,000 with females being the majority (more than half) of the population. The children population (0-14 years) constitutes about 40% of the population and the remaining being adults. The major towns in the district include Kpong, Akuse and Odumase township (which includes Atua, Nuaso and Agormanya). Farming is the major occupation in this district and serves as the means of livelihood for approximately 80% of the population (GSS, 2014). The major crops cultivated are maize, cassava, plantain, and vegetables. There are small villages along the coast who engage in fishing, bead making and pottery aside farming. Due to the clayey nature of the soil in villages like Okuanya, bead making and pottery serves as a major source of livelihood for the inhabitants. Fishing is as important as farming since it provides fish which is a major source of protein to improving the quality of diets consumed and nutritional wellbeing. However, malnutrition cases are recorded in this district hence different nutritional programmes have been implemented to help resolve the cases of malnutrition among sub-groups.

Figure 3.1: District map of Lower Manya-Krobo



Source: GSS (2010)

3.1.1 Overview of the study fields

The data was collected from two villages; Atua and Akuse which lies at the southern part of the LMK district (see Figure 3.1). Atua and Akuse were selected for the study because these two villages are where the LODARMAH project 'Born to Grow; Free to Survive' has been evaluated and gave rise to the research. These two villages are unique to the study; Akuse shares boundary with the Shai-Osudoku district which happens to be in the Greater Accra region of Ghana. The major livelihood in Akuse is farming and trading. Men are usually into farming and women usually trade in food commodities and other produce from Accra. There is often seasonal migration of men from Akuse to Accra during the dry seasons in search for seasonal employment. The major employment undertaken by men in Accra when they migrate include masonry, male porters in the central markets, or 'trotro' (public transport) drivers. Atua on the other hand shares boundary with the Yilo Krobo district which is also one of the districts in the Eastern region. The story in Atua is a bit different, farming and charcoal burning is the main source of livelihood. Charcoal burning is seen as men's business whilst farming is seen as women's business. The data collection lasted for four weeks starting from the 10th July until the 12th August 2017. The choice of these villages is because the two villages are where the LODARMAH project has been implemented for 27 months and have been evaluated. Even though Akuse compared with Atua is close to Lake Volta where fishing is a major occupation (fish as protein source), the evaluation of the supplementation project by LODARMAH in the two villages showed equally little improvement in both villages.

3.1.2 Community entry

The entry into the study area was through the Municipal Officer, who introduced me to the local chief of the villages. Permission was sought from the local chiefs and were made aware of my stay and the research to be conducted. For purposes of reducing bias and influence of the data to be collected, I was not accompanied at any point during the study by any staff associated with LODARMAH when I went out during my familiarisation of the villages and the entire study. The study took place at a time when there was the popular 'dipo' festival in Atua. The 'dipo' festival is a traditional puberty rite organised for young girls who are at their adolescent stage, and were to be initiated into womanhood. This festival comes with a lot of preparation by elderly women who initiate the young girls, and mothers whose children are at their puberty. This festival also served as a way of entering and familiarising myself with the people and also appreciate their culture. The researcher stayed in Atua for four weeks during the entire study, whilst she visited Akuse on several occasions.

3.2 Research Design

The approach employed in this research was the social constructionist approach. In this approach, the researcher spent time in the community, to observe and seek broad information about the issue under research. According to Laws et al. (2013), this approach is likely to identify issues that a different approach (which makes assumptions about people's problems) might miss. In this approach, caregivers of children under age five, community members and key informants were allowed to voice their opinions about the whole nutrition intervention as well as what constitutes beliefs, perceptions and assumptions about nutritional supplements. The study is mainly a qualitative one, where an in-depth study of the nutrition intervention by LODARMAH in the LMK district and other related issues were studied.

3.3 Sample size and sampling procedure

The selected villages for the study Atua and Akuse have an average population of 1000 households each household averagely composed of five persons (Opinion Leader interview). These two villages as explained are the two villages where the evaluation results of the project were found and gave rise to the research. For the purpose of the LODARMAH project and this study, beneficiaries were not differentiated whether they were from Atua or Akuse village because the project did not identify different beneficiaries based on their location. This is because the two villages have a common health centre where people from the two villages seek health care. LODARMAH therefore is assisted by the community health workers who are stationed in this health centre and they have records of 70% of the beneficiaries (without making mention of their location).

The purposive sampling was used to sample all beneficiaries of the LODARMAH nutritional supplementation programme. The beneficiaries of this supplementation programme were pregnant and lactating women, and children under age five. Children under age five were selected from the beneficiary sample. Out of this sample, households with children under age five who were beneficiaries of the programme were randomly selected for the study based on caregivers' availability and willingness to participate in the study. A total of twenty-seven (27) caregivers of children under age five out of fifty-six (56) were available and willing to participate in the study for the two villages. Three focus group (membership of averagely 9) discussions were held; one for mothers of children under age five, one for fathers of children under age five, one for the elderly people (50 years and above) in the community. These different focus group discussions gave different general perspective of what people belief, their knowledge and awareness of nutritional related problems in the community. A total of eight (8) key informant interviews were conducted (see 3.4 for more details).

3.4 Sources of data and methods

Secondary data

Through a desk study, both grey and scholarly literature were reviewed which gave the researcher insight into the topic under study. The grey literature consisted of the project brief on the LODARMAH 'Born to Grow; Free to Survive' project, and the monitoring and evaluation report of the project in the LMK district. This form of data provided insight into the organisation, implementation and evaluation process of the nutrition intervention in the LMK district by LODARMAH. Scholarly literature such as academic periodicals, research journals and articles, publications by development organisations underpinned theoretical frameworks in the study and provided insight in the developing of data collection instrument (topic lists).

Primary data

The primary data which was collected during the fieldwork involved four different methods of data collection. This involved key informant interviews, focus group discussions, individual interviews and observations. In order to check the validity in the study, multiple methods were used for collecting data in the bid to answering a research question to arrive at validity across the data sources. A method-sub question (MS) matrix was designed to serve as a guide in order to achieve the objective of triangulation in qualitative research (see Appendix 1).

Key informant interviews

Key informant interviews as a method of data collection involved identifying individuals with special knowledge and insights in the nutrition situation, the designing and implementation process of the intervention. These key informants were; the project manager of LODARMAH, two field staff of LODARMAH, one volunteer of LODARMAH (known as community based volunteer, CBV) who was involved in the baseline study before the intervention, two community health workers, one religious leader and one opinion leader (an elderly person who is respected in the village). Interview participants were selected based on the project brief from LODARMAH (which enlisted some individuals who were directly involved in the intervention programme) and recommendations from an already-interviewed participant. The recommendations were made for individuals to provide additional insight or missing information when considered necessary and needful. All interviews were pre-arranged as participants were usually busy and needed to have a scheduled time for the interview. Each interview with key informants lasted between 45 minutes to 70 minutes. The location for the interviews differed and was negotiated on the basis of what granted privacy and confidentiality.

Focus group discussions

The study also drew information through focus group discussions. The focus group discussions stemmed responses which stimulated discussions on the interplay of nutritional wellbeing, nutritional interventions, perceptions and beliefs concerning nutritional wellbeing and community members' knowledge on how to deal with malnutrition. The FGDs enabled participants to engage in discussions on common elements that went beyond individual perspectives. The FGDs were planned and involved three different groups. The men group, women group and the aged group (50 years and above); these various groups were created in order for participants who share similar characteristics or experience to be open to share their views about the subject matter. Prior to the focus group discussions, the opinion leader informed the researcher about decision-making dynamics in the area where women feel reluctant to openly discuss issues when they are amongst their male counterparts. The aged group was created in order to discuss issues of long traditions, beliefs and perceptions that exist in the study area. The nutrition security situation also called for a group who are aged and have good knowledge relating to the timeline of events in the study area. The focus group discussions were moderated by the researcher who is fluent in the local language (Krobo) and assisted by one male colleague (Crossby Osei Tutu Jnr.) who works as a field officer at ITOCA. A male was selected to give room for open discussions with male groups since per the advice from the commissioner, men in this area during group discussions prefer a male person to be the moderator.

Individual interviews

One-on-one interviews were conducted with 27 caregivers of children under five who are beneficiaries of the nutrition supplementation programme of LODARMAH. Data from the interviews with caregivers gave insight into the individual perspective in relation to the supplementation programme. The one-on-one interviews with caregivers under five provided more direct and personal response to the research subject matter. Caregivers were mostly women even though the researcher wanted to at least interview a male caregiver. A male caregiver may provide different insight into the study, but it was not possible at the time of the study.

Direct observation

The researcher also made use of direct observation to derive relevant data for study. This method was important in generating key insight and understanding in achieving the objective which is directing the study. The observations involved taking evening strolls within the community to visit households during meal preparation and eating hours to gain insight into what households are eating, general sanitation and hygiene situation of the villages and households, the infrastructure available within the study areas, non-

verbal expressions, interactions of participants especially during FGDs and at the households. The observations were done consciously and occasionally helped to stimulate or initiate conversations with participants. It also allowed the researcher to have a real feel of what happened during the study.

3.5 Data Analysis

Data from key informant and individual interviews as well as focus group discussions were recorded, and in some cases hand written. The recorded data were transcribed, sorted (grouped into themes) and analysed taken into consideration sub-research questions. In the analysis, responses are grouped under themes by identifying key ideas of the sub-research questions and relating them to the objectives of the research. The researcher also uses images captured and make inferences to data collected through observations during the entire study.

3.6 Validity and Reliability

One major methodological criticism in research is validity and reliability of the data. According to Laws et al., (2013), the validity answers the question if the findings are genuine and true; as well as the research measuring what it was supposed to measure. Reliability on the other hand means the findings of the research can be believed and trustworthy. In that, another researcher who will repeat the study will find the same results. First of all, to increase the validity, different methods and sources of data are used (triangulation). For the purposes of this study, several literatures have been consulted to gain insight into the appropriate method and research design employed for the study. Again, the research has used different methods of data collection and findings from interviews, observations and focus group discussions (see Appendix 1). For example, key informants served as a means of validating data collected through focus group discussions and individual interviews.

As a way of enhancing the reliability of the study, the used literature has been compiled into a reference list, interviews and focus group discussions have been in some cases hand written, and others recorded with a transcription made and saved electronically. If other research gathers data for the same case and interviews the same key informants, caregivers of children under age and participants of the focus group discussions in Akuse and Atua (LMK district) of Ghana, then similar results will be obtained which will allow to derive the same conclusions.

3.7 Ethical consideration

The study design and procedure was little likely to pose any form of risk to respondents. However, permission was sought from the Local head/chief of the two communities to undertake the research. Informed consent was obtained from all respondents and participants of focus group discussions and no information that could be used to identify respondents was used in the data analysis and the final report of this research. Individual respondents (caregivers of children under age five) were not comfortable with the researcher taking photographs with them giving reasons (being used on media; being traced and stigmatised) which I fully respect. Hence the researcher did not in any time during the study take photograph of respondents. Images used in this report are images from observations of the general surrounding and sanitation of the villages. Sanitation, hygiene and the type of food consumed by people directly affects nutritional status of individuals. These images therefore are found relevant by the researcher to be used where necessary. Respondents consent was sought (see Appendix 3) to discuss/not discuss issues related to child deaths when such topics came up during interviews and focus group discussions.

3.8 Limitation of the study

The study is limited in scope; it is about assessing possible factors that may have caused little improvement in the nutritional status of children under five who are beneficiaries of the LODARMAH project. I say this because, the intervention programme in entirety involved different sub-groups such as pregnant women, lactating women and children under age 5. Some caregivers of children under age 5 at the time of the study were pregnant and could also possibly be benefiting from the project. However, the study focused on only one group of beneficiaries. Again, the study did not differentiate the respondents based on their locality which could enrich the findings of this study.

3.9 Reflection

The dare of identifying an apt way of entering a community and successively leading a study with them can be inconceivably stimulating or otherwise for the researcher. It can at the same time be irritating for the researched for diverse reasons. The frustration of the research subject becomes evident in manifestation when groups within communities have been 'abused' with studies (have been studied over and over again) to a degree that crafts not only weariness but irritation. I tend to privilege the knowledge I have about the study area through my grandparents who stay in one community in the district.

Nevertheless, my entrance to the LMK district was hard-hitting; individual respondents for fear of been stigmatized (from previous experience) would not allow researcher to take a photograph, others would not approve of recording the interview. In all, I decided not to capture anybody during the entire research. I only made photographs of the general surrounding which relates to the research and people who were not directly involved in the research.

The social interaction between the researcher and respondents was very cordial; however, in order to reduce the level of bias in the responses, the researcher refrained as much as possible not to be seen with any known staff of LODARMAH or becoming over friendly with participants. This was because I wanted respondents to be as honest as possible with the responses. I have been amazed by the insights gained regarding the beliefs, perceptions that exist among community members which were revealed through the study. I must confess, despite my encounter narrated in the preface, I was not aware of the extent to which these beliefs go. These beliefs I know may shock some readers of this report.

I have battled with myself not to look down upon the beliefs, customs and traditions of people because the findings of this study enlightened me on some of them which I felt were 'backward' and undermined development and the fight against malnutrition. I therefore took the challenge to be a change agent by engaging respondents in conversations which will inspire them to positively change certain aspects of their beliefs, food habits and nutritional knowledge which will promote and improve their nutritional well-being.

CHAPTER FOUR RESEARCH FINDINGS

This chapter discusses the major findings of the study based on the research questions and objectives of the study. The findings are based on interviews with twenty-seven (27) caregivers of children under age 5, three (3) focus group discussions, eight (8) key informant interviews as well as observations and perusal of project documents.

4.1 Organisation and implementation of the micronutrient supplementation in LMK

This section looks at how the nutrition intervention (micronutrient supplementation) was organised and implemented by LODARMAH in the LMK district in a bid to answer the sub-research question 1 (*How was the intervention and implementation process organised by LODARMAH?*).

The nutrition intervention programme, was developed and designed as a result of the need to help reduce the number of malnutrition cases and assist improve the nutritional status of those who are at risk of malnutrition within the district. The quote below indicates what incited LODARMAH to start the nutrition intervention.

‘The intervention was born out of the call on NGOs, to support government bodies to help reduce the rising number of child malnutrition which was determined through series of data from the Ghana Health and Demographic Survey (GHDS). LODARMAH as an NGO, responded to this call’; (Interview: LODARMAH project manager).

LODARMAH as an NGO, responded to the call on other bodies by the government of Ghana to assist in the work of the government specifically Ministry of Health (since malnutrition is a public health concern) at the rural areas to improve the nutritional status and livelihoods of people. This intervention therefore is seen as response to the request by the government.

Overview and design of the intervention

According to the baseline assessment report from LODARMAH, over 5,000 children and adults in the LMK district do not get necessary vitamins and minerals such as iron, vitamin A, folic acid and iodine in their diets. This micronutrient malnutrition, often referred to as “hidden hunger,” leads to preventable blindness, increased rates of miscarriage, maternal death during childbirth, birth defects, compromised immune systems, and cognitive and developmental delays. Many diets, especially those of the poor within the LMK district contain insufficient amounts of vitamins and minerals due to lack of variation and/or consumption of predominantly starch based foods. Villages within the LMK district do not have access to pipe-borne water which is reliable and safe for usage hence people resort to the use of water from

streams. The water from the stream is usually contaminated and hence will require treatment at household level before usage. The most vulnerable groups who are at risk of being malnourished therefore are pregnant and lactating women, whose nutritional requirements are a bit higher than their other women counterparts, and children under the age of five.

LODARMAH was assisted by a CBV and an opinion leader to conduct the baseline study. They mapped out the nutritional needs of the LMK district at large through observations, interviews, and already existing data from the Ghana Health Service. The major issues therefore identified by LODARMAH according to the baseline report (LODARMAH, 2014a) were;

- high unemployment amongst women
- little access to portable water
- contamination of stream causing infections among children
- consumption of starch based staples leading to micronutrient deficiencies
- little or no dietary diversity
- unhealthy environment (housing, and sanitation)
- large family size
- over dependence on rain-fed agriculture and little farm inputs
- out-migration of men during the dry season.

Out of the baseline study report (LODARMAH, 2014a), a number of interventions were proposed (food fortification programme, behavioural change & nutrition education, nutritional supplementation programme, dietary diversification advocacy, provision of portable water and empowerment programme). The government of Ghana through the local and municipal assemblies were working towards providing portable water to these areas, as well as the Ministry of Food and Agriculture working towards assisting farmers with credits and inputs. LODARMAH, being an organisation with special interest in maternal and child health, selected the supplementation programme based on the available resources and support from the Ghana Health Service and UNICEF mass nutritional supplementation (Vitamin A and Iron) action.

Programme Setting and Implementation

LODARMAH with the assistance from the Ministry of Health selected Atua and Akuse as the starting point for the intervention due to the number of malnutrition cases within the two villages as against the other towns and villages with the LMK district. Through the approval of the local leaders of the two villages, a two-week sensitization programme was organised by LODARMAH and the Ministry of Health (Odumase

sub-metro) to create awareness of the introduction of the supplementation programme. This was done through house-house broadcast, the village information centre, posters, and public communication vans. LODARMAH in the organisation of the intervention were supported by different stakeholders at different level of operation and expertise within the LMK district. Among these identified stakeholders are the CBV, community health workers, religious leaders, opinion leader, and the field staff of LODARMAH. Each stakeholder performed specific tasks in the implementation process.

‘I was involved in assisting LODARMAH to map out households who have children under age five, pregnant and lactating women who were to be direct beneficiaries of the intervention. My work also involved talking to households and individuals to know what they think of the intervention’.
(Interview: CBV).

Community health workers based on their expertise and line of work, were directly to deliver supplements and monitor changes in the health, and nutritional status of the beneficiaries. This means they were to be directly involved in the implementation and assessing the outcomes of the intervention.

‘I move within the community and give supplements and provide health assistance to households. I also provide counselling during my visits on child care practices, as well as sanitation and hygiene education’. (Interview: Community health workers).

The field staff of LODARMAH assisted community health workers in the organisation of nutrition education programme, visiting beneficiaries of the project to monitor progress and to report any progress or challenge to LODARMAH. LODARMAH, coordinates the entire project and the supplements used are from the Ghana Health Service, and UNICEF. The supplements are multi-nutrient powders (MNP), Vitamin A tablets and Iron capsules. The Vitamin A, and Iron tablets are supposed to be taken orally with water. The multi-nutrient powder (MNP) is supposed to be mixed with foods (liquid or semi-solid) just before consumption; the MNP contain zinc, folic acid, iron, calcium, potassium, and vitamin C.

Religious leaders were involved within the first three weeks of the implementation to help convey the importance and the need of the nutritional supplements to their members. This was because, LODARMAH field staff had reported some households’ refusal to use the supplements, apparently since other people within the community were speculating the poor quality of the supplements being distributed.

‘I recall having a meeting with the LODARMAH project manager, and he asked me to assist his organisation to help demystify perceptions and beliefs some people have about the tablets provided by community health workers’ (Interview: Head Pastor of ARSC).

Eligibility criteria

All children below age five were eligible for the project; however, informed consent from at least one authorized caregiver was needed to make the child a beneficiary of the project. Caregivers who consented were selected and their children automatically became beneficiaries of the project. Caregivers of beneficiaries were visited and informed about the entire programme and were educated on the use and importance of the supplements. The total number of children who were beneficiaries to the project were 56; 22 girls and 34 boys.

Distribution and follow-up

Initial distribution of supplements (Vitamin A tablets, Iron tablets, Multi-nutrient powder (MNP)) was done at the community square to all beneficiaries through their caregivers for free. After a month, supplements were delivered at homes every two weeks to beneficiaries by community health workers and LODARMAH field staff. Caregivers of children under age five (mostly women) were provided the Vitamin A tablets, and Iron tablets for free whilst the MNP was to be sold at a subsidised price of Gh¢ 2 (40 cents) for a pack of twenty-four (24) small sachets of the MNP. The MNP generally provided the recommended nutrient intake (RNI) of six micronutrients (vitamin and mineral). Beneficiaries were visited every two weeks to collect information on the use of supplements and possible successes, challenges and changes in nutritional status in children from the use of the supplements. Each household with a beneficiary of the supplementation programme was given a dosage and nutritional record sheet. Changes and dosage records were captured every two weeks on these nutritional sheets. The evaluation was done mainly by the community health workers who assessed the weight gain, and physiological changes of beneficiaries (children under age 5).

Evaluation/Nutritional Assessment

At the end of six months of the supplementation programme for children under age 5, the beneficiaries were screened for body weight, iron deficiency (anaemia), vitamin A deficiency (xerophthalmia) and vitamin C deficiency (scurvy).

Among the three anthropometric indicators (weight, height and age), and the forms of undernutrition (underweight, stunting, wasting), the nutritional assessment indicator used during the evaluation was the weight-for-age (underweight). The community nurses justified why the nutritional assessment indicator for improvement used was to check for underweight in children.

'We assessed the weight-for-age which is an indicator for underweight because children may become underweight either because of wasting or stunting or both. Wasting is usually caused by

(Interview: Community health workers).

The body weight was determined by taking the weight of the child using an electronic scale, and the age of the child was recorded. The emphasis on the age of the child was important because according to the WHO Z- scores for the different malnutrition indicators, the scores are calculated based on months hence a child who is 3 years of age will be defined by the Z-score as 36 months old. Therefore, the full age of the child is recorded before the start of the intervention and during the evaluation. The new weight of the child is checked against the initial weight of the child before the start of the supplementation programme to determine any difference in weight gain.

Figure 4.1: Sample Assessment Sheet for Evaluation

[illegible]

Source: Fieldwork, (2017)

From the evaluation report (LODARMAH, 2017) and interview with community health nurses, it was revealed that after 27 months of the supplementation programme, only 18 out of the 56 children under age 5 who were beneficiaries of the project had an increase in body weight (between 0.5kg to 2.0kg). Out of the 18 children who had gained weight, there were 11 boys and 7 girls. The difference in the number of boys and girls was because there were more boys than girls (34 boys; 22 girls) amongst the beneficiaries of the project.

The assessment of the micronutrient levels in the body was done using physiological parameters as well clinical testing. The table below shows the physiological determinants of the micronutrient deficiencies.

Table 4.1: Micronutrient deficiency and physiological determinants

Micronutrient deficiency	Physiological determinants
Iron (Anaemia)	<p>Pale colour of the</p> <ul style="list-style-type: none"> • conjunctiva (thin lining of eye-lid and eye ball) • tongue • palms of the hands
Vitamin A (Xerophthalmia)	<ul style="list-style-type: none"> • Dryness, thickening and wrinkling of the conjunctiva
Vitamin C (Scurvy)	<ul style="list-style-type: none"> • Bleeding gum • Reluctance to move due to pain in joints (legs/arms)

Source: Adapted from community worker's sheet

Evaluation was done based on these three main micronutrients because the Vitamin A and Iron capsules were given for free and hence at the time of evaluation, community health nurses anticipated for micronutrient sufficiency among beneficiaries. On the contrary the results revealed that 35 out of the 56 beneficiaries showed levels of improvement (did not have any of the signs mentioned in table 4.1 above), as against the anticipated 100% improvement in the micronutrient levels in the beneficiaries.

Challenges faced in the implementation of the project

Community health workers (2) and the LODARMAH field staff (2) were asked about the challenges they faced in carrying out the assigned responsibilities of the project. The major challenges mentioned were scanty job aids (materials for nutrition education) to aid in facilitation of nutrition education; relative low budget for logistics (movement within the villages) to ensure enough follow-ups; insufficient staff number to intervention demand ratio, language barrier (inability to speak native language fluently). The quotes

below from community health workers and field staff of LODARMAH shows in their opinion the extent to which the challenges affected the effective implementation of the project and their work in general.

'I am not able to speak the Krobo and Ewe very well, so when I am teaching the caregivers in English or Twi they complain they don't understand what am saying. There is one boy who helps us to translate but he is not always around since he goes to school' (Interview, LODARMAH field staff 1).

'The posters we use to facilitate our teaching at community level are old and some of the pictures are not clear; we are yet to receive better ones but for the mean time this is what we use. I think it affects the quality of information we give to the people' (Interview, Community health worker 1).

'I think we are challenged with vocabularies in the local languages to replace the technical terms associated with nutrition education, supplements, health and nutritional well-being; our audience usually ask us questions which we are not able to explain to them using local words' (Interview, Community health worker 2).

'We are only two and we are assisted by two community health workers making the number four. We usually have to go in pairs to either Atua or Akuse and we are not able to cover the entire village since sometimes we do not meet anybody at home and have to come back later; this is usually any challenge since we do not live in the villages, we have to go back to our homes' (Interview, LODARMAH Field staff 2).

4.2 Public participation/involvement in planning and implementation of intervention

This segment of the findings answers the sub-research question 2 (*What is the nature of involvement of community members and/or public participation in the planning and implementation of interventions?*)

It was discussed in several of the FGDs and confirmed by the opinion leader that, the villages have their own ways of involving people to participate in decision making. There is a local association called 'company' in the village (local leaders and all other community members are members of the local association) that holds meetings at the end of every three months to discuss issues relating to their livelihoods, communal developments and also to make new laws. Apart from these quarterly meetings, there are some meetings they call 'emergency meetings'. These emergency meetings can be within any time of the year, usually when there is an impromptu issue or message that needs to be conveyed to inhabitants of the village. In all these meetings, according to comments made in the focus group discussions but also in interviews with caregivers and opinion leaders, that women's attendance and

participation is generally low. It was also revealed from all focus group discussions as well as 19 out of 27 caregivers confirmed that participation in communal activities such as building projects, festivals and programmes which involved incentives was very high as against meetings/forums without incentives.

Decision-making dynamics in the study area

The study sought to understand what informs public participation in decision making with regards to the implementation and designing of an intervention. However, besides this, the researcher found it necessary to understand the decision-making dynamics at the village and household levels. It came out clear from all sources of data (focus group discussions, individual interviews and key-informant (opinion leader)) that if there was a need for a decision to be taken without any third party (such as NGOs, government bodies) regarding the development of the village, decisions were taken by the local leaders and opinion leaders who usually consulted the males of the village. The quotes below are some of the responses that were given during FGD;

'The elders of the community usually decide what is good and needed in the village. Once it is decided we try to do what they want us to do. Sometimes we may have different ideas but we have to do what we are told to do' (Women Focus Group).

'The elders and men are the ones who make decisions in this village. It is our custom and so women are usually not consulted, they are told what to do' (Men Focus Group).

In cases where there is a need for decisions to be made involving a third party (NGO, government agency), these third parties per their way of operation involve the women in the public decision-making process.

This came up during the FGDs and was confirmed by the interview with the opinion leader;

'NGOs, and other people tell us that women are needed and have ideas to give in the development of the village so they invite them for their meetings to make decisions for themselves. The women will have to tell their husbands whatever decision they make' (Opinion leader).

At the household level, it was highlighted that, men decided whether or not their wives will attend meetings or be a member of women associations in the village. Again, decisions on household budget, and assets control were solely by the men whilst the women were in charge of feeding and general welfare.

'My husband makes every decision; whatever he says is final, I only decide what we will eat and take care of the children' (Interview: Caregiver).

Reasons for poor public participation of women

Apart from the customary esteem and respect for men and the elderly to be the decision-makers in the village; there was a need to understand if there were any other reasons for the poor participation of women in decision-making. The women explained through the focus group discussions that there are a number of reasons for which they do not attend community meetings as against their male counterparts. The reasons highlighted during the focus groups were confirmed by individual caregivers as valid reasons for their poor participation in public meetings. Table 4.2 shows the reasons highlighted through the FGDs as well as caregivers and the number of times these reasons were provided by individual caregivers. Multiple reasons were provided each caregiver; hence the frequency was used.

Table 4.2: Reasons for non-participation in public meetings by women

Reason for non-participation in public activities	Frequency
meetings were not held at the right time	12
fatigue from working on the farm and at home	25
attending to children/house duties	27
not present in the village at the time of meetings	18
feeling of their opinions not considered hence they do not find the need to attend such meetings	19
cannot attend without husbands' permission.	15
disabled women feel marginalised and do not want to attend such meetings	8

Source: Fieldwork, (2017)

The reasons stated by men in the focus group discussions on why women do not attend community meetings were similar to the ones from the women group. However, men gave other reasons which the women group did not mention. The reasons other than the ones mentioned by the women group are;

- women prefer to go to the market or visit other people during meetings
- avoidance of payment of late penalty.

Interestingly, 'avoidance of payment of late penalty' came up from the men group. It was explained that for every communal meeting, there was a late penalty of GH¢5 (1euro) which was established by the local association to be paid by anybody who attended meeting late. According to the men, women were likely to come for meetings late due to household chores and hence to avoid such penalties, they will prefer not

to come. This finding was later confirmed from individual interviews with female caregivers who mentioned it as a reason for not attending meetings.

Involvement of the public in the LODARMAH project

LODARMAH during the baseline study collected data through key informant interviews as well as the use of secondary data from the Ministry of Health. Before the implementation of the supplementation programme, LODARMAH consulted the local leaders who gave them permission to operate in the villages. As mentioned earlier, sensitization programmes were organised to inform the community members about the introduction of the project.

Individual interviews with respondents regarding their involvement in the organising and implementation of the nutritional intervention revealed that, there was a general meeting organised to formally introduce and create awareness for the supplementation programme. Out of the 27 caregivers interviewed, 25 mentioned that LODARMAH organised a general meeting to create awareness and to introduce the supplementation programme to them.

'I remember we were informed about the intervention when we went for the first meeting organized by some people (referring to LODARMAH)' (Interview: Caregiver).

In general, it was observed from the FGDs and individual interviews that most women were not present at the sensitization forums organized by LODARMAH. Out of the 27 caregivers that were interviewed, 12 said they attended the meeting whilst 15 did not attend. Of the 12 that attended, only 2 said, they contributed to decide whether they needed the nutritional supplements.

'I do not have time for such meetings, I use my time for working in the farm or selling in the market since my husband has travelled to Accra' (Interview: Caregiver).

But in contrast also;

'I try my best to attend all meetings, I make contributions on any issue being discussed. I know if I do not contribute, it will affect me' (Interview: Caregiver).

The quotes above show some of the reasons that were given by respondents for their attendance/non-attendance of the sensitization forum. According to the LODARMAH project manager, after realising the poor attendance to the initial general sensitization forum, they resorted to house-house, community public broadcasting system, posters and the van broadcasting.

Acceptance of interventions/projects/policies in the study area

It was discussed in all focus groups, interview with caregivers and opinion leader what informed the acceptance of any project, intervention or policy in the community. The findings of the study showed that community members consider certain factors before they accept programmes/interventions. These factors from the findings are regardless of whether a community member is involved in the decision making of an intervention, a programme or a policy; community members abide and accept to compile to the protocols of the programme, policy or programme. Factors that informed the acceptance of any type of project, policy or intervention are;

- endorsement from elders
- intervention/policy not against customs, taboos or beliefs
- acceptance by husbands/ male counterparts.

In addition to the three main listed reason for the factors that determines the acceptance of projects in the villages, the following were reasons given for the acceptance of the LODARMAH supplementation programme;

- supplements were to be provided for free
- benefits for improvement in children's health
- incentives given to beneficiaries (e.g. washing soap)
- fear of being stigmatized for not using supplements if one's child was malnourished.

4.3 Beliefs, assumptions and perceptions on nutritional wellbeing and supplements in LMK

The findings in this section are put together to answer the sub-research question 3 (*What beliefs, assumptions and perceptions exist among community members on their nutritional wellbeing and supplements promoted by LODARMAH in their project?*)

Every community within the LMK district, as well as the different households who belong to a particular tribe/clan have certain beliefs. Interviews and focus group discussions revealed that, there are different beliefs, perceptions and assumptions that exist amongst the people in the LMK district. Amongst these beliefs, assumptions and perceptions; there are some that are peculiar to foods, nutritional wellbeing and the use of supplements. Through the focus group discussions, it was outlined that these beliefs, assumptions and perceptions are based on:

- traditions
- customs

- religious doctrines
- personal experiences
- family taboos
- hear-says.

Food taboos

Food taboos are beliefs on the fitness of certain types of food for consumption. Members of certain churches and certain clan/tribe, do not eat certain types of fish, sea and shelled foods based on their food taboos which informs the types of food they eat. The food taboos that were identified from the study are;

- members of certain clan/tribe do not eat 'salmon' and 'mud-fish' (type of fish), snails, oysters and shrimps
- pregnant women of the '*Baako*' (not the actual name) clan do not eat snails.

These food sources are seen as unclean and it's a taboo to eat if any of the people belonged to these groups of people in both villages. The majority of the people in the village belong to these clans and tribes with food taboos regarding fish. Therefore, even though fishing is carried out in the community, most of the catch are sold outside of the village where it is not a food taboo. Out of 27 caregivers whose children were beneficiaries of the supplementation project, 12 had food taboos, 15 did not have any form of food taboo. Out of 12 who had food taboos, 5 had food taboos in relation to fish, and snails (protein sources of food).

Beliefs regarding nutritional status, well-being and supplements

It was also found that nutritional status and well-being are seen as natural and spiritual within the study area. People believe that their health and nutritional well-being are determined by God/god regardless of what they eat or do not eat.

'My child looks like this because it is the will of God for him to have this body; I do not have to do anything; all I can do is to give him food to eat.' (Interview with caregiver).

The quote above was from an interview with a caregiver whose child is a beneficiary to the project. The child is 4 years of age and the caregiver who is the mother is 32 years of age. She believes, her child's weight and height is what he is supposed to have (his fate) and not because he might be sick or suffering from underweight. It was highlighted from the focus group discussions with the elderly, that diseases with unfamiliar symptoms such as swelling of the feet (edema), or belly, unfamiliar skin diseases and infections are not necessarily due to poor nutrition but are afflictions caused by ancestors when taboos are broken. However, they acknowledge not eating regularly may lead to weight loss.

Another belief in the villages by some members of a religious group, is the belief in divine and spiritual healing. The name of the religious group when literally translated would be 'repulsive to medicine' believed that, man was not created to use drugs (conventional medicines) when sick, but rather use herbs which were created by God. Hence, they believe in the use of traditional herbal medicine other than the use of tablets. These beliefs were discussed during the focus groups and some were confirmed through the individual interviews. Nutritional supplements are seen to be medicine, hence a member of this religious group will not use any form of supplements due to his/her belief.

'My religion is against the use of white-man medicine (orthodox), which was not created by God. (Interview: Caregiver).

Perceptions/assumptions about nutritional supplements

The perceptions/assumptions about nutritional supplements were important for the purposes of the study. It was to know what people think about supplements which may be dependent on personal experience or hear-say. A general perception that came up regarding nutritional supplements during focus group discussions was;

'supplements are perceived to be for those in the cities who do not eat well and work hard to make money. These people therefore need to take pills so that they do not die prematurely' (Focus Group Discussions).

Individual interviews with some respondents revealed similar perceptions about supplements;

'I know supplements are taken by people who are sick in the cities and cannot eat properly, so that they do not die, and I hear the supplements are very expensive'. (Individual interview).

Moreover, it came out from the focus group discussions and individual interviews that; people perceive supplements to be expensive. Therefore, once they are given for free by the NGOs, they suspect they are not of good quality and hence do not subscribe to their usage. Individuals reported of their children having diarrhoea after the use of the MNP, therefore they assumed the supplements were not of good quality.

4.4 Knowledge on nutritional status & the use of nutritional supplements

The findings in this section are put together based on the sub-research question 4 (*What is the level of knowledge of community members (beneficiaries) on the use of nutritional supplements in the Lower Many-Krobo district?*).

Demographic characteristics of caregivers of beneficiaries (children under age 5)

The demographic characteristic considered under the study included education level of caregivers and the number of children they had.

Educational Status of Respondents: Out of the 27 respondents interviewed, 15 of them had no form of formal education, 10 had up to secondary level and the remaining 2 had some primary education.

The number of children based on the respondents (27 caregivers) is shown in table 3.

Table 4.3: Number of children of respondents

Number of children	1-2	3-4	5 and above
Number of respondents	10	15	2

Source: Fieldwork, (2017)

Knowledge on nutritional status

Caregivers were asked about their knowledge on the nutritional status of their children. All 27 caregivers did not have prior knowledge about the nutritional status of their children and themselves until community health workers came into the village to conduct a nutritional survey. According to the 27 respondents, they only know that their children sometimes get sick but they did not have any form of knowledge to determine whether their child was stunted, underweight, or wasted.

Through nutrition education by NGOs, and community health workers, they said they became aware of their nutritional status and what the implications might be for themselves and their children.

Knowledge on the use of nutritional supplements

With regard to the knowledge on the use of nutritional supplements, all caregivers confirmed their knowledge on the right dosage and the use of the nutritional supplements. From individual interviews with caregivers and community health workers, the education on use of the supplements was done at the initial stages of the implementation. Community health workers and the field staff of LODARMAH also provided education on the use of the supplements and guidelines for the right dose during their follow-up visits.

'I was taught how to use the MNP to ensure that my child gets the nutrients' (Interview, caregiver).

Caregivers were asked questions on how to use the supplements, caregivers mentioned that the tablets were to be drunk with water whilst the MNPs, were to mixed with food (liquids/semi-solids) just before eating. Overall, the summative data showed that all 27 respondents had knowledge regarding the use of supplements.

Other findings

Data was collected on the frequency of meals eaten in the household of respondents, and challenges with the use of the supplements.

Frequency of meals

The frequency of meals eaten within the household according to individual caregivers (n=27) consisted of meals eaten at breakfast, lunch, supper or as a snack. The common meal eaten as breakfast is 'koko', a porridge made from maize, millet or sorghum. The common food eaten as a snack in the study area is 'abolo', a cake made from fermented maize. For lunch and supper, the most common foods eaten are mainly from the starchy root and tuber food group or 'akple' which are accompanied by stew or soup.

Table 4.4: Frequency of meals eaten in households according to the individual caregivers (n=27)

Frequency of meal	2x a day	3x day	More than 3x
Number of households	10	15	2

Source: Field work (2017)

Challenges with the use of supplements

Respondents did not have challenges with the use of the types of the supplements. However, 3 caregivers who had beliefs regarding the use of conventional medicine did not give the Vitamin A, or Iron tablets to their children even though they were given for free. It was highlighted that the dose and the use of the tablets and MNPs, were clearly given through the community health workers and field staff during the implementation and follow-up visits. Even though all caregivers who participated in the study did not have any challenge with the use of the supplements, 2 did not comply to the usage of the supplement (MNP) based on their own experiences with the use of the MNP.

Experience 1: My child got diarrhoea after the first dose of mixing the MNP to his porridge, so I stopped using it without telling the community health workers.

Experience 2: *My child does not eat her food whenever I mix the MNP to it. I think the MNP affects the flavour of the food and she doesn't like it. I personally decided not to add it to her food again.*

Benefits of the LODARMAH project

Caregivers were asked the benefits they have derived from the LODARMAH project either for themselves or for their children. Table 5 shows the benefits mentioned by caregivers and the number of times it was mentioned by all respondents.

Table 4.5: Benefits from the LODARMAH project

Benefits	Frequency
Opportunity to understand and use nutritional supplements	19
Opportunity to understand and be conscious of child's nutritional status	18
Opportunity to learn about nutritional health and well-being	17
Improved appetite	14
Improved weight in children	11

Source: Fieldwork, (2017).

4.5 Observations made

Water and Sanitation

At the time of the study, there were two main sources of water; pipe-borne, and stream. Concerning pipe borne water, there are public stand pipes in the communities. The researcher counted 3 public stand pipes for the two villages, only one out of the three was providing water to the villages. That stand-pipe happened to be in Akuse hence the people of Atua need to walk miles to get pipe-borne water. It was observed that people go to the stream to wash, and fetch some of the water to their home as well. In Atua, specifically, a majority of the people depend on water from the stream for washing and cooking at the home since the pipe-water is not reliable and usually did not flow. This meant walking a long distance to Akuse to fetch water where the pipe-borne water was reliable. People who could afford to fetch water from the tap, usually use the pipe-borne water for cooking and still rely on the stream for water for washing and other household usage. Some households have a traditional way of treating the water

fetches from the stream before use. The method they generally use is boiling, or filtering using local materials (muslin cloth, naphthalene balls).



Picture 1: People washing and fetching water at the stream

The principal form of liquid waste disposal in the communities is the household open latrines. Each household owns a pit latrine, with a few homes having the modern closet latrine. There are also public toilets known as the KVIP, where people pay 20 pesewas to use. The villages have their solid waste dump sites located at the outskirts of the villages close to their cemeteries. These refuse dumps are enclosed by bushes and a narrow path which leads to the site. Each household has its own waste carrier, some use buckets with no lids, or old pans and place them at the back of their kitchen. They then take them to the refuse site when it is full, others burn their refuse every morning and do not carry them to the village refuse dump site.



Picture 2: Refuse dump site and public toilet

Housing and household fuel

There are different types of housing; ranging from mud houses, roofed with metal sheets/thatch, to wooden structures and cement houses. The main source of fuel used in households in the villages are charcoal and firewood. They use mud stove, metal traditional stove and coal pots. Cooking is usually done in small huts with open entrance for ventilation, or enclosed huts.



Picture 3: Woman cooking in a typical kitchen at Atua using firewood and mud stove



Picture 4: Types of housing in the study area

Foods available

The main types of foods available are made from starchy tubers and maize. At the household level and community level, there are different types of foods consumed. The foods from the tubers are cassava and yam, which is usually served with stews when boiled or served with soup when transformed into ‘fufu’. The maize foods are ‘abolo’ and ‘akple’; ‘akple’ is served with grind peeper or with okra whereas ‘abolo’ is eaten as a snack or main dish with a type of fingerlings called ‘one-man thousand’. The researcher observed a high consumption of ‘abolo’ during the entire period of the research. The ‘abolo’ is made from fermented corn, sweetened with sugar and baked to make a snack. At the household level, the researcher observed that families usually eat together. A household consisting of at least four members sit together and eat from the same dish pot. Younger children are either fed by an adult or an older child. This was seen as a common practice in the village.



Abolo and one-man thousand

Fufu and soup

Akple and okra

Picture 5: Foods available in the villages



Picture 6: Family eating 'akple' together

Health

There is only one health centre which is located in a different village called Torgorme. Hence the people of Atua and Akuse rely on the services provided by the community health workers who come round the village on certain days in a week. This means the first place of call when people fell sick is the traditional doctors. These traditional doctors make medicines in their homes, and provide special services to people.



Picture 7: Health centre at Torgorme

Religion

The researcher observed that the people in the villages are very religious. A good number being Christians and a good number also being traditionalist. Through participation in the 'dipo' festival, and conversation with people, the researcher observed that, people usually mentioned the name of a deity/God. Most things were referred to as either the doing of God or as fate. There is a diversity of Christian denominations with different beliefs.

CHAPTER FIVE DISCUSSION

The discussion is presented in themes that resonate with and highlight matters raised in the research question. The aim of the study was to identify the underlying factors for the little improvement in the nutritional status of beneficiaries (children below five) under the micronutrient supplementation by LODARMAH in the Lower Manya-Krobo district of Ghana. The discussion counts greatly on the empirical data as well as literature that fairly or wholly buttress significant findings provided in this study.

5.1 The intervention implementation process

The results indicated that LODARMAH as an NGO before the implementation of the nutrition intervention conducted a baseline study to assess the nutritional problem of the people, and based on LODARMAH's resources and the existing project by the Ghana Health service took up the supplementation programme. The baseline study report of LODARMAH stated all the issues that existed within the LMK district which could be potential causes of the malnutrition situation in the area. Problems with accessing clean water, waste disposal and general sanitation problems as well as certain food taboos existed among sub-groups which undermined nutritional well-being. If the existing problems identified from the baseline study were prioritized based on the needs of the people and LODARMAH had considered the root causes of malnutrition; then it could have been concluded that the nutritional supplementation may not have been the most appropriate or best intervention the people of LMK needed. The supplementation intervention could have been implemented at a time if malnutrition persisted after the government of Ghana through the local and municipal assemblies had successfully provided potable water to these areas, as well as the Ministry of Food and Agriculture successfully have assisted farmers with credits and inputs to increase productivity. According to Black et al. (2013), micronutrient supplementation is a proposed intervention to address inadequate dietary intake when all other possible causes of malnutrition have been dealt with. The competence of implementation of the supplementation programme was challenged by scanty job aids (materials for nutrition education); relative low budget for logistics to ensure enough follow-ups; insufficient staff number to intervention demand ratio; flaws in the nutrition behaviour-change communication; language barrier and finally beliefs, perceptions and assumptions that existed among community members in the area. For example, the translator who assisted community health workers and the field staff was a university student who was not available in the village all year round. This had consequences on the activities of LODARMAH when they had to convey messages and inspire people at community gatherings in a language they can easily understand the message being conveyed. Another example that hindered a proper implementation of the project was the case of poor quality visual aids used in nutrition and community education. This finding is in line with a study by Gongwer, (2014) in the

Omanye district in Ghana. According to Gongwer study the divided duty between nutrition and disease control by the public (ministry of health and ministry of agriculture) and private sectors remains a challenge in parts of Ghana. This challenge has been attributed to institutions and organisations not having resources to support nutrition programmes that are planned. Important gaps in the Gongwer study were also found in human resources (supervision, information management, training, and program performance, language barriers). These resources gap to demands of nutrition programmes ratio eventually creates a situation where nutrition programmes yield lower results than expected; since the staff are not efficiently equipped to undertake the task that comes with the project. A finding from our study that differs from other findings is the limited support materials for the job (posters/visual aids in local languages), needed by community health workers and field-staff to ensure delivery of services. Brantuo et al. (2009), and Okronipa (2017) found that information materials were largely available in health facilities for community health workers' usage in their field activities. This finding from these two authors contrast the findings in this study. The possible explanation for this difference may include priorities for district health facilities, availability of materials in languages commonly understood by local people, regional differences and financial resources. This therefore makes the situation faced by workers in the study areas (Atua and Akuse) even worse than in other areas in the country.

The key supplements provided for children under age five were Vitamin A tablets, Iron capsules, and micronutrient powders (MNPs). Vitamin A and Iron tablets were provided for free whilst the micronutrient powders (MNP) were sold at a subsidised price. Individuals could not afford the MNPs regularly hence they could not make use of them to help improve the nutritional status of the targeted sub-groups. This is a major flaw in the implementation of the supplementation programme; as some supplements were given for free whilst others were to be bought by the beneficiaries. This difference in the buying of one supplement whilst another will be given for free could create a situation where people reason that supplements are too cheap/free so they must of poor quality; or supplements are too expensive and they cannot afford them. Okronipa (2017) conducted a study on the use and acceptability of supplements by pregnant women in Ghana. In that study, it was revealed that supplements (MNPs) that were sold after initial free distribution were not purchased by the pregnant women to continue the usage of the supplements. The findings of Okronipa (2017) and our study are similar; the MNPs were not used regularly by caregivers because they had to buy them. For some of the caregivers, they did not have the means to buy it whilst others did not buy them because of little information to encourage and motivated them on the benefits for the health of their children. It is therefore important that, in any supplementation programme where different supplements are provided, they should all be provided for free or provided

at subsidised prices. LODARMAH could have been transparent with the caregivers on the means of acquisition of the supplements right from the initial stages (the ones to be bought and the ones to be given for free), and to provide enough information on the benefits of the types of supplements. This would have allowed caregivers to be inspired to buy the MNPs because of the known benefits for their children's health.

5.2 The involvement of the community

LODARMAH during the baseline study collected data through key informant interviews as well as the use of secondary data from the Ministry of Health. Before the implementation of the supplementation programme, LODARMAH consulted the local leaders who gave them permission to operate in the villages. It clearly shows that LODARMAH conducted the baseline study after which they involved community members through their local leaders in an open forum to make known the introduction of the supplementation programme within the district. This means that, the entire decision-making to introduce the supplementation programme was taken by LODARMAH with the support of the Ghana Health Service without the involvement of the local people of the LMK to deliberate on potential interventions that will address the malnutrition situation among the population sub-groups. According to FAO (2007), in the analysis of malnutrition situation amongst any population, there is a need for a participatory appraisal of nutrition from a livelihood perspective. The importance of the participatory appraisal according to the FAO (2007) are essential for the success of any project. The importance mentioned are: it allows to recognize the food and nutrition situation and raise awareness in the community; to encourage the participation of different groups in the community; to identify the problems, the prospects and restraints to adequate nutrition; to cooperatively plan food and nutrition activities to solve the problems and to contribute to community empowerment and ownership of the proposed project. The project in general was to provide supplements for children under age 5; children under age five become the primary target whilst their caregivers become the secondary target. Caregivers who are usually women could play important role in the success of the project (improvement of nutritional status of children) if they were involved in the entire planning and implementing of the project. Since from our study, it was highlighted that decisions were taken mostly by males in the study area, the involvement and targeting of male caregivers in the planning stages could have been an entry point to get to women to fully participate in the entire project. Our study showed that women generally were unable to attend meetings due to reasons enumerated in the findings chapter. One key reason which is; payment of a late penalty was highlighted as one main reason of preventing women who were most likely to be late for meetings (due to reproductive and productive activities) is something worth addressing. Even though it is a side issue,

LODARMAH could have taken this up in a negotiation to cancel this late penalty for all their meetings since it discourages women's participation which is already low. This could go a long way to encourage women's participation in public meetings.

In chapter 2 especially figure 2.3; we highlighted the need for public involvement in decision making at every stage in the project design. The non-involvement of the people to decide on the right intervention to improve the malnutrition situation within the LMK may have been one of the most important factors for the little improvement in the nutritional status of beneficiaries. The people of Atua and Akuse mentioned the need for clean water within the area and also a proper waste management system which could serve as a way of controlling mosquito breeding in the area which causes malaria. Prolonged malaria in an individual can lead to reduced anaemia levels in an individual; this means if children under five are given iron supplements and there is a sanitation problem which leads to malaria then eventually their nutritional status will not improve. Using the same case of malaria, malaria can cause loss of appetite hence children may not be able to eat enough food, the presence of malaria also affects the use of the nutrients in the food by the body which again in turn affects the nutritional status of the individual. This finding is therefore in line with Smith (1992); and NDPA (2010), who stated that, the perception of a particular population sub-group of its own nutrition priorities will contribute significantly to the effective design of nutrition programmes. The researcher agrees with the conclusions of Smith (1992), and NDPA (2010) who mentioned that interventions/programmes are much more probable to be effective if the issues of utmost significance to the group are addressed and they are involved in the planning, management, and ownership of the programme.

5.3 Beliefs, perceptions and knowledge of community members

Eating patterns and the food choices of population sub groups are rooted in their food taboos, beliefs and perceptions that exist regarding particular foods. Our study found that food taboos that existed amongst certain churches, clan and tribe influenced the consumption of fish, snails, oysters and shrimps. Fish is a good source of protein, snails a good source of both protein and iron whilst oysters and shrimps are equally good sources of micronutrients as well as protein. in the study area. This meant that even though fishing is carried out in Akuse (closeness to Lake Volta), the catch from the fishing are sold to neighbouring villages and individuals who do not have food taboos with respect to the above mentioned products from the lake. Even though the focus of the study is not on the consumption patterns of households, the types of food eaten by households directly affects their nutritional status. Our study found that the main foods consumed in the study area were mainly starch-based with little protein or vegetable sources. According

to the conceptual framework (figure 2.1), the prime determinants of the nutritional status of an individual is influenced by the food intake and utilisation of the food by the body at the individual level. However, the availability, accessibility and the use of the food are rooted in socio-economic, institutional, political, cultural and natural conditions. Food taboos as a cultural factor therefore has influenced the type of food available and accessible by people in the study area. The 'fatalistic' nature of people in the study area could have been another major cause of the poor nutritional status of the beneficiaries. People believe that their health and nutritional well-being are determined by God/god regardless of what they eat or do not eat. The attribution of diseases with unfamiliar symptoms such as swelling of the feet (edema), or belly, skin diseases and infections to afflictions caused by ancestors when taboos are broken rather than poor nutrition coupled with the belief in divine healing cannot be underestimated as a potential barrier to the seeking of health care and the use of conventional medicines (supplements in this case). Certain assumptions regarding the usage, quality and the purpose of supplements by individuals in the Atua and Akuse if not addressed by the field staff or community health workers in their follow-ups and visits were likely to influence negatively the usage of the supplements provided in the project. These findings of the study show that, there was a need for a proper and continuous nutrition education on the use and importance of supplements, as well as nutrition behaviour-change communication in the study area which could enhance addressing possible food habits and beliefs that undermines the potential of accessing and utilising food sources that promote healthy lives. This finding agrees with the WFP (2014), which stated that "though a programme may have positive impacts on several or one underlying factors of undernutrition, there is a need for effective nutrition behaviour-change communication since without this the programme will certainly not translate into an improvement nutritional status". The identification of such beliefs, perceptions and food taboos amongst population sub-groups is impossible without a participatory appraisal of the nutrition situation within the area. If there was a public involvement of the people in the baseline study to the planning stages of the project; these beliefs, perceptions, food habits and assumptions would have surfaced and then might have been addressed through nutrition behaviour-change communication and education. It would then become appropriate for LODARMAH to dedicate more time to the nutrition behaviour-change communication and education rather than directly going into the supplementation programme. LODARMAH needed to think through how their programmes can improve nutrition and achieve nutrition objectives and adequately integrate actions that will enable achieving nutrition objectives right from the planning stage.¹

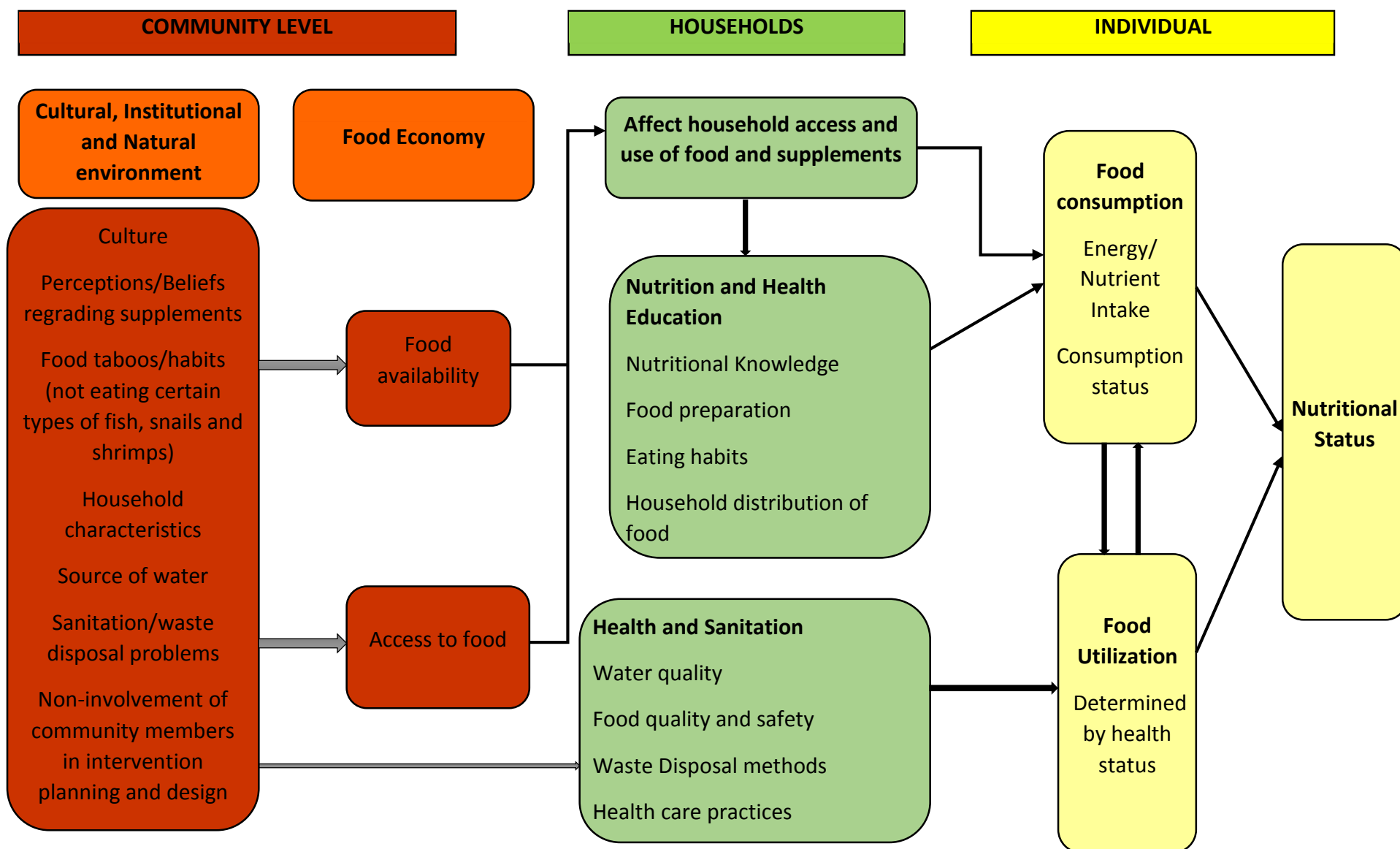
5.4 Bringing factors together

In summary, the possible underlying factors that caused little improvement in the nutritional status of beneficiaries in the LODARMAH project are;

- the non-involvement of the targeted population sub-groups to identify the most urgent intervention needed to address the malnutrition situation within the LMK district
- inadequate resources to match up the demands of the intervention
- a diverse range of managerial and implementation flaws of the project
- inadequate nutrition education as well as nutrition behaviour-change communication to address beliefs, perceptions and food habits that exist amongst sub-groups which undermines nutritional well-being.

A visual representation of the identified factors is shown in figure 5.1 below. Current nutrition programs implemented in Ghana according to Okronipa (2017) where population sub-groups are assisted by the intervening organisation to plan and design an appropriate intervention have yielded significant improvement in the nutritional situation in those areas. Other important gaps identified include proper conducting of baseline study for nutrition planning, and equipping staff with appropriate training (ability to speak local language). These capacity needs are essential for effectively implementing nutrition programs and deserve crucial attention. Although findings from this study are limited to Atua and Akuse in the LMK district, they may be applicable to other districts in Ghana.

Figure 5.1: Visual representation of the identified factors and their relations



Source: Researcher's own construction

CHAPTER SIX CONCLUSION & RECOMMENDATION

6.1 Conclusion

This section looks at the conclusion drawn from the results and discussions and based on that propose recommendations and strategies for improvement in the LODARMAH project.

The study revealed that the factors that contributed to the little improvement in the nutritional status of beneficiaries of the LODARMAH supplementation project are found at different levels from the planning to the implementation and finally to issues peculiar to the project area. The entire decision-making to introduce the supplementation programme taken by LODARMAH with the support of the Ghana Health Service without the involvement of the local people of the LMK to deliberate on potential interventions that will address the malnutrition situation among the population sub-groups was the major factor that undermined the potential of the project to yield immerse results. On the planning and implementation by LODARMAH, it could be concluded that if the existing problems identified from the baseline study were prioritized based on the needs of the people and LODARMAH had considered the root causes of malnutrition; then the nutritional supplementation may not have been the most appropriate or best intervention to address the malnutrition situation. The study also revealed that the challenge of scanty job aids (materials for nutrition education); relative low budget for logistics to ensure enough follow-ups; insufficient staff number to intervention demand ratio also contributed to gaps that could have affected the implementation of the project. Finally, another factor that led to the little improvement in the nutritional status of beneficiaries is the flaws in the nutrition behaviour-change communication; language barrier and finally beliefs, perceptions and assumptions that existed among community members in the area which were not identified and integrated into the entire programme by LODARMAH.

In short, our study wholly reaffirms that the problem of malnutrition is a multifaceted one which requires multi-sectoral and an integrated approach. It is important to deal with the root causes (basic causes) of malnutrition rather than dealing with the underlying causes; as this will not deal in entirety the malnutrition situation for a longer term. Where the targeted sub-groups are given the opportunity to be made aware of their nutritional needs and be fully involved in the entire designing and planning of appropriate interventions that could go a long way to improve their nutritional situation.

6.2 Recommendations

On the basis of the above-mentioned conclusions, it is recommended overall that;

- Baseline studies conducted by NGOs, government bodies and other private organisations to determine and understand socio-cultural uniqueness of communities during implementation of programmes/interventions of any kind are vital. To ensure the quality of data collected during baseline studies, it will be key for the involved parties to be fully immersed into the communities under study to enable the collection of the right data.
- Involvement of the beneficiaries of any project/programme right from the planning stage to make room for beneficiaries to own the analyses of issues and to own the found ways to address those issues and thus contribute meaningfully to the success of the project. This can be done by a participatory appraisal from a livelihoods perspective which will help to understand the specific problems in a particular livelihood and the possible solutions. Prevention of implementing of vertical programmes (decided by organising parties only) could be of pronounced benefit.
- Nutrition education programmes should promote an understanding of the basic principles of healthy eating. Since food choice and eating behaviour are intimately linked to culture, food habits and customs; the use of local language, influential people (religious, local leaders) could improve the success of nutrition behaviour-change communication.
- Organisations/planners of any form of project need to map out the resources and demands of any project to check their competence and capability to effectively execute projects. There is a need to think through how their programmes can improve nutrition and achieve nutrition objectives and plainly and effectively incorporate actions that will enable this to happen from the planning stage.

6.3 Lessons for my own organisation

I work as a programme facilitator for ITOCA (an NGO) who partners with LODARMAH (commissioner of the study) in its activities. Conducting this study is equally important to my organisation and as such I am liable to placing more emphasis/ or being silent on what might be wrong/right on the organisation and implementation of the intervention by LODARMAH. The findings from this study has enlightened me on the gaps ITOCA in implementing interventions leave when conducting baseline studies for the introduction of a project. It is very important to be well informed during baseline studies and to involve the targeted beneficiaries in the mapping out of the problems which require attention. Beneficiaries can also be consulted and involved in designing a project that will address the identified problems in order to create ownership and accountability of the project. ITOCA needs to be innovative in its approach and methods of implementing projects by inspiring and motivating beneficiaries through an inclusive and participatory way. In the implementation of projects, especially ones that require education and behaviour change communication, it is very important to know the demands of the project (competencies of the staff to meet the demands of language), and the use of other communication and teaching aids (posters, visual illustrations) which will ensure effective communication to yield positive change.

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List of Appendices

Appendix 1: Method-sub question (MS) matrix

			N= 1	N= 3	N= 4	N= 3	N= 27	
Sub question	Topics/Aspects to be asked	Project Documents/Reports	Interview project manager	Interview with other project staff	Interview with other stakeholders	FGD	Individual Interviews (caregivers)	Observation
1.How was the intervention and implementation process organised by LODARMAH?	What was the starting point /baseline that incited the intervention?	✓	✓					
	How did the whole programme start?	✓	✓	✓		✓		
	What is the means of communication/knowledge flow to beneficiaries	✓		✓		✓		
2.What was the nature of involvement of community members (public participation) in the planning and implementation process of the intervention?	What stakeholders were/are involved in the different stages of implementation?	✓	✓		✓			
	What was/is the role/nature of involvement of each of these stakeholders?	✓			✓			

	How were community members involved in the planning?		✓	✓		✓		
	How was the monitoring and evaluation done?	✓	✓	✓			✓	
3.What beliefs, assumptions and conceptions that exist among community members on the nutritional supplements promoted by the project?	<p>What do people think, believe (what are their thoughts about the various products).</p> <p>Perception/and knowledge on nutritional wellbeing</p>					✓	✓	
	How do they perceive nutritional supplements?					✓	✓	
	What informs acceptance to interventions implemented by organisations in the LMK					✓	✓	
4.What is the current level of awareness/knowledge of community members on the use of nutritional supplements in the Lower Manya-Krobo district?	Awareness of the existence of NGOs (LODARMAH) operations in the LMK					✓	✓	

	Awareness/Knowledge on the use of nutritional supplements.					✓	✓	
	Compliance to the use of nutritional supplement						✓	
	Daily nutritional record sheet for keeping track of use of supplements and improvement in nutritional status of child/children						✓	✓
	Labels and prescriptions on supplements							✓
Other information	Impression about the situation in the community Water Sanitation Waste disposal Type of Toilets (public, household)							✓

Appendix 2: Topic Lists for data collection

a) Topic List for LODARMAH project manager

1. Situation that triggered the intervention.
2. Different interventions proposed apart from micronutrient supplementation
3. Stakeholders involved in the designing of the intervention
4. What were their roles
5. How were community members involved during the designing of the intervention
6. What medium were information shared to targeted beneficiaries
7. Implementation of intervention
8. How were beneficiaries selected
9. Forms of nutrition education provided to beneficiaries
10. Source of supplements distributed to beneficiaries
11. Monitoring steps of compliance to the usage of supplements by beneficiaries
12. Evaluation of nutritional status of beneficiaries
13. How could things be done differently
14. Awareness of any perception or beliefs in the LMK
15. Any other project in the past that has yielded low results than expected

b) Topic List for LODARMAH project staff

1. How were community members involved during the designing of the intervention
2. What medium were information shared to targeted beneficiaries
3. Role in the implementation of the intervention
4. Challenges faced in relation to your working with this project
5. What form of education regarding the use and importance of supplements are available for beneficiaries?
6. Nutrition education programmes (use of local language/English/translators)
7. Monitoring process to compliance of the usage of supplements by beneficiaries
8. Evaluation of nutritional status of beneficiaries determined
9. Awareness of any perception or beliefs in the LMK
10. What have you learnt working on this project within the LMK

c) Topic List for Identified Stakeholders (Community health workers, other NGOs)

1. Connection with LODARMAH
2. Aspects/field of work with LODARMAH
3. Areas of expertise
4. Years of operation in LMK or elsewhere
5. Involvement in the implementation of nutrition related interventions
6. Level of operation in communities
7. Relevant information regarding the LODARMAH project

d) Topic List for Focus Group Discussion

1. Acknowledgement of NGOs/LODARMAH operations in the area
2. Participation in activities or education forum on nutrition
3. Participation in decision making when it comes to policies and programmes related to their livelihoods
4. What informs acceptance of interventions within the area
5. How are interventions usually introduced in the area
6. Perceptions, knowledge and understanding on nutritional supplements
7. Knowledge on nutritional health and wellbeing
8. Forms of communication in community health/ nutrition education programmes (clue: poster, announcement from community centre, health posts, through teachers, neighbours)
9. Perception or beliefs related to nutritional related issues
10. Other nutritional related issues they are aware of in the area
11. Other NGOs activities/interventions they benefit from
12. What other issues do they have and expect support or help from government, NGOs, relating to nutrition, and food security.

e) Topic List for One-on One Interviews

1. Beliefs regarding nutritional health and nutrition related interventions (supplements)
2. Level of participation when it comes to decision-making in policies, programmes, or interventions that will affect their livelihood?
3. What informs acceptance of intervention from a personal point in the area

4. Selection basis to benefit from nutritional supplementation programme
5. Knowledge of the nutritional status of child before the intervention and the possible future outcomes
6. Knowledge on use of nutritional supplements
7. Form of information/education on the use of supplements (in local language)
8. Supplements accessibility (purchased, given for free) and how often do they access supplements ((weekly, monthly)
9. Frequency of use of supplements
10. Challenges faced with the use of supplements/compliance to right dosage
11. Dietary arrangement at home (frequency of meals and types of food consumed)
12. Effects of supplements (powders, sprinkles) to texture, taste and aroma of food
13. Availability of nutritional record sheet
14. Process of monitoring of child nutrition
15. Any improvement they have seen so far with child's weight, and general health
16. Any follow-up from staff or community health workers to monitor progress
17. Most important benefit from the project (individual point of view)

Appendix 3: Consent form for individual interviews

CONSENT FORM FOR RESPONDENTS

The data provided will be held confidential by the researcher. Your name or other identifying information will not be associated with the data or any reports or presentation derived from the data.

I..... respondent #..... confirm that:

1.	I have read and understood the information about the project, as provided in the Information Sheet dated _____.	<input type="checkbox"/>
2.	I have been given the opportunity to ask questions about the project and my participation.	<input type="checkbox"/>
3.	I voluntarily agree to participate in the project.	<input type="checkbox"/>
4.	I understand I can withdraw at any time without giving reasons and that I will not be penalised for withdrawing nor will I be questioned on why I have withdrawn.	<input type="checkbox"/>
5.	The procedures regarding confidentiality have been clearly explained (e.g. use of names, pseudonyms etc.) to me.	<input type="checkbox"/>
6.	If applicable, separate terms of consent for interviews, audio, video or other forms of data collection have been explained and provided to me.	<input type="checkbox"/>
7.	The use of the data in research, publications, sharing and archiving has been explained to me.	<input type="checkbox"/>
8.	I understand that other researchers will have access to this data only if they agree to preserve the confidentiality of the data and if they agree to the terms I have specified in this form.	<input type="checkbox"/>
9.	I do not want my name used in this project.	<input type="checkbox"/>
10.	I, along with the Researcher, agree to sign and date this informed consent form.	<input type="checkbox"/>

Participant:

Signature / thumbprint Date

Researcher:

Linda Agbotah _____
Name of Researcher Signature Date