PREGNANT WOMEN AS BENEFICIARIES OF THE VULNERABLE GROUP FEEDING (VGF) PROGRAMME IN MBIRE DISTRICT ZIMBABWE: AN ASSESSMENT OF NUTRITIONAL VULNERABILITY

By

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ABSTRACT

The study intended to investigate the prevalence of malnutrition among the vulnerable pregnant women in Mbire and establish why they remain nutritionally vulnerable when they are benefiting from the World Food Programme (WFP) funded Vulnerable Group Feeding (VGF) Programme. Both quantitative and qualitative approaches were employed to gather data for the survey. The mid upper arm circumference (MUAC) and the Body Mass Index (BMI) were the anthropometric indicators used to determine nutritional status of the vulnerable pregnant women. Evaluation of the VGF food basket and micronutrient supplementation coverage also provided information on the nutritional status of the women.

The questionnaire collected information on nutritional status of the vulnerable pregnant women and some of the factors contributing to nutritional vulnerability. The focus group discussion (FGD) provided information on cultural taboos and religious beliefs that impact on what pregnant women eat. The sample comprised of 100 pregnant women. A two-stage sampling procedure was used. Simple random sampling was used to select the two rural health centres (Masoka and Angwa) and purposive sampling to select the cases for the survey. To choose participants for the FGD, simple random sampling was used with patients who had visited the clinics, but not necessarily VGF beneficiaries.

Major findings of the research were that 24% of the vulnerable pregnant women had a MUAC of less than 22 cm, which according to WHO and WFP standards is an indication of malnutrition. The BMI for the pregnant women ranged from 20 – 26.3 and for some it was again below the internationally accepted threshold. The study revealed that the VGF food basket was inadequate to meet the nutritional needs of the vulnerable pregnant women because it is meant for people with other sources of food. It was not designed to cater for the additional nutritional demands during pregnancy. It also emerged that besides inadequate food there were other immediate and underlying determinants of nutritional vulnerability. This leaves the vulnerable pregnant women susceptible to nutritional deficiency risks like anaemia and compromised immunity, which can result in morbidity, maternal and infant mortality.

Major recommendations were that to address nutritional vulnerability of the vulnerable pregnant women a food aid intervention only is not enough. An intersectoral approach is needed whereby government ministries, NGO's, traditional leaders, faith based organizations

and the community itself come together with different innovative risk reduction initiatives like food security and water and sanitation interventions to address the immediate and underlying causes of malnutrition. However, more research on micronutrient status may reveal more prevalence of malnutrition among the vulnerable pregnant women in Mbire.

Dedication

I dedicate this research to my family, husband Paul and children (Ngoni, Kuda and Ruva).

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God bless you ladies and gentlemen.

DECLARATION OF WORK

I, the undersigned, hereby declare that the work I am submitting is my original work and I have acknowledged all the sources I have used. This dissertation was never submitted at the University of Free State or any other academic institution for another degree, in part or full either by me or by any other person. This document has not been previously published.

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LIST OF ACRONYMS

CIRAD	Centre for International Cooperation in Agronomic Research and Development
HIV/Aids	Human Immuno-Deficiency Virus/ Acquired Immuno-Deficiency Syndrome
UNSCN	United Nations Standing Committee on Nutrition
LGDA	Lower Guruve Development Association
MoHCW	Ministry of Health and Child Welfare
MIMS	Multiple Indicators Monitoring Survey
NGO	Non-Governmental Organization
WHO	World Health Organization
UNICEF	United Nations Children's Fund
RDA	Recommended Dietary Allowance
SIRDC	Scientific Research and Development Centre
VGF	Vulnerable Group Feeding Programme
WFP	World Food Programme
ZDHS	Zimbabwe Demographic Health Survey
ZIMVAC	Zimbabwe Vulnerability Assessment Committee
ZNFC	Zimbabwe National Food and Nutrition Survey
MSF	Medecins Sans Frontieres (Doctors without Borders

CHAPTER 1

BACKGROUND TO STUDY

1.1. Introduction

Earthquakes, cyclones and floods are some of the disasters that immediately come to mind when people hear of the word disaster because the damage is more visible. However, malnutrition that results from drought/famine and other factors is a slow onset disaster (Wisner, Blaikie, Cannon & Davies, 2004:3) and people may suffer from it without even being aware. Bellamy (1998) asserts that although it is a silent emergent and largely invisible, the crisis is real. Malnutrition is more than a medical problem, because its causes are multifaceted (Webb *et al.*, 2006). This means that it can result from a combination of hazards. Its effects are even worse on vulnerable pregnant women, because they have additional nutritional demands and nutritional deficiencies result in the vulnerability of both the mother and the child to be born (Insel & Wardlaw, 1999:455). Research has proven that all pregnant women are nutritionally vulnerable and there is need to assess nutritional status (Papathakis & Rollins, 2005). The Zimbabwe Multiple Indicator Monitoring Survey (MIMS) (2009) reported that maternal mortality that was due to malnutrition and HIV/AIDS in Zimbabwe was between 8.7-13.7% and remained one of the highest in the world. This should be considered a significant public health threat.

1.2. Background

The Zimbabwean Prime Minister at the official launch of the Zimbabwe National Nutrition Survey (2010), referring to the results of the survey, lamented that malnutrition was prevalent in Zimbabwe. He added that because of that it was not possible for Zimbabwe as a country to achieve the Millennium Development Goal (MDG) one pertaining to food security and poverty (Mutseyekwa, 2010). This shows that malnutrition is rife in Zimbabwe. The Zimbabwe MIMS and the Zimbabwe Health Demographic Survey (ZHDS) are some of the surveys, which reveal the nutritional status of the population at provincial and national level, but their limitation is that they fail to provide information on micronutrient status of the population, and nutritional status of adults since the focus is on children.

Very few studies have investigated the nutritional vulnerability of pregnant women separately. Most surveys done in Mbire tend to focus on food security of the whole population or children, yet the pregnant are some of the most vulnerable. The researcher chose Mbire district because it is one of the three districts in the Zambezi Valley that is prone to a number of hazards like drought, cholera, floods, HIV/AIDS, measles, political violence and cyclones. The majority in Mbire are illiterate and are living in abject poverty because of lack of income, and this is attributable to the high unemployment rate and lack of meaningful and sustainable livelihood activities (Mbire Baseline Survey Report, 2009). All these directly or indirectly influence nutritional status of the vulnerable pregnant women in Mbire. The Zimbabwe Vulnerability Assessment Committee (ZIMVAC) Report (2010:88) reveals that Mbire is one of the four districts in Zimbabwe with 39 – 42% of the households, very food insecure. The nutritional vulnerable are the food insecure, mostly found in larger population groups exposed to vulnerability factors (The State of Food Insecurity in the World (SOFI) (2000). The Zimbabwe National Nutrition Survey (2010) indicates that prevalence of malnutrition in Zimbabwe is at 33.8 %.

Mbire rural district, formerly Guruve North Constituency, is located in the Mid-Zambezi Valley (Dande Valley) north of Harare (Mbire Baseline Survey Report (2009). It is bordered by Mozambique in the east and Zambia in the north, Mashonaland West province in the west and on the southern side Guruve. According to the Mombeshora and Le Bel et al (2010:3), the low-lying area that includes Chiriwo ward is between 340 – 420 m above sea level. The authors further states that, rainfall is low and erratic, mean annual rainfall ranges from 620–680 mm and the people in Mbire are vulnerable to recurrent droughts and majority depend on food aid. The climate supports dry land cultivation of drought tolerant crops (Le Bel *et al.,* 2004), but is not suitable for the production of maize, vegetables and fruits. Maize is the staple food in the area. Under the climatic regions of Africa, Mbire falls in the hot and Semi-Arid region (Practical Action End of Pilot Project, 2009:6). The area is prone to floods during the rainy season and is also a malaria prone area. Temperatures can sour up to 40 degrees celcius (The Zimbabwe Herald, 26 October 2009). Climatic change continues to have a negative impact on agriculture and food security in Zimbabwe (ZELA Report 2009:15). Mbire is one of the most affected districts.

Mbire was targeted as a district vulnerable to food shortages hence qualifying for the World Food Programme (WFP) funded Vulnerable Group Feeding (VGF) programme based on the results of the ZIMVAC Report (2010), Zimbabwe 2010 Community Household Surveillance

(CHS), and the 2010 FAO/WFP Crop and Food Security Assessment Mission (CFSAM) to Zimbabwe. The surveys were used to determine rural population that was likely to be food insecure, their geographical distribution and severity of food insecurity. Food Security ranking for 2010/2011 consumption years was carried out at ward level in Mbire to determine areas with most vulnerable populations and out of 17 wards, the most food insecure were Masoka (11), Angwa (2) and Chapoto (1) (ZIMVAC, 2010). Masoka and Angwa wards were sampled for this study. A ward prioritisation map for Mbire that indicates different levels of vulnerabilities to food insecurity, which partly affect the nutritional status of vulnerable pregnant women at ward level for the district, is shown in Figure 1.1.

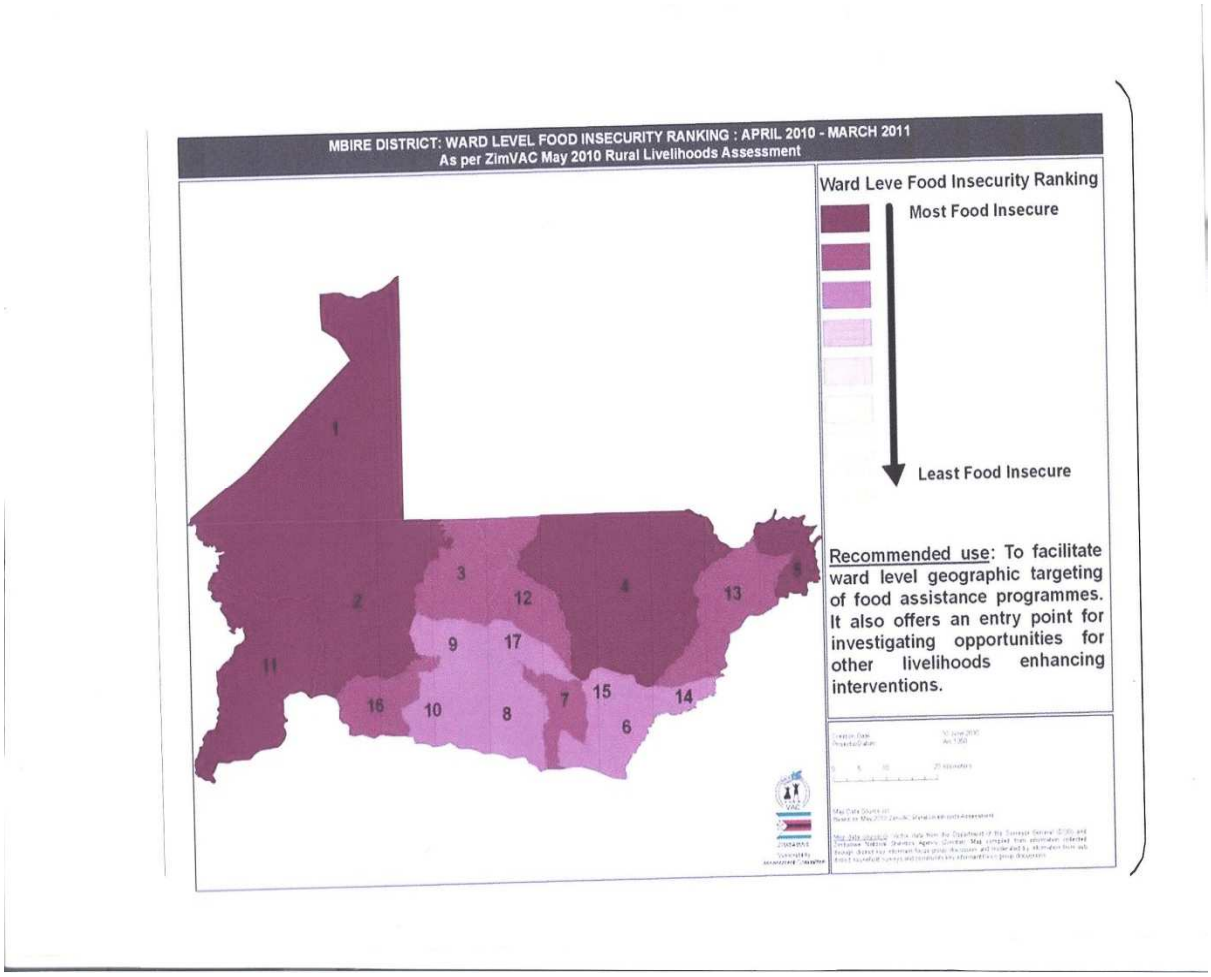


Figure 1.1: Mbire district: Ward level food insecurity ranking

Source: ZIMVAC Rural Livelihoods Assessment Report (2010:106).

Besides food security, other factors that determine nutritional well-being as stated in the ZIMVAC Report (2010) are water and sanitation, diseases, education and rural households' socio-economic status. The World Bank (2006d) supports that recent studies have shown that

contrary to popular myth, malnutrition does not only result from lack of food intake, but more often a consequence of bad sanitation and repeated infections. In the case of Mbire, findings were that the majority of vulnerable households were consuming unsafe dirt water from the three major perennial rivers, Angwa, Manyame and Hunyani **(**Mbire Baseline Survey Report, 2009)**.** However, the disadvantage of using ZIMVAC as a basis for interventions is that vulnerability is determined on the basis of food security not on the nutritional status of the population concerned, hence cannot be taken as a reflection of the nutritional status of vulnerable pregnant women.

Part of Angwa and the whole of Masoka wards are not suitable for cattle rearing due to tsetse fly infestation (Mbire Baseline Survey Report, 2009). This means unavailability of basic foodstuffs like milk and meat. These are good sources of nutrients essential during pregnancy for example protein, iron, calcium and phosphorous. The pregnant women risk developing nutritional deficiency related problems. According to the Zimbabwe National Nutrition Survey (2010:49) meat, eggs and milk are rarely included in the diets of the majority of the households in Mbire. The area is very rich in wildlife, but hunting is illegal for the ordinary community members and there is no other source of meat and milk. Mbire is one of the most underdeveloped districts in Zimbabwe with very few shops and butcheries (The Zimbabwe Herald, 23 September 2011:1)

Since the area is semi-arid, production of vegetables and fruits throughout the year is not possible for most households because of hot climatic conditions and scarcity of water, except for those who live along the major rivers. Hence, their diet is likely to lack in vitamins and other minerals obtained only from fruits and vegetables and they risk suffering from micronutrient deficiency related health diseases.

Malnutrition does not result from a single event (Spheres Handbook, 2011:144). Commenting on the causes of malnutrition the President of Uganda, Yoweri Museveni stated that nutrition is a crosscutting issue with economic, socio-cultural, political and biomedical dimensions (2011-2016 Uganda Nutrition Action Plan, 2010). For the Mbire vulnerable pregnant women disasters are a complex mix of natural hazards and human action. Wisner *et al.* (2004:5-7) summarize that vulnerable populations in least developed countries (LCDs) suffer repeated, multiple, mutually reinforcing and at times simultaneous shocks and these further increase their vulnerability. The Land Distribution Exercise which started in the year 2000 and the May 2005 Urban Clean-up Exercise resulted in the internal displacement of

very poor people to rural areas like Mbire where there was excess land (Report by United Nations Special Envoy to Zimbabwe, June 2005).

The national political and economic crisis of 2000-2008 led to the total collapse of the health delivery system and food shortages ensued according to the 2009–2013 National Health Strategy (Zimbabwe, 2011:33). Unavailability of drugs and shortage of qualified medical personnel meant the sick could not receive medical attention. That meant that vulnerable populations' nutritional status deteriorated as their health status deteriorated. The June 2008 re-run election political violence resulted in the destruction of property and some people in rural areas like Mbire were left homeless and without any source of livelihood (UN Consolidated Appeal for Zimbabwe, 2008).

Mbire district is susceptible to perennial flooding that takes place in the Zambezi Valley when the Zambezi River bursts its banks and the pressure forces water back into the Angwa, Hunyani, Kadzi, Dande, Mururuzi and Kadzi rivers (The Zimbabwe Herald, 18 February 2011:2). The report further states that flooding usually wipes away crops grown in flood plain areas like Kanyemba and Chikafa. All this further increases nutritional vulnerability of these poor and marginalised people. A picture of a flooded area in the Chapoto ward is shown below.

Figure 1.2: A picture of an area flooded in Kanyemba in the Chapoto Ward
Source: The Zimbabwe Herald 10 January 2012 00:00

Some of the pregnant women are victims of the above-stated hazards and do not have any source of income. As a result, they lack the capacity to anticipate, cope with, resist and recover from the above-mentioned hazards. All these causes of malnutrition interact in important ways and a food security intervention like the VGF Programme (2010-2011) strategy alone is not enough to address the problem (Webb, *et al*., 2006).

Although the vulnerable pregnant women are benefiting from the VGF programme, the quantity and diversity of the food basket is not enough to cater for the increased nutritional needs of the pregnant women. It is designed to meet the nutritional requirements for a population who have other sources of food, and is issued out irrespective of sex and physiological status. Shortages of food affect women in Mbire at a different level from those who are not pregnant because they have different levels of vulnerabilities. Vulnerable, pregnant women are more at risk because they need extra nutrients to cater for pregnancy needs (National Research Council, 2002:115), and they live in food insecure households unlike, for example those who are not pregnant in food secure households.

Lack of calibrated measuring scoops during distributions and lack of proper training on the preparation of some of the unfamiliar foods the vulnerable women receive for VGF like bulgur wheat and lentils are some of the factors contributing to nutritional vulnerability. Other beneficiaries also end up exchanging the food they receive for essential services and commodities like paying for medical bills, salt and grinding mill costs because of lack of income (Mbire 2010-2011 VGF Programme End of Term Report). All this will increase their vulnerability, especially considering the fact that the food basket is already not enough to cater for their nutritional requirements.

1.3. Preliminary Literature Review

Nutritional vulnerability is defined as the presence of risk factors of malnutrition or factors that make a person susceptible to malnutrition (Hewitt *et al.,* 2006:335). The WFP (2000:36) reveals that women, especially during pregnancy and lactation have long been considered a nutritionally vulnerable group. It further states that a Mid Upper Arm Circumference (MUAC) of below 22 cm is a simple indicator of malnutrition among pregnant and nursing mothers, and this has been noted in some emergencies. However, MUAC only measures wasting due to protein deficiency, and cannot be regarded as a true reflection of nutritional

status of any individual. Deterioration of nutritional status because of micronutrient deficiencies may be missed since this is usually hidden (WFP, 2000:52).

According to the WFP Policy for Ending Inheritance of Hunger (2000), which has been developed for some of the issues affecting its programmes, inadequate food during pregnancy has far-reaching consequences, "*Less visible but all the more damaging is the long effect of hunger that runs through families through succeeding generations*" (WFP, 2000:55). It is further stated that research has revealed that malnourished women give birth to babies whose start in life is already compromised by their small size.

Other risks associated with nutritional deficiencies are decline in maternal nutritional status, obstructed labour, maternal anaemia and impaired immune system that increases sensitivity to infections which can result in maternal and infant mortality (MSF, 2006:4). Low birth weight (LBW) and malformations can result before the baby is born. Webb, et al. (2006:68) reveals that about 140 women die every day in childbirth throughout the world due to severe anaemia. The Spheres Handbook (2011:144) asserts that malnutrition is a public health problem and among the leading causes of death whether indirectly or indirectly and this should be taken seriously. A Filipino commented, "*A pregnant woman giving birth has her one foot in the grave*". (UNICEF Report, 1 October 2008) and malnutrition is given as the most contributing factor to mortality. This shows how vulnerable the pregnant VGF beneficiaries are to nutritional deficiencies.

Wardlaw (2000:419) gives the following as essential elements for women during pregnancy and lactation. Extra quantities of high quality balanced nutrient dense food, for example they need more food rich in calcium, folate, iron, zinc, protein and vitamin D for successful pregnancy. The WFP (2000:27) adds release from onerous labour, adequate rest, sensitive pre- and postnatal health care from trained practitioners is vital.

The 1997 UNICEF Framework of Underlying Causes of Malnutrition and Mortality detailed in the MSF (2006:4) and WFP (2000:24) categorize factors that lead to malnutrition into immediate and underlying causes. Health care, water and sanitation and social, economic and political factors were listed as the underlying causes and inadequate food and diseases fall under immediate causes. Inadequate water and sanitation can lead to outbreak of diarrhoeal diseases and worm infestations resulting in malnutrition. Parasitic infections and lack of care

of the sick may also lead to continual deterioration of the nutritional status for the vulnerable pregnant women (SAFAIDS News 2, 2009).

Nutritional vulnerability of pregnant women is a typical example of progression of a community to vulnerability suggested in the Pressure and Release (PAR) Model: Progression to Vulnerability by Wisner *et al.* (2004:51). The root (basic) causes are ideological, political and economic systems, which affect the distribution of resources among different groups of people, dynamic pressures (inadequate water and sanitation, health services, food insecurity), and unsafe conditions (prevalence of endemic diseases and inadequate food intake being the immediate causes). All these will result in malnutrition, nutrient deficiency risks and can ultimately lead to death.

Nutritional vulnerability of vulnerable pregnant women increases their risk to common epidemics like cholera, HIV/AIDS, pneumonia and malaria and other diet related non-communicable diseases (FAO, 2006). Research has proven that malnourished individuals succumb easily to these hazards because of impaired immune system (MSF, 2006:4). In fact, most deaths of children during disasters are not due to conflicts or natural disasters themselves, they result from malnutrition (UNICEF, 1 October 2008). Although this seems to imply that children are the most vulnerable, pregnant women are equally vulnerable. Therefore, nutrition programming in any disaster response is vital as a mitigation strategy against health epidemics. After realising the importance of management of nutrition for different groups during disasters, the World Health Organisation (WHO) convened a meeting on "Nutrition in Times of Disasters." in 1989 where food rations for different emergencies were determined (WHO, UNHCR, IFRC & WFP, 2007).

1.4. Problem Statement

Humanitarian organizations have been distributing food in Mbire for the past ten years, but unfortunately, vulnerable pregnant women remain nutritionally at risk. The general nutritional trends for women in Zimbabwe reflected in the 2009-2013 National Health Strategy for Zimbabwe (2010:50) are that there is a general increase in malnutrition among women in Zimbabwe. This is evidenced by the prevalence of a body mass index (BMI) of 18.5 point from 1999 to 2005/6 and this is an indication of chronic nutritional insecurity.

This means that the problem of malnutrition does not only result from inadequate dietary intake. The causes of this problem and nutritional and health risks associated with nutrient deficiencies need to be identified at all levels and solutions suggested.

Despite the surveys carried out annually to determine the nutritional status and food security for the Zimbabwean population, information on nutritional status of adult pregnant women is still lacking. Hence, they remain nutritionally vulnerable. The VGF programme implementation is based on food security findings not on nutritional status of the people concerned. It is worth conducting this research because persistent lack of knowledge about nutritional issues in the area might lead to continuous deterioration of the vulnerable pregnant women's health and the children being born.

1.5. Aim of the Study

It is anticipated that the study will reveal the prevalence of malnutrition among the vulnerable pregnant women who are beneficiaries of the VGF programme in Mbire and the risks associated. Immediate and underlying causes of malnutrition among the vulnerable pregnant women will also be revealed. Through the study it is hoped that communities, Non-Governmental Organisations (NGOs) and policy makers will understand that nutritional vulnerability does not only result from inadequate dietary intake, but also from factors like inadequate water and sanitation and diseases. The findings will help to enhance the programmes currently being provided by NGOs and government ministries, and to recommend other risk reduction initiatives.

1.6. Objectives of the Study

Main Objective

To explore the prevalence of malnutrition among the vulnerable pregnant women in

Mbire

Sub- Objectives

1. To establish the nutritional requirements (RDA) for pregnant women in Mbire.
2. To identify factors that contribute to nutritional vulnerability of vulnerable pregnant women in Mbire.

3. To evaluate the nutritional content of the food ration distributed for VGF to determine whether it is meeting the nutritional needs of the vulnerable pregnant women.
4. To state the nutritional risks associated with malnutrition in pregnant women.
5. To suggest possible risk reduction initiatives to address the problem of nutritional vulnerability during pregnancy.

1.7. Research Questions

1. What is the recommended dietary allowance (RDA) for pregnant women?
2. Which factors could be responsible for the failure to meet nutritional requirements for vulnerable pregnant women in Mbire?
3. What is the nutritional composition of the VGF programme food basket?
4. What are the effects of malnutrition to the vulnerable pregnant women?
5. What are the possible solutions to the problem of malnutrition among the vulnerable pregnant women in Mbire?

1.8. Research Methodology

Both qualitative and quantitative approaches were used to gather data for the study. In this study, a cross sectional survey-based method was used for collecting primary data because it was the most suitable method for collecting data on nutritional status of a sample (Spheres, 2011:155). Using the last section of the questionnaire an anthropometric survey was carried out with the fifty sampled women at Masoka and Angwa health centres. The anthropometric indicators used were the BMI and the MUAC recommended as some of the best methods that could be used to determine nutritional vulnerability (Cogill, 2003). The SOFI (2000) defined BMI as the anthropometric standard for defining the body composition of men and women and a low BMI indicates undernourishment.

Direct assessment method of assessing the nutritional adequacy of the food basket and providing information on micronutrient supplementation coverage as suggested in the Spheres Handbook (2011:156) was also used to determine nutritional status of the vulnerable pregnant women.

A Focus Group Discussion (FGD) with five women and five men not necessarily VGF beneficiaries at each health centre, gathered information on cultural beliefs, political and economic factors that determine what is acceptable or not acceptable for pregnant women to

eat in Mbire. It was vital to find out about the cultural practices in the area because research revealed that malnutrition was likely to occur in societies where women suffered socio-economic discrimination or where food taboos were observed (WFP, 2000:28).

Clinical assessments revealed the possibility of micronutrient deficiency disorders affecting some of the vulnerable pregnant women. Because of shortage of resources in institutions in Zimbabwe, biochemical tests using body fluids in the laboratory to detect invisible signs of nutritional deficiency like anaemia could not be carried out. As a result, clinical tests that were simply an examination of participants for visible signs like bitot spots (sign of vitamin A deficiency) and goitre were carried out.

Secondary data was sourced from the following reports, ZIMVAC (2010), Zimbabwe National Nutrition Survey (2010), Zimbabwe MIMS (2009) , Christian Care VGF Proposal (2010), Zimbabwe Demographic Health Survey Report (2009) and the FAO/WFP Crop and Food Security Assessment Mission for Zimbabwe (CFSAM, 2010). The researcher could have used reports that were more recent, but they were not yet available when the researcher started the research in February (2011).

1.9. Survey Timing

The research was carried out in August (post harvest period) when food shortages were very common in Mbire since the little amount of food harvested in April would probably have run out. Most bridges had been swept away by floods that occasionally hit the area, so it was ideal to have the research during the dry season to ensure safety and convenience.

1.10. Data Analysis

Qualitative information was analysed as the assessment progressed. This involved constantly reviewing, categorizing, coding and analysing the data collected according to themes and concepts identifying omitted issues in the process. Comparison of the categories to discover connections between themes followed with final integration of the themes and concepts into theory that offered detailed interpretation of factors (DIMTEC Module 601, 2010:147) affecting nutritional status of the pregnant women. Evidence to support claims was presented in a descriptive form with quotations from the FGD. SPSS Version 17 and Microsoft Excel 2010 computer aided software were used for analysis of the quantitative data. Nutritional status and prevalence of malnutrition among the vulnerable pregnant women were

determined using anthropometric data. The direct assessment method of assessing micronutrient supplementation coverage findings and the nutritional adequacy of VGF programme food basket was also used to determine nutritional status.

1.11. Delimitations

The study focused only on pregnant women who were beneficiaries of the WFP funded VGF programme in Mbire rural district. The ZIMVAC (2010) Assessment, CHS (2009) and CSFAM (2010) findings and the WFP ranking criteria were used for the selection of the vulnerable population. Mbire is a very remote district and it is on record to be the only district in Zimbabwe with three kilometres coverage of tarred road (*The Zimbabwe Herald*, 23 *September 2011)*. Because of lack of road infrastructure and public transport, it was difficult to cover all the women, especially the Doma who had to travel very long distances to get to the health centre. However, it might not have affected the results much because the Doma only constitute about four per cent of the total population in Mbire (Mbire Baseline Survey Report, 2009).

1.12. Limitations

The research involved only two clinics representing only two wards in Mbire due to limited time and financial constraints. The researcher is not familiar with the Chikunda language that the Doma women speak, and making use of an interpreter might have resulted in some participants failing to understand the questions the way the researcher had intended. Use of anthropometric measures to determine nutritional status creates problems in terms of accuracy and the opportunity of detecting malnutrition due to micronutrient deficiencies will be missed. However, results can be used as a warning sign for advanced malnutrition.

1.13. Operational Definitions

Iron deficiency anaemia – is a decrease in number of red blood cells that may result from inadequate dietary intake or loss of blood. Deficiency is caused by lack of iron or folate.

Anthropometry – the use of body measurements (usually height and age) to assess nutritional well-being of a child or adult.

Anthropometric survey – measuring of the nutritional status of a sample of children or adults in order to estimate the prevalence and distribution of malnutrition in a population (WFP, 2000).

Disaster – an occurrence disrupting the normal conditions of existence and causing a level of suffering that exceeds capacity of adjustment of the affected community (WHO, 2002:3).

Mid-upper arm circumference – The circumference of the left arm measured in centimetres. It is the point below the tip of the shoulder and above the elbow (Cogill, 2003:78).

Nutritional vulnerability − factors that increase the susceptibility of a community to malnutrition (ISDR, 2002) or presence of risk factors of malnutrition (Hewitt et al, 2006:335).

Nutritional requirements − average quantity of nutrients an average person needs to remain in good physical and mental health taking into account her physiological condition, sex, weight, age, environmental and physical activity.

Prevalence rate – the per centage of a population with specific characteristics at a given point in time (ISDR, 2002:41).

Vulnerability – a set of conditions and processes resulting from physical, social, economic, and environmental factors that increase susceptibility of a community or individual to the impact of a hazard (ISDR, 2002).

Vulnerable – being in a dangerous position or condition and thereby susceptible to being injured or infected (ISDR, 2002).

Risk – the probability of harmful consequences or expected (loss of lives, people injured, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human induced hazards and vulnerable conditions.

1.14. Chapter Outline

Chapter 1: Introduction

The chapter provided an introduction and background of the research area. Preliminary literature review, the problem statement, research objectives and questions were also covered. A brief outline of the methodology, limitations and delimitations was given.

Chapter 2: Literature Review

The chapter reviewed work done by other researchers on nutritional vulnerability (malnutrition) of the pregnant women and the risks associated. Malnutrition in relation to disaster management and factors contributing to malnutrition was covered. The most important objective was to set the research gaps or points of departure.

Chapter 3: Research Methodology

This chapter examined the research methodology used to collect data for the study. In addition, the chapter looked at the target population, sampling procedures, data collection instruments, pilot testing, survey timing, data collection procedure, data analysis, ethical considerations, delimitations and limitations in depth.

Chapter 4: Presentation and Analysis of Research Findings

Findings on nutritional status of the Mbire vulnerable pregnant women based on anthropometric survey and the assessment of the nutritional adequacy of the VGF food basket were given. The underlying and immediate determinants of nutritional vulnerability were presented in this chapter. Economic, cultural, religious and traditional factors (underlying causes) that affected the nutritional status of the vulnerable pregnant women were presented. Research findings were analysed based on the objectives of the research.

Chapter 5: Conclusions and Recommendations

This chapter drew conclusions anchored on the findings and analysis of the research in chapter four. Recommendations were given on how to address the problem of nutritional vulnerability among the pregnant vulnerable women in Mbire at household, community and national level.

CHAPTER 2

LITERATURE REVIEW

2.1. Introduction

This chapter will present the literature review for the study. To gain more understanding on nutritional vulnerability of pregnant women the following sources were consulted: books, journal articles, internet publications, newspapers and surveys. The literature that is presented below covers the following areas, nutritional vulnerability and how it is related to disaster management, factors that contribute to nutritional vulnerability and Recommended Dietary Allowances (RDA) for pregnant women. Sources of the essential nutrients needed during pregnancy, nutritional inadequacy of the Vulnerable Group Feeding (VGF) programme food basket for the pregnant women, and risks associated with deficiency of vital nutrients required during pregnancy are also some of the areas covered in this chapter.

The literature demonstrates that food insecurity and nutritional problems are good examples of emergencies that can be "long term" or "silent", which can continue for many years sometimes fluctuating in severity but never fully resolved (Wright & Husemann, 2006). This shows that they are different from more '"acute" disasters like tsunami and earthquakes. Pregnant women are more vulnerable to malnutrition because they have higher nutritional demands. Findings from the Zimbabwe National Nutrition Survey (2010), the 2010 Zimbabwe Vulnerability Assessment Committee (ZIMVAC), the 2009 -2013, The 2009-2013 National Health Strategy for Zimbabwe (2010), the Zimbabwe 2009 Multiple Indicator Monitoring Survey (MIMS) and the Zimbabwe 2010 Crop & Food Security Assessment Mission (CSFAM) that reveal the nutritional status of the Zimbabwe population are also cited in this chapter.

However, the limitation with the above surveys is, previous work has been more focused on children and pregnant women were rarely included in the surveys. The Spheres Handbook (2011:156) highlights that it is a widely accepted practice to assess malnutrition levels in children aged 6 - 59 months as a proxy for the population as a whole but is quick to point out that groups like the pregnant that may even be at greater risk might be left out. The chapter

also establishes how the World Food Programme (WFP) has been managing nutrition for pregnant women in food aid interventions similar to VGF in Mbire elsewhere in the world.

2.2. Nutritional Vulnerability of Pregnant Women

Pregnant women are nutritionally vulnerable. This means that they are susceptible to developing risks associated with deficiency of vital nutrients required because their diets cannot cater for all the nutritional requirements or because of other factors (The State of Food Insecurity in the World [SOFI], 2000). **Nutritional vulnerability** is the presence of risk factors of malnutrition which means that a person is already malnourished (Hewitt et al., 2006:335). It is also defined as the factors that make a community susceptible to malnutrition, which covers the causes of malnutrition. This implies that nutritional vulnerability of pregnant women is a result of interplay of various diverse factors like environmental (inadequate water and sanitation), socio-economic and cultural factors, morbidity and inadequate food and lack of maternal care (UNICEF 1998:10).

Research has proven that pregnant and lactating women represent a large segment of the nutritional vulnerable in the world and their nutritional status can affect the health status of other household members especially children (Campilan, Sreenath, Prain, 2009:1). The same view is shared in the Women, Infants and Children (WIC) Programme Report (National Research Council, (2002:115) where it is highlighted that nutritional requirements for pregnant and lactating women are higher than for other women and deficiency in nutrients are potentially more serious for pregnant women than for other women or men. However, it should be noted that nutritional vulnerability does not mean that disaster will automatically follow (WHO, 2002:15). It only means that the pregnant women are more exposed to danger that is, they are more susceptible to nutritional deficiency risks and diseases that can result in maternal and infant mortality.

Nutritional vulnerability/malnutrition can be assessed using the following anthropometric indicators Mid Upper Arm Circumference (MUAC), the Body Mass Index (BMI)) and direct assessment of micronutrient deficiency using clinical and subclinical deficiency (WFP, 2000). Evaluation of the nutritional adequacy of a food ration and providing information on micronutrient supplementation coverage can also be used to establish nutrient intake of a population (Spheres Handbook, 2011:156). This therefore means that the terms malnutrition and nutritional vulnerability mean the same so, they will be used interchangeably throughout this document.

2.3. Why the Focus on Vulnerable Pregnant Women

Wisner, Blackie, Cannon & Davies (2004:127) admit that of all the disasters famine is perhaps the most damaging because it results in malnutrition. They go on to state that whilst the worst recorded earthquake in 1976 China (Tangshan) death toll was 240 000 in the 20th Century, it is dwarfed by the famous Great Leap Famine of 1958- 1961 where between 14-26 million were affected. If these were the effects to ordinary people what more was the damage of nutritional deficiencies to vulnerable pregnant women who had higher nutritional demands. UNICEF (1998) supports that malnutrition is very risky when it reveals that over 600 000 women die worldwide each year from pregnancy related problems.

The same view is shared in the 2011 -2016 Uganda Nutrition Action Plan [UNAP] (2011). where it is stated that iron deficiency anaemia is the leading cause of maternal mortality accounting for 20% of the estimated 536 000 maternal deaths worldwide annually. After realising that malnutrition was rampant in Uganda and different forms of malnutrition affect women the UNAP was implemented with the goal of improving nutritional status of all Ugandans with an emphasis on women of reproductive health age (15 – 49 years), children and other vulnerable groups (2011 -2016 UNAP, 2011).

The SOFI report (2010:10) highlights that majority of the undernourished, pregnant women included live in developing countries (for example Bangladesh, China, DRC, Ethiopia, India, Indonesia and Pakistan) and over 40% live in China and India alone. This shows that malnutrition is a global problem and pregnant women are among the most affected as reflected in the next two paragraphs below.

Contrary to popular view in the developing countries, Africa is not the only country where malnutrition is getting worse (Webb et al., 2006:58). WFP (2000:21) reveals that micronutrient deficiency malnutrition is widespread in developing countries and the most common is anaemia. Beginning of the year 2011, the Democratic People's Republic of Korea (DPRK) was facing serious food shortages and a Rapid Food Security Assessment (RFSA) revealed that pregnant women were among the most vulnerable groups identified (DPRK EMOP 200266, 2011:4). The prevalence of malnutrition among women aged between 15 and 49 years was said to be at 26% that is those with a MUAC below 22.5 cm and this is considered a public health threat.

It is surprising to note that, even in industrialised nations and countries in transition for example in Eastern Europe and former Soviet Union nutritional vulnerability of women and children remain high; at 34 million children, men and women included according to the SOFI (2000:IV). The report further states that there are more chronically hungry people in Asia and the Pacific but the effects of malnutrition are greatest in 46% of the Sub–Saharan African countries. Other countries where malnutrition of pregnant women is rife are Afghanistan, Bangladesh and Mongolia (Webb et al., 2006). Nutritional vulnerability in most countries is not only about insufficient food as explained in the following paragraph.

It should be emphasised that even if a country has enough to feed the whole population, some groups still remain vulnerable because of inequitable distribution of resources or their need for additional nutrients. For example, although the Caribbean and Latin America produces enough food to meet nutritional needs of three times the current population malnutrition especially in rural areas is still prevalent (World Bank, 2006d:12). The reason why pregnant women are regarded as more vulnerable to malnutrition than non-pregnant women or men will be explained in the next paragraphs.

Campilan, Sreenath & Prain (2009:16) argue that biologically women and men differ in needs for nutritional well-being. Although pregnancy can be viewed as a normal process, there are changes that take place in the mother's body and these lead to nutritional stress for her because her uterus grows, placenta develops, total blood volume increases, heart and kidney works harder and body fat stores increase in preparation of birth and milk production (Insel & Wardlaw 1999:454). The same view is shared in the WFP (2000:23) where it is highlighted that nutrients intake need to be increased because there is physiological adaptation such as increased absorption of nutrients during pregnancy and deficiency causes a wide range of disorders and diseases, disability or mortality.

Tomkins (2001:8) also adds that if a woman is already malnourished before pregnancy and continues to have inadequate supply of nutrients during pregnancy, physiological competition between the mother and the foetus will result and both may be at risk. However, Fox and Cameroon (1995) are of the opinion that there is also need to watch out for toxicity of some nutrients if consumption is excessive especially where micronutrients supplements are used.

Research has also proven that, during pregnancy 30 000 kcal (336 MJ) are required to produce a baby, increase the size of the placenta and reproductive organs, provide energy for newly formed tissues and create additional fat stores in the mother (WFP, 2000:57). Those

carrying twins or triplets are even more vulnerable because they are not only dealing with the nutritional vulnerability of the mother but also that of the children to be born. Vulnerable pregnant women in Mbire live in households which are food insecure (ZIMVAC, 2010) and cannot build up the 30 000 kcals stated above hence will remain nutritionally vulnerable.

Lack of basic maternal care at health centres or in the home in developing countries rural areas can also result in nutritional vulnerability. The SOFI report (2000) highlights that, with diseases and lack of adequate health care people become more vulnerable, fragile and sensitive to shocks. The Zimbabwe MIMS Report (2009) revealed that 39% of pregnant women in rural areas in Zimbabwe were not accessing maternal health care and were now delivering at home with the assistance of the traditional birth attendant because of financial constraints.

A pregnant woman is expected to demonstrate that she is still capable of doing any physically demanding work, feeding the whole family and be the last one to feed (Oniang'o & Mukudi, 2002). Campilan, Screenath & Prain (2009:17), comment that pregnant women are the most vulnerable in poor households because *"they eat less and last."*

2.4. Malnutrition

2.4.1. Malnutrition in relation to Disaster and Risk Management

One may wonder how nutritional vulnerability fits into disaster management. To understand why nutritional vulnerability has been discussed from the disaster management perspective it is necessary to first discuss nutritional terminology and explore the underlying determinants of malnutrition. Attempts will be made to reveal that nutritional vulnerability result not only from one disaster but also from complex disasters like drought and political violence, which lead to poor water and sanitation facilities, disease outbreak and displacements.

WHO (2002:3), defines a disaster as an occurrence disrupting the normal conditions of existence and causing a level of suffering that exceeds the capacity of the affected community to cope using its own resources. The loss can be in material, economic, human and environmental. This may sound as if malnutrition does not qualify as a disaster. Wright & Vesala-Husemann (2006) asserts that while many disasters have been acute, many more could be described as "long term" and "silent" and malnutrition, which results from inadequate food or other factors, is a very good example. It is even worse when it affects pregnant women and children or the chronically ill.

In any disaster, it is paramount to ensure nutrition security because malnutrition can contribute to health epidemics through creating a vicious cycle whereby it impairs the immune system and increases the incidence and severity of infections (MSF, 2006:4). On the other hand, the infections often cause malabsorption of nutrients (through diarrhoea and thrush) and poor appetite and nausea, which further worsens the situation (WFP, 2000:25). This can ultimately lead to death. The SAFAIDs News 2 (2009:4) asserts that malnutrition is a major factor contributing to the maternal deaths and death of the HIV infected vulnerable women in Sub- Saharan Africa. Victims of any disaster can become nutritionally vulnerable if nutritional programming is lacking. Therefore, careful planning is needed when managing nutrition during disasters.

According to WFP (2000:55), the WFP Policy for Ending Inheritance of Hunger, developed for some of the issues affecting its programmes reveals that the problem with inadequate food is, *"Less visible but all the more damaging are the long effects of hunger that run through families through succeeding generations."* The effects live permanent invisible scars. Research has proven that*, "Malnourished women give birth to babies whose start in life is already compromised by their small size and are susceptible to diseases."* (WFP, 2000:55). What make it an issue of concern is both the mother and the unborn baby become nutritionally vulnerable. Therefore, more exploration on malnutrition will be given.

2.4.2 Malnutrition Defined

The WFP (2000:19) defines malnutrition as "*A state in which the physical function of an individual is impaired to a point where he or she can no longer maintain adequate bodily performance processes as growth and pregnancy, lactation, physical work and recovery from disease."* According to the SOFI report (2000)**,** malnutrition encompasses the broad range of problems that occur when dietary energy or nutrients intake are insufficient, excessive or simply imbalanced. This includes under nutrition and obesity (WFP, 2000). However, although research has proven that obesity has been on the rise in Southern Africa because of high intake of fats and sugars in urban diets (Disease Control Priorities Project, 2007), this is rare among vulnerable populations staying in very remote areas like Mbire where people lack access to adequate food, water and sanitation and health services. Bellamy (1998:10) reveals that there are various forms of malnutrition and these usually appear in combination and contribute to each other for example, Protein Energy Malnutrition (PEM), iodine deficiency disorders and deficiency of iron, calcium and vitamin A. As a result, this document is going

to be focusing on malnutrition that result from insufficient intake of nutrients (under nutrition) and other factors as explained in the following paragraphs.

The SOFI Report (2000:9), states that malnutrition (under nutrition) is identified through wasting, stunting, low dietary energy supply, underweight and low Body Mass Index (BMI). It is not synonymous with lack of food as some people believe and can result from both macronutrient (energy and protein) and micronutrient (minerals and vitamins) deficiencies. However, the Spheres Handbook (2004:187) largely considered the blueprint of aid work stipulates that there is no clear, tested and agreed definition of malnutrition in adults and adolescents but the fact remains that it affects human beings, pregnant women and children being some of the most vulnerable.

According to the WFP (2000:21), micronutrient malnutrition is widespread in developing countries and the most common deficiencies and risks associated are due to lack of iron (anaemia), iodine (goitre and cretinism), vitamin A (xerophthalmia) and calcium (osteoporosis and osteomalacia). What makes it an issue of concern as cited by Webb, et al. (2006) is that, outbreak of these and other types of disorders have been noted in emergencies among populations dependent on food aid. Since the majority of the vulnerable pregnant women beneficiaries depend on food aid they may also suffer from the above-mentioned deficiencies.

The Joint Statement by WHO, WFP & UNICEF (2007:1) supports that micronutrient deficiency has become an issue of concern globally. The report further states that, around 2 billion people in the world are estimated to be deficient in key vitamins and minerals like iron, zinc and iodine. Pregnant and lactating women and children are listed as the most vulnerable (Webb et al., 2006). Therefore, this means that malnutrition does not only result from macronutrient deficiency. Malnutrition is risky in most developing countries in the world because it increases the general risk of infections and illness and dying from endemic diseases in the areas like malaria, diarrhoeal diseases (SAFAIDS News 2, 2009).

The WFP (2000:19) laments that for a long time Protein Energy Malnutrition (PEM) has been considered the most common form of malnutrition among infants and children and malnutrition which result from other deficiencies or which affect adults have been overlooked. For example, the annual Zimbabwe National Nutrition Survey focuses only on children and lacks information on micronutrients status of both children and adults. This

obviously will not be a true reflection of the nutritional status of vulnerable pregnant women. Various factors interact to cause malnutrition among pregnant women.

2.5. Causes of Malnutrition

The 2011 – 2016 UNAP (2011:23) adds inadequate maternal care as one of the underlying causes of malnutrition, for example there are teenage pregnancies, short birth intervals, high workload for women and lack of knowledge on good maternal caring practices as causes of malnutrition in Uganda. These apply to vulnerable women in most developing countries like Zimbabwe. Figure 2.1 indicates the underlying causes of malnutrition and mortality.

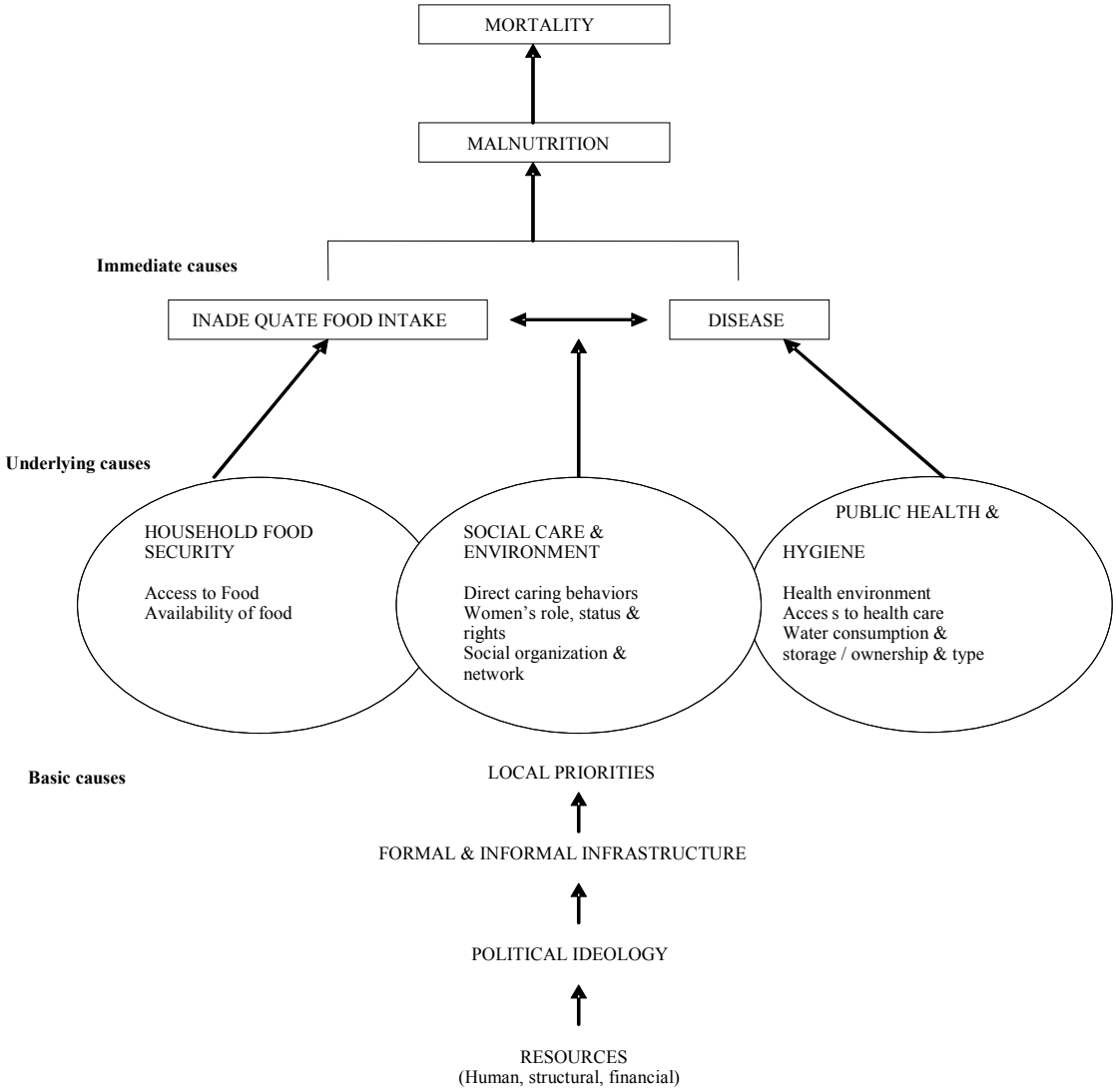


Figure 2.1 : Figure 2.1 UNICEF Framework of Underlying Causes of Malnutrition and Mortality

Source: MSF Nutrition Guidelines (2006:5).

2.5.1 Inadequate diet

Usually the very food insecure households depend on food aid during emergencies to cater for their nutritional requirements since they will be very poor without any source of food, income and livelihood. As for the VGF programme, it is designed just to alleviate short-term hunger (MSF, 2006). Therefore the food basket cannot provide the essential nutrients, and pregnant women are among the most affected vulnerable groups. The SOFI report (2000:19) reveals that in households where food security is precarious, women are more often vulnerable than men are to malnutrition because of their different physiological needs. To

ensure that pregnant women's needs are addressed this has to start well before pregnancy as explained in the paragraph below.

According to Insel and Wardlaw (1999:450), *"Good nutrition is critical during child bearing years and the health and nutritional habits of woman in the years before pregnancy and while she is trying to get pregnant or has the potential of becoming pregnant is particularly important."* This is supported by Chatterjee (1990), who highlights that while malnutrition is prevalent among segments of a population, poor nutrition among women begins at infancy and continues throughout their lifetime. Therefore vulnerable pregnant women who lack access to a nutritionally balanced diet during childhood and adolescence will suffer the consequences during pregnancy or after birth. Early research supports the importance of good nutrition in pregnancy. A good example is of the study carried out in Toronto that proved that dietary supplements and nutritional counselling led to the improvement of the health of pregnant mothers, reduced birth complications and yielded healthier babies (Insel & Wardlaw, 1999:454). In summary, pregnant women should be better nourished so that they could nourish their babies from conception to lactation (UNAP, 2010).

The Zimbabwe National Nutrition Survey (2010:30) notes the lack of recommended diversity in the number of food groups received by 30.7% of the children between 6- 23 months sampled for the survey in Mbire. In the same report, Mbire is cited as one of the few districts in Zimbabwe with a minimum acceptable diet (which is a composite of meal frequency and diversity) and food products like eggs, milk and meat were rarely included in the diet. Wright and Vesala-Husemann (2006) argue that nutritional needs for mothers are unlikely to be met if they cannot first meet the nutritional needs of their children. Hence, they are more likely to be nutritionally vulnerable. This shows how vulnerable pregnant women are.

The nutritional composition and the lack in diversity of the food basket offered to the vulnerable pregnant women through the VGF programme are revealed in the paragraphs below.

(a) The VGF food basket

Since majority of the vulnerable pregnant women will be depending on the food basket for their nutritional requirements it will be critical to take a closer look at the food basket and analyse whether it meets pregnancy nutritional requirements. Ration/Food Basket is the type

and amount of food provided daily to each beneficiary in a food emergency programme (Spheres Handbook, 2011).

The table below illustrates the commodities usually distributed for the VGF programme and their nutritive value as adopted from the WFP (2000:114).

TABLE 2.1: WFP COMMODITY LIST

COMMODITY	ENERGY (KCAL)	PROTEIN (G)	FAT (G)
***Cereals*:**			
Rice	360	7.0	0.5
Sorghum/ Millet	335	11.0	3.0
Maize	350	10.0	4.0
Processed Cereals:			
Maize Meal	360	9.0	3.5
Bulgur Wheat	350	11.0	1.5
***Oils and Fats*:**			
Vegetable Oil	885	-	100.0
Pulses:			
Beans	335	20.0	1.2
Peas	335	22.0	1.4
Lentils	340	20.0	0.6

*Nutritive Value per 100 g

Source: WFP (2000:114)

Webb *et al.* (2006:52) emphasizes that the quality of rations need to be enhanced not only through a balanced food basket but also by adding nutritive value to food through micronutrient fortification. As for the VGF food basket the vegetable oil is fortified with vitamin A and D.

According to the Christian Care VGF Proposal for Mbire District (2009:3), the monthly food basket consists of 12.5 kg of cereal, 0.6 kg of vegetable oil and 1.8 kg of pulses per person per month. The ration is distributed irrespective of physiological status, gender and physical activities one engages in and is not enough to cover 2 100 kcals required per person per day. The 2100 kcals/day is the average estimated per capita energy requirement according to Spheres Standards (2004) and is based on the assumption that the people will be engaging in light work (National Research Council, 1995) which is not the case with the vulnerable pregnant women in most developing countries. The figure is consistent with the figure in the WHO Manual for managing nutrition in emergencies (WHO, UNHCR, IFRC & WFP, 2000:2).

The VGF food commodities are issued as dry rations and distributed through government structures and traditional leaders to the most vulnerable (the very food insecure) people in the community (Christian Care, 2010) and some pregnant women are also targeted for the programme. The food basket for the VGF programme is designed to meet the nutritional requirements for a population not wholly dependent on food aid. According to the ZIMVAC Report (2010), it is assumed that these beneficiaries have other sources of food to cater for their nutritional requirements. There is failure to realize the problem that they are selected on the basis that they are poor, do not own assets and do not have any source of livelihood. It is very difficult for them to have other sources of food.

(b) Vulnerable Group Feeding Programme Food Basket

Nutritional requirements are defined as the average quantity of nutrients an average person needs everyday to remain in good physical and mental health taking into account her physiological condition, sex, weight, age and environmental and physical activity (Perrin, 1996). The VGF food basket is designed just to alleviate short-term hunger, not to cater for the beneficiaries' nutritional requirements (Christian Care, 2009). The MSF (2006) maintains that, the VGF Programme is meant to alleviate short-term hunger not to prevent deterioration of nutritional status. As a result, it cannot offer the required nutrients for vulnerable pregnant women.

The Spheres Handbook (2011) stipulates that during food aid interventions, there is need to meet nutritional needs of the whole population by ensuring access to Vitamin A, C and iodized salt, additional sources of niacin (pulses, nuts, fish) if the staple food is maize or sorghum. This unfortunately is partially achieved for some of the VGF operations throughout the world (Webb *et al.,* 2006).

The joint monitoring statement by WHO, UNICEF & WFP (2007:1), designed to address problems that arise in emergency interventions asserts that it is critical during emergencies that food aid rations are adequate, fortified and well balanced to meet nutritional needs and are distributed regularly in sufficient quantities. This can help to ensure that nutritional requirements for the vulnerable pregnant women are met. The Spheres Handbook (2004:57) stipulates that rations should be planned to make up for the differences between the nutritional requirements 2100 kcal/day and what the population can provide for own consumption. This cannot work for vulnerable pregnant women who depend on the food

basket for their nutritional needs. Commodities from WFP have the following limitations given below.

One of the challenges that WFP faces when coming up with standard rations for vulnerable populations is that commodities are sourced from different donors in different countries for example Norway, China and Malawi. This creates confusion in cases where both fortified and unfortified oil is distributed (Webb *et al.,* 2006:74). For example in the 2009 –2010 Mbire VGF programme, vegetable oil in 20 litre plastic containers without micronutrient specifications were distributed (VGF, 2010). It presents a challenge to vulnerable pregnant women if micronutrients like Vitamin A and D are lacking. It complicates the whole issue because it will be hard for WFP and its partners to make judgments on alternative food basket compositions where micronutrient deficiencies are of concern (Webb *et al.,* 2006).

After establishing that the majority of the vulnerable pregnant women depend on the VGF food basket for their nutritional requirements, it is critical to take a closer look at it and see whether it is offering the nutrients essential during pregnancy. They are discussed in the paragraphs below.

(c) Nutritional inadequacy of Food Basket for vulnerable pregnant women

Regarding the protein requirements the general practice is, source of protein distributed during food aid interventions are pulses (lentils, cowpeas, sugar beans or peas) as stated by Perrin (1996). The disadvantage of these commodities distributed as source of protein is that the proteins from pulses are deficient in essential amino acids, and cereals lack lysine and methionine, essential during pregnancy.

Elson and Haas (1992:54) argue that the diet of a pregnant woman needs to be balanced so that she gets sufficient essential amino acids (building blocks for protein) in easily digested and easily assimilated forms essential for good health. This is supported by Fox and Cameroon (1995:170-172) who state that pulses offer low biological value (LBV) proteins, which are not easily digested and absorbed by the body. Therefore if pulses are used as the only source of protein this will not be a good source of protein for pregnant women. There is need for complimenting with animal protein.

Proteins during pregnancy are vital for building and maintenance of tissues, hair and nails. Insel and Wardlaw (1999:451), argue that protein deficiency during the first trimester is a disadvantage to the growing foetus for this is a period of major organ formation through rapid increase in the number and size of cells. Proteins are also important for building important substances like hormones, antibodies and haemoglobin iron bearing protein (Fox & Cameroon, 1995). For the vulnerable pregnant women, deficiency of proteins results in lack of antibodies and compromises immunity. This makes them more prone to health hazards like cholera, pneumonia and malaria.

Lack of animal products in the food basket may also result in Vitamin B12 (cobalamin) deficiency in the vulnerable pregnant women. It is essential in very tiny amounts for the production of nucleic acids, in the complex cell division in the body, for formation of red blood cells combined with folate and iron and important for the production of the myelin tube or sheath that surrounds each nerve fibre (Fox & Cameroon, 1995:254)

- **Vegetable oil** constitutes fat in the food basket. The advantage of having oil in the food basket is that it improves the palatability of the diet, and increases energy density (WFP, (2000:66). It is further stated that vegetable oil commonly distributed for emergencies is rape seed oil usually fortified with Vitamin A and Vitamin D, but this is not enough to meet nutritional requirements for vulnerable populations as elaborated in the paragraph below.

  Although the vegetable oil distributed is fortified with vitamin A and D the joint monitoring statement by WHO, WFP & UNICEF (2007:1) warns that fortified foods may not fully meet the needs of pregnant women in less developed and poor countries where people have difficulties in accessing micronutrient rich foods like fruits, vegetables, animal products and fortified foods. For example in Mbire, these food products are beyond the reach of the vulnerable pregnant women (Zimbabwe National Nutrition Survey, 2010).

  According to the 2009–2013 National Health Strategy for Zimbabwe (2010) micronutrients deficiency represents a significant health problem in Zimbabwe, especially iron, vitamin A and B vitamins. Unfortunately pregnant and lactating women and children are more vulnerable to micronutrient deficiency and this carries greater risk of dying during childbirth (UNHCR, 2007:301). Micronutrients, elaborated below, are vital not

only during pregnancy but throughout the life cycle. Deficiency results in nutritional risks.

- **Iron**

The main source of iron in the food basket, since maize (the cereal usually distributed) is very low in iron, is pulses, which have the following disadvantages. Non-hem iron that constitutes pulses is not usually biologically available and can easily be inhibited by certain agents (Boyle & Morris, 1999:389). Insel and Wardlaw (1999:464) recommend an increase in iron intake for maternal and foetal needs and add that this can be achieved by supplementation if the diet is lacking. Unfortunately, micronutrient supplementation coverage in Zimbabwe has not been satisfactory.

The Zimbabwe National Nutrition Survey (2010:52) revealed that a coverage of only about 27, 8% was achieved in maternal micronutrient supplementation coverage in Mbire where folate and iron were administered through health centres. Fox and Cameroon (1995:225) list the following, as good sources of iron eggs, green leafy vegetables and organ meats, beef and fortified cereals. These, except for cereals, are not part of the commodity list for products usually distributed by VGF. According to the Zimbabwe National Nutrition Survey (2010:52), these were rarely included in the diet of households in rural areas and might be an indication that vulnerable pregnant women are still nutritionally disadvantaged and this carries a number of risks.

Iron deficiency anaemia, a decrease in number of red blood cells that results from inadequate dietary intake of iron or folate or loss of blood (Donavan & Gibson, 1995), can affect vulnerable pregnant women. This leads to impairment of the immune system, which can result in death. Webb, *et al.* (2006:48) state that malnutrition's contribution to mortality is through disease. The joint statement by WHO, WFP & UNICEF, (2007) concurs with SOFI (2000:17) that about two billion people in the world, mostly women and children, are anaemic and this contributes to maternal mortality through disease. As a result, the Spheres (2011:161) emphasises that pregnant and lactating women are supposed to receive iron and folic supplements before and after pregnancy; vitamin A within 6 – 8 weeks of delivery and this should be in accordance with internationally recommended doses. Unfortunately, this is rarely achieved in emergencies, and leads to nutritional vulnerability of the disaster victims.

- **Importance of iron in the body**

  Iron is crucial in haemoglobin synthesis during pregnancy, and is critical for the transfer of oxygen to various sites in the body (Insel & Wardlaw, 1999:464). Elson and Haas (1992:700) add that it aids in disease resistance and elimination. If a pregnant woman does not get enough in the diet, it will deplete her sources for transferring to the foetus because of increased efficiency in absorption, and she will end up nutritionally vulnerable.

  Women lose a lot of blood during childbirth. Research has proven that 140 women die daily in childbirth throughout the world because of severe anaemia (Webb *et al.,* 2006:68). The same view is shared in the joint statement by WHO, WFP & UNICEF (2007:1), where it is highlighted that iron deficiency is one of the most prevalent micronutrient deficiencies affecting at least half of all the pregnant women in developing countries.

- **Calcium**

  Calcium is another micronutrient that may be insufficient in the VGF Food Basket. Insel and Wardlaw (1999:464) list the following as the practical food sources of calcium that can easily be absorbed; milk, fortified orange juice and cheese, and these are not provided in the food basket. Usually, vulnerable pregnant women's diets lack in meat and milk because of poverty and lack of livestock like cattle. Fox and Cameroon (1995:222) add dark green vegetables and fortified cereals, and nuts as the other sources of calcium, and the food basket do not offer these commodities.

  Elson and Haas (1992:700) highlight the following functions of calcium during pregnancy. It helps to form the baby's teeth, aids muscle and heart function, prevents blood clotting and nerve transmission. Insel & Wardlaw (1999:464), asserts that calcium is vital during pregnancy for it promotes adequate mineralization of the foetal skeleton and teeth. Therefore, it is very important for both the pregnant mother and the developing baby.

Inadequate intake of calcium results in the vulnerability of the mother because her body will draw it away from her bones through the blood to nourish the growing foetus (Insel & Wardlaw, 1999:454)). The vulnerable pregnant woman will be nutritionally at risk of developing osteoporosis (fragile or shrunken and painful bones that can easily break) or osteomalacia (bending of bones) later in life (Fox & Cameroon, 1995:224). The two authors reveal that osteoporosis used to be a common disease in the developing countries amongst women who had suffered repeated pregnancies. The pregnant woman can also bleed to death during childbirth if calcium is not enough to aid in blood clotting, especially if this is compounded with anaemia.

It is very important to note that calcium cannot work in isolation. It needs **phosphorous** which is present in nucleic acids which forms part of all cells responsible for manufacturing of body proteins and transmission of hereditary characteristics but more of it can cause calcium to be pulled from the bones easpecially for those with kidney problems (Mahan & Escott-Stump, 2000). It is also part of the Adenosine Triphosphate (ATP), which plays a complex process of oxidation for the body to benefit from the nutrients (Fox & Cameroon, 1995:223). Phosphorous is present in milk, cheese, bread, cereals and green vegetables and is essential for energy storage and transfer, cell division and reproduction (Elson & Haas, 1992). Except for cereal, which is very low in calcium the above-stated sources, are not part of the VGF food basket. Therefore, the pregnant women will be nutritionally vulnerable.

Fox & Cameroon (1995:322) recommend an RDA of 1000 milligrams/day of calcium for a pregnant woman. Wardlaw (2000:423) recommends an RDA of 1300 milligrams/day for the 14-18 years age group where the women are at adolescent stage, still growing and developing bones. This can help them to cope with both pregnancy and adolescence demands. Teenagers who marry or get pregnant very early due to religious, traditional and economic demands are the most vulnerable (*The Herald Zimbabwe*, 23, July 2011).

- **Folate/ Folic Acid**

Folate is a crucial nutrient during pregnancy needed for formation of red blood cells and supporting the development of the nervous system of the foetus (Elson & Haas, 1992:700). In fact, it is needed for the synthesis of DNA which means growth of the foetus depends on this according to Insel and Wardlaw (1999:463) who emphasize that,

"it deserves the most attention with respect to diet planning during pregnancy", because foetal and maternal growth need this. Good sources for folate are folate-fortified foods, folate rich fruits and leafy vegetables, whole grains, yeast, fish, dairy products and organ meats and most breakfast cereals (Elson & Haas, 1992). These are not provided in the VGF food basket and unavailable and very expensive. This leaves pregnant women vulnerable to the development of anaemia.

- **Dietary fibre (non-starch polysaccharides)**

The ration lacks in adequate dietary fibre (non-starch polysaccharides) essential for the absorption of water, binding of food residues to itself and ensuring quick digestion of food. Constipation is a common problem during pregnancy hence fibre intake needs to be increased (Fox & Cameroon, 1995). The majority of vulnerable pregnant women in most developing countries are prone to develop risks associated with deficiency, because their diets do not cater for this and fruits and vegetables are usually not readily available throughout the year.

- **Iodine**

The VGF ration in Mbire does not provide for iodized table salt. WFP (2000:3) agrees with Boyle and Morris (1999) that iodine is necessary for the development of the foetus's brain and nervous system during the first three months of gestation. It is also important for the pregnant mother, because it is an essential constituent of hormones produced by the thyroid gland in the neck (Fox & Cameroon, 1995:232).

Although the 2009 − 2013 National Health Strategy for Zimbabwe (2010:51) reveals that Iodine Deficiency Disorders were eliminated after the MoHCW launched a universal salt iodisation programme in 1999, Mbire, still has pockets of areas with people who cannot afford to buy the iodised table salt. Those who cannot afford use locally processed salt. Mbire has a type of grass that only elderly women are allowed to harvest and process into salt (*The Herald Zimbabwe, 23 September 2011*). However, more scientific research is needed to determine whether the salt from the saltpans in some parts of Mbire is rich in nutrients required by the vulnerable pregnant women, for example iodine. Deficiency of iodine carries the risk of development of goitre for the mother and severe mental and physical disability for the baby if the water they drink is deficient in iodine (WFP,

2000:2). Hence, although it is needed in tiny amounts iodine plays a critical dietary role during pregnancy. So one wonders why it is not distributed in most WFP operations worldwide.

The WFP guidelines procurement specifications recommend that iodized salt be part of the food basket for emergency operations. However, because salt is a commodity which is needed in very tiny amounts it presents logistical challenges because it is difficult to track. That is the reason why it was not being distributed in 68% of WFP operations worldwide according to reviews done in 2006 (Webb *et al.,* 2006:61).

- **Zinc**

It is one of the important minerals needed during pregnancy as it supports growth and development (Wardlaw, 2000:424). According to Fox and Cameroon (1995:231), it forms part of the enzyme found in red blood cells that assist in respiration. It is responsible for protein and carbohydrate metabolism. With inadequate zinc intake the pregnant and vulnerable women run the risk of having low birth weight (LBW) babies (Wardlaw, 2000). This can result in infant mortality. A LBW baby weighs between 2000 -2499 grams (World Bank, 2006d). Although the rich sources of zinc are shellfish and Oysters (Elson & Haas, 1992:700), Insel and Wardlaw (1999**:**464) affirm that if a pregnant woman has adequate supply of protein it can also supply enough zinc. The VGF food basket offers LBV protein and hence is poor in zinc. The graph below in Figure 2.2 summarizes the nutritional requirements of pregnant women.

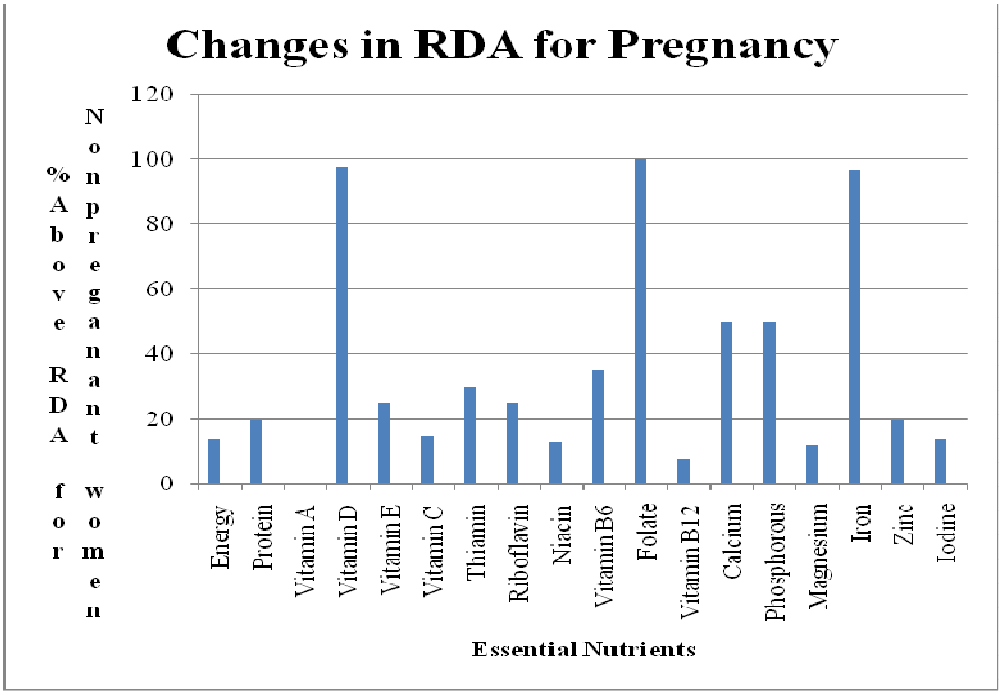


Figure 2.2. Changes in the Recommended Dietary Allowance for Pregnant Women
Source:Insel and Wardlaw (1999:460).

During pregnancy, some nutrients are needed in greater amounts than at other times; these include vitamin D, folate and iron. Even for those vulnerable pregnant women who may have been lucky to receive the maternal iron/folate and vitamin A supplementation, this on its own is not enough since nutrients interact for them to be absorbed by the body as elaborated below.

It is very important to note that, nutrients do not work in isolation. According to Fox and Cameroon (1995), a lot of interaction takes place for nutrients to be absorbed and be of nutritional benefit to the body. Providing folate without Vitamin C (of which rich sources are fruits and vegetables) may not yield intended results. Vitamin C is needed for the absorption of iron (Wardlaw 2000:423) and vitamin D for the absorption of calcium and phosphorous, which are important for bone and teeth formation and maintenance and blood clotting (Wardlaw, 1999:463). For synthesis of transferrin (an iron transport protein) vitamin A is required. Folate and vitamin B12 are needed for packaging of folate into cells (Elson & Haas, 1992). Vitamin E is required for the absorption of vitamin A and its mobilization from the liver. Zinc is essential for proteins and carbohydrates for metabolism (Fox & Cameroon, 1995). Absence of other nutrients in the diet may result in a waste of other nutrients consumed (Boyle & Morris, 1999) resulting in a number of nutritionally-related risks.

2.5.2 Water, sanitation and hygiene

(a) Water

Water and sanitation are other important determinants of nutritional status of individuals who live in any area (WFP, 2000:26). Water is essential during pregnancy and a diet without clean, safe water is incomplete. According to Elson and Haas (1992:15), it constitutes 70% of the human body and caters for the following functions; "It is required for metabolic function reactions, keeps linings of mucous membranes, digestive tract and bronchial tubes moist." It is also required for all body fluids (digestive juices, blood, saliva, sweat, urine) and some nutrients need to dissolve in water for proper absorption (Tull, 1997). Therefore if it is lacking in the body it means that even if a person eats enough food these processes of digestion, assimilation and metabolism will be disturbed and then the body will not be able to utilize the food optimally (Webb *et al.,* 2006). This can lead to the deterioration of the nutritional status of vulnerable pregnant women.

According to WHO, nutritional status is compromised when people are exposed to high levels of infection due to unsafe and insufficient water supply and inadequate sanitation WHO Report on World Water Day (August, 2001). The report also supports that inadequate water and sanitation contributes to *"secondary"* malnutrition that results when a person suffers from diarrhoea and fails to benefit fully from the food he will be consuming, because frequent stools prevent adequate absorption of nutrients. Diseases that are linked to consumption of contaminated water are typhoid, cholera, viral hepatitis (Hutley, Morris & Pissana, 1997). All these diseases contribute to deterioration in nutritional status. The Global Water Fund summarises the importance of safe water and adequate sanitation for pregnant women as stated in the following statement: "*Clean water and sanitation reduces diseases that undermine maternal health and contribute to maternal mortality*." Global Water Fund: Government Services (2003-2011 Copyright). This shows that safe water and adequate sanitation provision is vital for pregnant women.

UNICEF (1998) estimates that 1.1 billion people lack access to safe drinking water and 2.9 people lack access to adequate improved sanitation. The report further states that this results in spreading of infectious diseases, which in turn are the major causes of malnutrition. It should be noted that usually it is the poor marginalised vulnerable populations who do not have access to safe water, adequate sanitation and health services who at the same time do

not have enough food to eat (Wisner *et al*., 2004). All these factors interact to increase nutritional vulnerability of pregnant women staying in these areas as explained below.

The ZIMVAC and Nutritional Surveys carried out so far in Zimbabwe and the Mbire Baseline Survey Report (2009) have proven that water and sanitation are a problem in the Mbire district so it may also be a problem to pregnant women who benefit from the VGF programme. Lack of clean and adequate water supply and sanitation facilities may result in spreading of infectious diseases that may ultimately lead to malnutrition.

The British Red Cross Report (2011) reports that water and sanitation related illness are among the leading causes of death in Zimbabwe. The organization is working with the Zimbabwe Red Cross Society to provide adequate water and sanitation to most vulnerable people living in the rural areas of the Mashonaland Central Province, Mbire District included. Unfortunately, in Mbire for the Masoka and Angwa wards the coverage has been very poor as reflected in the following paragraph.

The Zimbabwe National Nutrition Survey (2010:53) points out that 71, 2% − 80% in Mbire lived in households that have improved water and sanitation facilities. This may be a true situation for the wards just below the escarpment. For remote areas like Gonono and Masoka wards, clean safe water is a problem. The Mbire Baseline Survey Report (2009) states that only 0.06% has access to tap water and are only those residing near the business centres Mahuwe and Mushumbi. Instead of having a maximum of 250 people or 25 households per borehole as stated in the Zimbabwe National Master Plan for Rural Water Supply (1985), in the Masoka area there are 2348 persons per functioning borehole. This results in overuse of boreholes and eventually breakdowns. The water sources provision for Masoka and Angwa are given below in Table 2.2.

TABLE 2.2: BOREHOLE PROVISION FOR MBIRE.

Ward	Functional Boreholes	Non Functional Boreholes	Salty	Seasonal
Angwa 2	16	14	5	0
Masoka 11	1	0	1	1

Source: Mbire Survey Report (2009:23).

TABLE 2.3: SEASONAL SOURCES OF WATER PER WARD

Ward	Wells	Boreholes	Rivers
Angwa 2	9	1	4
Masoka 11	0	0	1

Source: Mbire Baseline Survey Report (2009:24)

The phenomenon reflected in Table 2.3 results in people having to walk for very long distances to fetch water. In Masoka, for example they walk an average distance of 6.5 km and the furthest source of water is 15 km away according to the Mbire Baseline Survey Report (2009). Pregnant women might end up compromising and getting water for household consumption from the nearby major rivers, thereby risking worm infestations and contracting other waterborne diseases, which will in turn lead to malnutrition.

(b) Sanitation

Lack of sanitation and clean water are underlying determinants of malnutrition (MSF, 2006). According to the Mbire Baseline Survey Report (2009:3), more than half of the households have no toilets. The Zimbabwe National Nutrition Survey (2010:53) reflected that 53.2% − 68.6% households utilized improved sanitation facilities and 72.2% − 80.4% lived in households that utilized an improved water source. However, this is not reflective of the true situation in the remote wards like Angwa and Masoka. Table 2.4 gives information on sanitation provision at ward level for Angwa and Masoka.

TABLE 2.4: SANITARY PROVISION FOR ANGWA AND MASOKA

Ward	Number of Households with Blair Toilets	Households with Pit Latrines	Households Without Toilets
Angwa 2	107	27	1446
Masoka 11	69	31	307

Source: Mbire Baseline Survey (2009:20).

(c) Inadequate health, sanitation and hygiene promotion

Hutley, Morris and Pissana (1997) reveal that constant supply of safe water and sanitation facilities is not adequate to improve health and ensure good nutrition. The report further states that it must be accompanied by hygiene promotion, for example research has proven that hand washing with soap or ash reduces diarrhoea malnutrition by 47%. Diahrrea is one of the immediate causes of malnutrition.. Research has revealed that most endemic diseases are not water borne, but are transmitted from person to person through poor hygiene practices

(Essrey *et al*. 1991; Hutley *et al.,* 1997). The Mbire Baseline Survey (2009) cites the lack of basic hygiene practices like hand washing because of lack or scarcity of water in most Mbire areas, poverty and low literacy levels. This shows that the area needs a comprehensive primary health and hygiene promotion to reduce nutritional vulnerability.

2.5.3. Inadequate health services and disease infection

(a) Malnutrition and disease infection

A link exists between diseases and malnutrition because diseases contribute to malnutrition and malnutrition makes an individual more susceptible to diseases (WFP, 2000:23). The MSF (2006) supports that malnutrition can increase the sensitivity to infections, incidence, duration and severity of infectious diseases. It is important to note that certain illnesses and infection such as tuberculosis, malaria and diarrhoea are directly linked to malnutrition (Wright & Vesala-Husemann, 2006).

According to the UNICEF (1998), nutritional vulnerability results from a combination of inadequate food intake and infection, which impairs the body's ability to absorb and assimilate food. Examples of how a combination of inadequate food and disease infection can increase vulnerability of pregnant women are detailed on the page below.

Wisner *et al.* (2004:131) reveal that for Malawi in the 2002 drought/famine, WFP estimated that 70% of the population was at risk not only because of shortage of food. Deterioration in nutritional status resulted in impaired immune system and more susceptibility to HIV/AIDS, cholera, tuberculosis, diarrhoea and bubonic plague. It is recorded that 32 968 already weakened by malnutrition were affected by cholera alone**.** Unfortunately environmental disease burden is high in the sub–Saharan Africa, and malnutrition is rampant there (Poverty –Environment Partnership Joint Agency Paper, 2008:19).People who are sick and undernourished succumb faster than those already well-nourished and healthy**.**

Intestinal worm infestations which hinder the optimal utilization of food consumed may also result from poor water and sanitation, and pregnant women may become nutritionally vulnerable even when subsisting on a nutritionally balanced diet (Webb *et al.,* 2006:53). Ivavov *et al.* (2004) estimate that two billion people in the world are infected by intestinal worms, which thrive in poor unsanitary conditions. It is further stated that this contributes to malnutrition, and the poorest communities of the developing world are the worst affected.

Hence, vulnerable pregnant women are more likely to be malnourished due to worm infestations, which result from lack of adequate water and sanitation provision.

Diarrhoeal diseases result from poor water and sanitation and this will be a risk to the vulnerable pregnant women. They were found to be some of the factors affecting children's nutritional status in Mbire with the per centage of 17, 2% − 23.3% of children between 0 − 59 months having been affected by the diseases in the two weeks before the survey (Zimbabwe National Nutrition Survey, 2010:53). Therefore it is more likely that pregnant women who reside in the same households are all affected. Mbire is one of the few districts affected by the 2008 cholera outbreak that claimed over 3 000 lives in Zimbabwe and more than 8 000 people were affected (ZELA Report, 2010). The surveys carried out so far in Mbire, show that diarrhoeal diseases are a problem in the area. Nutrients will be lost through vomiting and stool and then malabsorption of nutrients results in malnutrition (MSF, 2006).

Inadequate health care compounded by parasitic infections (malaria, bilharzia, HIV & AIDS and diarrhoeal diseases) undermines the nutritional status of vulnerable pregnant women and compromises their immune system (SAFAIDS News 2, 2009). It has been observed that interaction between nutrients is critical in relation to TB and HIV and Aids and according to the WFP (2000:25), the vicious cycle in which diseases and malnutrition exacerbate one another is known as the "malnutrition infection complex." This shows that malnutrition cannot be divorced from the health status of an individual, and vulnerable pregnant women who are HIV positive and chronically ill are at more risk. The worst thing that can happen to a pregnant woman is to lose her life or that of the baby to be born during pregnancy or delivery as elaborated below.

According to Webb, *et al.* (2006:48) malnutrition can result in maternal mortality in cases when iron and vitamin A deficiency leads to anaemia or weak immune system. Micronutrient deficiencies have been proven to increase the general risk of infectious illness and of dying from measles, malaria and pneumonia and these conditions are among the ten leading causes of death in the world (WHO, UNICEF & WFP, 2007:2). This shows how risky it is for pregnant women to be malnourished.

Tomkins (2001:23) reveals that although very little has been published of the effect of malnutrition on maternal health, it contributes to high mortality and morbidity in developing countries. It is further stated that in Nepal vitamin A and B supplementation reduced maternal

mortality by 44%. In Malawi for every 100 000 live births, 807 mothers die partly as a result of malnutrition which contributes to nutritional deficiencies and pregnancy complications UNICEF (2007). It should be highlighted that maternal and infant mortality is a loss of human capital with cumulative long-term social and economic impact (World Bank 2006d: 9). Therefore malnutrition should not only be viewed from a human perspective because it can also affect the economy of the country.

Malnutrition of a woman during childhood and adolescence can lead to stunting and this contributes to obstructed labour, which may result in maternal mortality (Kambarami & Chirenje, 1999: 294 - 9). According to the SOFI Report (2000:19) lack of access to adequate and nutritious diet places pregnant women at greater risk of complications during pregnancy and delivery and many babies and children's deaths in developing countries are attributable to their mothers' poor nutritional status.

It is estimated that a woman living in Africa where adequate diet, health and maternal care lack has 1 in 16 chances of dying in pregnancy (Webb *et al.,* 2006:48). According to the Malawi Multiple Indicator Cluster Survey (2006), Malawi is the riskiest place to have a baby partly because of malnutrition. This means that vulnerable pregnant women are very much at risk. A Filipino was quoted saying, *"A woman giving birth has her one foot in the grave"*. (UNICEF, 2008). This summarises how vulnerable pregnant women are.

(b) Inadequate health care

According to the British Red Cross Report (2011), people living in poor countries often live miles away from health care centres and cannot afford to buy medicine. For the poor pregnant women this leaves them even more vulnerable nutritionally. The disadvantage of having health centres far away from homes is explained below.

Such long distances are prohibitive especially for the vulnerable pregnant women who may end up opting not to go for prenatal checks and give birth at home with the assistance of the Traditional Birth Attendants. They may also not visit the clinic when they are sick and their condition may deteriorate further at home resulting in serious malnutrition (Webb *et al.,* 2006). Efficient and timeous delivery of health services are a pre-requisite to sound nutritional status especially in areas where health epidemics like, cholera, HIV/Aids, malaria are endemic, and there is great food insecurity (UNICEF, 1998).

Serious shortage of drugs and medical equipment to treat diseases is a problem in developing countries rural health centres. (The 2010-2012 Zimbabwe Health Sector Investment Case, 2010). Zimbabwe as a country still has to recover from the total collapse of the health delivery system that the health sector experienced during the economic meltdown from 2000–2008 (Zimbabwe National Health Strategy, 2010:1). Therefore, it is more than what a pregnant woman eats which determines her nutritional status. Webb *et al.* (2006) even cite the lack of skills in disciplines beyond medical training as another cause of malnutrition in addition to non-availability of food.

2.5.4. Wrong or poor cooking methods

Nutritional vulnerability of vulnerable pregnant women can result from poor or wrong cooking methods of some of the unfamiliar food commodities they receive (Christian Care 2010-2011 VGF End of Term Report), for example in Southern Africa commodities like bulgur wheat and lentils. Usually, these are distributed without any cooking instructions and to make matters worse the food basket keeps on changing depending on the donor source. Any type of food has a stipulated cooking/preparation time and ignorance may result in overcooking and destroying of nutrients or undercooking (Fox & Cameroon, 1995). The vulnerable beneficiaries lack the technical and managerial skills, and as a result may fail to benefit from the food they obtain for the programme (Webb *et al.,* 2006).

Because of low literacy levels, the majority of the women in rural areas in most developing countries cannot understand nutritional issues conveyed in English on the packaging of the food commodities. The WFP Cooking Guidelines Handbooks usually used for the emergency programmes are written in English.

This is unlike in other WFP interventions elsewhere like in Rwanda and other countries where the Food for Education (FFE) programme was launched for the schools feeding programmes and the Maternal Child Health and Nutrition (MCHN) programmes, which was introduced in the school curriculum and in vernacular language (Webb *et al.* 2006:52). Nutritional education in Zimbabwe lacks in schools and even at rural health centres because of unavailability of experienced staff and shortage of resources according to the Zimbabwe National Nutrition Survey (2010). As a result, it may be difficult for the vulnerable pregnant women to benefit nutritionally if they do not have the nutritional knowledge about the nutritional content of the food they are receiving and the correct preparation methods.

2.5.5. Gender disparities

Traditional and cultural beliefs may affect maternal care practices at community and household level, which in turn can affect the nutritional status of vulnerable pregnant women. This unfortunately results when consciously and unconsciously women's nutritional needs are deprioritised either because of cultural norms or as part of poor households' short term coping strategies (Campilan, Sreenath & Prain, 2009:17). The World Bank (2006d), states that malnutrition in the Caribbean and Latin America is another indication of social inequalities, which shows that causes of malnutrition are not as obvious or straightforward as most people would think. According to Webb *et al*. (2006), large social and economic gaps exist between women and men in developing countries, and this inequality in a way contributes to nutritional vulnerability as elaborated in the paragraph below.

Discrimination against women is one of the important contributing factors to malnutrition and LBWs in South Asia where it has been proven that malnutrition is linked to women's poor access to education and low levels of participation in paid employment (UNICEF, 1998). The vulnerability of vulnerable pregnant women should be considered not only in terms of their food insecurity being "wounded" by drought and low food availability, but also in terms of their food security being "wounded" by "social injustice" and exploitation because of their powerlessness and lack of skills (The WFP's Role for Ending Long Term Hunger, Report Number OE/2011/007). Inadequate and/or inappropriate knowledge and discriminatory attitudes limit household access to actual resources because political, cultural, religious, economic and social systems including status of women limit the utilization of potential resources (WFP, 2000). The vulnerable pregnant women will fail to access adequate food resultantly leading to malnutrition.

According to Webb *et al*. (2006), this intergenerational cycle of malnutrition maintained by the poor and malnourished women underline the importance of the WFP Enhanced Commitment to Women (ECW) programme 2003-2007. This stresses the importance of protecting and fulfilling women and adolescent girls' rights to adequate nutrition. However, in most WFP VGF operations in developing countries, although women are now actively participating in the VGF programme distribution activities, the element of creating nutritional awareness and making sure that nutritional needs for mothers and adolescents are addressed is still lacking (Webb *et al*., 2006). Hence, the pregnant women remain nutritionally vulnerable to many nutrients deficiency risks.

Polygamy has been proven as another factor that contributes to nutritional vulnerability. The Zimbabwe Herald (June 2011:3), had a very sad report on hunger-stricken families in Mbire giving away their daughters shortly after puberty for marriage to older married men in order to get food or cash to buy food in return because of food insecurity. Although many countries have raised the legal age for marriage, this has little impact because culture, religion and poverty depict that marriage and childbearing are symbols of status for women (Harmful Traditional Practices Affecting the Health of Women and Children, Fact Sheet No. 23. 1995). The Zimbabwe Standard (2011: pS11) highlights that early marriages and sexual encounters increase the chances of maternal morbidity and mortality through malnutrition and HIV & Aids and that eight women die every day giving birth in Zimbabwe.

This is unlike El Savador where in 2002 WFP food aid interventions went up a step further to include fathers in nutrition education sessions (Webb, 2006:52). If men are not involved in maternal and child nutrition education, programmes these may fail because the programmes need support from everyone in the community.

2.6. Vulnerability of the adolescent pregnant women

Adolescence occurs around 10 – 18 years and it is a period of rapid growth (WFP, 2000:36). UNICEF states that no girl should become pregnant before the age of 18 because she is not yet physically ready to bear children (Harmful Traditional Practices Affecting the Health of Women and Children, Fact Sheet No. 23, 1995). Because of the cultural, economic or religious reasons, girls in developing countries marry very early, and have children early and at short intervals more than those who start parenthood later. The report cited Pakistan and Bolivian adolescent pregnant women as other examples of nutritionally vulnerable women because they marry very early. According to the Malawi Multiple Indicator Cluster Survey (2006), almost 11% of women aged between 15–49 years were in marriage or became pregnant before their 15th birthday and a high proportion was in rural areas and from low literacy level groups.

The 2005- 2006 Zimbabwe Demographic Health Survey (ZDHS) Survey states that 21% of the youth in Zimbabwe between 15 -19 years has started childbearing, but the document goes on to reveal that childbearing also occurs among girls below 15 years of age not covered by ZDHS (Wekwete, 2010). The report further states that evidence exist that sexual activity for

some children in Southern Africa begins at 12 years and there is a very high risk of HIV infection and nutritional deficiency risks because the body is not yet fully developed.

Insel and Wardlaw (1999:454) lament that adolescent mothers face overwhelming nutritional demands during pregnancy although they view it in a different context than the United States of America where quality and quantity of the diet is far better than in most rural areas in developing countries. A steady nutrient supply for adequate growth is necessary for a teenager for adequate growth because the two years after a girl begins menstruating are the last years of linear growth. The same view is stated in the SOFI (2000) where it is emphasised that teenage mothers and their children are particularly nutritionally vulnerable because girls grow in height and weight up to the age of 18 years and continue to achieve peak bone mass up to age 25.

It should be noted that a child's nutritional future begins with the mother's nutritional status in childhood, adolescence and pregnancy (Oniang'o & Mukudi, 2002).Teen pregnancy adds foetal needs to that of the mother, and there is a high risk for LBW babies and the mother developing anaemia, osteomalacia or osteoporosis later in life (Fox & Cameroon, 1995). A LBW baby is effectively born malnourished and at a higher risk of dying early in life (SOFI, 2000:22). This means that vulnerable, adolescent pregnant women should receive even more in terms of quantity and quality of rations than a pregnant woman who has passed the adolescent stage.

2.7. Contribution of Protracted Crises to Nutritional Vulnerability of Pregnant Women

Research has proven that nutritional vulnerability of pregnant women is high in countries or regions in protracted crises. According to the SOFI Report (2010:14) protracted crises are characterised by recurrent natural disasters and/or conflicts, longevity of food crises, breakdown of livelihoods and insufficient institutional capacity to react to situations. Somalia, Afghanistan, Sudan and Somalia are good examples of countries that have been in protracted crises in the past ten years. The crises can be limited to a certain geographical area like the West Bank and the Gaza Strip where Israel and Palestinians have been in conflict since 1948 (WHO, 2011).

According to the report, WHO assessment revealed that micronutrient deficiency was rampant and prevalence of anaemia among pregnant women visiting antenatal centres was

45% in the Gaza Strip and 20.6 % on the West Bank. This was attributed to inadequate diet, diseases and unsanitary conditions. Maternal mortality ratio was 29% per 100 000 live births in the Gaza Strip and 36.4 % per 100 000 on the West Bank. Mbire district is a classic example of a community in a protracted crisis because of the recurrent droughts and outbreaks of epidemics like cholera. It is also a malaria-prone area. However, this does not mean that the vulnerable populations there should be receiving food assistance forever. Since they have been receiving food aid for the past six years it is necessary to make use of the disaster continuum to ensure that resilience to such shocks is built in the communities.

2.8. Contribution of Food Taboos to Nutritional Vulnerability of Pregnant Women

Mallikharjuna, Balakrishna, Arlappa and Brahman (2010:15) assert that at household level, cultural norms and practices and traditional factors determine the extent of nutritional status of pregnant women. They give an example of traditional Indian households where access to certain types of foods is restricted through taboos and ritual observances. Food taboos are defined as unnecessary impositions based on myths or superstitions about women who unfortunately, are already malnourished, and this contributes to high mortality and morbidity (Harmful Practices Affecting the Health of Women and Children. Fact Sheet No. 23. 1995:10). This regular avoidance of certain types of food is not only meant for religious and cultural reasons but can also be meant for health reasons intended to protect the pregnant women from harm, but because of ignorance it can lead to malnutrition. For example some cultural practices discourage women from gaining weight to prevent birth complications.

Research has proven that pregnant women in various parts of the world are forced to abstain from nutritious foods as part of traditional food habits. At the same time, pregnancy will be imposing on them the need for considerable extra calories and nutritional requirements (Patil, 2010:1). Chatterjee (1990) says that the prevailing culture and traditional practices in India influence health and nutritional status of pregnant women. This was revealed in a study carried out at a Rural Health Training Centre in Manapet India which shows that some fruits and vegetables like papaya/pawpaw and green leafy vegetables were avoided because it was believed consumption of these could cause rigors, seizures, deformations of the baby, overweight , abortions and difficulties in labour.

In Kuala Lumpur studies on Chinese pregnant women attending maternal health clinics revealed that most fruits and vegetables were prohibited during pregnancy because they were considered "cold foods", but "hot foods" like ginger, wine and rice were permitted. This is more likely to lead micronutrient deficiencies (Koon, Pengy & Karim, 2005). Noor, Hanafiah, Idris and Fatimah (1994) carried out a study on Chinese and Indian ethnicities in Kualor Selangor which revealed that for pregnant women tubers were considered "itchy food" and protein foods considered "poison" except for chicken and mutton, which is more likely to cause protein deficiency and health risks associated with it.

2.9. WFP Maternal Child Health and Nutrition (MCHN) Interventions Elsewhere

It is important to look at how WFP has been addressing nutritional vulnerability of pregnant women in emergencies elsewhere in the world and see how this can be applied to Zimbabwe. Considering the fact that WFP has been involved in MCHN programmes addressing nutritional needs of pregnant mothers since the 1960s, delivering support through health clinics accounting for six per cent of its expenditure (Webb, 2006:50), it may be a necessary intervention in Mbire. To date WFP has allocated roughly 20% of its development resources to the MCHN interventions targeted at more than 5, 6 million people − 38% from South Asia and 49% from Sub-Saharan Africa (Webb, *et al.* 2006).

MCHN programme activities are designed to reduce maternal and child malnutrition, through nutritional education, health services like vaccinations, antenatal care, health referrals, micronutrients supplements especially iron and folate, vitamin A, iodized, salt, deworming and disease control.

To ensure nutritional well-being of vulnerable pregnant women and children elsewhere WFP introduced MCHN activities, which involve a deworming exercise. For example in Cambodia, WFP supported the National Investment Plan from 2002 – 2007 for children over two years and pregnant women after the first trimester (Webb *et al.,* 2006:53).

Nutritional education training like the one that was offered to 37 000 women in Zambia could be beneficial if offered to women in Mbire to ensure that they were equipped with nutritional knowledge. In Pakistan, women were trained in anaemia management which was one of the nutritional risks very common during pregnancy among vulnerable populations in developing countries (Webb *et al.,* 2006).

2.10. Summary

Literature relating to definition of nutritional vulnerability, nutritional vulnerability in relation to disaster management, underlying causes of nutritional vulnerability, and nutritional adequacy of the WFP funded VGF food basket were highlighted in this chapter. Recommended dietary allowance (RDA) for pregnant women and risks associated with nutritional deficiencies were covered as well. Different surveys were reviewed to create a base against which the findings of this research would be compared. The extensive coverage of the above key themes enabled the researcher to link information from the literature review to study findings to enable answering of research questions. The next chapter covers the research methodology used to carry out the study.

CHAPTER THREE

METHODOLOGY

3.1. Introduction

This section highlights the methods and techniques utilised in order to realise the research objectives. It summarises the methods used to determine nutritional vulnerability of the vulnerable pregnant women in Mbire and the causes of malnutrition. The chapter deals with the following aspects: research design, methodology, population, sample and sampling procedure, data collection techniques, ethical considerations, pilot study, validity and reliability, data collection procedures, survey timing, data analysis and data presentation.

3.2. Research Design

A cross sectional survey method of collecting data based on random sampling was used because according to the Spheres Handbook (2011:155), it is a suitable method for collecting data on nutritional status of a sample and measuring nutritional composition of meals. Structured questionnaires with fixed closed questions and a few open-ended questions, direct observation, Focus Group Discussion (FGD) Guideline and document analysis were the instruments used to collect data. The qualitative approach, a FGD complimented the cross sectional survey.

The advantage of using a cross sectional survey is that it is less costly and data can be collected in a relatively short space of time and allows for further inquiry (Creswell, 2008). The design is simple and clear such that the purpose of the study and its results are clear and understood by those involved in the research and those who use the research findings. The design allows for direct observation of the environment and clinical assessments of the respondents for micronutrient deficiencies. To a limited extent, a qualitative descriptive approach was used where a FGD was conducted to gather respondents' beliefs and perceptions regarding culture, maternal care and nutrition, as well as environmental, economic and political factors. The FGD was used to obtain data, which would otherwise be concealed by statistical methods of collecting data that characterise the quantitative paradigm (Capacity Building in Educational Research in Southern Africa, 1999:135).

3.3. Methodology

Most of previous studies in the field of nutrition tended to be quantitative, but this study was a descriptive research relying on generation of both qualitative and quantitative data. This enabled the researcher to probe into underlying issues relating to nutrition and pregnancy and to establish the nutritional risks associated with nutritional deficiencies during pregnancy.

According to White (2003) a quantitative approach is objective hence its use in nutritional research. Best and Kahn (1993) affirm that a quantitative approach focuses on measurable attributes of a phenomenon hence, its use in measuring nutritional status. In this regard, it yields empirical data that is objective and value neutral.

As a result, a survey using a questionnaire with fixed closed and very few open-ended questions with the last section on anthropometric survey (to gather quantitative data) was carried out with 100 randomly selected vulnerable pregnant women at Masoka and Angwa Rural Health Centres.

3.3.1. Anthropometry

According to the WFP (2000:31) anthropometry is the use of body measurements (usually weight, height and age) to assess nutritional well-being. Anthropometric status is sometimes referred to as nutritional status of a person. The recommended anthropometric measurements based on physical body parts used to determine nutritional status in the survey are the Body Mass Index (BMI) and Mid Upper Arm Circumference (MUAC) according to WHO (1991). MSF (2006) also recommends FGD, direct observation and anthropometric survey as suitable methods for carrying out nutritional assessments. The researcher used the direct assessment method of assessing the VGF food ration nutritional adequacy for the pregnant women and providing information on micronutrient coverage as suggested in the Spheres Handbook (2011:156).

MUAC is the measure of the circumference of the left upper arm and gauges body fat reserves and muscles (UNHCR, WFP, UNSCN & WHO, 2011). It measures wasting caused by lack of protein and is primarily used for children, but can be applied to pregnant women to assess nutritional status (MSF, 2006). The researcher opted for this method because of lack of resources (financial and time) to carry out expensive methods like biochemical tests (using body fluids in the laboratory) or engaging more research assistants. The MUAC assessment is cheap for it requires no expensive equipment since a simple tape measure can be used and the

index is the actual measurement (UNHCR, WFP, UNSCN &WHO (2011). The report further states that further manipulation of the measurement obtained is not necessary. Therefore, even those who are not experienced can use it. A range below 22 cm is an indicator of malnutrition according to the Spheres Handbook (2011) and a range of 25.0 and 29.99 cm indicates overweight and signals obesity. However, MUAC presents a challenge in adolescent women because the cut-off points are age specific (Woodruff et al, 2002). MUAC for a woman aged above twenty years can not be the same with that of a fifteen or fourteen years old teenager.

BMI provides useful information at a relatively low cost and is used to identify chronic energy deficiencies. Height was taken using measuring tape and weight, using scales at the clinic. BMI was calculated using the following formula **BMI=Weight (kg)/ Height (m^2)** (WFP, 2000:36) and findings were recorded. The measures were then compared to reference standards to assess weight status and arm circumference and risk to various diseases. However, because of the added extra weight in pregnant women it was not easy to determine nutritional status using BMI. The normal BMI range according to the World Bank report is 18.5–24.99. According to UNHCR, WFP, UNSCN & WHO (2011), anthropometric measures provide an excellent indication of the nutritional status of the vulnerable groups and individuals, but were quick to point out that to provide a basis for action they needed to be complemented with other types of information on the reasons why people were underfed.

3.3.2. Direct observation

The researcher used clinical assessments to determine the possibility of existence of micronutrient deficiency disorders. This involved simple examination of the 100 vulnerable pregnant women during the interviews for physical signs like goitre or bitot spots. The recognition of clinical signs remains the primary means of identifying nutritional deficiencies, but the disadvantage is deterioration prior to the development of clinical signs will be missed and with it, the opportunity to take preventative action (WFP, 2000:52).

3.3.3. Focus group discussion (FGD)

A FGD with five women and five men randomly selected at each clinic, not necessarily benefiting from the VGF programme was conducted in Shona. Findings were noted down, and audio taped**.** This enabled the researcher to obtain opinions and attitudes at another level where there was consensus or disagreement (DIMTEC, Module 601, 2010). This was used to find out more about the quality and quantity of resources in the area and that brought in legal

and political factors at national and local level that promoted or hindered efforts for households to become well nourished (WFP, 2000). The FGD revealed the community's views concerning nutritional requirements for pregnant women, food taboos and effects of inadequate dietary intake. It is culturally unacceptable among the Mbire people for a married woman to sit next to a male who is not her husband. Therefore, participants instead of sitting in a circle, sat in the order of their own choice. Active participation of all the members was ensured by making sure that everyone contributed to the discussion and no individual dominated.

However, an FGD has the following disadvantages. Respondents may be influenced by others or may feel the need to conform, and it is difficult to protect respondents' confidentiality or prevent adverse effects group participation has on certain individuals **(**Van Rensburg *et al*, 2010:180).

3.4. Population

The target population was all pregnant women in the Mbire district selected as vulnerable using the WFP selection criteria and benefiting from the VGF programme. Mbire district is divided into 17 wards and has a population of over 115 000 people (Mbire Baseline Survey Report, 2009:6). Although it cannot be exactly quantified approximately how many vulnerable women will be pregnant at any given time in Mbire, according to the nurses in charge at the health centres approximately one in every five women will be pregnant at any given time. This includes women who are not vulnerable and therefore not benefiting from the programme. Dooley (2001) states that generally the practice is, the sample size of 10% can be representative of a sample.

The researcher decided to focus on the most vulnerable group because usually they did not receive the attention they deserved. The WFP (2000:36) warned that women, especially pregnant and lactating, were a nutritionally vulnerable group, which deserved the most attention just like the children and the chronically ill.

3.5. Sampling Procedure

A two stage sampling procedure was utilised. Simple random sampling was used for sampling the wards to minimise sampling error and bias (Saunders *et al.,* 2003:165).The researcher then used purposive sampling to select the 50 cases for the interview and the

anthropometric survey at each health centre. That ensured that the sample was representative of the population as much as possible. Purposive sampling enabled a researcher to use his judgement to select information rich cases that would best enable him to answer research questions and to meet research objectives (Saunders *et al.,* 2003:175).

In this case, the sampling frame comprised of pregnant women who were beneficiaries of the VGF programme and the researcher purposely left out pregnant women who were not benefitting from the programme and beneficiaries who were not pregnant. The sampling procedure ensured that only extreme cases (most vulnerable pregnant women) were included. The researcher opted to do purposive sampling for the survey and random sampling for the FGD at the health centres, because homesteads in Mbire were sparsely located (could even be one km apart) and did not have specific house numbers and streets. The researcher could not afford to do home visits because of resource constraints (financial, time and staff) so it was ideal to carry out the survey at the clinics where the women were already gathered for antenatal visits.

Simple random sampling was used for selection of the ten participants for the FGD. The advantage of using simple random sampling is, it allows selection of a sample without a bias and was the best suitable, because the population was easily accessible (already at the clinic).

3.6. Data Collection Instruments

The structured questionnaire generated information on the following sections which were demographics, maternal health, food basket adequacy and utilisation, immediate and underlying causes of malnutrition and nutritional/anthropometric status. Both open-ended and closed questions were used in the questionnaire. Open-ended questions aided in the collection of information that was difficult to quantify (qualitative). The questionnaires were essential in quantifying data important in making deductions. A guideline for the FGD necessitated the smooth flow of the discussion. In addition, an observation guide was used for clinical observations.

3.7. Validity and Reliability

Validity refers to a degree to which instruments actually measure what they are supposed to measure *"or whether the findings are really about what they appear to be."* (Saunders *et al*., 2003). Its importance lies in its usefulness as an indicator of '*goodness'* or quality in

research. Validity in the study was ensured by asking questions that were linked to the research questions and research objectives.

To minimise the lack of validity of measurement the researcher made sure that the questions designed for the questionnaire were clear, precise and unambiguous. Training of the research assistant on the administration of the questionnaire guaranteed the validity and reliability of the data collected. Units of measurement were checked during data cleaning while still in the field. For the anthropometric indicators, missing values on age, height and weight were checked to avoid distortions during data analysis.

To allow the Doma women to open up to the researcher made use of the Community Mobiliser (Bernard Chandafira) they are used to working with, because their culture prohibits them from talking to strangers. It is only the responsibility of chosen male leaders in the community to speak for the community to outsiders.

Reliability refers to the consistency, stability and predictability of an instrument such that if it was used by anybody else, the same results would be obtained (Bogdan & Biklen, 1992, White 2003; Opie, 2004). In this research reliability of the data collection instruments (the questionnaire and clinical observation guide), especially the section on anthropometric data determined the reliability of the data collected. The instruments were considered reliable because they gave similar results when used repeatedly in the same situations (Christian & Greger, 1994; Boyle & Morris, 1999). In this regard, the instruments have been established and authenticated by experts and widely recommended for assessing nutritional status among vulnerable populations worldwide (WFP, 2000:36). However, in this case, reliability was affected by some of the respondents' inability to estimate their dietary intake properly and their ages for those who did not have national registration documents because of low literacy levels, for example the Doma women.

3.8. Pilot Testing

The researcher conducted a pilot study to ensure validity and reliability to enhance statistical power of the instruments of ensuring data handling process. Dooley (2001) and Leedy (1993) advise that instruments must be pilot tested before actual use to ensure that they will measure what they are intended to measure and they are free from random error when used repeatedly. Creswell (2008) asserts that all data collection tools and instruments must be pilot tested to

see how long it takes the respondents to complete the questionnaires, establish instructions and whether questions are clear and ask what they purport to measure.

A research expert Doctor D, Chikobvu from the University Of Free State, Statistics Department commented on the structure, representativeness and suitability of the questions. The research instruments were test run with a small sample at Mahuwe Health Centre in the same district that had almost the same characteristics to the ones to be used for the study. That enabled the researcher to make some adjustments in content appropriateness in preparation for the main study. On the anthropometric section of the questionnaire, for example a column on illness suffered by the respondent in the last two weeks preceding the survey was added, after noting that it might have affected the nutritional status of the respondents.

3.9. Survey Timing

The research was carried out during the month of August (post harvest period), a period when food shortages were very common in Mbire since the little amount of food harvested in April would have run out. Since the district is a low-lying area occasionally hit by floods, it was ideal to carry out research during the dry season. Most bridges had been swept away and if the research was conducted during the rainy season, it would have been risky to cross the Manyame, Hunyani and Angwa Rivers using locally made canoes as the rivers were infested by crocodiles.

3.10. Data Collection Procedure

The researcher obtained an introductory letter from the University of Free State (Disaster and Management Training and Education Centre for Africa - DIMTEC). The permission to carry out the survey was sought from the Ministry of Health District Offices, the local Headman and the Ministry of Local Government.

3.10.1 Primary data collection

This was carried out in two days when the pregnant women from different villages were visiting the health centres for monthly antenatal care. With the help of the nursing staff at the two clinics, collection of data was done promptly without wasting time of the respondents of whom the majority had travelled distances of more than two kilometres and were obviously tired. The researcher made use of their waiting time to collect the data.

Primary data was collected using questionnaires, administered through face-to-face interviews. This enabled the researcher or the research assistant to explain misunderstood and ambiguous questions. That was an opportunity for the researcher to make a clinical assessment for visible signs of micronutrient deficiencies and check for facial expressions. The last section of the questionnaire involved the taking of anthropometric measurements to determine the nutritional status of the respondents. Data was also collected through the FGD.

3.10.2. Secondary data collection

Secondary sources, the Zimbabwe National Nutritional Survey (2010), the Zimbabwe Vulnerability Assessment Committee (ZIMVAC, 2010), the Zimbabwe Multiple Indicator Monitoring Survey (MIMS, 2009), the 2009 -2013 National Health Strategy for Zimbabwe (2010) and the Zimbabwe Demographic Health Survey (ZDHS, 2010) were some of the sources used to gather information for the research. The above documents provided information on prevalence of malnutrition, food security situation and underlying and immediate causes of malnutrition among the Mbire population. Information from the above findings was compared with what the researcher obtained on the ground to reveal the extent of nutritional vulnerability of the vulnerable pregnant women in Mbire.

3.11 Data Analysis

Data collected was analysed to answer research questions. In nutritional surveys traditionally anthropometric surveys analysis was carried out using software like ATHRO (WHO, ATHRO Version 2, 2007) and EPI- IFO (Anthropometric Indicators Measurement Guide, 2003, Part 7). However, because of non-availability of the software and financial constrains the researcher could not use them. Instead, quantitative data collected using questionnaires was coded, processed and analysed using Microsoft Excel 2010 and an electronic data analysis package SPSS Version 17 (Statistical Products, Services and Solutions) formerly the Statistical Package for Social Sciences.

Data collected from the FGD relating to cultural beliefs and taboos that affect nutritional practices, maternal care and availability of food commodities in the area were merged and analysed simultaneously. For FGD findings and responses from open-ended questions, collating and interpretations were used. In addition, data collected during clinical observation relating to signs for micronutrients deficiencies was also summarized. Nutritional status and

estimate of the prevalence of malnutrition and distribution of malnutrition among the vulnerable pregnant women were determined using anthropometric data.

Data were presented using tables, graphs and pie charts and interpreted using frequencies and percentages. Tables were used to summarise data before representing it graphically or to show specific values. Most of the tables presented were generated using EXCEL 2010 and SPSS version 17. Graphical presentation of data to policy makers promotes rapid assimilation of information to be conveyed compared to written reports (Wegner, 1993:45).

3.12 Ethical Considerations

The researcher was open to the participants about the general nature of the study and ensured that consent was fully informed and freely given (Saunders *et al.,* 2003). Pregnant women who felt they were too tired to participate in the survey because of the long distances they had covered coming to the clinic were excused. The researcher made sure that since the participants were already vulnerable or disadvantaged somehow, extra care was taken not to subject them to harm that is, not to cause physical discomfort, humiliation, emotional stress or embarrassment (Van Rensburg *et al*, 2010). To avoid misleading the participants the researcher clearly stated to them that although questions on the VGF basket were to be asked the research was not meant for giving them any form of extra aid. Participants' responses were kept confidential and information was used for academic purposes only. Participants' privacy was respected and sensitive questions regarding HIV status were avoided. Coding of the responses ensured anonymity.

3.13. Delineations and Limitations

The study only focused on pregnant women who were beneficiaries of the WFP funded VGF programme in Mbire selected as vulnerable using the 2010 ZIMVAC Assessment findings and ranking criteria determined by WFP. Damaged road infrastructure resulted in some pregnant women who lived very far from health centres being left out in the survey so the sample might not be representative enough. That might have resulted in the most vulnerable being left out. It was difficult to get the precise birth dates for eight illiterate Doma women who were above 20 years, were born at home, and did not have national identity registration cards. Hence, approximations were made. However, the number was so insignificant that it did not affect the results much.

3.14. Summary

This chapter highlighted the research design, data collection techniques, validity and reliability as well as data presentation. The pilot study as well as the method used for data analysis was also presented.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1. Introduction

The chapter focuses on presentation, analysis and discussion of the data collected. Presentation of quantitative data is in the form of tables, graphs, pie charts and analysis is in frequencies and percentages. These facilitated visual presentation and interpretation of the responses making analysis easier. The instruments used for collecting data were the questionnaire, clinical observation guide and the Focus Group Discussion (FGD) guideline. The average response rate for the questionnaire was 100%. Data collected was coded and processed using Microsoft Excel 2010 and the electronic package Statistical Products and Services and Solutions (SPSS) formerly the Statistical Package for Social Sciences Version 17. Data collected from the FGD relating to beliefs, cultural practices and socioeconomic status of the respondents were merged and analysed at the same time.

4.2. Demographic Characteristics

One hundred vulnerable pregnant women who were beneficiaries of the WFP funded Vulnerable Group Feeding (VGF) Programme, participated in the survey and their age ranged as presented in Figure 4.1.

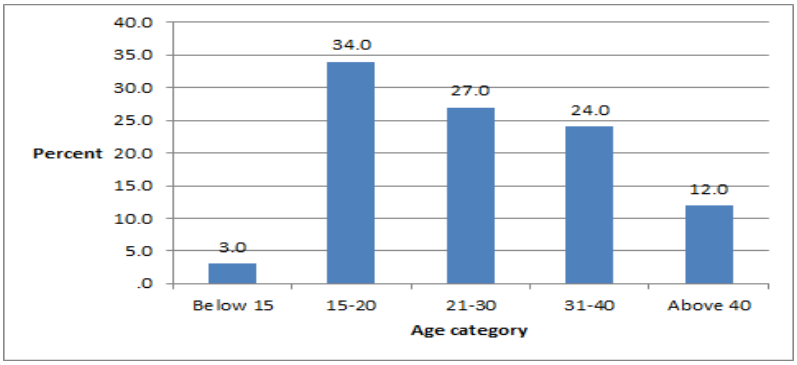


Figure 4.1: Age range of the respondents

The graph in Figure 4.1 indicates that the majority (34%) of the respondents fall within the 15 -20 years age range followed by 27% of the respondents aged between 21 -30 years. Twenty-four per cent (24%) of the respondents were from the 31-40 years age group and only

12% of the respondents were above 40. Only three per cent of the respondents were aged below 15 years.

The high percentage for the 15 – 20 years age group reflects that women in Mbire have children very early at adolescent stage before their bodies are fully developed, thereby risking developing nutritional deficiency-related problems like maternal anaemia and pregnancy complications as stated by Wardlaw (2000). This is one of the major causes of maternal mortality. The high response rate represents the willingness to share problems and experiences. It might also be an indication of dependency syndrome among the Mbire people. The experience that the researcher has after working in the area for three years is, the Mbire people may imply that they are being registered for additional aid, but they have been getting aid for over ten years.

The level of education attained is a critical determinant in the understanding of nutritional issues. It is also critical when it comes to the administration of the questionnaire and training and capacity building on nutrition, education and hygiene. The pie chart (Figure 4.2) presents the highest level of education completed by the respondents.

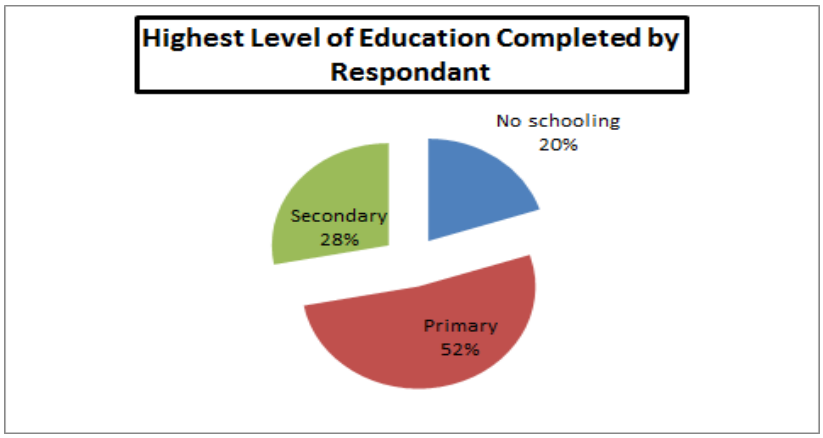


Figure 4.2: Highest level of education completed by the respondents

Twenty per cent of the respondents had never been to school while 52% only went up to primary school level. Those who had gone up to secondary level were 28%. None of the respondents had gone up to Advanced High School or Tertiary level since the sample consisted only of unemployed, poor vulnerable women in the community. The few with advanced level and tertiary qualification were people working as government/civil servants (teachers, nurses and police) and council workers. Those, according to the WFP selection criteria, did not qualify for the VGF programme and hence could not be part of the survey.

The majority of the respondents had not attained a level of education adequate to enable them to complete the questionnaire. Therefore the researcher, with the help of an assistant, had to administer the questionnaire completing it personally. Those respondents who never went to school comprised of the Doma women who were over 20 years. That was probably due to lack of resources or their lifestyle, which involved moving from place to place hunting and gathering with the whole family.

Those who attained secondary education are an essential human resource. They could be trained in nutrition, health, hygiene, monitoring and appropriate cooking methods to improve nutritional status of the people in the community. They could in turn train others by translating. According to the World Bank (2006d: 8) in Andean countries, prevalence of malnutrition among children whose mothers had completed primary education was lower. It was clear that basic education was very important in mitigating against malnutrition.

- **Marital status of the respondents**

  In most cases in Zimbabwe among the rural folk whether a person is married or not determines the amount of income, quantity and diversity of, and food consumed in the household.

  A mere eight per cent of the respondents were single while the majority (71%) were married although 57% of the married ones indicated that they were in a polygamous relationship. From the findings of the study, it was clear that four per cent were divorced, ten per cent widowed and seven per cent in the Any Other category where the respondents indicated that they had separated from their partners.

  It was surprising to note that some of the single, divorced and widowed were also pregnant. That might be implying that those women might be in relationships with other women's husbands. If they were not living with their partners they would fail to get the material and emotional support a pregnant woman needed during pregnancy. Webb *et al.* (2006) recommend that there is also need to engage fathers in maternal care to ensure satisfaction of pregnant women's nutritional and emotional needs. An example is that of the Maternal, Child Health and Nutrition (MCHN) Programme that involved men in ElSavador and it resulted in the improvement of nutritional status of pregnant women (Webb *et al.,* 2006). If the vulnerable pregnant women continue to lack material and emotional support they will be susceptible to malnutrition and the risks associated with it.

The percentage of those who were unmarried might be even higher, because divorce in the area carries a stigma especially for women. Thus they were not free to open up to strangers. From the experience that the researcher had working in the area from 2006 – 2008 some women just ended up lying that they were married to safeguard their status in society.

- **Traditional and religious characteristics of the respondents**

Religion and ethnicity of the respondents indirectly contributes to the nutritional status of the vulnerable pregnant women in Mbire because it determines what they eat and what is prohibited. Therefore, it was necessary to gather information on ethnicity and religion.

The most common form of religion among the respondents was traditional with 43% followed by Apostolic Faith Sects at 28%. Christianity religion came third among the respondents with a percentage of 21% and the least indicated was the Any Other Category with 8% where some of the respondents indicated that they were Moslems. The proportion of the respondents' religion is as reflected below.

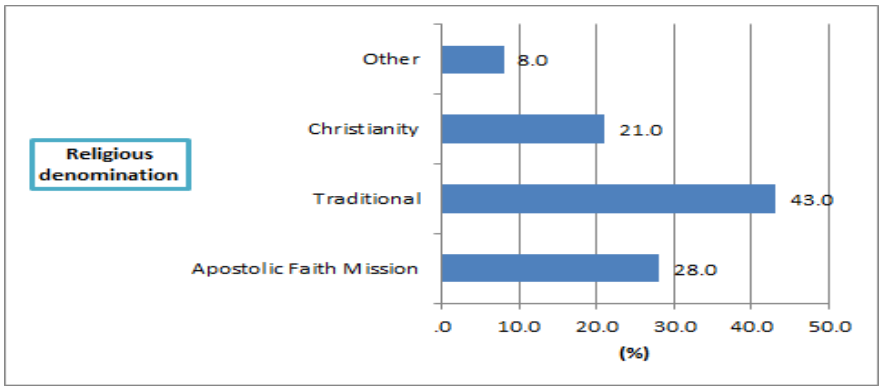


Figure 4.3: Religious denominations of the respondents

The Moslem religion, which prohibits the eating of pork, is common among the respondents displaced from former commercial farms during the 2000 - 2005 Land Reform Programme or retired from the farms. Tradition and religion carry with it many taboos because, according to information gathered during the Focus Group Discussion (FGD), pregnant women are not allowed to eat food products like pumpkins, male parts of animals and eggs during pregnancy. This means that they cannot get vital nutrients from these food products and become nutritionally vulnerable. Traditional religion was most common among the Doma people and this influences maternal care and what one eats and ultimately the nutritional status of the pregnant women in Mbire.

In addition, tradition and culture determines the number of wives a man marries and at what age a woman is married and become pregnant. For example, the Apostolic Faith Religion (the Marange Sect) requires that girls get married early at adolescence and a man can marry as many wives as he wishes. This again contributes to nutritional vulnerability of the girls in the church who are married when they still have nutritional demands for the adolescent stage, which they are already failing to meet. The fact that husbands can marry other wives means that some of the vulnerable pregnant women are left with very little material and emotional support and hence become nutritionally vulnerable.

- **Ethnicity of the Respondents**

Ethnicity in Mbire determines access to economic and environmental resources, and this has a bearing on the availability of food and water and sanitation at household level.

Findings of the study reflect that 63% of the respondents were original Korekore people who were born and bred in Mbire. The Any Other category had 22%. Eleven per cent of the respondents were of the Malawian origin and 4% of the Mozambican origin.

The majority of the respondents of Malawian and Mozambican origin were the people who used to work on farms and were displaced during the controversial Land Reform Programme 2000 - 2005. Without any source of income and livelihood, it meant that those people were more vulnerable. The majority were born on the farms, and movement from farms meant disruption in the social support networks because the few relatives were now scattered all over the country which further increased their vulnerability.

In most developing countries, dismantling and loss of social capital for the poor and vulnerable because of migratory processes and social conflicts limit collective response capacity to natural and economic disasters, which obstruct access to food (World Bank, 2006d: 8). Social support networks are very important in Zimbabwe when it comes to what the poor people eat in the rural areas like Mbire. During food shortages, people can share things like vegetables and fruits, which can contribute to good nutritional status. Without social support networks the vulnerable pregnant women may become nutritional disadvantaged because they do not have other people to help them with food. The diversity of the respondents by ethnicity means that these people have different cultures, traditions, religion, economic status and food preferences, which again may affect pregnant women's nutritional status.

Most (63%) of the original Korekore respondents' household heads were in Mbire early and had the privilege of allocation of plots along the major rivers (Angwa, Manyame and Hunyani) and established vegetable gardens and orchards. This means that they can get vegetables and fruits for household consumption throughout the year which can improve their nutritional status. Fox and Cameroon (1995) concur with Wardlaw (2000) that fruits and green vegetables are good sources of micronutrients like folate and vitamin C, which are vital for the prevention of micronutrient deficiency related problems like anaemia and scurvy.

Therefore those women, who reside in households without vegetable gardens and orchards and lack income to buy from other areas, are prone to these micronutrient deficiency related problems. The joint Statement by WFP, WHO & UNICEF (2007:1) warns that micronutrient deficiencies increase the general risk of infectious illness and dying from diarrhoeal diseases, malaria, pneumonia and other diseases. This means that micronutrient deficiencies can contribute a lot to health epidemics like cholera, HIV and AIDS and measles.

Findings from the study were that the majority (55%) of the respondents spoke Shona (Korekore dialect), which showed that they were born and bred in Mbire. Eighteen per cent (18%) spoke Shona (Karanga dialect), and only nine per cent spoke Chikunda. The Any Other Category with the mixture of Nyanja and Shona contributed 18% of the respondents. A visual presentation of the findings is provided in Figure 4.4.

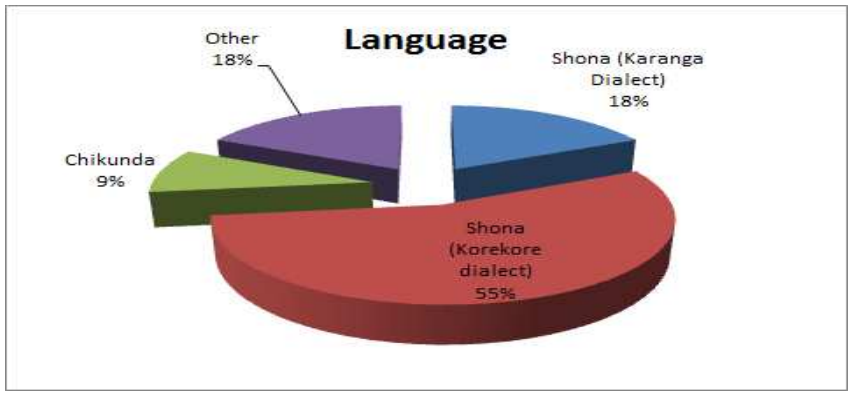


Figure 4.4: Language spoken by the respondents

The respondents who spoke the Shona language of the Karanga dialect are those people who migrated from other provinces in Zimbabwe in search of good soils for cotton farming. Although it is almost the same language as the Korekore dialect, there are some

words which have different meanings. Chikunda is a totally different language to that of the researcher so an interpreter, the Lower Guruve Development Association (LGDA) Community Mobiliser staying in the area who was familiar with both languages assisted with the interpretation. Maybe that affected the results because he might have interpreted some of the questions in a way different from what the researcher intended.

- **Duration of stay in Mbire**

  Findings of the study established that only 2% lived in Mbire for fewer than three years and 17% had been living in Mbire for the past three to five years. Fourteen per cent (14%) of the respondents had been staying in Mbire for a period ranging from 6 – 15 years and the majority (67%) had been living in Mbire for over 15 years.

  Some of the respondents who have been in Mbire for a period of less than six years are victims of the 2005 Urban Clean Up Exercise and Former Farm Workers who were chucked off the farms without any meaningful assets and source of livelihood. They are nutritionally vulnerable because without gardens, orchards and money to buy fruits and vegetables they are more likely susceptible to develop problems associated with micronutrient deficiencies.

4.3. Polygamous Relationships

Results from the study were that 57% of the respondents were in polygamous relationships and 43% were married to husbands without any other wife.

The majority of the respondents who had husbands married to other wives were either of the Apostolic Sects or traditional religion. The pregnant women who were in polygamous relationships were more likely to be suffering from lack of emotional and material support because their husbands moved on to other wives once they were pregnant. They might fail to fend for themselves and hence fail to cater for all the nutritional needs. For example, single women would find it difficult to get fish for household consumption from Carbora Bassa in Mozambique about 30 km away. Men have to walk on foot through thick forests to get there. Fish is rich in protein, calcium, phosphorous, zinc (Fox & Cameroon, 1995), and contributes to good nutritional status of pregnant women. Its absence in the diet increases these women's nutritional vulnerability especially in the absence of meat, milk and eggs.

4.4. Maternal History

About 74 % of the respondents indicated that they had their first pregnancy when they were between 15 – 17 years. Respondents who first fell pregnant between 18 – 24 years were only 24 %. Two per cent of the respondents had first pregnancies between 21 – 25 years. None of the respondents experienced a first pregnancy above 25 years.

The statistics confirm that majority of the vulnerable pregnant women in Mbire fall pregnant at a very young age, and this exposes them to nutritional deficiency related risks. The vulnerable women who became pregnant when they were still 15-17 years were at a disadvantage nutritionally. Being at the adolescent stage meant they had to meet higher nutritional demands of both the growth spurt and pregnancy (Insel & Wardlaw 1999:454). If they failed to meet them, they were prone to nutritional deficiency risks like anaemia, which could result in maternal mortality. Figure 4.5 presents the respondents' age range when they first became pregnant.

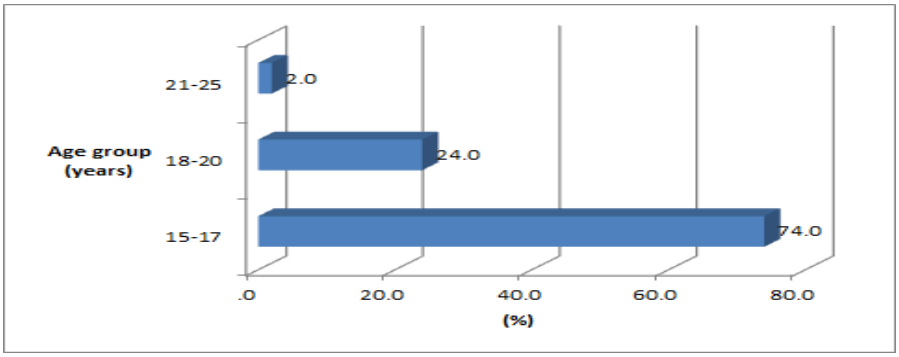


Figure 4.5: Age group when respondents first became pregnant

Besides the age at which the respondent became pregnant, the study was intended to ascertain the number of pregnancies that the respondent had before the existing one and intervals between the pregnancies. This has a strong bearing on the nutritional status of the pregnant women. Research has proven that women who have short pregnancy or birth intervals are prone to nutritional risks like anaemia, impaired immunity because they already have diminished nutrient stores, and have to cater for the present pregnancy requirements (Wardlaw, 2000).The results are as reflected in Table 4.1 below.

TABLE 4.1: NUMBER OF PREGNANCIES BEFORE THE CURRENT ONE

		Valid per cent
Valid	None	30.0
	1	16.0
	2	7.0
	3	14.0
	4 and over	33.0
	Total	100.0

From the study, observations were that 33% of the respondents had four and above pregnancies before the current one, while 30% had never been pregnant before and that was their first pregnancy. Sixteen per cent (16%) of the respondents had one pregnancy while 14% had three pregnancies. Only seven per cent of the respondents had two pregnancies before the current one. A male participant commented during the FGD that *"A woman was created to have as many children as possible and God gave him the biological make up to enable that so, there is no need to worry much about what they eat."* This shows how ignorant some people are concerning the nutritional requirements during pregnancy and the risks associated with nutritional deficiencies.

- **Birth intervals**

  In addition, results from the research showed that 71% of the respondents never experienced birth intervals of fewer than two years and only 29% experienced birth intervals of fewer than two years.

  The 29% of the respondents with birth intervals of fewer than two years did not depict a very pleasant scenario, especially considering the fact that some of the women married very early at 15 years. Some might end up having two children during their teenage period. Because of poverty, they could not cope with the demands of both the growth spurt and pregnancy requirements. That compounded with inadequate diet, diseases common in the area, lack of safe water and inadequate sanitation and lack of timeous care of the sick would lead to deterioration of the pregnant women's nutritional status (WFP, 2000). .It did not mean that the 71% who never had birth intervals of fewer than two years were not nutritionally vulnerable. They remained

nutritionally vulnerable because the food (quantity and diversity) was not enough to meet their pregnancy nutritional requirements.

4.5. Household Characteristics

Number of children in any household has an influence on the nutritional status of the household members. The research results reflected on the next page revealed that 28% of the respondents did not have children, while another 32% had one or two children. Eleven per cent had a number of children 3 or 4 and 23% had between five and six children. Only 6% had more than six children as indicated in Table 4.2

TABLE 4.2: NUMBER OF CHILDREN FOR THE RESPONDENTS

		Valid per cent
Valid	None	28.0
	1-2	32.0
	3-4	11.0
	5-6	23.0
	Above 6	6.0
	Total	100.0

The results are not a true reflection of the size of households in Mbire. Results from the FGD revealed that people in Mbire were still a socially bound community who valued the importance of the extended family and believed they had a social obligation to look after extended family members. It was a very common practice in Mbire to have families staying with extended family members. For example, the HIV/AIDS pandemic resulted in the size of some families increasing because they had to accommodate orphaned children. According to the experience gathered by the researcher while working in the area from 2006–2008, some households could even have up to 17 members. Vulnerable pregnant women staying in such big households depending on the inadequate VGF food basket were more likely to be nutritionally vulnerable, because they had to share the little amount of food available in the home with the other members.

4.6. Health Services Provision

- **Micronutrient supplementation**

The study sought to establish whether the vulnerable pregnant women received iron/folate and vitamin A supplementation since the diet was not adequate to address these

micronutrient requirements. Only 32% of the respondents stated that they had received vitamin A supplementation, but the majority (68%) did not receive any supplementation. Vitamin A supplementation coverage for Mbire in 2010 was 25.2% according to the Zimbabwe National Nutrition Survey (2010:52) which was close to the findings but far below the internationally accepted threshold.

On the other hand, a mere seven per cent received Iron/Folate Supplementation and 93% did not receive it. Figure 4.7 illustrates iron/folate supplementation coverage in Mbire as revealed by the study**.** This was far below the 27.8 % stated in the Zimbabwe National Nutrition Survey (2010:52) for Mbire District.

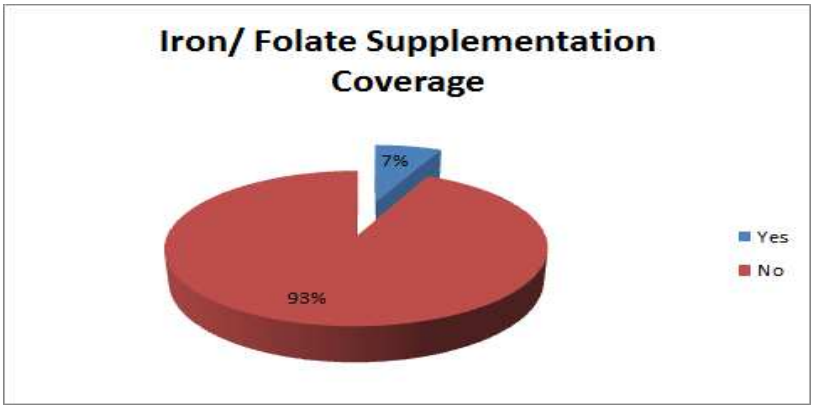


Figure 4.6: Iron/folate supplementation coverage in Mbire

However, because of low literacy levels some of the respondents might have received the supplementation without even being aware of it. This resulted in the researcher making further enquiries from the nurses in charge at the two clinics who revealed that micronutrient supplementation coverage over the past five years had been very low, because of shortage of resources. Although the Ministry of Health and Child Welfare integrated vitamin A supplementation into the Expanded Immunisation Programme (EPI) in 2002, it declined from 2002-2003 because of the economic downturn in Zimbabwe (National Health Strategy. Zimbabwe, 2010:49).

The fact that the majority of the vulnerable pregnant women had not received iron/folate supplementation and vitamin A supplementation prior to their pregnancy meant they began pregnancy with diminished micronutrients stores (Wardlaw 2000). Vitamin A deficiency reduced the immune system's response to several infections, caused blindness, and increased risk of maternal and infant mortality (World Bank, 2006d).That meant that they were likely to suffer from anaemia and compromised immunity that can led to

maternal deaths. The Spheres Handbook (2011:161) emphasises that pregnant women are supposed to receive iron, folate and vitamin A supplementation administered in accordance to the internationally recommended doses and timing by the World Health Organisation (WHO).

The Joint Statement by WFP, UNICEF & WFP (2007:1) and Webb et al. (2006:68) agreed that the majority of women, especially in developing countries, did not have access to a diet with adequate micronutrients and hence were nutritionally vulnerable. That meant that the vulnerable pregnant women in Mbire remained nutritionally vulnerable because they were not receiving micronutrient supplementation, because that was not being catered for by the food basket and their limited food resources.

- **Travelling**

Figure 4.7 gives the distance that the respondents cover to travel from their homes to the nearest health centre where they can get medical assistance. Only nine per cent of the respondents pointed out that they took less than one hour to travel to the nearest health centre on foot followed by 21% who stated that they took three to five hours. The majority of the respondents (70%) indicated that they took one to three hours to get to the nearest health centre to seek for medical assistance. None of the respondents indicated that it took them more than five hours to travel to the nearest health centre. The findings are presented in Figure 4.7.

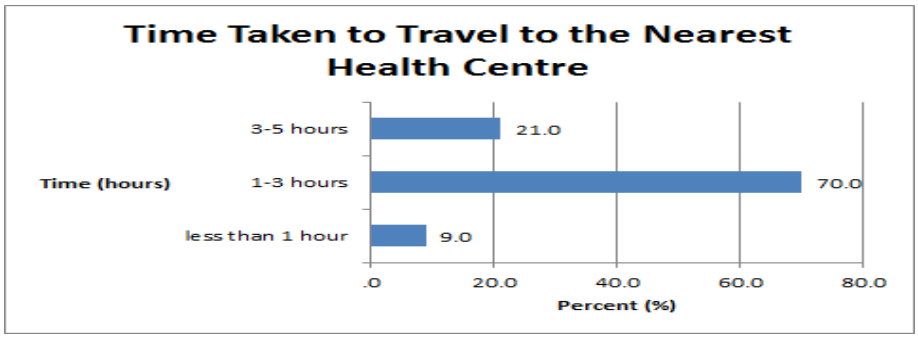


Figure 4.7: Time normally taken by respondents to travel to nearest health centre

Close analysis revealed that it did not imply that the furthest health centre was three to five hours away from the respondents' homes. It might be an indication that people living furthest were not visiting the health centres, and could not participate in the survey, for example, the Doma people who moved from place to place hunting and gathering.

Former farm workers or victims of the 2005 Urban Clean up Exercise, who came into the area late, were allocated land further away in the forest some distances away from initial settlers (original Korekore people) and social services facilities like clinics. That increased their vulnerability. Webb *et al.* (2006) state that long distances from health centres further increases nutritional vulnerability of marginalised populations in developing countries.

Such long distances are prohibitive especially for the pregnant women who may just decide to stay at home when they are sick. Lack of medical attention will cause the situation to deteriorate even further. A compromised immune system and malabsorption of nutrients may result, leading to deterioration of nutritional status.

- **Antenatal checks for pregnant women**

Antenatal checks are monthly check ups that are carried out for pregnant women to determine whether the person is not suffering from any medical problem or have clinical signs of malnutrition.

Findings from the study indicated that 31% of the respondents knew of other pregnant women in their neighbourhood who were not visiting health centres for antenatal checks. On the contrary, 69% stated that they were not aware of other women in their neighbourhood who were not visiting health centres for antenatal checks.

- **TABLE 4.3: VISITS TO HEALTH CENTRE FOR ANTENATAL CHECKS**

		Valid per cent
Valid	Yes	31.0
	No	69.0
	Total	100.0

Antenatal checks are very important when it comes to the nutritional status of pregnant women because some overt clinical signs of malnutrition can be detected and addressed early. The majority of the respondents who stated that they knew of other pregnant women who were not visiting the health centres for antenatal care, lived far away from health centres. Therefore, distance might be a contributing factor. Some of the respondents might not be visiting the health centres because of traditional and religious beliefs. Failure to address medical problems in time for the vulnerable pregnant women, would ultimately result in deterioration of nutritional status.

4.7. Water and Sanitation

Findings from the study revealed that 66% of the respondents obtained water for household consumption from the rivers (Manyame, Angwa or Hunyani) while 32% indicated that their water for household consumption was from boreholes. Only two per cent of the respondents stated that they consumed water from unprotected wells. None of the respondents had access to tap water or water from protected wells. The water table in Mbire, especially during the dry season was very low and that was the reason why very few people did not rely on wells for water.

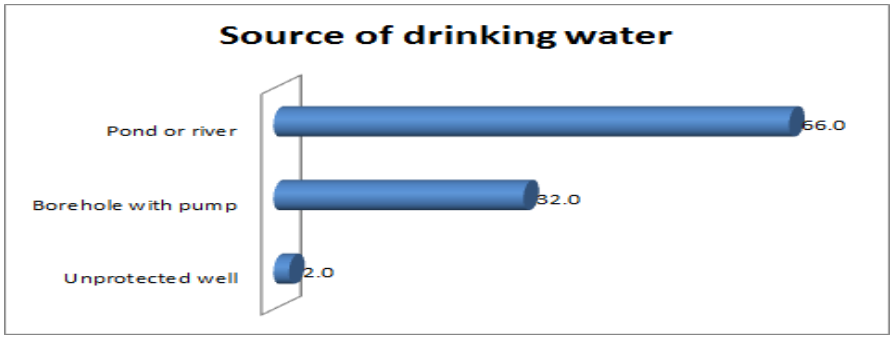


Figure 4.8: Respondents' source of water for household consumption

Lack of clean safe water for the vulnerable pregnant women exposes them to a number of nutritional risks especially considering that in Mbire temperatures can go up 40 degrees Celsius in summer. Water is essential for digestion absorption and metabolism in the body of any human being (Tull, 1997). When it is inadequate in the body the pregnant women are more likely to suffer from constipation. In addition to that, digestion, absorption and metabolism of the ingested food will be disturbed and body will fail to benefit nutritionally from the food.

Consuming dirt water from the river may result in the pregnant women suffering from diarrhoeal diseases, the immediate causes of malnutrition according to the MSF (2006). For example the 2008 Cholera outbreak, which claimed over 3 000 lives in Zimbabwe was due to lack of adequate clean water and sanitation (National Health Strategy for Zimbabwe, 2010). Diarrhoeal diseases usually result in vomiting and stool, and nutrients will be lost leading to deterioration of nutritional status and at times death.

Dirt water from the river can result in worm infestations in the vulnerable pregnant women further exposing them to nutritional vulnerability. Webb *et al.* (2006:53) highlight that worm

infestations hinders optimal utilisation of the food consumed, and this is likely to happen with vulnerable pregnant women in Mbire who consume unsafe water from the river.

The majority of the respondents who indicated that they used water from boreholes for household consumption were from the Angwa ward because in Masoka, for the ordinary community members there was only one functioning borehole, since two others had broken down. That further increased the vulnerability of the majority of the respondents because they would consume dirt water from the river. None of the respondents indicated that they had access to tap water because in the wards sampled, there is no provision for tap water.

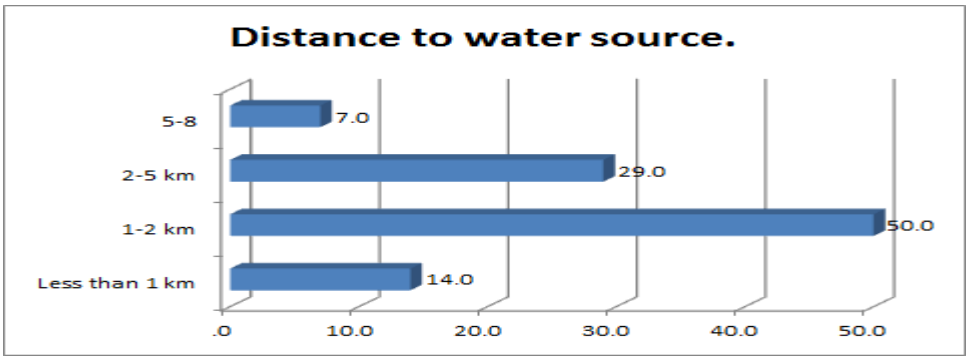


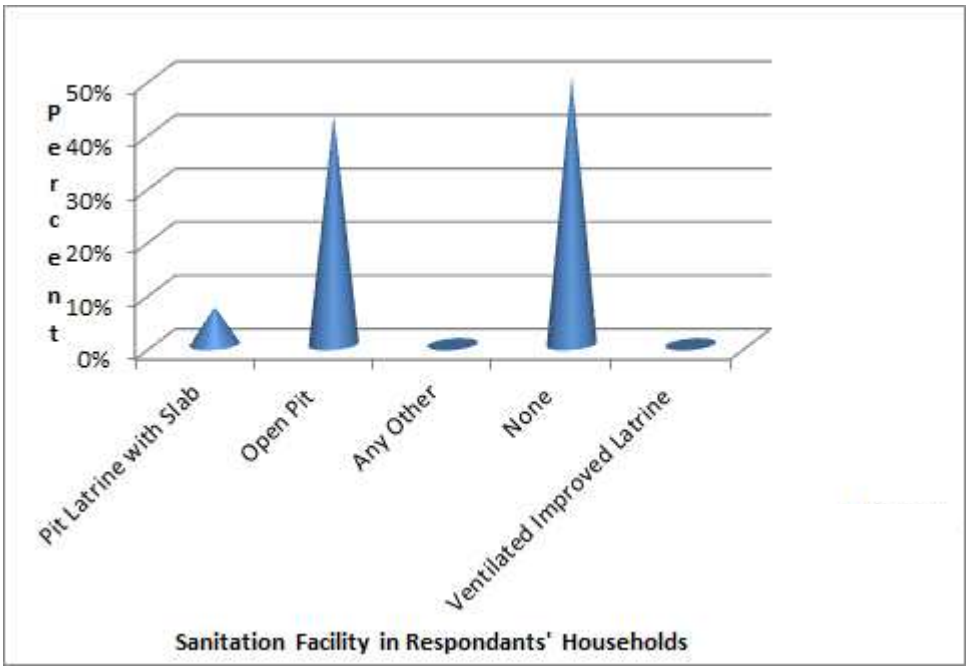
Figure 4.9: Distance of water source from respondents' home

It was necessary to establish the distance that the respondents had to travel to get to the nearest water source, because it affected the quality and quantity of water available for consumption in the home.

Fourteen per cent of the respondents indicated that their source of water was less than a kilometre (km) away from their homes. The majority (50%) of the respondents stated that they got water for household consumption from a source, which was about one to two kilometres away. Only seven per cent of the respondents indicated that during the dry season their source of water was five to eight kilometres away from their homes.

The distance from which water is obtained is very important for sanitation and hygiene in the home. Households that reside in areas far away from a water source will find it difficult to transport sufficient quantities of water, because they do not have draught power and scotch carts since they do not own cattle. As a result, there will be no proper cleaning of cooking utensils, washing of products like vegetables and washing hands. This sounds as if it is something that does not apply to nutrition and health, but clean water is very important for hygiene practice in the home. Lack of it can result in outbreak of communicable diseases like

cholera and typhoid. This results in the weakening of the vulnerable pregnant women's immune system compromising their nutritional status. Table 4.10 shows sanitation facilities in the respondents' households.



4.10. Sanitary facility in the respondents' households

Findings from the study established that 50% of the respondents stayed in households that did not have toilets followed closely by 43% who resided in households utilising an open pit toilet. Only seven per cent of the respondents lived in households that utilised ventilated improved pit latrines.

The statistics given above confirms a high level of unsanitary conditions among the vulnerable populations in the Mbire district. Lack of proper faecal disposal combined with consumption of water from the river may lead to outbreak of diarrhoeal diseases proved to cause malnutrition and usually accompanied by vomiting and stool that cause loss of nutrients. The Joint Monitoring Statement by WHO, UNICEF & WFP (2007:7) adds that infectious diseases suppress appetite while at the same time increasing the need for micronutrients to fight illness. None of the respondents came from households utilising the ventilated improved latrine because they could not afford to construct them unless they received donor funding.

4.8. Food Basket Composition, Adequacy and Utilisation

The respondents were required to list food commodities that they received from the VGF programme on a monthly basis. All the respondents could list in their language that they received vegetable oil, cereal (either maize or bulgur wheat) and pulses (cowpeas, lentils or sugar beans). The monthly ration given for the programme is reflected in Table 4.4.

TABLE 4.4: COMMODITIES USUALLY DISTRIBUTED FOR VGF

Commodity	Ration
Cereal	12.5 kg
Pulses	1.8 kg
Vegetable Oil	0.6 kg

Source: Christian Care VGF Proposal for Mbire District (2010)

The ration is distributed on the assumption that the beneficiaries have other sources of food to cater for their nutritional needs. The food basket lacks in diversity because the protein from pulses is of low biological value (LBV). Pulses are also a source of LBV iron not easily assimilated by the body. Therefore if pulses are the only source of protein or iron for the vulnerable pregnant women they will be susceptible to malnutrition because they may develop iron deficiency anaemia, which is the major cause of maternal deaths in developing countries (Joint Statement by WHO, UNICEF & WFP, 2007). Mahan and Escott-Stump (2000) postulate that protein is one of the major components of antibodies. If it lacks in the body this may result in a weak immune system rendering a person prone to opportunistic infection. This proves that protein is a vital macronutrient that must be adequate in any pregnant woman's diet. The vitamin A that is provided by the vegetable oil will not be enough to meet the nutritional requirements, and this again will result in weak immune system and more susceptibility to infections. The food basket does not cater for vitamin C, which is also an essential nutrient.

4.9. Fortification of Food Commodities

About 23% of the respondents were aware that the vegetable oil they received for the VGF programme was fortified and 77% were not aware. A follow-up question posed was for the respondents to check whether they understood more about fortification. Surprisingly only 13% could specify the nutrients (vitamin A and D) used to fortify the vegetable oil. Variations in responses to this question showed that the beneficiaries lacked nutritional

knowledge about the products that they were receiving. Ignorance about fortification might also be due to low literacy levels and unfamiliarity with the food commodities (especially among the Doma who were not used to the products).

WFP and UNICEF policy and standards on food aid require that food distributed to vulnerable populations must be of the best quality. This can be achieved not only by a balanced food basket, but by adding nutritive value to food through micronutrient fortification.

However, although the vegetable oil is fortified with vitamin A and D the WFP, UNICEF and WHO (2007) advise that it is not adequate to meet the micronutrients requirements. It means that although pregnant women are receiving fortified vegetable oil, they are still prone to develop problems associated with vitamin A and D deficiency and hence, nutritionally vulnerable. Fortification with folate may go a long way in addressing the problem of folate deficiency related anaemia.

It was apparent that there was no provision for graduated containers for distributing commodities at the FDP. Findings with regard to types of measuring scoops used to distribute food aid from large containers during distributions indicated that 96% did not use calibrated measuring scoops. Results are reflected in the graph (Figure 4.11) below.

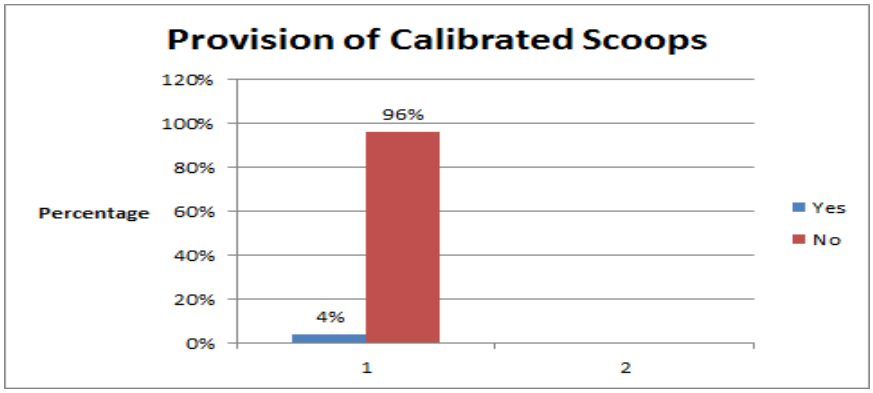


Figure 4.11 Provision of measuring scoops for distribution

The beneficiaries indicated that they had to improvise using ordinary containers they brought from home. Lack of graduated measuring scoops could result in under scooping (beneficiaries not getting enough rations). That meant that the beneficiaries would not receive the intended quantity of nutrients. As a result, they might become malnourished especially considering the fact that the majority did not have enough food to supplement the food basket. The four per cent who indicated that they had access to measuring scoops were those

who made use of Salter scales from clinics to calibrate their containers, which were not hygienic because contamination of the food commodities could result leading to diarrhoeal diseases.

4.10. Training in Preparation of Food Commodities

Findings were that only 13% received training in the preparation of the food commodities and 87% had not received the training and were preparing the food commodities as they saw fit.

WFP requires that beneficiaries of the programme be trained in the food preparation of some of the unfamiliar food products they receive for VGF to ensure that nutrients are conserved during cooking, but there has been very little coverage in Mbire. The 2004 WFP Cooking Guidelines Handbook was issued out to FDPs committee members, but from the experience that the researcher had working in the area, no trainings were carried out. It might be because of low literacy levels. Those who could understand English better were the very few who had reached secondary level and the majority were not beneficiaries of the VGF programme

The researcher working with the Doma on the same programme from 2006 – 2008, gathered during post distribution monitoring visits that the Doma were pounding the maize they received for VGF and threw away the hulls. That might have been due to lack of training in nutrition and health and lack of money to go to the grinding mill. The maize hulls are excellent for roughage to prevent constipation and other diseases, especially among the vulnerable pregnant women who lacked access to adequate fruits and vegetables.

The FGD revealed that some of the beneficiaries were overcooking the pulses as suggested in the following statement by one participant, "*We have an abundant supply of firewood from the vast forests so we can afford to leave kids boiling the pulses whilst working in the fields or garden and can prepare them using different recipes we have invented."* Overcooking of pulses might lead to destruction of nutrients (Fox & Cameroon, 1995) and the beneficiaries would not benefit nutritionally from them.

4.11. Food Basket Contribution to Households

It was very essential to ascertain what contribution the VGF food basket made to the food consumed in the households of the respondents. That would reveal whether nutritional requirements for the vulnerable pregnant women were being met or not in the households which depended much on the VGF food basket for food.

The food basket contributes almost 100% to the amount of food consumed in 68% of the respondents' households yet it is only designed to complement. If income or any other meaningful assets lack in these households the pregnant women will become malnourished. The facts gathered during the FGD are that, vulnerable pregnant women lack adequate income to fend for themselves by acquiring extra food to meet the nutritional requirements the VGF food basket is failing to meet. Only 32% of the respondents indicated that they had other sources of food as illustrated in Figure 4.12.

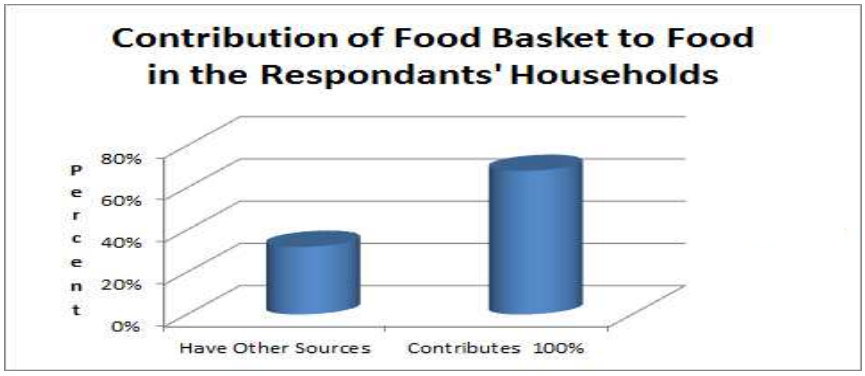


Figure 4.12: Contribution of food basket to food consumed in the household

The MSF (2006), state that the VGF programme has been designed to meet the nutritional requirements of vulnerable populations who have other sources of food. The fact that the majority (68%) of the vulnerable pregnant women depend only on the food basket means that they are still nutritionally at risk. It does not mean that the 32% who indicate that they have other sources of food are getting more than what they need in terms of dietary needs. Diversity and quantity may still be insufficient to meet the pregnancy requirements.

4.12 Food Harvests in Respondents' Households

Food security and livelihood activities in any household determine nutritional status of the household members. Findings were that 54% of the respondents had not harvested the previous farming season while only 46 % had harvested.

Mbire falls under Region IV (semi-arid) in the Zimbabwe ecological regions (ZELA, 2009). This is not suitable for maize production, which is the staple crop for the Mbire people. Production of maize during the normal farming rain season in Zimbabwe, October to April (for rain fed agriculture) is almost impossible and the majority in Mbire who harvest small quantities of maize, produce it during winter practising stream bank cultivation. However,

environmentalists have criticised this as the major cause of environmental degradation along rivers.

Even for those who have harvested, the food will be insignificant to sustain them for over three months. This means that they remain nutritionally vulnerable because the food basket they depend on is not catering for all their nutritional requirements. The major crops for consumption produced in Mbire are groundnuts and small grains on a very small scale. This means that there is a lack in diversity of the food consumed by the vulnerable pregnant women.

4.13 Livestock Ownership by Respondents

The number of livestock (cattle, goats, sheep and chickens) that a household in the rural areas owns has a bearing on the household members' nutritional status. Cows and goats can provide milk and all the above-stated animals can be slaughtered for meat. The two food commodities (milk and meat) have a high biological value (HBV) protein, iron and calcium.

Eighty –eight per cent (88%) of the respondents alluded that they did not own any cattle while four per cent owned one to two beasts. Those who indicated that they owned between three to four cattle were five per cent. An insignificant three per cent reported that they owned more than four cattle.

Mbire is an area suitable for goat rearing but wild animals like lions and jackal usually prey on them. Table 4.5 presents the ownership of goats among the respondents.

TABLE 4.5: NUMBER OF GOATS OWNED BY THE RESPONDENTS

Number of Goats	Per centage of Respondents
None	67 %
1 -2	7 %
2 – 4	9 %
Above 4	14 %

TABLE 4.6: NUMBER OF CHICKENS OWNED BY THE RESPONDENTS

Number of Chickens	Percentage of Respondents
None	42
1 -2	14 %
3 -4	15 %
Above 4	29 %

Forty-two per cent (42%) of the respondents pointed out that they did not own any chickens and about 14 % owned one or two chickens. Fifteen per cent (15%) of the respondents owned three or four chickens and 29% owned more than four chickens and guinea fowls. Scarcity of chickens in most households can be attributed to the Newcastle epidemic that periodically affects most rural areas in Zimbabwe (FAO/WFP, 2010).

None of the respondents from the tsetse infested Masoka ward owns cattle. This is the situation in most parts of the Angwa ward and it means the vulnerable pregnant women cannot get milk and meat. Almost no beneficiaries own chickens enough to produce eggs for household consumption. The result will be the pregnant women's diets will lack in eggs.

On the other hand, Mbire is a very remote area without shops or butcheries to buy products like meat, eggs and meat. These are essential during pregnancy for provision of proteins and iron of HBV and calcium. Although Mbire is very rich in wildlife (Mbire Baseline Survey Report, 2009) hunting is illegal and animals are only slaughtered as a culling measure by local authorities and Safari operators. The Headman among the community members share the meat and obviously this is not adequate to meet the nutritional requirements of the vulnerable pregnant women. This means that they will be prone to develop some nutritionally related problems like inadequate weight gain, anaemia and weak immune system, which can result in maternal death. Inadequacy of the above stated nutrients means that the unborn baby is also vulnerable. Insel and Wardlaw (1999:458) lament that this has been proven to result in low birth weight (LBW) babies that contributes to infant mortality.

The Zimbabwe National Nutrition Survey (2010:49) revealed that eggs, milk, fruits, vegetables and meat were rarely included in the diets of children staying in remote rural areas like Mbire. That obviously affected the nutritional status of the whole population, pregnant women included.

4.14. Main Source of Income for Households of Respondents

Source and amount of income for any household determine the type and diversity of food consumed there. In other words, the amount of income coming into the home influences the nutritional status of the household members directly or indirectly. Data collected indicated that none of the respondents obtained income from formal employment and 18% engaged in petty trade. Forty five per cent (45%) indicated that casual labour was their source of income

while about 17% of the respondents in the any other category mentioned sources like gifts and remittances. The findings are illustrated in Figure 4.13.

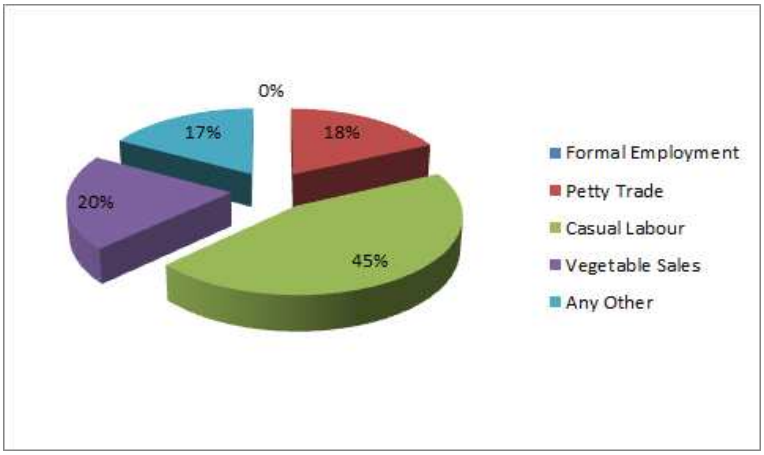


Figure 4.13 Source of income for the respondents

The majority pointed out that they relied on casual labour as source of income. They moulded bricks, worked as seasonal farm workers on Centenary or Concession commercial farms or crossed over to Mozambique. These are very strenuous activities for pregnant women. If they do not have the support of their husbands/partners, they will become nutritionally vulnerable because they cannot continue with the activities when they are pregnant. This means that they will not have any source of income to buy food to supplement the food basket.

The nil per cent formal employment among the vulnerable pregnant women reflected a very high level of unemployment among the Mbire people. The high level of illiteracy meant that they could not get formal employment in the government departments or council the only major sources of formal employment. Very few men were employed as game rangers or trekkers. The Dandito Sugar Cane and Cotton Project that had been earmarked to employ hundreds of the unskilled people in the Chapoto area failed to take off because of economic hardships between year 2000 and 2008 and wrangles over water rights in the Zambezi River (World Bank, 2010:99**).** Cotton production that used to be a source of income for the Mbire poor peasants was no longer viable because cotton companies had since stopped giving loans to peasant farmers who lacked collateral. Therefore they were no longer producing cotton for they could not afford to buy the agricultural inputs on their own.

4.15. Source of Fruits and Vegetables for Respondents

Thirty three per cent (33 %) of the respondents established that they owned gardens while 16% stated that they depended on gifts from those with vegetable gardens for vegetables to

consume in their households. Only 11% indicated that they purchased and 31% obtained vegetables from either exchanging their labour or other commodities for vegetables. Nine per cent (9%) were in the Any Other Category.

From the findings of the study only ten per cent of the respondents owned orchards. The majority (76%) of the respondents indicated that they relied on indigenous fruits as a source of fruits for household consumption while a mere two per cent pointed out that they relied on purchases. Ten per cent (10%) indicated that the source of fruits for their consumption was barter trade and two per cent selected the Any Other category where gifts were listed as another source of fruits for household consumption. The findings for vegetables are as illustrated in Figure 4.14.

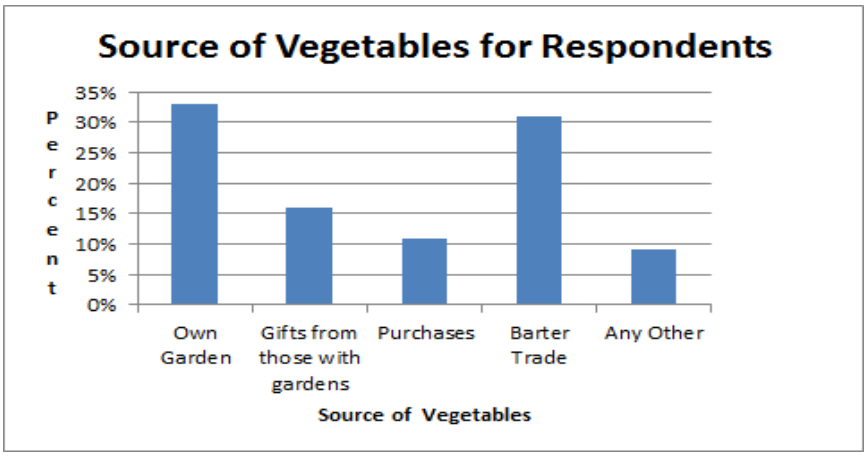


Figure 4.14 Respondents' source of vegetables for household consumption

The low figure on purchases shows that because of poverty the respondents lacked the purchasing power to buy fruits and vegetables even if they were available from those with gardens and orchards. Agriculture Rural Development Authority (ARDA) Mushumbi, which used to be a cheap source of fruits and vegetables scaled down operations during the economic meltdown period (2000 -2008) leaving some of the people solely dependent on indigenous fruits, which were seasonal. Lack in roughage and micronutrients like vitamins and folate obtained from fruits and vegetables in the diet would result in malnutrition.

Fruits and vegetables are good sources of vital micronutrients like vitamin C, A, E and folate. Lack of these during pregnancy results in nutritional deficiencies related health problems like constipation, anaemia, scurvy and compromised immunity, which can lead to maternal deaths. The joint statement by WHO, UNICEF & WFP (2007) reveals that around two billion

people in the world are estimated to be deficient in key vitamins and minerals and pregnant women were listed as the most vulnerable. The Mbire pregnant women were not exceptions.

4.16. Diversity of Food Consumed on Daily Basis

Respondents were required to list different food products they normally consumed on a daily basis to ascertain whether they were getting an adequate diet (in diversity) to cater for the nutritional needs during pregnancy. The findings are reflected in the graph in Figure 4.15.

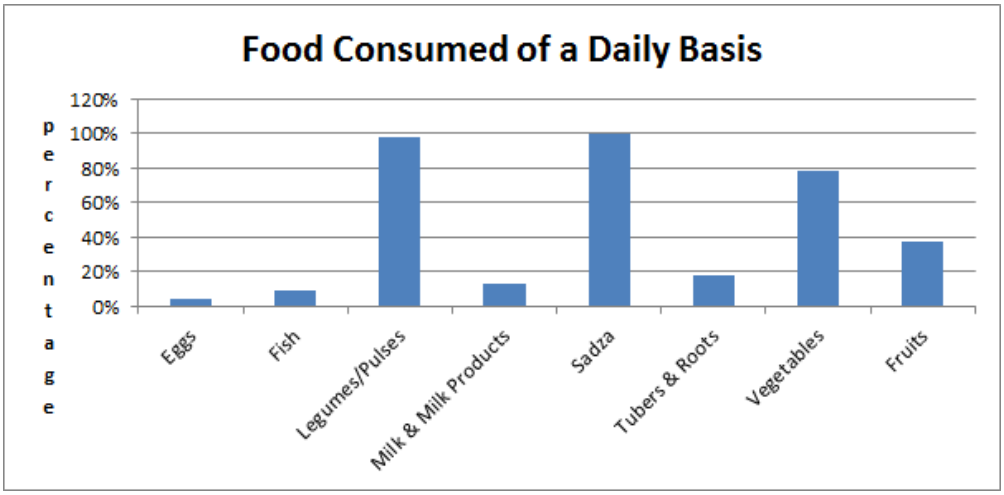


Figure 4.15 Percentages of Vulnerable Pregnant Women Consuming Specified Food Groups

Eggs and fish were rarely included in the diets of the vulnerable pregnant women. Meat was regularly consumed by a few (13%). This reveals the nutrition of the vulnerable pregnant women as far as consumption of vital nutrients needed during pregnancy is concerned. These food products are critical during pregnancy for various functions like provision of iron and protein for sound immune system, growth of the foetus, increase in blood volume, maintenance of tissues and production of antibodies and enough blood. This means that the vulnerable pregnant women are more likely to suffer opportunistic infections.

Those who consume fish are likely to be those with husbands or male relatives who can travel to Caborra Bassa in Mozambique for casual labour in exchange for fish. This demonstrates the importance of material support during pregnancy that can be encouraged by other community members in order to ensure reduction in malnutrition among the pregnant women.

The majority of the respondents who indicated that they consumed tubers and roots were the Doma women who were still practising hunting and gathering and they consumed roots and

tubers like '*tsitsi'* and '*garatongo*'. However, the fact that those were products sourced straight from the forest did not mean that they were not nutritionally rich. There is need for scientific research to find out the nutritional content of these products.

The majority of those who stated that they consumed honey were from the Doma ethnic group, and they sourced that through hunting and gathering in the forest. That was actually an advantage to them nutritionally. Honey has been proven to be rich in phosphorous, calcium, carbohydrates, vitamins and iron that are essential during pregnancy (http://health-benefits-ofhoney.com). The Doma people may even be in a better position nutritionally than their counterparts.

4.17. Food Products Vital during Pregnancy

It was an open-ended question intended to find out whether the pregnant women knew what pregnant women were supposed to consume to ensure successful pregnancy. Variations in the responses showed that even women who had never been to school knew that meat, eggs and milk were some of the vital products required during pregnancy. However, a few were aware that indigenous fruits were very nutritious. Some of the illiterate women indicated that bread and tea were vital during pregnancy. That demonstrated lack of knowledge about nutritional issues and showed that there was need for training and capacity building.

4.18 Type of Salt Used

Iodine is one of the nutrients necessary during pregnancy for both the mother and the baby to be born. This means that even before pregnancy women need to consume food commodities with adequate iodine like iodised table salt.

Findings from the study revealed that 34% of the respondents used coarse salt, which was not iodised while only 23% used iodised salt, two per cent used salt processed from local grass and 41% used fine salt that was not iodised. The use of uniodised table salt was due to the lack of income to buy and unavailability of the iodised salt on the market in Mbire. Use of uniodised table salt can lead to iodine deficiency disorders like the development of goitre.

4.19 Perception of Nutritional Needs

A significantly high proportion (83%) of respondents pointed out that there had been failure to meet nutritional requirements for the vulnerable pregnant women in Mbire. Only 17% admitted that it was successful. The majority of the respondents who indicated that there was

failure to meet nutritional needs might be referring only to quantity not diversity of the food they were receiving from the VGF programme. A number of the respondents lacked nutritional knowledge about the food groups that were vital for sound nutritional status and that further increased their nutritional vulnerability. That implied that there was need for training in health and nutrition education.

4.20 Recommendations by Respondents on how reduce to Reduce Malnutrition

The respondents recommended the following strategies to reduce nutritional vulnerability among the vulnerable pregnant women:

- An increase in the quantity of food commodities the vulnerable pregnant women received from VGF.
- More diversity in the VGF food basket with the addition of food products like milk, meat and eggs.
- WFP to take into consideration the beneficiaries' food preferences and habits rather than bringing to them unfamiliar products like lentils and bulgur wheat for VGF.

All the recommendations were on the increase of quantity of food and diversity which showed that respondents were ignorant about the fact that malnutrition did not only result from inadequate diet, but also from underlying factors like lack of water and sanitation, lack of timeous treatment of the sick and socio-economic and political factors. These issues should be addressed to ensure good nutritional status of vulnerable pregnant women.

The respondents failed to realise that besides the food being distributed by WFP or food bought from shops, there might be other locally available food commodities that could be of nutritional benefit to them. Therefore it might be necessary to sensitise them about these products like the baobab fruits and *'Masawu'*. By so doing, the community would be capacitated to solve their own problems using locally available resources.

4.21 Nutritional Status

Nutritional status of any given population as measured by anthropometry is considered a biological outcome of the level of nutrition security (Brouwer, 1994). Therefore to measure nutritional well-being of the vulnerable pregnant women, the following anthropometric indicators were used; weight, height and mid upper arm circumference (MUAC). Inadequate

diet and diseases suffered by the respondents in the two weeks preceding the survey were taken into consideration since that also affected their nutritional status.

- **Anthropometric Findings**

  Findings from the survey revealed that height of the respondents ranged from 1.44 – 1.76 m and weight range was from 48 kg – 72 kg. Although height and weight is a function of genetics, the diet of a person from childhood is a contributing factor (WHO, 1991). A closer look at the weight ranges revealed that some of the pregnant women were underweight which was an indication of malnutrition.

  The Body Mass Index (BMI) range for the respondents was between 20 and 26.3. The WFP (2004:36) recommends a BMI range of 19 – 21 for non-pregnant women in developing countries except for the Kenyan Samburu (17.6) and Dinke from South Sudan (17.6) who are unusually tall. However, BMI is rarely used in anthropometric surveys for pregnant women because it adds extra work to interpret because of the extra weight gain. A significant number of respondents (76%) had a MUAC of equal or greater than 22 cm and only 24% had a MUAC of less than 22 cm, which was a simple indicator of malnutrition according to WFP (2000). The Spheres Handbook (2011) warns that a MUAC of less than 20.7 indicates severe risk of malnutrition and fortunately only 2 participants had a MUAC of less than 20.7. The MUAC of the respondents is illustrated in Figure 4.16.

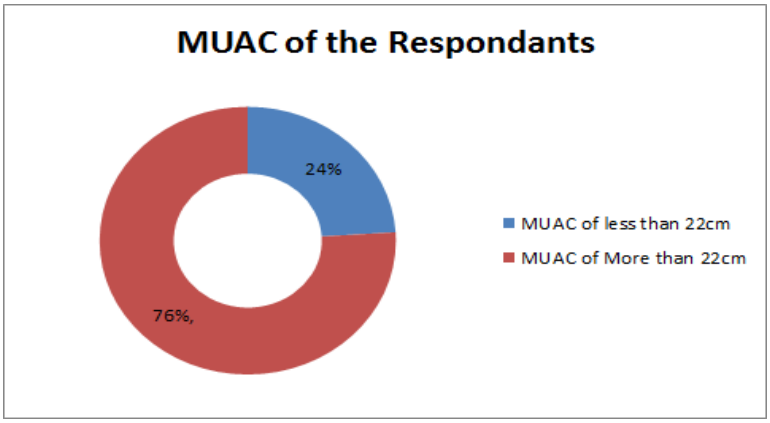


Figure 4.16: MUAC Measurements for the Respondents

So based on the evidence in Figure 4.16, though not conclusive, it could be argued that the prevalence of malnutrition among the vulnerable pregnant women in Mbire was about 24%,

which was the percentage of the respondents with a MUAC of less than 22 cm. That was not very far from the 33.8% given as prevalence of malnutrition in Zimbabwe according to the Zimbabwe National Nutrition Survey (2010).

- **Prevalence of diseases two weeks preceding the survey**

  - **Diarrhoea**

    Eighteen per cent of the respondents had diarrhoea in the last two weeks preceding the survey and five of the respondents who had diarrhoea had a MUAC of less than 22 cm which meant that they were malnourished.

    Diarrhoea was more prevalent among the vulnerable women than any other disease. Consumption of unsafe dirt water from the rivers and lack of proper sanitary disposal might be contributing to the high incidences of diarrhoea. It was interesting to note that diarrhoea affected MUAC more than any other disease.

  - **Coughing**

    From the study findings, it was evident that 35 of the vulnerable pregnant women had been coughing in the last two weeks before the survey, but none had a MUAC of less than 22cm. This shows that coughing does not affect nutritional status to a greater extent.

  - **Malaria**

    Mbire is a malaria-prone area. Usually vomiting, loss of appetite and impairment of the natural immune system accompanies malaria. In pregnant women, this can result in malnutrition or even death. Findings from the survey revealed that seven per cent of the respondents had suffered malaria in the last two weeks before the survey and 17% of them had a MUAC of less than 22 cm. That was the reason why from 2006 to 2007 when the researcher was working in the area the Ministry of Health and Child Welfare was distributing WHO funded mosquito nets specifically for pregnant women and children. The prevalence of diseases is reflected in Figure 4.17.

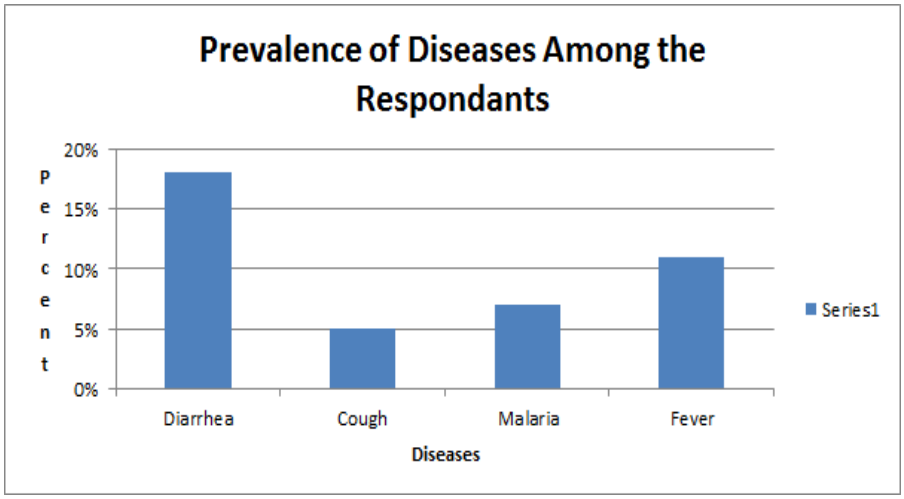


Figure 4.17: Illness suffered by respondents in last two weeks preceding the survey.

- **Dietary intake by the respondents**

  The number of meals that an individual consumes contributes to that person's nutritional status. The standard is that a person should consume at least three meals per day. Findings from the study were that the majority (62%) of the respondents normally consumed three meals per day. Thirty one per cent of the respondents stated that they normally consumed two meals per day. Only three per cent of the respondents indicated that they consumed four meals per day. The number of meals usually consumed by a person contributes to MUAC of the respondents.

4.22 Summary

The chapter presented and analysed data collected in the research. The next chapter will summarise the research findings in the light of the problem statement and research objectives.

CHAPTER FIVE

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter focuses on the summary of the study, draws conclusions from the results and suggests recommendations to address the problem of nutritional vulnerability among the vulnerable pregnant women who are beneficiaries of the Vulnerable Group Feeding (VGF) Programme in Mbire.

5.2 Summary of the Findings

The major findings of the research were summarised around the research objectives and few general themes that emerged during interviews. They are given below.

5.2.1 Socioeconomic background of the vulnerable pregnant women

A high level of illiteracy was revealed among the vulnerable pregnant women especially among the Doma women. As a result, they lack knowledge on nutrition, health and hygiene. Even for the very few who have gone up to secondary level, the school curriculum does not cater for nutritional education. Some of the respondents are peasant farmers and some are very poor to an extent that they do not have basic assets to engage in peasant farming and depend on casual labour as source of income. All the respondents are poor and vulnerable and that is the reason why they qualified for the VGF programme. This is more likely to lead to inadequate food, poor meal planning and preparation and poor nutrition and health practices in their homes, which cause malnutrition.

5.2.2 Findings on immediate determinants of nutritional vulnerability diseases

Diarrhoea, fever and malaria were some of the prevalent diseases among the vulnerable pregnant women as indicated in Figure 4.17. That was attributable to the lack of basic water and sanitation facilities in the case of diarrhoea and also inadequate curative health services and preventative health care. Some of the respondents who were ill two weeks preceding the survey had a mid upper arm circumference (MUAC) of less than 22 cm, which was an indication of malnutrition according to World Food Programme (WFP) and World Health Organisation (WHO) standards.

- **Inadequate food intake**

There was failure to meet the RDA for the vulnerable pregnant women because the food that they were consuming lacked in diversity and quantity as shown in Figure 4.15**.** Although the majority of the respondents indicated that they consumed three meals per day, further analysis revealed that they were subsisting on an unbalanced diet. Grains and tubers were the most consumed food products and those were energy giving foods. Some food products needed during pregnancy like eggs, meat, milk and milk products, rich in vital nutrients iron, folate, protein, phosphorous zinc and calcium, were rarely included in the diets of the majority of the vulnerable pregnant women.

The VGF food basket is designed for populations with other sources of food. Hence it is not enough to meet all the nutritional requirements for the beneficiaries who have been identified using the WFP selection criteria as those without any assets, income or source of livelihood. Therefore they are more likely to be nutritionally vulnerable even when receiving the VGF food basket. The protein and iron they are getting from the pulses they receive for the VGF food basket is of low biological value (LBV) that is not easily assimilated or absorbed by the body.

Lack of fruits and vegetables in the households of the vulnerable pregnant women further increases their nutritional vulnerability because they will lack in micronutrients and roughage that can only be obtained from fruits and vegetables. They are also vulnerable because they may not benefit from the food they are consuming because nutrients interact for them to be absorbed in the body. For example for the absorption of iron, vitamin C is required. Lack of it results in the women suffering from anaemia even if iron is available in the diet.

5.2.3 Findings on underlying determinants of nutritional vulnerability

- **Inadequate curative health services**

Thirty-one per cent (31%) of the vulnerable pregnant women lacked access to antenatal and maternal care. The majority lacked access to adequate curative health services because of poverty, long prohibitive distances to health centres or traditional and religious beliefs. In addition to that, unqualified inexperienced staff manned the

health centres and there was a serious shortage of drugs. That was likely to affect their nutritional status, because when one became ill and did not receive medical attention in time, the condition can deteriorate because of malabsorption of nutrients from the inadequate food they eat.

- **Lack in preventative health care**

Primary health care was lacking in Mbire, for example scarcity of water was more likely to result in lack of basic hygiene practices like hand washing and the washing of cooking utensils. That was more likely to lead to diarrhoeal diseases that were the immediate causes of malnutrition. The number of women who had received micronutrient supplementation was very negligible as indicated in Figure 4.6. Only seven per cent received iron/folate supplementation and 32% of the respondents received vitamin A supplementation. The majority were more likely to be suffering from micronutrient deficiencies like anaemia and weak immune system, which resulted from vitamin A deficiency.

- **Food insecurity**

Although the vulnerable pregnant women were benefiting from the VGF programme food insecurity was evident in most of the households. The Masoka ward and part of Angwa ward were tsetse fly infested, which meant that they did not have cattle for draught power, milk and meat. Very few owned chickens which meant unavailability of eggs and meat. The majority of the pregnant women's households owned goats because Mbire is an area very suitable for rearing of goats. However, it was noted that the vulnerable population was not utilising all the benefits they could get from keeping goats. If they kept them in large numbers, they could use them as source of milk because research proved goat milk was nutritionally rich.

Scarcity of water and the hot climatic conditions meant that the majority could not produce fruits and vegetable for consumption leaving them only dependant on indigenous fruits when they were in season. They could not produce maize the staple food in the area and had to depend on the VGF programme food basket. The majority indicated that they had not harvested the previous season because of poverty and lack of income to buy from Guruve or Centenary hence, they lacked access to enough food. That further exposed the pregnant women to nutritional vulnerability because

the VGF food basket was not adequate to cater for their nutritional requirements. Because of lack of income, the majority of the women used salt that was not iodised and risked developing iodine deficiency disorders like goitre and cretinism in the unborn baby. A few of them (mostly the Doma) used salt they processed from special grass harvested in the area. Research is needed to prove whether it is nutritionally rich to meet pregnancy nutritional requirements.

- **Lack of training and calibrated measuring scoops for VGF food basket**

  Christian Care the VGF Implementing Partner of WFP was not training the beneficiaries on preparation of the unfamiliar food commodities they were receiving like bulgur wheat and lentils. Hence, they were just preparing them anyhow. Overcooking of the food commodities resulted in the loss of nutrients and the beneficiaries could not benefit nutritionally from the food. There was no provision for graduated measuring scoops for the beneficiaries to use during distributions, which more likely to result in under scooping, and beneficiaries would not receive the ration they were entitled to receive and would become disadvantaged nutritionally.

- **Fortification of the food products**

  The vegetable oil that the vulnerable pregnant women are receiving is fortified with vitamin A and D. Vitamin D fortification is necessary because the beneficiaries lack access to good sources like margarine, milk and fat fish. Vitamin A in the vegetable oil is not adequate to meet nutritional requirements for the pregnant women who already do not have access to sources like milk, carrots and green vegetables. Deficiency often leads to compromised immunity, which means more susceptibility to diseases. However, it should be noted that some of the food local food products the respondents are consuming like 'moringa alfera' might be rich in vitamin A and D but research is needed to prove the nutritional content.

- **Social care**

  Majority of the respondents hinted that although they needed emotional and material support, their husbands or partners were not offering it because some were in polygamous relationships and for some they did not simply care. This leaves them disadvantaged because they cannot fend for nutritionally rich food on their own through casual labour or hunting and foraging during pregnancy.

- **Cultural beliefs and taboos**

  Findings regarding the care of women revealed that pregnancy is just a natural process that can pass without any serious consideration to what the woman eats. Food products like pumpkins, organ meats and eggs were listed as some of the products which pregnant women are prohibited to eat for either cultural or religious reasons. This means that they will be nutritionally vulnerable because these are rich in vital macronutrients and micronutrients needed during pregnancy like iron, protein and vitamin A. There were indications that Mbire women still suffer economic and social discrimination and this result in lack of access to resources exposing them to nutritional vulnerability. Literature has proven that health and nutritional status of women in any society is to a greater extend linked to their status in the society (Mallikharjuna, *et al.,* 2010:167).

- **Teenage pregnancy**

  Religious, traditional beliefs and economic pressures are some of the factors which came out as distant causes of nutritional vulnerability of the vulnerable pregnant women in Mbire. Girls from the Marange Apostolic Church and others from the traditional religion marry at early adolescence stage and have their first pregnancy when their bodies have not yet fully developed and they have to cater for nutritional demands for both pregnancy and the adolescence growth spurt. With insufficient food, these pregnant women are likely to develop nutritional deficiency related diseases like anaemia that causes impairment of the immune system, vulnerability to infections and sometimes resulting in maternal mortality. Around 160 women die everyday during childbirth due to anaemia related health problems (Webb *et al.,* 2006). Teenage pregnancy may also result in malnutrition that can cause obstructed labour and Low Birth Weight babies, which may also result in mortality.

5.2.4. Nutritional status of the respondents

Anthropometric findings revealed that 24% of the vulnerable pregnant women were more likely to be malnourished because they had a mid upper arm circumference (MUAC) of less than 22 cm, which according WHO and WFP standards was a simple indicator of malnutrition. The prevalence of 24% was below the internationally accepted emergency threshold according to the Zimbabwe National Nutrition Survey (2010). MUAC ranged from

19 – 25 cm. Height of the respondents ranged from 1.44 to 1.76 metres and weight ranged from 48 – 72 kilograms that reflected that some of the vulnerable pregnant women were underweight because of malnutrition. The body mass index (BMI) for the vulnerable pregnant women ranged from 20 – 25.63. It might seem to be within the acceptable range, but for pregnant women WHO recommended a weight gain of 11 -16 kg.

5.2.5 Interventions to address nutritional vulnerability

Recommendations given by the vulnerable pregnant women regarding vital food products during pregnancy indicated that the majority of them were aware of the nutritionally rich foods except for a very few who listed things like bread as vital during pregnancy. That might be because of lack of knowledge All the respondents stated that an increase in the quantities of the VGF food basket commodities would improve their nutritional status. However, quantity alone is not enough; quality of the diet must be considered when it comes to sound nutrition.

5.2.6 Achievement of Millennium Developments Goal 1 and 5

Findings stated above is enough evidence that Zimbabwe as a country is still very far from achieving the United Nations Millennium Development Goals (MDGs) 1 and 5 pertaining to food security and maternal health respectively. To achieve this there is need to address nutritional problems of women from birth through adolescent stage to adulthood to make sure the women are nutritionally well before they become pregnant.

5.3 Conclusions

Regarding findings of the research, the following conclusions can be drawn.

The findings of the study could not be generalised because due to the size of the sample and the time factor, no conclusive evidence could be arrived at. However, it was evident that some of the vulnerable pregnant women who were beneficiaries of the VGF programme were malnourished and prevalence was about 24% of the respondents with a MUAC of less than 22 cm. This is slightly below the 33.8 % prevalence rate of malnutrition in Zimbabwe stated in Zimbabwe National Nutrition Survey Report (2010).

The weight of the respondents varied from 48 kg to 72 kg and the height range was from 1.44 to 1.76 metres. That indicated that vulnerability among the pregnant women varied. Some were more vulnerable than others; their needs needed to be addressed individually.

Present findings, though not sufficient, pointed to the fact that illness/diseases contributed to malnutrition. Some of the respondents who had suffered illness two weeks before the survey had a MUAC of less than 22 cm, which is an indication of malnutrition according to WHO and WFP standards. Some of the respondents who resided in households consuming water from the river without sanitation facilities, were suffering from diarrhoeal diseases that could lead to malnutrition and ultimately mortality.

Lack in diversity in the food consumed by the respondents was one of the factors contributing to malnutrition. That could be attributed to poverty (lack of livestock, assets and income), internal displacements, political violence and lack of diversity in the VGF food basket.

Nutritional deficiencies during pregnancy have far-reaching consequences both for the mother and the baby to be born and these are anaemia, osteoporosis, osteomalacia, obstructed labour, low birth weight (LBW) babies and iodine deficiency disorders. Iron-deficiency anaemia, vitamin A deficiency and protein deficiency are more risky because they result in compromised immunity making the victim prone to infections and vulnerable to develop diseases that might eventually lead to mortality**.** Anaemia was the major cause of child and maternal mortality and some deaths of non-pregnant women throughout the world.

It can therefore be concluded that the VGF food basket did not lead to the improvement of the nutritional status of some of the vulnerable pregnant women as stated in the Christian Care VGF Proposal (2010) because it was designed to meet the nutritional requirements of a population with other sources of food. The majority of the vulnerable pregnant women depended on the VGF food basket for their nutritional requirements.

Findings of the study were in agreement with the problem statement that even though the vulnerable pregnant women were receiving food aid they remained nutritionally vulnerable because there were other factors besides inadequate food that were affecting their nutritional status. These were underlying factors, which were inadequate water and sanitation, household food insecurity, lack of maternal care, economic and social discrimination of women, inadequate preventative and curative health care services and lack of graduated measuring scoops for distributing aid. Immediate factors that contributed to nutritional vulnerability were inadequate food intake and diseases like diarrhoeal diseases.

The respondents recommended improvement in the diversity and quantity of the VGF Food basket as an intervention that could help to reduce malnutrition among the vulnerable

pregnant women. The respondents failed to understand that nutritional vulnerability did not only result from inadequate food, but also from underlying and basic root causes like inadequate water and sanitation. These need to be addressed to reduce vulnerability.

Malnutrition is a cause of concern in Disaster Management because it is one of the major contributing factors to susceptibility of pregnant women to health hazards like HIV/AIDS, diarrhoeal diseases, malaria and respiratory problems like tuberculosis that eventually lead to mortality. Success in combating these hazards partly depends on nutritional status of the people concerned. As mentioned above, malnutrition results in compromised immune system, increases the severity and duration of infections creating a vicious cycle perpetuating malnutrition ultimately leading to mortality (MSF, 2006:4).

5.4 Recommendations

From the strategic issues raised in Chapter 4, the literature review and conclusions drawn in the above section, the following practical recommendations can be made to reduce nutritional vulnerability of vulnerable pregnant women. This will involve addressing not only issues of inadequate food through food aid intervention, but also addressing the root causes and other immediate causes of malnutrition at different levels by different sectors as discussed below.

- **At household and community level**

  - Collaboration of the Ministry of Agriculture, Mechanisation and Irrigation Development, Agriculture and Extension Services (AGRITEX) and Lower Guruve Development Association (LGDA) and other NGOs operating in the district to introduce food security interventions like small grains production, vegetable gardens, orchards, poultry and goat rearing projects so that the vulnerable populations can have access to an adequate balanced diet.
  - Training of everyone in the community by Ministry of Health on nutritional education practices, health and hygiene. Information and educational material to be provided in their own language for the literate. Songs, drama and cookery competitions can help the illiterate to understand the issues better.
  - Collaborate with World Vision and LGDA who once had projects on water and sanitation in the area to address health and hygiene issues at household and community level through adequate clean water and sanitation provision. This will reduce outbreak of diarrhoeal diseases that are immediate causes of malnutrition.

Safe water can be guaranteed through cheaper and affordable interventions like provision of water treatment tablets, training in boiling and safe storage of water as a short-term measure. Borehole rehabilitation through pump minders already trained in the community by World Vision can also be of benefit as a long-term measure.

- Safe human waste disposal can be encouraged to those who are using 'bush' toilets through working with the Ministry of Health Environmental Technicians to carry out trainings on pit latrines construction using locally available resources. This will help in preventing spreading of diarrhoeal diseases, the immediate causes of malnutrition. The able-bodied can build for themselves and help those who are not able like the elderly and the chronically ill since everyone can be affected in case of disease outbreaks in the community.
- Trainings on proper food handling and hand washing practices encouraging those without soap to use ash can also help to reduce outbreak of diarrhoeal diseases which are the immediate causes that lead to malnutrition.

➢ **At national level**

- Advocacy and lobbying with policy makers in education, gender and health for policies that promote nutrition education, empowerment of women and improvement in health delivery. Nutritional education can be introduced in the school curriculum so that children can help parents at home and benefit when they grow up.
- Government to build more clinics in the remote areas, provide enough drugs and address the skills gap to ensure curative health care. This can prevent deterioration of health and nutritional status among the vulnerable pregnant women.
- Research by SIRDC and the Zimbabwe Food and Nutrition Council to determine the nutritional content of some food products like the locally processed salt from grass, tubers and *"moringa alfera"* consumed especially among the Doma. This may help in revealing some cheap and nutritionally rich local products that can be of benefit to the vulnerable pregnant women. The Doma people once approached this researcher with these products when she was working in the area in 2007.

- Ministry of Health through the Expanded Programme on Immunisation (EPI) launched in Zimbabwe to increase micronutrient supplementation through health centres to reduce micronutrient related risks like anaemia and impaired immunity.
- Malnutrition is difficult to detect without regular assessments, on-going nutritional surveillance by WFP collaborating with Ministry of Health, to check continuously on nutritional status of the pregnant women may reveal early warning signs of nutritional vulnerability.
- Coordination of different sectors whereby government ministries (Education, Health, Gender, Local Government, Agriculture), and NGOs, the community itself come together and respond appropriately to address vulnerability. It is not a problem that WFP can solve by simply bringing in truckloads of food to address vulnerability. "A one size fits all approach will not work" (Webb *et al.* (2006:47).
- Government can work together with the private sector and NGOs to create employment in the area to improve access of income to households, and this again can go a long way in improving food security, access to improved health care, water and sanitation for the households hence reducing the nutritional vulnerability of the pregnant women. Sourcing for investors to scale up operations at Mushumbi Pools ARDA Estate, and the Dandito Project where vast tracks of land were cleared over ten years ago for sugar plantations and cotton farming. This can create jobs for the uneducated and unskilled majority of Mbire people.
- Addressing the nutritional needs of the whole Mbire population at household level will help to reduce vulnerability, because usually it is fruitless to address pregnant women's needs in isolation. This will ensure meeting of the nutritional needs of the child and the mother even before she becomes pregnant (reproductive age 15 – 49).

➢ **World Food Programme level**

- Introduction of the Maternal and Child Nutrition and Health (MCHN) programme, WFP collaborating with Ministry of Health. WFP actually has a budget for that at global level, and once had interventions in Pakistan where it trained pregnant women in anaemia management and in El Salvador where fathers were trained in maternal care (Webb *et al.,* 2006:52). MCHN activities are programmes that reduce maternal and child malnutrition by providing nutritional education, health

services (vaccinations, antenatal care, health referrals, micronutrient supplementation especially iron, folate and vitamin A) and iodised salt.

- WFP to introduce deworming exercise for the vulnerable pregnant women because the majority of them lack access to clean source of water and sanitation facilities. Literature has proven that they are likely to be suffering from worm infestations that may hinder them from benefitting nutritionally from the limited amount of food they consume.
- Fortification of cereal distributed by WFP for VGF with iron and folate can go a long way in preventing anaemia that can result in infant and maternal mortality.
- Supplementary feeding for the vulnerable pregnant women to address the immediate cause of malnutrition, which is inadequate food intake, can be introduced through health centres. The food basket to consist of iodised salt, dried fruits, vegetables, and animal products rich in calcium, phosphorous, zinc, protein and iron of High Biological Value (HBV) which can easily be digested and assimilated by the body.

5.5 Recommendations for Further Study

- There is need to carry out research on a larger scale covering the whole district of Mbire. Research proved that the majority of the pregnant women were vulnerable before they even became pregnant because of both underlying and immediate causes.
- Another further study could be carried out to assess nutritional vulnerability of non-pregnant women who were not benefitting from the VGF programme because they might also be at risk.
- Replication of the study in an urban area to establish nutritional status of the urban women especially in high-density areas might reveal that they were also at risk.

5.6 Strengths and Limitations

- The study lacked information on micronutrient status of the respondents that could reveal more vulnerability of the vulnerable pregnant women. Only one woman with a goitre was identified, but there could be more women suffering from other micronutrient deficiencies.
- The sample size was too small and the time very limited. No conclusive evidence could be arrived at. Therefore the information obtained could not be generalised.

- Unavailability of software for nutritional analysis like EPI-INFO and ANTHRO might have affected the accuracy of the results.

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Dear Madam

I am a second year student in Masters in Disaster Management with the University of Free State - Disaster Management Training & Education Centre for Africa (UFS-DiMTEC). I am conducting a research in the partial fulfilment of the requirements of the programme. The research serves to explore the prevalence of malnutrition among the pregnant women who are beneficiaries of the World Food Programme (WFP) funded Vulnerable Group Feeding (VGF) Programme in Mbire, Zimbabwe.

The **Title** of the research is, Pregnant Women as Beneficiaries of the Vulnerable Group Feeding Programme in Mbire, Zimbabwe: An Assessment of Nutritional Vulnerability.

Your contribution to the research through completing the questionnaire will add value when added to other knowledge sources. It is estimated that the questionnaire will take 20 to 30 minutes to complete.

All the information you contribute will be treated in strictness confidence. The information gathered through the questionnaire will be used for academic purposes ONLY

May I take this opportunity to thank you in advance for taking your time to respond to the questionnaire?

Yours Faithfully

Stella Man'ombe

University of Free State (Masters in Disaster Management Student 2011).

QUESTIONNAIRE

Introduction

Pregnancy is a period of high nutritional demands. Deficiency results in the malnourishment of both the baby to be born and the pregnant mother. Vulnerable pregnant women in Mbire remain nutritionally at risk yet they are beneficiaries of the WFP funded Vulnerable Group Feeding (VGF) Programme. This study focuses on nutritional vulnerability of the vulnerable pregnant women, the immediate and underlying causes of vulnerability and risks associated with nutritional deficiencies.

Section A. Administrative

Date of interview ……..

Questionnaire Number …….

Interviewer …….

Health Centre …….

Section B Demographics

Please indicate your response with a tick

1. Gender of respondent

1) Male [ ]

2) Female [ ]

2. Age of respondent

1) Below 15 years [ ]

2) 15 - 20 years [ ]

3) 21 – 30 years [ ]

4) 31 - 40 years [ ]

5) Above 40 years [ ]

3. Qualification (Highest Level of Education)

1) No Schooling [ ]

2) Primary School level [ ]

3) Secondary Level [ ]

4) Advanced Level [ ]

5) Tertiary Qualification Level [ ]

4. Marital Status

1) Single [ ]

2) Married [ ]

3) Divorced [ ]

4) Widowed [ ]

5) Any Other [ ]

Specify ……

5. Religion

1) Apostolic Faith Religion [ ]

2) Traditional [ ]

3) Christianity [ ]

4) Any Other [ ]

Specify ……

6. Ethnicity

1) Malawian origin [ ]

2) Mozambican origin [ ]

3) Original Korekore [ ]

4) Any Other

Specify…….

7. Language Spoken

1) English [ ]

2) Shona (Karanga dialect) [ ]

3) Shona (Korekore dialect) [ ]

4) Chikunda [ ]

5) Any Other [ ]

Specify ……..

8. How long have you lived in Mbire?

1) Less than 3 years [ ]

2) 3 - 5 years [ ]

3) 6 -15 years [ ]

4) Over 15 years [ ]

9. Besides yourself, does your husband/partner have other wives?

1) Yes [ ]

2) No [ ]

Section C. Information Sought Section

Maternal Health

10. How old were you when you first got pregnant?

1) 15 – 17 [ ]

2) 18 -20 [ ]

3) 21 – 25 [ ]

4) Above 25 [ ]

11. How many pregnancies did you have before this one?

1) None [ ]

2) 1 [ ]

3) 2 [ ]

4) 3 [ ]

5) 4 & Above [ ]

12. Any birth interval of less than 2 years?

1) Yes [ ]

2) No [ ]

13. Did you receive Vitamin A dose like this? *To show sample*

1) Yes [ ]

2) No [ ]

14. Did you receive folate supplementation like this? *To show sample*

1) Yes [ ]

2) No [ ]

15. How long do you take to travel to the nearest Health Centre?

1) < I hour [ ]

2) 1 - 3 hours [ ]

3) 4 - 5 hours [ ]

4) Above 5 hours [ ]

16. Do you know of anyone in your community who is pregnant and is not visiting the Health Centre for antenatal checks.

1) Yes [ ]

2) No [ ]

Water and Sanitation

17. What is the main source of drinking water?

1) Protected dug well [ ]

2) Unprotected well [ ]

3) Borehole with pump [ ]

4) Pond or river [ ]

5) Public Tap [ ]

6) Other [ ]

Specify...……

18. How far is your source of water for household consumption?

1) Less than 1 km [ ]

2) 1- 2 km [ ]

3) 3 – 5 km [ ]

4) 6 – 8 km [ ]

5) Above 8 km [ ]

19. What sanitation facility does your household use?

1) Pit latrine with slub [ ]

2) Open pit [ ]

3) Ventilated improved with pit latrine [ ]

4. None [ ]

5) Any Other [ ]

Specify ……..

VGF Food Basket Composition, Utilisation and Satisfaction

20. What constitute the food basket that you receive for the Vulnerable Group Feeding Programme (VGF)?

……

21. What contribution is the food aid you are receiving to the food that is consumed in your household?

1) Wholly dependent on food aid [ ]

2) Contributes half [ ]

3) Contributes a quarter [ ]

4) Contributes less than a quarter [ ]

22. Are the food commodities you are receiving fortified with micronutrients?

1. Yes [ ]

2. No [ ]

23. If yes, please specify

……...

24. Are you provided with calibrated measuring scoops when distributing food aid?

1. Yes [ ]

2. No [ ]

25. Were you trained in the preparation of the food commodities that you receive for the VGF Programme

1) Yes [ ]

2) No [ ]

Assets and Source of Livelihoods

26. Household Size

1) 1- 3 [ ]

2) 4 - 6 [ ]

3) 7 - 8 [ ]

4) Above 8 [ ]

27. Did your household harvest last summer season?

1) Yes [ ]

2) No [ ]

28. How many cattle do your household own? (*Indicate the number)*

1) None [ ]

2) 1 -2 [ ]

3) 2 -4 [ ]

4) Above 4 [ ]

29. How many goats/Sheep do you have?

1) None [ ]

2) 1 -2 [ ]

3) 2 -4 [ ]

2) Above 4 [ ]

30. How many chickens or guinefowls do you have?

1) None [ ]

2) 1 -2 [ ]

3) 2 -4 [ ]

4) Above 4 [ ]

31. What is the main source of income for your household?

1) Formal Employment [ ]

2) Petty Trade [ ]

3) Casual Labour [ ]

4) Vegetable Sales [ ]

5) Any other [ ]

Specify……..

32. What is the main source of vegetables for your household consumption?

1) Own garden [ ]

2) Gifts from those with gardens along major rivers [ ]

3) Purchases [ ]

4) Barter trade [ ]

5) Any other [ ]

Specify……

33. What is the main source of fruits for your vegetable consumption?

1) Own Orchard [ ]

2) Indigenous fruits [ ]

3) Purchases [ ]

4) Barter trade [ ]

5) Any Other [ ]

34. List the different types of foods that you normally consume on a daily basis

……

35. Which food products do you think are vital during pregnancy?

……

36. What type of salt do you use in your household?

1) Coarse salt [ ]

2) Iodised fine salt [ ]

3) Uniodised fine salt [ ]

4) Any other [ ]

Specify……

37. Do you think all women's needs including nutritional needs for pregnant and lactating women are being met?

1) Yes [ ]

2) No [ ]

38. Are there any recommendations that you think should be adopted to reduce the risk of malnutrition of vulnerable pregnant women in Mbire?

……

……

39. Anthropometric Data

Gestational Age	**Height**	**Weight**	**Body Mass Index(BMI)**	**Mid Upper Arm Circumference (MUAC)**	**Number of Meals per day**	**Illness in Last 2 Weeks**

Thank you for your cooperation

Focus Group Discussion Guideline

Was used for discussions with community members (mixed men and women) to gather information on general opinions on maternal health care for pregnant women cultural and religious beliefs that impact on what is acceptable for them to eat and their recommendations on what can be done to improve nutritional status of pregnant women.

1. At what age is a girl or woman ready for marriage?

   Encourage open discussion from different religious, ethnic backgrounds.

2. At most how many children can a woman bear in her lifetime?

3. What are some of the religious or cultural taboos, which prohibit pregnant women from eating some types of food?

   Encourage 10 minutes explanation of different, religious, ethnic background of different groups, food preferences; taboos encourage overview of the past 6 years.

4. How do you prepare the food commodities that you receive for the WFP Funded Vulnerable Group Feeding Programme (VGF)?

5. Which are the indigenous fruits available at different seasons in your area?

6. Which are the health care services that a pregnant woman is supposed to receive?

7. Which are the risks associated with nutritional deficiencies during pregnancy?

8. What is being done, at household, community government or by other NGO's to address pregnant women's vulnerability in Mbire.

   Participants to be guided into a 15 minutes discussion on what support mechanisms already exist for pregnant women in the community.

9. What can be done to improve nutritional status of the pregnant women in your community?

Encourage open discussion of the solutions, note whether practical and encourage and use of locally available goods to ensure cost effectiveness and sustainability.

Rules Followed during the Focus Group Discussion (Hofstee 2006:135).

The researcher avoided grilling the participants and made sure was checking for body language like nodding, silence or looking puzzled for this revealed some of hidden information which some were afraid to raise say in public. Silence was also another technique that the researcher used for it proved to be an effective way of asking for more information. Everyone was given a chance to talk to ensure that no one dominated the discussion.