I, **Musole Kenneth Chihinga**, declare that this dissertation:

(a) Represents my own work

(b) Has not previously been submitted for a degree at this or any other University; and

(c) Does not incorporate any published work or material from another dissertation.

Sign:.....

Date:.....

APPROVAL

This dissertation of **Musole Kenneth Chihinga** is approved as fulfilling the partial requirements for the award of the degree of Master of Arts in Philosophy and Applied Ethics by the University of Zambia.

Signed:	**Date:**
.....	.....
.....	.....
.....	.....
.....	.....

ABSTRACT

Micronutrient malnutrition has been identified to be a public health problem affecting a wide range of the population in the world. Almost all African countries have been affected by it. Zambia has equally not been spared. In Zambia efforts have been made to fortify various foods. Despite these efforts the micronutrient deficiency diseases are still prevalent.

This research's main focus is to evaluate the programme of food fortification in Zambia from an ethical point of view, hence the title: "An Ethical Assessment of Food Fortification in Zambia." The specific objectives were: to explain the debate about food fortification; to describe the current situation of food fortification in Zambia; to give an ethical evaluation of the current situation of food fortification in Zambia; and to recommend improvements of food fortification in Zambia.

Primary data in this research were collected using semi-structured interviews. Purposively chosen officials from various departments of the government and other organizations that play a role in the programme of food fortification were interviewed. Selected consumers were also interviewed especially those from Kasempa. These included a chief, a headman and some of their subjects. Secondary data were collected from books, journals and the internet.

It has been concluded that there is need to give fair opportunities to all the people to access fortified food so that the micronutrient deficiency diseases can be mitigated if not completely eradicated. The price of most of the fortified foods is quite high especially that of sugar and of other foods fortified outside Zambia. Mainly, it is the rich and those in urban areas who have easy access to it. There is also need to closely monitor and evaluate the programme of fortification especially that of fortifying the local salt mined at Kaimbwe in Kasempa district. Currently, fortification of the local salt has halted. This has put the majority local people at risk.

Different ethical principles were used to assess the data. They include the principles of distributive justice, Rawls's Theory of Justice, the Utility Principle and the UN Universal Declaration of Human Rights. Justice requires that an individual be given what is his or her due. All individuals should be given equal opportunities if they are to access fortified food. In the Zambian situation the poor should be specially treated by giving them fair opportunities to access fortified food, for instance by subsidising the food, so that they will have adequate micronutrients to improve their health, and their wellbeing. This would be a morally right policy according to utilitarianism. The people in influential positions must make rules and policies pertaining to fortified food impartially and rationally, as Rawls puts it, if the programme is to be a just one. People, especially the leaders, should realise that having access to fortified food is a human right as implicitly declared by the UN in article 25 of the Universal Declaration of 1948, hence the need to make it easily accessible by all.

To dad and mum and all my relations

ACKNOWLEDGEMENTS

I am grateful for the help I received in preparing this research from various institutions and individuals of good will. Without them my work would have been in futility. I would, especially, love to acknowledge Prof. George Spielthenner, my supervisor, for his critical judgement and numerous beneficial suggestions to my work, Prof. Clive Dillon-Malone and Dr. Anthony M. Musonda, the co-ordinator and the Head of the Department of Philosophy and Applied Ethics at the University of Zambia, respectively, for their useful advice and academic support. I extend my acknowledgements to the entire management at the University of Zambia and various institutions that I visited during my research work. I would also like to acknowledge Roy, my big brother, and his wife Miriam (*"Banyali"*) to whom I am highly indebted for their unending financial support during my studies at the University of Zambia. My mum Kubangu and my dad Chisanda "I thank you so much for your ever moral and financial support: you have never ever left me alone." I thank my brothers, sisters, cousins, uncles and aunties for always being there for me. I know their ever prayers were that I successfully complete my studies. I would like to sincerely thank Aggie, Festus, Moses (Fr.) and Rachael my close friends who, without any hesitations, gave me their laptops to have my entire work typed. I also thank my friend and brother, Washington ("*Shanji Mwiinuna*") who found some relevant material for my research, especially during his visit to Kaimbwe, and Bupe (*my dearest friend*) for ever being there for me through thin and thick. My special thanks go to my classmates, Fatima (*the "Motswana lady"*), Major (*the "General himself"*), Rachael (*"Mwaice wandi"*), Shandele (*"my grandson"*) and Marlin (*from Finland*) for their moral and academic support. To Freddie ("*ba roomie"*) and Lillian ("*boyi"*) thumbs up for your unending support. To all these and several others whom I have not mentioned I say may God bless you abundantly.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

1.1.1 An overview of food fortification

Micronutrient malnutrition has been identified to be a public health problem affecting a wide range of the population in the world. Almost all countries in Africa have been affected. The term 'micronutrient' refers to the essential minerals needed by the human body that must be obtained in pre-assembled form because the human cells cannot make them from any raw materials. The body needs them only in small amounts, hence the prefix 'micro'. These micronutrients must be part of the diet or, taken as supplements; lack of any of them from the human diet results into malnutrition.

In 1990 attendants at a summit called "the World Summit for Children" held in New York agreed to double efforts of eliminating and controlling the micronutrient malnutrition by the year 2000. Some goals, for example, to virtually eliminate vitamin A deficiency and iodine deficiency diseases, and to ensure that one third of iron deficiency anaemia is reduced, were set. In 1991 and 1992, the "Ending Hidden Hunger", a conference held in Montreal and the "International Conference on Nutrition" held in Rome, respectively, endorsed these goals. Zambia, as a nation, adopted these same goals in its Programme of Action for the Health of Women and Children. In order to meet these challenges the Zambian National Food and Nutrition Commission formed a National Task Force. Its main task was to recommend any type of intervention that would effectively control the various micronutrient deficiencies. The appropriate interventions included: micronutrient supplementation, diet diversification and food fortification (Ministry of Health 2005). In this study the concern is on food fortification.

The term 'fortification' can be understood in three different ways. Firstly, it literally refers to the strengthening of a place against military attack, especially, by building high walls. Secondly, it means to make an attitude or a feeling, stronger. Lastly, it means to increase the strength or quality of food (or drink) by adding nutrients to it (Hornby 2003, 408). It is in this third sense that fortification has been referred to in this study. Hence, food fortification is "The addition of one or more essential nutrients to the commonly consumed food, whether or not it is normally contained in the food, for the purpose of preventing or correcting a demonstrated deficiency of one or more nutrients in a target population" (Chomba 2009).

In many African countries the lack of nutrients and vitamins disproportionately affects children and women of reproductive age (those between 15 and 49 years old) and as such hinders both the potential development of an individual human and the economic and social development of the nation (International Life Sciences Institute 2003, 2). Research has shown that foetal death, blindness, mental retardation and many common infections that kill the young and the weak are prevalent in the developing world. This is so because many people lack adequate essential vitamins and minerals in their diets. Fortification of food in such instances plays a major role. It makes available the essential nutrients. This leads to the reduction on the number of these critical consequences of deficiencies.

Food fortification efforts are being addressed in most parts of the world. At regional level, the programmes are being run by organizations such as the New Partnership for African Development (NEPAD) and the East, Central and Southern African Health Community (ECSA). These organizations assist member countries to identify and address the region's health and nutritional needs (Global Directory 2007, 8). Zambia as a member of both of these mentioned bodies, makes efforts too, to address the importance of food fortification. This is done with the view that the nutritional status of the large population will be improved. This will ultimately contribute to the attainment of some of the Millennium Development Goals (MDGs), which include: the eradication of extreme poverty and hunger, the reduction of child mortality and the improvement of maternal health through combating HIV/AIDS, Malaria and other diseases. Other Millennium Development Goals that can be attained through access to fortified foods are: the achievement of universal primary education and the promotion of gender equality and empowerment of women.

1.1.2 Food fortification in Zambia

Despite having adopted the goals to virtually eliminate micronutrient malnutrition by the year 2000, in Zambia, micronutrient malnutrition has remained a public health concern. Vitamin A deficiencies, iodine deficiency disorders and iron deficiency anaemia have continued to be prevalent. Zinc and folic acid deficiencies are slowly being recognized as significant public health problems, too. Such public health problems need an intensified programme of fortification of food if they are to be mitigated.

Available literature shows that fortification of foods in Zambia commenced in 1970s when salt and margarine were mandatorily fortified with iodine and vitamin A, respectively. In 1990s the fortification efforts were intensified. Locally produced sugar began to be fortified.

Plans and discussions are still under way to start fortifying the maize meal effectively (Global Directory 2007, 9).

In 2001, a preview on the fortification of salt was carried out. It was re-emphasised that only fortified salt must be used in food, and hence, be available on the market. Salt is fortified with potassium iodate. At production level the content of iodate must be very high so that by the time it reaches the retail and household level, the content would have been reduced to normal, fit for human consumption.[1]

It has to be noted that iodine is mainly found in sea water, and hence, soils near seas have iodine. Sea foods and plants near seas have iodine too. In Zambia, the few areas that produce salt, for instance, Kasempa and Kaputa districts, have no iodine in their soils. This results into iodine deficiencies to remain prevalent. The salt consumed has no iodine. Cooperating partners of the government came in and tried to lessen the situation by fortifying the salt with iodine. The impact study of 2002 showed that this fortification programme worked quite well. (About 93% of the people surveyed had accessed iodine.) Having had recorded such results the government, together with the cooperating partners, have seemed to relax because they apparently think that they have managed to control the problem of iodine deficiency. Up-to-date there has been no other impact study that has been carried out to make a follow up to the fortification programme. This has also led to the sustainability of the programme to be challenged. As at now there is no fortification of iodine taking place at a local level. The local people in Kasempa district especially those at Kaimbwe where salt is mined expressed ignorance as to why the supply of potassium iodate has stopped (for location of Kaimbwe, see figure 1). Meanwhile the Ministry of Health officials attributed the erratic supply of the potassium iodate to lack of funding from the government.

It must be noted that all the fortified salt in the country is imported from the neighbouring Namibia and Botswana. This raises a very important question about the extent to which imported salt, or even any other food, is fortified. Are the micronutrients in the fortified food adequate for the health of the Zambian population?

1.1.3 The Importance of Iodine

The role of iodine in the body is related to its function as a constituent of the thyroid gland. The thyroid gland is the only one capable of synthesizing the thyroid hormones which are

[1]Personal communication by Mrs Kabaye a nutritionist at National Food and Nutrition Commission (16 February 2010).

important in the synthesis of protein and enzymes. This entails that the thyroid hormones play an important role in growth and metabolic processes that involve the efficient use of nutrients (Ministry of Health 2005, 3).

Lack of iodine causes failure of the thyroid gland to make enough thyroid hormones. This results into iodine deficiency disorders that include: the goitre, hypothyroidism, reproductive failure and mortality.[2] In children, hypothyroidism affects the development and function of the brain and nervous system. In expectant mothers it may cause miscarriage or still births, low birth weight babies, and congenital deformities in newly borns (King and Burgess 2006, 40 – 41).

The complications mentioned can be drastically reduced if enough iodine is made readily available, especially in the locally produced salt. There is need of finding suitable and sustainable methods of fortifying the local salt.

1.1.4 The Importance of Vitamin A

The efforts made to increase the intake of vitamin A through fortified food (sugar and margarine) should be commended. These play a role in curbing the problems enhanced by vitamin A deficiency. The effects of vitamin A deficiency include: visual impairments, weakened immunity, leading to increased susceptibility to infections such as pneumonia, diarrhoea, measles, Protein-Energy Malnutrition and lower respiratory infections (ibid., 255). These infections are common and last longer in children because they tend to grow quickly, and hence their needs for vitamin A are greater.

Zambia has been affected much by vitamin A deficiency. The problem was first recognized as a public health concern in 1960s. It was identified as a major cause of blindness in Luapula Province. Many children were also found to have had exophthalmia. Exophthalmia is a range of disorders that affect the eye, and can lead to blindness. It is a result of vitamin A deficiency (ibid., 256).

A nationwide study in 1997 showed that 66% of children under-six years of age, and 21.5% of women in reproductive age were vitamin A deficient, respectively.[3] This placed Zambia in a severe clinical and sub-clinical vitamin A deficiency category according to the World Health Organization population cut offs. About 30% of child deaths in Zambia had been directly attributed to lack of vitamin A. In 2003 the impact survey study showed a slight

[2]Goitre is the enlargement of the thyroid gland – a swelling in the neck. Hypothyroidism is the result of low levels of thyroid hormones in the body. It has effects like sluggishness, sleepiness, dry skin, cold, food intolerance and constipation.
[3]Personal communication by Mrs Kabaye (16 February 2010).

improvement in the presence of vitamin A deficiency: 54% of children and 13% of women in reproductive age were vitamin A deficient, respectively (Ministry of Health 2005, 5).

1.1.5 The Importance of Iron

The micronutrient iron is important in the human body because of its vital function in the haemoglobin of red blood cells. Haemoglobin is the red portion in the red blood cells that carries oxygen from the lungs to the cells. Cells need oxygen to 'burn' starch, sugar and fat to release energy for metabolic processes in the body (King 2006, 37). Lack of iron in the body leads to iron deficiency anaemia. This weakens and impairs the immune system. The most affected groups with iron deficiency anaemia are children, women and the poor in society. Severe anaemia in pregnant women may cause foetal growth retardation and low birth weights. In children, it impairs physical growth, cognitive development, and affects their performance at school. In adults, it causes fatigue and reduces work capacity. This contributes to the reduction of economic and social development of a nation. In Zambia, a study in 1998 showed that 65% of under-five children and 39% of women in the reproductive age, respectively, were anaemic. A slight improvement was recorded in 2003 during an impact survey study: 56% and 29% of the said children and women were anaemic (Ministry of Health 2005).

1.1.6 The need for an efficient food fortification programme

The current prevalent levels of micronutrient deficiencies should not to be ignored. They should be a source of concern. The levels are quite alarming: they stand above the minimum accepted levels, according to World Health Organization standards. This indicates that we are in a severe situation where a comprehensive micronutrient malnutrition control programme is required. Among the many appropriate interventions needed is the fortification of hugely consumed food. Other appropriate interventions include, provision of micronutrients in form of vitamin A pills and some food supplements, and the newly introduced bio-fortification, that is, the breeding of crops with increased content of a micronutrient. The programme of fortifying foods has already commenced. There is need, however, to enhance its efficiency, that is, if the "many deficiencies" are to be completely eradicated. One of the ways is to see to it that fortified food reaches the intended recipients: all the people. This means that there is need to justly distribute the fortified foods, as we shall see in Chapter Five below. Every individual person (rich and poor alike) needs to get enough of the required micronutrients.

Some philosophers suggest that special attention should be given to the poor because they are more vulnerable than the rich.

As already indicated, the common foods that are fortified in Zambia are sugar, margarine and salt. Plans are under way to start the efficient fortification of the maize meal. Salt is fortified with potassium iodate. These foods require funds to be accessed. This has left many of the poor Zambians not to have enough of the needed micronutrients – especially vitamin A. Vitamin A is fortified in sugar and margarine. These two commodities are quite expensive and almost unaffordable to the majority of the poor. Though fortified salt is less expensive and usually affordable to the majority, the challenge remains to those who live near places where local salt is produced. They still go for the unfortified salt because it is cheaper than the iodated salt. This raises the question for the consumer choice: "Should the intake of fortified food be an obligation for the government?" "Should the consumers be allowed to choose whether or not to eat the fortified food?"

1.2 LIMITATIONS TO THE STUDY

This study is an ethical assessment of food fortification in Zambia. Many things that are important from the perspectives of biologists and social scientists are not relevant to this research. It does not look at the medical understanding of food fortification (for example, to find out the exact measurements of micronutrients needed in a particular food vehicle). The researcher has no medical expertise. This study has not focused on the opinions and attitudes of Zambians about food fortification, too, because they are not relevant to this ethical assessment either. Its main emphasis is to re-emphasise the need for fortified food to be distributed fairly.

It has to be noted that during the research some respondents were not willing to give enough information during the interviews for fear of being victimized even when they were assured that the study was for academic purposes. Some officials were also difficult to access. They were too busy. Notably those at the Central Statistical Offices for they were busy with the 2010 National Census exercise - the same period when I was doing the research.

Other limitations were financial. The researcher did not have the money to meet the many financial challenges during research, especially in terms of bus fares. This is because he was not sponsored by any organization. He was a self-sponsored student, and was not working anywhere.

1.3 STATEMENT OF THE PROBLEM

Despite the efforts made by the Government of Zambia to fortify food, micronutrient malnutrition has continued to be a public health concern. This is seen from the many disorders that have remained prevalent, for instance, vitamin A deficiency, iodine deficiency disorders and iron deficiency anaemia. To combat this undesirable situation more appropriate measures and effective interventions need to be undertaken. These should include the improvement of the programme of food fortification (which is recognized as a cost-effective measure in improving the micronutrient status of large populations). This programme ought to be a just one if the fortified food is to meet the requirements of the large population. The fortified food ought to be distributed fairly, especially having realized that the food is beneficial to every individual. It also contributes greatly to the social and economic development of a nation. In other words, food fortification promotes the wellbeing of all individuals and hence the wellbeing of the entire nation.

1.4 OBJECTIVES

The main focus for this research was to evaluate the programme of food fortification in Zambia from an ethical point of view. However, the research had four objectives as listed below.

i. To explain the debate about food fortification
ii. To describe the current situation of food fortification in Zambia
iii. To give an ethical evaluation on the current situation of food fortification in Zambia.
iv. To recommend improvements on food fortification in Zambia.

1.5 RESEARCH QUESTIONS

There were four research questions in this study.

i. What are the arguments for and against food fortification?
ii. What is the current situation of food fortification in Zambia?
iii. What are the strengths and weaknesses of food fortification in Zambia from an ethical point of view?
iv. What recommendations can be put in place with regard to food fortification in Zambia?

1.6 SIGNIFICANCE OF THE STUDY

Lack of micronutrients in foods is a global problem. According to research findings, more than 30% of children in Zambia suffer from micronutrient malnutrition related diseases (Ministry of Health 2005, 5). This is because many of the foods eaten lack the essential nutrients that are highly needed by the body. Therefore, to re-emphasise the necessity of food fortification will be important because fortification prevents malnutrition. Food fortification improves the nutritional status of food; it makes it richer in nutrients.

This study has re-emphasised how fortification of food contributes greatly to the health of an individual and hence to the social and economic development of the nation.

The study has also applied principles of justice to explain how fortified food ought to be distributed and the utility principle to emphasise how fortified food contributes to the welfare of the nation through promotion of health. It is by referring to the principles of justice that society and its laws and practices can be critiqued. The claim that society is failing to meet some basic needs of all citizens, and that this is unfair and unjust is a serious charge. It can be a call to action in the service of justice. To eliminate the source of injustice is an obligatory call for everyone. Everybody (rich or poor, alike) has a right to fortified food, hence the need to distribute it to everyone, justly.

1.7 METHODOLOGY

This study consists of a combination of empirical and philosophical research. In empirical research, data were collected from primary sources and secondary sources. The sampling technique for primary data collection was purposive sampling. Primary data were mostly collected through semi-structured interviews using open-ended questions with experts from the National Food and Nutrition Commission, the Ministry of Health, the Food and Drugs Control Laboratory, Zambia Bureau of Standards, World Health Organization, Consumer Competition and Protection Commission, the Central Statistical Office and from other organizations and government departments that play a role in food fortification as can be seen in Chapter Four below. At least four respondents from each organization, government ministry or department were interviewed. Some consumers especially those from Kaimbwe where local salt is mined were also interviewed on 10th October, 2010 during the *Nsakwa ya baKaonde* traditional ceremony. These included two chiefs, namely, Senior Chief Kasempa and Chief Ingwe, respectively, a village headman, Mr. Kilalo and some of his subjects. (See the appendices for the interview schedules.)

Secondary data were obtained from written documents such as books, reports and journals from the University of Zambia Library, the National Food and Nutrition Commission Library, Ministry of Health Library and from the department of information services under the Ministry of Agriculture and Cooperatives. The internet was favourably used.

The philosophical research consists of an ethical analysis based on the results of the empirical research. It has assessed the current situation of the Zambian food fortification from an ethical point of view. The principles of justice (especially distributive justice) and John Rawls' theory of justice have been applied to determine the equity and fairness of the current food fortification programme. The Principle of Utility has also been applied especially when assessing the pros and cons of food fortification. Above all the 1948 United Nations Declaration of Human Rights has been used to argue that having access to fortified food is a human right. The government of Zambia should therefore make sure that all the people have equal access to fortified food.

1.8 SUMMARY

This Chapter serves as the introduction to the entire research report. It has mentioned in brief that malnutrition, which is a global public health problem, has not spared the Zambian nation from its effects. Concerted efforts are required to curb this problem. This should include fortification which has proved to be the most cost-effective intervention to promoting the wellbeing of the nation through fighting malnutrition. Cost-effective should here be understood as the cost of achieving a specified outcome. Since the 1970s, Zambia has embarked on the mission to fortify different foods with a variety of micronutrients. If, however, the micronutrient deficiencies are to be curbed, the fortified food needs to be distributed evenly and justly to all the individuals in society. All the people despite their statuses in society need to have access to fortified food.

The next chapter looks at the literature review. Its focus is on the global debate about food fortification. "What are the arguments for and against food fortification?"

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter discusses the global debate about food fortification. The aim of the chapter is to answer the question, "What are the arguments for and against food fortification?" In other words, "What are the pros and cons of food fortification?"

One of the Millennium Development Goals aims at halving the rate of malnutrition worldwide by 2015. This is because malnutrition has been identified to be causing deaths of as many as three million mothers and young children every year. Lindsay (2006) reports that according to the World Health Organization, micronutrient malnutrition is widespread in the industrialized nations but even more in the developing regions of the world.[4] Malnutrition has many adverse effects on human health. Even moderate levels of deficiency can have serious detrimental effects on human functioning. Halving the rate of malnutrition will not only reduce hunger but it will also significantly improve the health of mothers and children. Men will not be sidelined too. Their health will drastically improve.

Among the many approaches set to improve the health of both women and men, girls and boys, lies the fortification of food. That is, the addition of micronutrients to foods to prevent or correct a demonstrated deficiency of micronutrients.[5] Many countries, those in the developing world inclusive, are now turning to food fortification so as to supply a substantial part of their micronutrient requirements. Fortification has indeed become a realistic option – it has become mandatory for many. Many foods that include cereals, dairy products, fats and oils, salt and sugar have been fortified.

2.2 TYPES OF FOOD FORTIFICATION

Food fortification can be done at different levels depending on the need of the population for the micronutrients. It also depends on what population is targeted and on what kind of food is fortified. If the foods to be fortified are widely consumed by the general population, and the aim is to curb a micronutrient deficiency that is affecting the said general population, then

[4] Developing regions here include those countries that are underdeveloped.

[5] Lindsay et al. (2006) in the *Journal of Nutrition* explain that food fortification has been designed to restore nutrients during food processing, to replace nutrients in substitute food, and to correct obvious deficiencies in populations.

Mass Fortification is required. Usually Mass Fortification is mandatory. It has regulations and laid down procedures that must be followed.

Targeted Fortification aims at fortifying foods designed for specific population subgroups, such as complementary foods for young children or rations for displaced populations. This kind of fortification can be mandatory and voluntary. Like for the Mass Fortification, the laid down procedures and regulations in targeted fortification must be followed too. The other type of fortification is **Market-driven Fortification.** This type of fortification is usually voluntary. It allows food manufacturers to voluntarily fortify foods that are available on the market (Lindsay 2006b, 26).

It is good to note that food fortification can be done also at **Household** and **Community level.** This type is still at experimental stage though. This allows small amounts of food consumed at households and communities to be fortified. Micronutrient powders that contain a mix of micronutrients in powder form are packaged in small sachets and can be added directly to any semi-solid complementary foods prepared in the household without substantially affecting taste or colour of the food. Iron and other essential micronutrients such as zinc, iodine, B vitamins, and vitamins A, C, and D may be added to the sachets. Several efficacy studies conducted in different parts of the world consistently demonstrate that micronutrient powders are as efficacious as other forms of fortifying foods in reducing and preventing micronutrient deficiencies when added to complementary foods. Smaller effectiveness trials in Bangladesh, Benin, Haiti, and Vietnam have all demonstrated improved anaemia rates when micronutrient powders were provided for two or more months (Rolf et al. 2009, 30).

Home fortification of complementary foods is neither mandatory nor national in scope in any region. However, if implemented well, it produces positive results. For example, one program in Mongolia distributed iron sachets to 15,000 children free of charge and achieved high coverage (89%) and compliance (ibid., 30). On average children took the powders for 13 months and 88% of households reported using the powders daily. Reported anaemia rates declined from 46% to 25% in children of 6-59 months old, with a concurrent reduction in stunting. In response to the Indonesian tsunami emergency another program distributed 28 million sachets to caregivers of 200,000 infants and children aged 6 months to 12 years (ibid., 31). This represented approximately 90% coverage in program districts within 5 months of distribution. A 25% reduction in anaemia prevalence was noted in these districts, though it was not possible to rule out all secular changes or other factors possibly affecting anaemia rates in either program (ibid., 31).

As already mentioned, all the above types of food fortification are governed by regulatory limits which can either be mandatory or voluntary. These regulations vary from country to country depending on the various nutritional needs of the population. Different food vehicles may have different regulations applied to them. Lindsay (2006a) writes that the World Health Organization suggests some key factors that determine whether mandatory or voluntary fortification can be the appropriate option for dealing with the micronutrient deficiencies.

The first key factor is the significance of the **public health need**. How is the problem of micronutrient deficiency spread? If it is widely spread and the majority are affected, then mandatory fortification is required. Clinical or sub-clinical research can help determine whether the micronutrient deficiency is widespread or not.

The second key factor is that of the **size and scale of the food industry sector**. This depends highly on the number, capacity and geographical distribution of producers of food products. If, for instance, the number and capacity of the producers is big then mandatory fortification can be employed. Vice versa, if the number and capacity is limited then it is much easier to go for voluntary fortification. Connected to this is the **food consumption pattern**. If there are more consumers, then it is better to go for mandatory fortification. This also depends on the presence of the government control. How much and how far is the government involved in controlling the fortification programmes? If they are highly involved, then mandatory fortification can be carried out. However, if the government does not engage itself in these programmes, then voluntary fortification would be appropriate.

Having the **knowledge about fortification** is very important when determining whether mandatory or voluntary fortification is an appropriate option. The World Health Organization says that when there is awareness among the population about the nutritional needs, then voluntary fortification works well. If the level of awareness is low, mandatory fortification is advocated for; it is the most appropriate (Lindsay 2006a, 36).

2.3 THE PROS OF FOOD FORTIFICATION

One of the major arguments for food fortification is that it reduces the occurrence and recurrence of several complications identified with micronutrient deficiencies. For example, it reduces the effects of neural tube defects in babies when foods fortified with folic acid are consumed. Fortification can reduce other effects like blindness caused by the lack of vitamin A, goitres caused by the lack of iodine, and anaemia due to iron deficiency. In other words, food fortification is advocated for because it enriches foods with nutrients. It promotes the health of the individuals and of the society. Fortification has been found to be an excellent

way of increasing the content of vitamins in several food contents, more excellent than the intermittent supplements. If consumed regularly and frequently, fortified foods maintain body stores of nutrients more efficiently and more effectively than those from intermittent supplements. They are also better at lowering the risk of the multiple deficiencies that result from poor quality diet.

Lindsay (2006b) reports that properly fortified foods usually contain natural or near natural levels of micronutrients, which may not be the case with supplements. If widely distributed, they have the potential of improving the nutritional status of large proportion of the population. This is especially so if staple food is used for fortification. This kind is what has been referred to as Mass Fortification. It is worthwhile also to note that one particular food can be fortified with multiple micronutrients. This is known as **Multiple Fortification**. This is an advantage of food fortification over intermittent supplements.

2.3.1 Food Fortification in some Developed Countries

The practice of food fortification has a long history especially in industrialised countries. For instance, in 1920 Switzerland and the United States of America fortified salt with iodine. In 1940, margarine was fortified with vitamin A in Denmark, and milk was fortified with vitamin D in the United States of America, respectively. In the recent past, wheat flour and sugar have been fortified with folic acid and vitamin A in the United States of America, Canada, Central and Latin America. Other foods that have been fortified include cereals, dairy products, fats and oils. The point at hand is that many countries have realized the importance of fortifying foods. Food fortification fights malnutrition and hunger. A report in 2001 entitled, “TeleFood: Food for All”, reminded the world that it was time to set our sights on the fight against malnutrition. This will help us win the fight against poverty. Hunger is the most critical manifestation of poverty. It causes illness and death. It robs people of their potential to work. It cripples the capacity of children to learn. It traps people in a vicious cycle of poor health. It is a violation of human rights. People have a right to quality food, food that is rich with micronutrients. Denying people quality food is tantamount to infringing on their rights. In other words, what the Telefood reports is that the people are the engine of a nation’s growth, and food is their fuel. So in order to make strides in reducing poverty,

people must first have enough to eat. This food must be rich in both macronutrients and very importantly, micronutrients.[6]

2.3.1.1 Fortification of Food in Canada

Canada began its fortification programme in the 1930s when vitamin B deficiencies were identified. Whole wheat and white bread were fortified with thiamine and folic acid, respectively. Though the Canadian nutrition authorities remained sceptical about the need for additional vitamins, food fortification was identified as a tool to improve the nutritional health of the population. After identifying vitamin B, vitamin A, calcium and iron deficiencies, the Canadian government decided to fortify whole wheat flour and white flour (bread) with thiamine (vitamin B1) and folic acid (vitamin B9), respectively. Nearly fifty years later the practice of food fortification was widely accepted.[7] This is because significant changes and tangible results were seen. The problem of vitamin B deficiency was put under control (Tasnim et al. 2005).

The legal authority that mandates the fortification of foods in Canada comes through the Food and Drugs Act and its accompanying regulations. This legislation protects consumers from fraud and health hazards in the sale of food and drugs. In 1944 the Newfoundland government conducted a dietary survey that found widespread malnutrition. This necessitated the fortification of margarine with vitamin A and D and the mandatory fortification of flour. Stricter regulations regarding the addition of micronutrients were promulgated in 1964. The regulations list the food to which specific micronutrients are to be added and to what levels. These regulations apply to all foods sold in Canada, whether imported or domestically produced (ibid.)

Until the 1970s fortification of flour and bread remained optional. By the mid 1970s, results from the national nutrition Canada study showed that many people were not consuming adequate quantities of vitamins A, D, C, iron and thiamine. This led to fortification being made mandatory. The composition and identity of the food was regulated.

In the twentieth century, the attitudes of the people towards fortification changed. The public were now interested in their wellbeing. They were interested in having adequate vitamins. They slowly realized that vitamins are of benefit to their health. There is now high

[6]It is interesting to note that malnutrition has been identified as both the cause and effect of poverty. Fighting it is the first step to reducing poverty.

[7]Fortification of food in Canada is a population based strategy. The majority of the population supports it. It is no longer considered solely for the purposes of restoring nutrients lost during processing and as an antidote to malnutrition. Arguments surrounding fortification now focus on providing an optimal diet to reduce risk (Tasnim et al. 2005).

demand for vitamins to be added to the food. Many people have now realized that fortification plays a very vital role in the prevention of several infectious and non-communicable diseases like cancer and cardiovascular diseases.

2.3.1.2 Fortification of Food in Europe

In Europe researchers have pointed out that there is a deficiency of vitamin D among the majority population especially during winter, hence the need to fortify several foodstuffs with vitamin D. This is because there is not enough sunlight for the production of vitamin D (Copenhagen Conference 2004). It has to be known that sufficient vitamin D status can be obtained if people spend some time in the sunlight. This is in order to gain enough UV-B irradiation for the skin to synthesise the vitamin. However, in Northern Europe in the months October-February, there is not enough UV-B for the skin to produce vitamin D. Lack of vitamin D in the body causes deformities in children, bone softening in adults (a condition known as osteoporosis) and brain, kidney and cardiovascular damage.

Cashman (2004) in his article "The Importance and Effects of Vitamin D" advises that even if it cannot be proved that an optimal vitamin D status in the population will reduce the occurrence of osteoporosis, it will be irresponsible not to act on the widespread low status among populations, especially concerning the knowledge about the correlation between vitamin D status and other diseases like cancers, high blood pressure and psoriasis.[8] Greater awareness of the consequences of vitamin D deficiency is needed. This will help many people to seek interventions which include supplementation of tablets with vitamin D, access to fish and fish products and especially access to fortified foods.

As mentioned above, fortification of food in Europe has some history. In Switzerland it began in 1920 when salt was fortified with iodine. In Denmark milk was fortified with vitamin A. Nowadays different kinds of foods are being fortified and the majority has come to appreciate them especially having realized their importance. Fortified foods have played a big role in maintaining the health status of larger populations in Europe. Like in other continents, the programme of fortification in Europe has proved to be a cost effective measure as compared to other programmes that aim at improving the health of the population.

However, it is important to note that many European consumers recognize the contribution of food fortification in the context of a balanced diet. In his article, Taeymans (2004), reports that 77% of European consumers are confident that their diet provides the required

[8]Psoriasis is a skin disease that causes rough red areas where the skin comes off in small pieces.

micronutrients. About 50% of consumers from the Nordic countries eat vitamin supplements. Many consumers know that there are fortified foods on the market but less than 50% say they eat fortified foods because they do not rely on fortified foods for their daily nutritional needs.

A key concern in relation to food fortification in Europe is the safety of consumers. This is the reason why consumers affirm their right to select between fortified and unfortified foods. This is also why it was suggested that health benefits from fortified foods should be communicated to consumers. Consumers ought to know what kind of nutrients and vitamins they receive from the fortified food.

2.3.1.3 Food Fortification in Asia

Asia, as is true with the other continents, has not been spared from the effects of micronutrient deficiencies. This has made various governments to start the promotion of multiple fortifications. Many countries, for instance Saudi Arabia, Thailand and China have already commenced the programme of fortification. It is already proving to be beneficial. Foods that have already been fortified include salt, flour and soy sauce. They have been fortified with iodine, vitamin A and B and with iron respectively (Solomons 2008).

The Chinese academy of sciences reports that despite making enormous strides towards reducing poverty, hunger and malnutrition, China still has large numbers of people who do not consume sufficient micronutrients such as iron, zinc and vitamin A (Carl 2008). To meet this need, government agencies in China support programmes in industrial fortification and vitamin supplements. This is in an effort to reduce micronutrient deficiencies.

Fortification in China is mandatory. It began in 1994 with salt being one of the first to be fortified with iodine. Other foods that have been fortified include flour with vitamin A and B, and soy source with iron. China has become the first country to develop bio-fortified crops. Some of these crops are being developed using conventional plant breeding while others, such as Golden Rice, are being developed through genetic engineering. Bio-fortification is the breeding of crops with increased content of a micronutrient. It can both comprise of transgenic breeding or selection of varieties with genetically determined increased nutrient value from the existing germ-plasm. Note that transgenic techniques are still not widely accepted. Because of this bio-fortification has been confined to selection of crops that have genetic advantages in terms of nutrient accumulation (Melse-Bonstra et al. 2007, 29).

The process of fortification in China is decentralised. This makes it expensive to monitor. The costs of fortification are high relative to the price of the product, which pushes up prices and gives both producers and consumers incentives to ignore the rules. Some foods are “over-

fortified" while others are "under-fortified". This can lead to serious consequences and complications in the health of the individuals and the entire population. Serious monitoring needs to be embarked upon. While making fortification mandatory, good guidelines need to be set.

As already mentioned, in China, food supplements and fortification are starting to have an impact, primarily in urban areas. The Micronutrient Initiative reports that the vitamin A supplementation programmes were estimated in 1998 to be saving the lives of approximately 70,000 children a year and preventing a similar number of cases of permanent blindness. More than 90% of China's newborns are currently being protected to some degree against mental impairment by adding iodine to household salt (ibid. 2008). Several trends in the Chinese food industry indicate that Chinese consumers would welcome bio-fortified foods.

Several Chinese companies have established a market niche of fortified foods. Consumers have become aware of the importance of food fortification through the government programmes to reduce micronutrient deficiency. This shows that political support for the concept of fortification is there.

In Thailand the government has embarked on the fight against malnutrition by forming the National Nutrition Programme. It focuses at reducing malnutrition levels drastically. The programme includes nutrition education, better primary health care, improved production, food fortification and supplementary feeding for the young children. Efforts to improve nutrition were matched with income generating opportunities. Within ten years severe malnutrition was virtually eliminated in pre-school children. Mild malnutrition dropped to 10% of children down from 35%. As people gained strength they could work more. Incomes rose and poverty fell (Telefood: Food for All 2001).

Having realised the need of adding micronutrients to foods which has become a technically feasible issue, the government of Saudi Arabia has embarked on massive fortification of foods. This issue has become of public policy. The fortification of salt is either mandated or encouraged at a national level. It is a legal mandate to fortify folic acid to almost all the foodstuffs. Vitamin B and iron are added to flour and rice (Al-Assaf 2007).

2.3.2 Food Fortification in some Sub-Saharan Countries

Sub-Saharan Africa has not been spared from the global crisis of micronutrient deficiencies. The levels of malnutrition are becoming of great concern. Many donors have been involved in trying to mitigate this crisis. The key organization, especially in terms of the current

Southern African crisis, is the United Nations World Food Programme (WFP).[9] Fortification for edible oils, salt and some other foodstuffs has been advocated. Several foods have been fortified prior to purchase always according to World Food Programme guidelines.

Due to the high prevalence of HIV/AIDS, food fortification in Southern Africa has become far more important for the recipients. Both the donor community and the governments are actively encouraging the fortification of basic foods. Each country in the region has a statutory body that is responsible for the coordination of nutrition policy or the delivery of mechanisms to facilitate food fortification (Whitehouse and Associates 2003).

2.3.2.1 Fortification of Food in South Africa

In South Africa laws regarding food fortification have been laid down. It is mandatory that salt be fortified with iodine, and it is voluntary that bread, maize meal, cereals and fruit juices be fortified. This is up to the discretion of the company. All companies that fortify food need to follow the National Food Fortification Programme (Klugman 2002).

2.3.2.2 The Need of Food Fortification in Angola

In August 2009, Micronutrient Initiative reported that high rates of mortality and morbidity in Angola were attributed to malnutrition resulting from lack of sufficient protein rich food, micronutrient deficiencies and repeated exposure to infectious diseases, and lack of access to general health services such as scarcity of drug supplies (Whitehouse and Associates 2003). This prompted the World Food Programme to start exploring the feasibility of having some food fortified. For instance, it was proposed that maize be fortified with micronutrients through a local milling project. United Nations Children's Fund (UNICEF) agreed to make the necessary fortificant available. It is predicted and hoped that the mortality and morbidity rates will reduce in the few years to come.

2.3.2.3 The Need of Food Fortification in Tanzania

Mhegera (2009) reported that the United Republic of Tanzania's population has severe vitamin and mineral deficiency. This is why food fortification has been identified as one of the best ways to curb the deficiencies. Every year deficiencies in iron, vitamin A and folic acid were costing the government a lot of money amounting to about 2.65% of the country's Gross Domestic Product (GDP). It was also identified that beyond the economic losses,

[9]As a United Nations body, the WFP operates in each country at the request of the government, and as such they are bound by the regulations of each country in terms of fortification policies.

vitamin and mineral deficiencies were significant contributors to infant mortality. Several deaths that occur among infants and mothers can be attributed to vitamin and mineral deficiencies. Control of the situation would contribute to boosting the economic development and ensuring the wellbeing of many Tanzanians. This would guarantee the achievement of some of the Millennium Development Goals. Deficiency control programmes should be implemented and imbedded in the national nutrition policy. Food fortification must be among the many programmes.

2.4 THE CONS OF FOOD FORTIFICATION

Despite being advantageous over some other ways of curbing micronutrient deficiencies, food fortification has limitations. Fortified foods are not a substitute for a good quality diet. They cannot always provide all the necessary requirements that a good diet needs to have. Another limitation is that foods that have been fortified might not be consumed by everyone who is in dire need of them. Very often the distribution of food meets some constraints. This could be because of transportation of the foods, delayed delivery or high prices of the foodstuff. The fortified food usually fails to reach the poorest of the poor who are at the greatest risk because of low purchasing power and under developed distribution channels.

It has been noted that infants and children (as well as women of the reproductive age) are at a higher risk of being affected by micronutrient deficiencies. In a similar manner, infants and children who consume relatively small amounts of food are less likely to be able to obtain their recommended intakes of micronutrients from the fortified food. This is why other methods of curbing micronutrient deficiencies such as tablet supplementation and eating foods that contain enough of the needed micronutrients must be advocated.

Another limitation of food fortification is technological. At times micronutrients in the fortified food can either exceed or not reach standard and acceptable levels. Over-fortification may intoxicate the body. Also the nature of the food vehicle may limit the amount of the fortificant that can be successfully added. There can also be the problem of the stability of the fortificants and interaction of the nutrients. Experts have mentioned that the presence of some nutrients in the food inhibits the absorption of other nutrients. This implies that some fortificant nutrients may be detrimental to some members of the society. There is need of technocrats and experts to measure the amount of micronutrients in the food to standard and appropriate levels lest the food becomes a danger to the consumers.

Some programmes of food fortification cover the entire population rather than targeting the people who need it most. By affecting the consuming public, such programmes may create

problems for some individuals who may need to avoid certain nutrients. For example, some individuals with haemachromatosis (iron overload) must avoid iron fortified foods. Those with hyperthyroidism (an overactive thyroid) or thyroiditis (an inflammation of the thyroid gland) must avoid iodised salt. Another problem could be that an unrecognised micronutrient deficiency may mask some complications or even accelerate them. For example, unrecognised vitamin B12 deficiency can mask the haematological abnormalities and allow the neurological complications to progress.

Another problem of food fortification is ironical. Subsumed within the right to health is the right not to be made ill by public health initiatives. There are certain nutrients that can be beneficial when added to the foods of deficient individuals and potentially detrimental as fortificants in the diets of nutrient-replete individuals. The ironic problem is that the heterogeneity of status across individuals finds persons of both categories coexisting in the same societies.

Although food fortification is in general cost-effective, it can also be expensive, especially in its initial stages. Start up costs and trials for the programmes are usually high. Such expenses can contribute to the fallout of the programme of food fortification and in the end not helping in the reducing of the micronutrient deficiencies.

2.5 THE WORLD HEALTH ORGANIZATION STRATEGY ON FOOD FORTIFICATION

The new global guidelines from World Health Organization on fortification state that, food fortification should provide 97.5% of individuals in a population with an intake that meets their requirement for specific micronutrients without exceeding the tolerable upper intake levels (Lindsay et al. 2009). This is important for it helps to evaluate which nutrients to add, which foods to fortify and how much to add (level of fortification). It also helps to identify target groups and risk groups. In Europe it was observed that dietary surveys are difficult and expensive. So it was suggested that the food industry support such surveys financially. Other cooperating partners should also help in financing such projects.

The World Health Organization is also highly concerned with the safety of the consumers and their right to choose, or rather select between fortified and unfortified foods. They suggest that health benefits from fortified foods should be communicated to consumers. This throws the dice back to consumers to select between fortified foods and unfortified foods. This implies that the use of fortified foods in some countries is optional and not mandatory. However, Kiely (2004) argues that if fortification is optional and not mandatory, it gets more

complicated. Calculating the levels of nutritional intakes and choosing the kind of food vehicle becomes difficult. Mandatory fortification identifies appropriate food vehicles for fortification and helps calculating effects of different fortification strategies. In other words, laid down rules, laws and procedures for fortification can easily be followed when fortification is mandatory.

Chaudhari (2004) states that addition of nutrients to foods should only be done if it is safe, the nutrients are bio-available and the process will be cost-effective. Some biologists have defined bio-availability as the fraction of an ingested nutrient that is absorbed and that is used for metabolic processes and storage in the body. In this context, however, bio-availability, means that when, for instance, vitamin premixes are produced, vitamins must still be present and active by the end of shelf life.

Put in summary form, what the World Health Organization's strategy suggests is that if food fortification is decided, a strong political commitment and availability to enforce regulations in a facilitative manner is needed. Involvement and willingness in the private sector to comply with regulations is also needed, just as public sector backing including the endorsement by professional medical organizations. What is also necessary is a sound scientific basis design of the fortification programme. In short, both safety and necessity of fortification have to be unveiled to consumers if fortification is to be accepted.

In history, Lindsay et al. (2009) note, that food fortification programmes were often undertaken with little attention. Other methods to improve the nutritional status of populations were implored. Today it is a different story. Fortification of food has proved to be one of the most cost-effective measures undertaken to improve the health and nutritional status of the majority. It has been designed to restore nutrients removed during processing, to replace nutrients in substitute foods, and to correct obvious deficiencies in populations.

2.6 SUMMARY

This chapter aimed at explaining the debate about food fortification. It has been explained that many countries worldwide have embarked on various programmes to mitigate the micronutrient deficiencies that have become a global issue. Various governments have realized that if the micronutrient deficiencies are left alone then there will be worse consequences. Several diseases related to micronutrient deficiencies will be the order of the day. This will result in a rise of mortality rates and hence in the reduction of economic activity. To counter these problems, several governments have advocated for food fortification. History has shown that food fortification has helped in mitigating the problems

resulting from micronutrient deficiencies. Several countries, including developing countries, have taken the process of fortification seriously. It has proved to be beneficial.

It has to be re-emphasized here that the cost of improving nutritional status of a nation should be regarded not as an expense but as an investment. Thailand has made strides in reducing poverty, and the payoff has been high. Poor nutrition, which is universally recognized as an underlying cause of mortality in children and a major contributor to a number of health problems in all segments of the population, must be eradicated. Governments and indeed their populations must realize that good nutrition is an essential determinant of wellbeing. It is a fundamental right for all individuals. Bad nutrition, on the other hand, has strong ramifications on economic activity of the country. Adequate intake and utilisation of both macronutrients and micronutrients has to be sped up. The term ‘macronutrient’ refers to carbohydrates, proteins and fats needed in large quantities by the body for day-to-day activities.

The next chapter presents the theoretical framework of the research. The principles of distributive justice, John Rawls’s Theory of Justice, the Utility Principle and the UN Universal Declaration on Human Rights have been described so that they help in analyzing the data from an ethical point of view.

CHAPTER 3
THEORETICAL FRAMEWORK

3.1 INTRODUCTION

This chapter presents the theoretical framework of the research. It consists of three major parts divided as follows: the Principles of Justice, the Principle of Utility and the UN Universal Declaration of Human Rights. In Chapter 5, these principles will help to analyse the findings of the research from an ethical point of view.

3.2 PRINCIPLES OF JUSTICE

Put in simple terms, justice, used many times interchangeably with fairness, can be defined as "giving to persons what is their due". In other words, it is the constant and permanent will to render to each person what is hers or his (Beauchamp 1982, 221).[10] It is the fair treatment of the people. It is also concerned with what ought to be done when different people's desires or interests oppose one another and cannot all be fully satisfied.

Several philosophers agree that justice is the first virtue of social institutions, as truth is of thought, hence the emphasis to promote it. Laws and institutions, no matter how efficient and well arranged they may be, if they are unjust, they must be abolished. Being the first virtue of social institutions, justice remains uncompromising. It must be given every time where it is due.

Justice has been analysed in different ways in rival theories. But common to all theories of justice is the following minimal principle: "like cases should be treated alike.... Equals ought to be treated equally and un-equals unequally" (Munson 1996, 3). This is what is referred to as the principle of formal justice, or sometimes as the principle of formal equality. Formal because whatever respects are under consideration, persons who are equal in those respects should be treated alike.

It must be noted that there are different types of justice, which include, Commutative Justice, Retributive Justice and Distributive Justice. For my research, distributive justice is crucial; therefore I have concentrated on it. The other two kinds will be mentioned only briefly. I will also briefly discuss John Rawls's "Theory of Justice", which is one of the main modern theories of distributive justice in the 20th century.

[10]This is, however, a vague definition because it does not tell us what is meant by "hers" or "his".

3.2.1 Commutative Justice

Commutative justice is concerned with the fairness of exchanges or mutual dealings such as wages and prices as opposed to exploitation and profiteering. It refers to that which is owed between individuals, such as in conducting business transactions. Commutative justice calls for fundamental fairness in all agreements and exchanges between individuals or private social groups (Blackburn 2005). Questions that are asked include these: When is the salary of a worker a fair one? Are the prices we pay when purchasing goods just?

3.2.2 Retributive Justice

Retributive Justice is concerned with the questions of when and why punishment is justified for a wrong doing. One punitive form of retributive justice is most simply summed up in the principle, 'an eye for an eye, and a tooth for a tooth'. Retribution embodies the idea that an offence may 'cry out' for punishment, and that the moral order is out of balance until this is administered (Lester 2008).

Traditionally, philosophers of punishment have contrasted retributivism with utilitarianism. For utilitarians, punishment is forward-looking, justified by a purported ability to achieve future social benefits, such as crime reduction. For retributionists, punishment is backward-looking, and strictly for punishing crimes according to their severity. Depending on the retributivist, the crime's level of severity might be determined by the amount of harm, unfair advantage or moral imbalance the crime caused. To the contrary, some theories of ethics say that punishment (or proportionate punishment) is self-contradictory in the sense that two wrongs do not make a right (ibid.).

3.2.3 Distributive Justice

Principles of distributive justice are normative principles designed to guide the allocation of the benefits and burdens in society. Questions that have to be answered include these: How fair is the distribution of the common resources in society? Who is entitled to the goods of the society and to what proportion?

The resources to be distributed include social services like medical services, welfare payments, public offices, taxes and military services (Munson 1996, 1). Burdens can be categorised as follows: paying taxes and being drafted into the armed forces to fight a war. Primary distributive concern should not only focus on material goods and services but also on values that increase the wellbeing of the society. This implies that distributive principles should be designed and assessed according to how they affect welfare.

In what follows, I briefly describe four principles of distributive justice, that is, principles that tell us how benefits and burdens should be distributed. These principles are the principle of need, the principle of equality, and the principles of effort and contribution.

3.2.3.1 Need

Sometimes justice consists in treating people according to their needs: “To each according to their needs”.

Some philosophers say that this principle of need is an extension of the egalitarian principle of equal distribution. People should be treated not really equally but as equal as possible according to their needs (Munson 1996, 39). This implies that goods should be parcelled out according to individual needs. Those who have greater needs should be given more than those with fewer needs. The poor, for example, should be provided with enough opportunity so that they equal the rich who have better opportunities already. The aim of this principle is that the basic needs of everyone should be met.

3.2.3.2 Equality

Equality is one of the most important factors that determine justice. It plays a very important role in the distribution of material goods and services. Two important components should be considered here, these are, Equality of Treatment and Equality of Opportunity. Equality of Treatment simply entails that all people must be treated equally regardless of their individual differences. Justice must be determined by attending to the relevant respects in which individual people differ.

Equality of Opportunity implies that all people must have equal opportunities as they receive benefits and burdens of society. Everyone is entitled to the same slice of the pie and everyone must bear an equal part of the social load. Benefits and burdens should not be distributed on the basis of fortuitous characteristics like luck of birth (family and class origin) natural endowment, and historical circumstances. Everyone needs to have a fair opportunity to access the benefits in society. Philosophers say that it is considered unfair for some to have more than they need and for others to have less than they need.

Raphael (1992) says that all human beings should have equal claims. The fundamental status in society is to be equal. This is a status that all citizens need to have as free and equal persons. If we are equal as citizens then we will have fair access to the fair procedure on which the basic structure relies. In a well ordered society, citizens are considered to be equal at the highest level and in the most fundamental respects. In such a society citizens view and

recognise one another as equals (Rawls 2003, 132). It is unjust to discriminate in favour of some and against others except in order to meet special needs. Something should be done, for instance, for the poor, the sick and the disabled because they are disadvantaged as compared with most people.[11]

In the absence of special circumstances, it seems wrong that some or much of the society should be amply provided for while many or even a few suffer hardship, hunger and illnesses. It is also wrong that more urgent needs and wants go unfulfilled, while the less urgent ones of others are satisfied. Rawls (2003) says that unless there is real scarcity, all should have at least enough to meet their basic needs. One part of society should be prevented from dominating the rest.

To conclude on equality, the following has to be put across: In order to provide genuine equality of opportunity, society must give more attention to those with less native assets and those born into the less favourable social positions.

3.2.3.3 Effort

The principle of effort holds that justice consists in the treatment of people according to their efforts and sacrifices they make on their own behalf, or on behalf of their society, family, tribe or nation (Munson 1996, 3). People should be rewarded according to the effort they expend in their work activity. Those who work hard deserve more benefits than those who work complacently. The lazy should receive proportionately less than those who work hard.

However it has to be noted that according to this principle, those who make equal efforts towards work deserve to be treated equally. For instance, if a secretary and a president are both working hard in their different capacities, both of them ought to receive the same proportion of social goods (for example, money).

This principle has to be applied with caution lest it encourages the inefficient, the untalented and the incompetent. This is because effort by its very nature is a two-sided thing. It can either be fruitful or in vain, well directed or misguided, properly applied or misapplied, availing or unavailing. Thus to reward by effort only rather than by achievement is socially undesirable. As already mentioned, it can encourage inefficiency and incompetency. The untalented can be committed to doing things and always be present yet they might be inefficient. To treat such people according to the principle of effort might cause society to

[11]Raphael refers to this as discrimination in favour of the needy. It has an egalitarian purpose where the needy are given more because they have less in attempt to reduce inequality.

crumble (for example, economically). This entails that judging justice according to effort may be defective.

3.2.3.4 Contribution

This principle states that people ought to be treated according to the actual contribution to their society. Every person should get back that proportion of social goods that is a result of his or her productive labour. Those who do more should be more rewarded; those who do less than their best should be less well rewarded. People should be rewarded for their work activity according to the value of their contribution to the social product.

However, as a general rule, like the principle of effort, this principle is clearly defective. For instance, when you are in desperate need for medical treatment but you have not contributed to society (maybe because you were not able to do so), then you might easily have no right for treatment. This does not sound to be justice. It is unfairness.

3.2.4 John Rawls's Theory of Justice

John Rawls was an American philosopher who lived from 1921 to 2002. In his book *A Theory of Justice*, he explained his socio-ethical position and a defence of his views on the moral life of individuals within society. His basic idea is that a just principle is one that would be accepted by people who are impartial and rational. He says that the correct standards of justice (and morality in general) are those that individuals who are free, equal and rational in a certain hypothetical state analogous to Hobbes's state of nature would accept if given a choice (Rawls 1971, 191).

3.2.4.1 The Rawlsian Society

Before going on to outline Rawls's theory of justice, it is important to get a clear picture of how he conceptualizes society. Rawls sees society as a self-sufficient association of individuals. These individuals acknowledge that there are certain rules of conduct in society that are binding on them, and in most instances they are willing to abide by those rules. These rules constitute a system of cooperation designed to further the good and improve the welfare of those who participate (Falikowski 2005, 111). Individuals from this society want the same kind of things and want to share the same basic needs.

Though in this society cooperation among equals appears to be the order, Rawls recognizes that conflicts of interests will inevitably arise. For instance, people will tend to disagree on how benefits secured by collaborative efforts should be distributed. Also in pursuit of their

life goals, different individuals will develop different interests and they would want to have better and greater shares than others. This can definitely be a source of conflicts. In view of this, Rawls proposes that there be a set of principles and rules in society that people can abide by when determining the distribution of benefits. These principles are the principles of social justice (Falikowski, 112).[12] To explain how these principles can be arrived, I must say more on Rawls' theory of justice in what follows.

3.2.4.2 The Original Position

The Original Position is analogous to the so called State of Nature as it was described by various philosophers. It is an imaginary situation prior to the creation of society and this implies that it is purely hypothetical. In this situation, people have to create the rules and institutions of a society. To ensure that these rules and institutions are just, there are two key elements of the Original Position: the Veil of Ignorance and the Maximin Principle.

3.2.4.2.1 The Veil of Ignorance

Rawls says that as human beings we normally tend to be biased towards ourselves and our friends. This implies that the decisions we make will usually be partial and unfair. Because of this, Rawls argues that fair decisions are made when we are deprived of personal information, that is, of the information that would enable us to tailor things to our own advantage. When we do not know who we are, decisions that we make would be fair. This is what Rawls calls the Veil of Ignorance. Individuals behind this imaginary Veil of Ignorance lack personal knowledge. They do not know whether they will turn out to be old or young, strong or disabled, knowledgeable or ignorant, male or female, rich or poor, urban-based or rural-based, and so on, when they enter society. When individuals lack such knowledge they cannot advocate principles, laws or decisions that they think will benefit people like themselves. They will instead make laws that will be fairer so that in case they are found in an under-privileged position, they still will not be disadvantaged. That is to say, behind the Veil of Ignorance, agreements and choices occur from an impartial perspective. Many philosophers believe this to be constitutive of morality. According to Rawls, an impartial moral judgment is one rendered in accordance with the principles which would be chosen in the Original Position behind the Veil of Ignorance (Rawls 1971, 190). This so called Veil of Ignorance is the device that Rawls developed to ensure impartiality.

---

[12]The principles of justice provide a way of assigning rights and duties in the basic institutions of society and they define the appropriate distribution of the burdens and of social cooperation.

Let me illustrate this by a simple example. If we are required to share a loaf of bread among the three of us, I would most likely give myself a bigger share and give others smaller shares. But if we lose all our personal knowledge, we cannot do this because we do not know who we are and who our friends are. If we do not have this knowledge we cannot favour ourselves or our friends. In this way, the Veil of Ignorance ensures impartiality.

The table below helps to clarify this. We take A, B, C, and D to be ways of dividing the loaf among three individuals, namely, Kenneth, Musole and Chihinga.

	A	B	C	D
Kenneth	½	¼	¼	⅓
Musole	¼	½	¼	⅓
Chihinga	¼	¼	½	⅓

Rawls would say that if you have personal knowledge and you know that you are Kenneth, you would favour to share the loaf according to way A. If you know that you are Musole, you would favour way B, and if you know that you are Chihinga you would favour way C.

However, if we assume that Kenneth, Musole and Chihinga do not have personal knowledge, the loaf would be shared according to way D because they cannot favour themselves. This, however, is at the same time a fair distribution. This simple example can illustrate how the Veil of Ignorance can make decisions impartial. All the individuals would get one third each of the loaf.

3.2.4.2.2 The Maximin Principle

Rational choices have to be made under three conditions, namely, under certainty, under risk and under uncertainty. Under certainty means that before you decide what to do, you know already what the outcome would be. For example, if you decide to water a seedbed, before you do it you already know what the outcome will be. The soil will be wet.

Making rational choices under risk means that one decides under likelihood. For example, if you know that the covered box has got 10 green and 5 red pens in it and you decide to pick one, you already know that the probability of getting a green pen is ⅔ although you do not know whether you will pick the green or red pen. But if you do not know how many pens there are in the box, and you decide to pick, you do it under uncertainty. You do not even know the probability of getting a green or red pen.

Rawls held that decisions in the Original Position are decisions under uncertainty and he favoured the so called Maximin Principle (at least as a heuristic principle) for rational decisions under these conditions. The Maximin Principle states that under conditions of uncertainty, it is rational to choose the option that maximises the minimum. That is to say, you have to choose the best outcome of the worst. The table below illustrates this principle of

rational choice. Take D_1, D_2 and D_3 to be the different decisions made, and C_1, C_2 and C_3 as the different conditions.

	C_1	C_2	C_3
D_1	**Pay K10,000**	**Gain K15,000**	**Gain K20,000**
D_2	**Pay K12,000**	**Gain K10,000**	**Gain K25,000**
D_3	**Gain K7,000**	**Gain K8,000**	**Gain K12,000**

The worst outcomes from the three decisions are: paying K10, 000 for D_1, paying K12, 000 for D_2 and gaining K7, 000 for D_3. From these worst outcomes the best would be to gain K7, 000. This means that this best outcome among the worst has maximised the minimum. In actual sense D_2 would produce the best outcome (gaining K25, 000). Nevertheless it would produce the worst outcome also (to pay K12, 000). From the three decisions it would be better to gain K7, 000 than to pay K12, 000. According to the Maximin Principle, this would be the rational decision. The minimum has been maximised.

As I sum up on Rawls, it is important to highlight once again that according to Rawls the basis of the Original Position is the Veil of Ignorance and the Maximin Principle which together ensure that decisions are impartial and rational. Therefore, principles and policies that are acceptable in the Original Position are impartial and rational and for this reason they are just.

3.3 THE PRINCIPLE OF UTILITY

Utilitarianism belongs to a broad group of ethical theories that are called **Consequentialist** (or teleological) **theories**. Consequentialist theories hold that the rightness or wrongness of actions and practices depends solely on the value of their consequences. It is the outcome of an action on the affected parties that establishes their moral worth (Beauchamp 1982, 73).

Utilitarianism is a well known special type of consequentialist theories. Many utilitarians believe that what we really ought to seek and promote in life are certain experiences and conditions that are good in themselves. They further hold that to improve society, people's actions and those of government could and should be evaluated according to their practical consequences or how much good they produce. Let me now highlight the key elements that distinguish utilitarianism from other consequentialist theories. Among the key elements of utilitarianism are: universalism, impartiality, wellbeing and maximization.

Universalism: utilitarianism as a consequentialist theory applies to everyone that is affected. All the affected should be promoted. This implies that the moral rightness of an act depends on the consequences for all people, or for all sentient beings (as opposed to only the individual, the present agents or a limited group). Everyone who is affected counts and they

count equally (Munson 1996, 3). People and/or other sentient beings should not be favoured because of what they are but according to how they are affected.

Impartiality: utilitarianism implies impartiality. It is impartial because the value of consequences depends on how one is affected. All that are affected count equally. When determining the moral rightness, benefits to one person matter just as much as similar benefits to any person do. All cases, regardless of individuals involved, should be treated equally. We must consider the consequences of our actions on everyone whose wellbeing is and/or will be affected.

Wellbeing: utilitarianism holds that the value of the consequences depends on the welfare (or wellbeing) in the consequences. Wellbeing should here be understood as the intrinsic good in the consequences. It should also be understood that a person's wellbeing is that which is good for them, or, that which is in the interest of the person.

Maximization: maximization implies that an act is only morally right if its consequences are better than the consequences of its available alternatives. Maximization requires that we do not choose an alternative that is worse than another that can be chosen instead. The implication here is that according to the Utility Principle an act is morally right if there is no other possible act that has overall perceived better consequences. Another way of putting this is that an act is morally right if it has the best consequences (better consequences than all other alternatives). This is what is meant by the phrase 'maximising the good'. As I have already mentioned, the good is the wellbeing of the affected.

3.4 UNIVERSAL DECLARATION OF HUMAN RIGHTS BY THE UN

In Chapter five I shall be using the Universal Declaration of Human Rights to argue for food fortification. Therefore, I want here to explain briefly what rights in general are and what human rights in particular are.

3.4.1 What are Rights?

It has to be known that there are no clear and straightforward definitions of what rights are. However, there are different theories that explain about rights in different ways. To understand this in a better way, rights need to be categorised as legal and moral.

Legal rights exist in virtue of given laws. They are rights derived from political constitutions, legislative enactments and from the executive wing of the government (Beauchamp 1982, 189). An example of a legal right is the right to vote.

Human rights, however, do not belong to the category of legal rights but to the category of moral rights. Moral rights are usually understood as rights that exist prior to, or independent of, any legal rights. They are the rights through which legal rights and rules can be evaluated, for example, as just or unjust. To understand what is meant by a person having a right to something, two different kinds of rights have to be distinguished, these are Claims and Liberties (Thomson 1990).

Claims: Rights in the strictest sense are claims. A person's right means that he or she has a valid claim against someone, and that this someone has therefore an obligation (duty) towards that person. For example, if you borrow a book from me, it means that I have a right to that book and that you have an obligation to give me back the book. In other words, I have a valid claim against you to give me back the book that you borrowed. You have the duty towards me. You have to give the book back to me.

Liberties (or Freedoms): Some rights are somewhat weaker than claims. These rights have been called liberties. For example one can have a right to go to church. Another example could be that one has a right to use his or her cellular phone without prior permission from any one. This can mean that other people have obligations not to interfere in the freedom of someone else to go to church or to use the cellular phone. As I have mentioned, liberties are weaker than claim rights.

Another important feature to mention as we deal with rights is to understand that claims of rights are not always absolute but can be *prima facie*. Put in other words, most (if not all) rights can be overridden by other rights. A prima facie right is to be distinguished from an *absolute* right because a more important conflicting right can override it (Beauchamp 1982, 188). To be sure, that a right is *overridden* does not mean that it does not any longer exist (it is not lost); it only means that another right is more important. For example, another person's right to life may override your right to property, but you still have this right. Any law that infringes a fundamental right would be at least *prima facie* unjust.

3.4.2 What are Human Rights?

Put simply, Human Rights are rights possessed by all human beings basically because they are human beings. Merely being human is sufficient to make one a possessor of those rights; therefore they are properly called *human* rights (Donnelly 2003). They are what some describe as "general" rather than "special" rights since they are regarded as universal to all humanity. The doctrine of human rights is an egalitarian doctrine. It ascribes a number of rights to human beings indifferently and those rights are held equally by all human beings.

Declarations and conventions of human rights do not "create" and "give" rights to human beings; they simply *recognise* and *announce* the rights that human beings have.

The United Nations, in the preamble of the Universal Declaration of Human Rights, recognizes the inherent dignity and the equal and inalienable rights of all members of the human family as the foundation of freedom, justice and peace in the world. Article 25 of the same declaration mentions that every person has the right to a standard of living adequate for the health and wellbeing of himself and of his family, including food, clothing, housing, medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control (United Nations 1948).[13]

3.5 SUMMARY

The aim of this chapter was to outline the ethical theories that will be used to evaluate the findings of the research. Some principles of justice, the principle of utility and the Universal Declaration of Human Rights have been explained.

The minimal principle of justice common to all types is that like cases should be treated alike. Equals ought to be treated equally and un-equals unequally. Rawls says that just and fair decisions are those that rational and impartial people would agree to accept if they were in the hypothetical Original Position behind the Veil of Ignorance. The Utility Principle states that an act is morally right if there is no other possible act that has overall perceived better consequences. The Universal Declaration of Human Rights recognizes the inherent dignity and the equal and inalienable rights of all members of the human family as the foundation of freedom, justice and peace in the world. Every person has the right to a standard of living adequate for the health and wellbeing of himself and of his family, including food, clothing, housing, medical care and necessary social services.

The next chapter will look at the current situation of food fortification in Zambia. It will present some findings of the research which were acquired through interviews with various officials and consumers.

[13]The Declaration was proclaimed in a resolution of the General Assembly on 10 December 1948 as the "common standard of achievement for all peoples and all nations" in respect for human rights.

CHAPTER 4
DATA COLLECTION, ANALYSIS AND DISCUSSION

4.1 INTRODUCTION

This chapter discusses the current situation of food fortification in Zambia. Officials from the Ministry of Health, National Food and Nutrition Commission, Zambia Bureau of Standards and from other related organizations were interviewed concerning the situation of food fortification in Zambia (see appendices). Selected consumers especially those from Kaimbwe in Kasempa district where local salt is mined were also interviewed. Other data presented came from hardcopy documents and the internet. The question that has been attempted to answer is: "What is the current situation of food fortification in Zambia?"

4.2 THE CURRENT NUTRITIONAL STATUS IN ZAMBIA

Kapekele (2010) reported in *The Post* newspaper that Zambia has been selected as a beneficiary for the United States Agency for International Development feed the future strategy.[14] This strategy appeals to governments worldwide to invest more in halving the rate of malnutrition to significantly improve the health of mothers and children. It is encouraging to note that the Zambian government is part and parcel of this strategy. One of the ways to see to it that the target and aim of this initiative is achieved is the programme of fortifying foods. The question is "Is the Zambian government doing enough towards the achievement of the set targets and aim of the USAID feed the future strategy which is to reduce hunger and under-nutrition?"

In order to understand fully the nutrition problems in Zambia, it is important to understand the food and nutrition security in the country.[15] Food security here implies the physical and economic access to food of sufficient quality and quantity in a socially and culturally acceptable manner. Nutrition security implies the outcome of food intake, good health, a healthy environment, and good caring practices in addition to household-level food security (National Food and Nutrition Commission 2006, 12). This means that food and nutrition security can only be achieved when adequate food is available and accessible to all and when it is satisfactorily utilized by all individuals at all times to live a healthy and quality life.

[14]Feed the future strategy is a comprehensive initiative that targets the causes of hunger and aims at reducing hunger and under-nutrition at national level.

[15]The two terms, that is, 'food security' and 'nutrition security' are usually used interchangeably in literature.

When asked whether Zambia has achieved both food and nutritional security, four respondents at National Food and Nutrition Commission said that in Zambia, as is common to several African countries, the two securities have not yet been fully achieved. Many people, especially women from low income generating areas, are food insecure and worse still, nutrition insecure. Most of them cannot afford enough food (especially quality food) to cater for their daily needs. Quality food is usually expensive.

Nutrition security is a challenge to many people. It is possible for one to have access to food and yet be nutritionally insecure. This is true for those who have poor health or improper care and those who are ignorant about their nutrition needs. This is typical of the current Zambian situation. In the year 2002, for example, a report showed that in Zambia infant and under-five mortality rate stood at 95 deaths and 168 deaths respectively per 1000 births. Malnutrition was associated with 42% of these deaths (Central Statistical Office 2002). Note that malnutrition acts synergistically with disease. Death due to disease is more likely to occur among the malnourished.

Surveys that have been done in the previous years have shown that micronutrient deficiencies are still a major public health problem in Zambia. The levels of both the macro and micro nutrient malnutrition are still undesirable; they are still high. A Mr. Siamusantu, a National Food and Nutrition Commission official confirmed that the most prevalent micronutrient deficiencies are vitamin A deficiency, iron deficiency and iodine deficiency. Zinc and folic acid deficiencies are slowly being recognized as significant public health problems, too.

In 2003 an impact survey revealed that vitamin A deficiency as measured by a serum retinol level below 200µg/l, among children under five and women of reproductive age was 54% and 13%, respectively. Anaemia defined as a haemoglobin level below 110g/l in under five children and women of reproductive age was 56% and 29%, respectively. According to the World Health Organization's standard, levels of vitamin A deficiency and anaemia should not exceed 50%. If they do, then the situation is severe. In 2003 the prevalence levels of vitamin A deficiency and anaemia in under-five children in Zambia were above 50%. This indicated that Zambia is in a severe situation requiring a comprehensive micronutrient malnutrition control programme.

During the interviews, it was revealed that the immediate causes of micronutrient deficiency diseases in Zambia are the low dietary intake and the poor health status of individuals. Much of the food that is taken by the majority, especially the poor, is usually inadequate both in quantity and quality. The food is either too little to cater for the daily

energy requirements or it has insufficient micronutrients. “The major underlying cause of malnutrition in Zambia is the food security situation,” said Mrs Kabaye.[16] Only about 36% of the households usually have enough to eat. About 19% of the Zambian households seldom or never have enough to eat. This puts most of the Zambian population at risk. The majority, especially children and women of the reproductive age, are malnourished. It is said that a poorly nourished person has a weakened immune system and is more prone to infections (National Food and Nutrition Commission 2006, 8). This is true of the Zambian situation. It is estimated that one in every three people is at risk for one or more micronutrient deficiencies. This has an impact on the nutritional status which has an important impact on the individual’s health, productivity and quality of life in general.

Mrs Kabaye further said that diets which do not contain adequate amounts of vital micronutrients often result in deficiency diseases that include blindness, mental retardation and reduced resistance to infectious diseases, depending on a particular micronutrient. Vitamin A, for instance, is essential for eyesight while niacin is essential for the metabolism of carbohydrates. Zinc helps to maintain a healthy immune system. In Zambia, vitamin A deficiencies and iron deficiencies are still prevalent. At the beginning of 2010 Zambia recorded some cases of measles. Some lives were claimed with Lusaka recording the highest number of cases. This could be a sign of micronutrient deficiency. Micronutrient deficiency impairs the normal defence mechanisms of the body, making it not function properly. It reduces the ability to fight various diseases including malaria and measles. Much needs to be done towards fighting these micronutrient deficiencies.

The Ministry of Health (2006) in its nutrition policy outlines the nutrition indicators. These include the anthropometric measurement of children, micronutrient deficiency levels, body mass index (especially for women) and the birth weight of the newly borns. Body Mass Index is understood as an assessment of nutritional status obtained by dividing body weight by height in meter squared. The normal range is 18.5 to 25. What is considered under anthropometric measurement are: stunting, underweight and wasting. Lindsay (2006a) reports that according to the World Health Organization’s standards, rates of stunting that are above 10% are indicative of a public health problem. In 2003, the rates of stunting in Zambia were between 49%and 53% of the infants. This is indicative of a chronic malnutrition. Underweight is indicative of either chronic or acute malnutrition. The National Food and

[16]Personal communication by Mrs Kabaye a nutritionist at National Food and Nutrition Commission (16 February 2010).

Nutrition Commission (2006) reported that Zambia had made no progress in trying to reduce hunger as measured by underweight children. The rate was at 24%. Wasting which is the condition that causes somebody to gradually become weaker and thinner is also indicative of acute malnutrition. In Zambia the levels of wasting are within the globally acceptable standard. They are between 2.5% and 7.6%. This is indicative of both the children and women of reproductive age. The above figures indicate that women are still consuming inadequate food and that there is poor intra-household food security. There is much that still needs to be done.

4.3 THE DEVELOPMENT OF A MICRONUTRIENT DEFICIENCY INTERVENTION

The Zambian government has realized that severe malnutrition is not good for any society. It thwarts both the social and economic development of the nation. This realization has created a renewed sense of urgency surrounding the provision of micronutrients to communities in the country among several other strategies, in form of supplementary pills and other foods like the High Energy and Protein Supplements. Another strategy that is embarked upon is fortification where food has specific and scientifically identified micronutrients added to it to improve its nutritional status. Another is the newly introduced bio-fortification, that is, the breeding of crops with increased content of a micronutrient.

Food fortification has been practiced worldwide for nearly ninety years and has proved to be one of the most cost-effective ways of improving the health of a nation. It is also a very efficient way of using public resources to promote health for all.

In Zambia, as already mentioned in Chapter One, fortification of food started in 1970s when salt and margarine were fortified with iodine and vitamin A respectively. These efforts were intensified in 1990s. Currently, locally produced sugar is fortified with vitamin A. Plans are still under way to fortify the maize meal with a multi-mix of vitamins and minerals.

Not too long ago a report in the *Lusaka Times* showed that the Zambian Agriculture Research Institute (2010) in Luapula province had successfully completed the development of fifteen new varieties of bio-fortified sweet potatoes. This research to fortify the sweet potatoes had taken seven years at a cost of US$30,000 financed by the Rockefeller foundation of the United Stated of America. The new sweet potato variety has vitamin A content of up to 13%, which is higher than that of a carrot which has only a maximum of 7%.

Whether this project will remain viable and sustainable is a different question that can be asked.[17]

Zambia Agriculture Research Institute (2010) also indicates that additional measures are required to further reduce vitamin A deficiency in the country. This should include the bio-fortification of maize with pro-vitamin A. Maize is the staple food in this country. The provision of vitamin A through bio-fortified maize grain will therefore have a far-reaching impact on the reduction of vitamin A deficiency. Vitamin A deficiency still remains a serious problem in Zambia, affecting over 53% of children. Vitamin A deficiency is associated with the high levels of child mortality, partial and complete blindness. The control of Vitamin A deficiency will highly contribute to lasting improvement in childhood survival and prevention of reversible blindness caused by micro-nutrient malnutrition.

Efforts are also made towards fortifying locally mined salt. Since 1900s the Kaonde people of Chief Ingwe in Kasempa district of Zambia have been mining, processing and packaging salt at Kaimbwe salt pan which lies at the spring of Kaimbwe and Shingo streams about

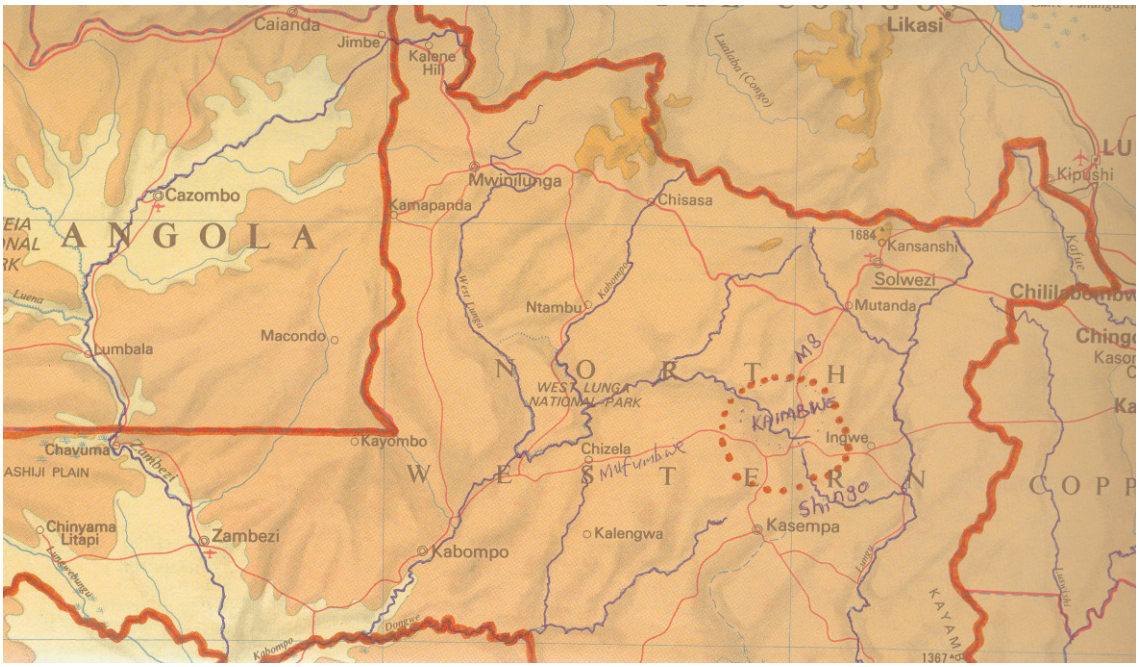

Figure 1 ***Source: New Basic Education Resource Atlas for Zambia***

[17]In promoting this intervention, one of the activities is to assess the level of utilization of fortified foods by households and determine whether samples of fortified foods meet the government standards.

60km from Kasempa District along the M8 Mutanda-Chavuma road in North-Western Province of Zambia (see figure 1). Being a natural resource, the Kaimbwe salt pan is endowed with abundant forest, elephant grass, water and rich soil from which the salt is mined.

In the 1990s, the Ministry of Health had embarked on a mission to sensitize the local people about the importance of fortifying the locally produced salt. The main reason for this was that a number of iodine deficient diseases, like goitres, were identified among the locals. This was proved by clinical health researchers. Potassium Iodate was taken to Kaimbwe to start the process of fortifying the salt at the community level. Unfortunately, many people that were interviewed observed that the supply and distribution of the Potassium Iodate has since stopped. “No official from the Ministry of Health or from any other organization has been seen in the recent past distributing the iodine,” says Headman Kilalo of Kaimbwe during the Nsakwa ya BaKaonde traditional ceremony held on 16th October, 2010 in Kasempa district. He does not know why they have stopped. When asked if the Ministry of Health trained any local people to do the fortification, Chief Ingwe of the Kaonde people said that they are not there. When contacted for a comment, the Kasempa District Director of Health, who refused to be identified by name, attributed the erratic supply and distribution of Potassium Iodate to the non-availability of funds. The project has since stopped to be funded. Despite this stoppage, the mining of the salt has continued. The Kaimbwe people have since gone back to the old unhygienic way of processing the salt. The produced salt is packaged in green leaves to make *“Nsuumba”* the estimated one kilogram packet of the Kaimbwe salt. People, not only those from Kaimbwe, still use this un-iodated salt.

Another strategy implemented by the government is the intermittent supplementation where people are given micronutrient supplementation in the form of a pill containing the needed micronutrient. For instance, there is a vitamin A supplementation programme that aims at achieving about 90% of the national coverage. Activities of this programme include the procurement of the vitamin A capsule and timely distribution to the districts and clinics. It is the aim of vitamin A supplementation programme to improve the coverage for postpartum women, and to increase the coverage of supplementation among children with measles, diarrhoea and malnutrition. For this programme to continue being effective, the country needs to procure adequate stocks. Some officials, at the Ministry of Health, who refused to be identified, disclosed that there is no constant supply of these intermittent supplementation pills. Funding is usually the problem.

Encouraging people to improve and expand on the variety of foods that they eat to ensure that they contain the needed micronutrients is also one of the strategies initiated by the government to fight micronutrient deficiencies. This is called dietary diversification. When asked how this is done, Mrs Kabaye said that education nutrition programmes have been developed where the government has embarked on a mission to teach people about the importance of micronutrients and in which food they are found. This is done at local communities. A balanced diet is advocated for. Whether this is successful is yet to be established for it is still in the initial stages. Other programmes include the feeding of the infants and the young children. These programmes promote, support and protect breast feeding.[18] They are designed to improve breastfeeding and complementary feeding. The Zambian government has adopted the World Health Organization and United Nations Children's Fund recommendations that all infants and young children be exclusively breastfed and be given high quality complementary foods (National Food and Nutrition Commission 2006, 60). The implementation of this strategy contributes towards the attainment of some of the Millennium Development Goals.

4.4 THE ROLE OF ORGANIZATIONS ON FOOD FORTIFICATION

There are different organizations in Zambia that play various roles where food fortification is concerned. Notable ones are the following: National Food and Nutrition Commission, Food and Drugs Laboratory, Ministry of Health, Ministry of Agriculture and Cooperatives, Zambia Bureau of Standards, Consumer Competition and Protection Commission, Central Statistical Office, the United Nations through Food and Agriculture Organization and World Food Programme. Others include the different business companies that are involved in the fortification of their commodities such as, Kafue Sugar Company, Zambia Sugar, and Kasama Sugar. In what follows, I will briefly describe some of these organizations and characterised what role they play pertaining to food fortification.

4.4.1 Zambia Bureau of Standards

Zambia Bureau of Standards is a specialized organization of national importance that serves the country in the field of standardization, standards formulation, quality control, import and export quality inspections, certification and removal of technical barriers to trade. Its main functions are as follows: a) to prepare Zambian standards and promote their use; b) to make

[18]Breastfeeding has always been the best and healthiest source of several micronutrients needed by infants and young children.

arrangements or provide facilities for the examination and testing of commodities, materials and substances from which commodities may be manufactured, processed, treated or finished; c) to provide schemes for pre-export inspection of commodities; d) to provide training and consultancy in standardization, quality management and quality assurance; and e) to establish some testing laboratories.

As far as food fortification in Zambia is concerned, the Zambia Bureau of Standards plays a vital role through its mandate under the Standards Act, Cap 416 of 1994 of the laws of Zambia. The technical regulations mandate it to monitor the quality of fortified products. In other words, the standard of fortified foods is inspected. It is a legal requirement and therefore mandatory for domestic manufacturers to obtain a permit and supply fortified products on the market from the bureau. In this Act, provision to protect the consumer against defective or dangerous fortified commodities is made. Any commodity found defective or dangerous for human consumption should be prohibited or restricted. This should be made in the public interest, public safety and environment. Any commodity declared defective or dangerous shall be withdrawn from distribution and recalled at supplier's cost and the affected customer shall be compensated.

Margaret Lungu, an official at Zambia Bureau of Standards was asked, on 21st September, 2010, to confirm if there are any trained officers at various centres or industries for fortification. She said this was the task for the Ministry of Health and they have officers at the entry points, that is, at border posts. These monitor the standard of the fortified food that enters the country from outside. Mrs Lungu was also quick to mention that there are very few officers who are knowledgeable about how to use the equipments for monitoring the standard of food fortification. When further asked to tell if Zambia Bureau of Standards knows the number of fortified foods that enter the country, the respondent said no. She said that it is the task of the Ministry of Health to take samples of fortified food from the traders and industries to the bureau so that the standard of the fortified food can be monitored.

Delphin Kinkese, an official at Ministry of Health, on 13th September, 2010, said that the ministry does not know the specific number of fortified food that enters the country though at policy level it does. There is monitoring done at border posts or entry points to ensure that the food that requires fortification before it enters the country is fortified. Asked if there is a continued monitoring (and evaluation) of the levels of fortificants in various foods, Mr Kinkese said at policy level there is. But maybe this is not so at ground level. At ground level there is no continued monitoring and evaluation of the program of fortification as the situation found at Kaimbwe local salt production shows. The Ministry of Health officials in

Kasempa, who did not want to be identified by names, said that monitoring of fortification of local salt is dragging due to lack of sufficient funds to monitor the programme. There is lack of consistency in the supply and distribution of the potassium iodate from the ministry to ensure that the salt is locally fortified. The supply of kits and the cumbersome machines to use during fortification of salt also is no longer there. There is no sustainability of this programme.[19]

The other question asked was to find out if there were enough personnel from the Ministry of Health at various centres for fortification to monitor the levels of fortificants in food. The response was that they were there though some of them are not qualified. There are some public health officials at the border posts also, said Mr Kinkese. There is supposed to be well qualified personnel at rural health centres, supervisors at district councils and municipal councils, the Ministry of Health and the Ministry of Local Government.

Ministry of Health officials confirmed that the fortification of food affects the price of the commodity though this is very negligible. The price is affected because of the kits and fortificants that are bought. For instance, Chengo (2010) reported that the Consumer Unity Trust Society International had observed the continued high prices of sugar and how they have made it impossible for many Zambian households to afford this basic commodity. The Overseas Development Institute revealed that Zambia has one of the lowest sugar production costs in the world but still the country has maintained high prices. Prices of sugar in Zambia are quite high as compared to other producing nations in the region and other least developing countries. This has ultimately made it impossible for some households to afford this basic food. This has somehow contributed to the continuous prevalence of micronutrient deficiencies especially among the poor in society because they are unable to buy the expensive fortified food stuffs. Other foods meant for diversification are also too expensive for the poor majority.[20] For example, milk, eggs, rice and beans.

Apart from a legal framework that states that people should eat food that is fortified; and that the fortified food should reach all people including those in far and remotest places, there is no formal program from the government for the distribution of foods. The government formulates laws and policies that have to be followed. For instance, the government can put up a policy which states that all sugar must be fortified. They will not make follow ups to see where and to whom the sugar is given. Distribution is done by the individual industries and

[19] Personal communication by Mrs Kabaye (6 September 2010).

[20] Mrs Kabaye expressed the view that people should sacrifice knowing that the micronutrients are for the benefit of their health: “the so called poor waste money on worthless items; paying for the food should not be a burden”.

the traders. There is no follow up to ensure that the fortified food reaches the intended target. The job for the government is to ensure that the food is fortified and has met the Zambian standards of fitness for human consumption.

It should also be reemphasized that the exercise of food fortification should not be taken in isolation as such. Other interventions, as is the case at present, must be embarked upon. Despite these various interventions taken, prevalence of the micronutrient deficiencies is still high. It is still a public health problem. This means that the desired requirements have not yet been met.

One of the major contributors to the continuous prevalence of micronutrient deficiencies is lack of knowledge about the need to eat micronutrient rich foods. Most of the people in the villages just eat for the sake of doing away with hunger. They pay little attention to the quality of food. For instance, ten purposively chosen consumers of Kaimbwe were asked whether they were aware of the dangers of taking unfortified salt, they responded in the affirmative that it causes goitres. Asked further why they continue to partake of it despite knowing the dangers, they said it is cheaper; one does not need money to have it. They just go to make their own salt.

4.4.2 Central Statistical Office

The Central Statistical Office's main roles are to document statistics of various things in the country. This includes carrying out a census of the nation's population and products. This helps the government to plan the economic activities of the country. In terms of the fortification of food, the Central Statistical Office should know the number of the fortified food that is in the country. This includes those that come from outside the country. Unfortunately, during the interviews no records of the number of fortified foods in the country were found. There is very little done towards the documenting of the fortified food that is in the country. It was also noted that Central Statistical Office does not have records of people who have access to the fortified foods. Census on fortified food rarely takes place, unless there is a special request from the government.

4.4.3 Consumer Competition and Protection Commission

The Consumer Competition and Protection Commission is the secretariat that was established in 1997 to administer the Competition and Fair Trading Act. The Act was enacted in 1994 by the parliament of the Republic of Zambia to encourage competition in the economy by prohibiting anti-competitive trade practices. It regulates monopolies and concentrations of

economic power. It protects consumer welfare and strengthens the efficiency of production and distribution of services. It is also meant to secure the best possible conditions for freedom of trade and expands the base of entrepreneurship. In simpler terms, the Commission is concerned with the general rules of trade. Its aim is to make sure that competition in trade is done within the law. There should not be injustice or favouring from the traders.

In the case of fortified food, the Commission ensures that the prices of the fortified food are controlled. The officials confirmed that the process of fortification does affect the price of the commodity. The effect is negligible, though.

One official, who refused to be named for fear of victimization, said that in Zambia there is no efficient programme for the distribution of the fortified food. The poor in the country have no access to most of the fortified foods be it those fortified within or outside the country. The commodities are too expensive to be afforded by the poor in society. For example, sugar, margarine, cornflakes and other items that come from abroad are expensive. The poor cannot manage to buy them. This puts them at a greater risk than those who are rich and have the money. Most of these rich people live in urban or semi-urban areas. This has led to the continuous prevalence of micronutrient deficiencies especially among the poor.

4.4.4 Food and Drugs Control Laboratory

Margaret Sakala, an official at Ministry of Health, said that the Food and Drugs Control Laboratory was established and enacted under the Food and Drugs Act cap 303 of the laws of Zambia in 1972. It was raised to the laboratory standards in 1978. It was mandated to test the standard of food, water and drugs. It is a department under the Ministry of Health. This department also tests the standard and quality of fortified foods in markets. They measure the levels of fortificants in foods to make sure it is within the required standard. If they find that the levels are not sufficient, corrective measures are taken rather than litigation.

4.4.5 The World Food Programme

The United Nations as cooperating partners contribute significantly in trying to mitigate the problems of malnutrition in Zambia especially through distribution of fortified food and other foods that are rich in micronutrients. The people targeted include the vulnerable, children, women of the reproductive age and the refugees. Of late the World Food Programme has started targeting pupils in boarding schools. Different foods, the fortified included, are distributed so that malnutrition in schools is curbed. This programme can be made sustainable through empowering different groupings including schools by introducing farming. Schools

and other groups must start farming crops that are rich in micronutrients. If possible, these crops should include the newly introduced bio-fortified crops like maize and sweet potatoes. The United Nations officials were quick to mention that what they were doing is just a drop in the ocean. Much still needs to be done in terms of fairly distributing food rich in micronutrients especially to the poor in society.

4.4.6 Other Companies

Kafue Sugar Company and Zambia Sugar Company are very much involved in the process of fortifying sugar with vitamin A. This is a mandatory exercise directed by the government that all sugar meant for domestic use in the country must be fortified with vitamin A.[21] This process of fortification affects the price of the commodity though it is negligible. The vitamin A is expensive to purchase. The sustainability of these programmes still remains a big challenge that the sugar producing companies are faced with. They are trying, though, since it is a business, and more especially that they are facing stiff competition. Both companies confirmed that there is no formal programme from the government meant for the distribution of the fortified sugar. What they said is that they have outlets and depots in various places of the country though these are meant for their customers. What they are interested in is that their commodities are sold.[22]

4.5 SUMMARY

The aim of this chapter was to describe the current situation of food fortification in Zambia. From the various officials and people who were interviewed it has been found that much needs still to be done, especially where distribution of fortified food is concerned if the micronutrient deficiencies are to be curbed. The current nutritional status of Zambia leaves much to be desired. Children and women of the reproductive age are the ones who are mainly affected. There is need for a fair distribution of the fortified food if the nutritional status of the country in general and of the children and women in particular is to improve.

The next chapter will evaluate the programme of food fortification in Zambia from an ethical point of view.

---

[21]The sugar meant for industrial use for instance by the Coca Cola Company and Maheu producers may not be fortified.

[22]Personal communication (9 September 2010).

CHAPTER 5
ETHICAL ASSESSEMENT OF FOOD FORTIFICATION IN ZAMBIA

5.1 INTRODUCTION

This chapter aims at giving an ethical evaluation of the current situation of food fortification in Zambia. The ethical assessment is based on the research findings. The principles, discussed in chapter four, will be used as a guide to assess this situation. The main question under discussion is as follows: "What are the advantages (or strengths) and disadvantages (or weaknesses) of food fortification in Zambia from an ethical point of view?"

5.2 FOOD FORTIFICATION PROMOTES THE WELLBEING OF ZAMBIANS

Utilitarianism, as outlined above, emphasizes that to improve society, people's actions and government policies should be evaluated according to how much good they produce. In other words, the utility principle states that the rightness of an action is established by its effects.

The programme of food fortification has a very important impact on the health of individuals. It has already been mentioned that food fortification plays a vital role in the fight against several micronutrient deficient diseases. In Zambia this has been the case. A few years ago the country had many cases of iodine deficiency diseases, vitamin A deficiency diseases, and iron deficiency anaemia. These cases have now reduced. Salt has been widely used to curb the iodine deficiency diseases. Iodation of salt has proved to be successful from its inception in the 1970s because the majority has access to it. By 2003, about 93% of the Zambian population had accessed fortified salt, said Mrs Kabaye.[23] Goitres and other diseases related to lack of iodine like hypothyroidism, reproductive failure and child mortality have reduced drastically. Recently, a slight reduction in vitamin A deficiency diseases has also been recorded in Zambia.[24]

The National Food and Nutrition Commission (2006) reports that from the impact survey carried out in 2003, vitamin A deficiency reduced by 12% in children, that is, from 66% in 1997 to 54% in 2003. In women of reproductive age, that is those between 15 and 49 years of age, the percentages reduced to 13% from 21.5%. A slight reduction in iron deficiency anaemia was also recorded. In 1997 research showed that 65% of under-five children and

[23]Personal communication (16 February 2010).
[24]The reduction of vitamin A deficiency diseases is slight because sugar is more expensive than salt.

39% of women of reproductive age were anaemic. These figures reduced as shown by the impact survey of 2003 to 56% and 29% respectively.

From the utilitarian point of view, food fortification is a good programme because it improves the health of the Zambians. In other words, the wellbeing of all the affected is promoted. To an extent, the wellbeing of the entire nation is promoted.

Utilitarians believe that we have a moral duty to promote the wellbeing of all people. Whenever possible we should make efforts to promote the welfare of all people in the world. Promoting the wellbeing of all the people includes promoting their health, too. This is no doubt the purpose of the programme of fortifying foods in Zambia. It is known that poverty and disease cause misery in the entire world, not excluding Zambia. The poverty and the diseases can be reduced by fortifying a number of foods with various micronutrients. This leads many people to direct their energies and strengths towards economic activity. Many people are likely to spend more time on work rather than in hospitals and homes nursing their diseases. This justifies the contribution that food fortification makes towards the attainment of the Millennium Development Goals, which include the eradication of extreme poverty and hunger, the reduction of child mortality and the improvement of maternal health through combating HIV/AIDS, malaria and other diseases. Utilitarians will identify this as the promotion of the welfare of the Zambians.

According to the Utility Principle, an act is morally right if it has the best consequences (better consequences than all other alternatives). This is maximising the good. The good here implies the wellbeing. We should act in such a way that we promote the wellbeing of all that are affected. Judging from this point of view, utilitarianism would recommend food fortification. This is because, apart from it being the most cost-effective, the cheapest, easily accessible and a very efficient way to use public resources in promoting the health of the population, there seems not to be any other possible intervention so far that can produce overall seen better results in terms of mitigating the public health problem of micronutrient deficiencies that has hit Zambia. This is not to say that the other interventions are ineffective. What it does say is that the other possible interventions are not as effective as food fortification. Food fortification has proved to be the most cost-effective and cost-beneficial venture, so far, compared to other interventions that fight for the same cause, that is, those that aim at curbing the micronutrient deficiencies.[25] The programme has proved to be the least expensive. It is cost-effective because it covers a wider range of the population. Many

[25]Cost-effective should here be understood as the cost of achieving a specified outcome; and cost-benefit as that which compares the monetary value of the outcome.

people do benefit by having access to a variety of micronutrients more than those that can be gotten from the other interventions.

The other reason why food fortification is cost-effective is that it uses food vehicles that can easily be accessed, for example salt and sugar. Plans are still under way to start using the staple food which will make the programme more cost-effective and cost-beneficial.

It has already been mentioned that the process of food fortification in Zambia can prove to be a very efficient way of using public resources to promote the health of everybody. Food fortification brings forth health. The programme of food fortification does not solely depend on the government but also on other cooperating partners. The other interventions usually depend on the expenditures of the government. They become more expensive ventures to undertake. More public resources are used.

To sum on the advantages of the programme of food fortification in Zambia, it should be mentioned that according to utilitarians food fortification seems to be the morally right thing to do so far because there seems to be no other possible intervention so far that can produce overall seen better results in terms of mitigating the public health problem of micronutrient deficiencies that has hit Zambia. It is the most cost-effective, the cheapest, easily accessible and a very efficient way to use public resources in promoting the health of the population. Ultimately, it promotes the wellbeing of all the affected.

5.3 FORTIFIED FOOD SHOULD BE DISTRIBUTED ACCORDING TO INDIVIDUAL NEEDS

In Zambia it is common that people who are in the greatest need of the social services like health services are least likely to receive those services; for instance, the majority who are poor are unable to afford medical fees. This is the reason why there is a need to reemphasize that the government of Zambia needs to fairly distribute fortified foods to the majority poor of the society.

As shown above, data obtained from most of the government departments and other organizations that deal with the issues of food fortification revealed that there is no written policy from the government of the Republic of Zambia about how fortified foods ought to be distributed. The distribution of the fortified food is left to the discretion of the business companies that produce and trade in these commodities. The main aim of these companies is profit. Their first priority is to see to it that the commodities are sold. It is a secondary task for them to fortify the commodities. They seem to do it to avoid being troubled and sued by the government. In other words, the distribution of fortified food seems to be strictly done on

business lines and to a certain extent to profiteering. This implies that there is more fortified food dispatched to urban areas and those places where there is money than to rural areas and to those places where there is no money. This disadvantages many people who are in rural areas and in places where there is no money. They are disadvantaged because they are likely not to receive or get enough micronutrients that help in the mitigation of micronutrient deficiencies.

The Principle of Need states that sometimes justice consists in treating people according to the principle: “To each according to their needs”. This implies that goods should be parcelled out according to individual needs. Those who have greater needs should be given more than those who are less needy. The poor, for example, should be provided with enough opportunity so that they equal the rich who have better opportunities already. In other words, the basic needs of everyone should be met. In Zambia, everyone needs the fortified food. However, the fortified food must be made available according to how much need particular individuals require. For instance, the poor need more of this fortified food than the rich. The poor need slightly more attention. According to the Principle of Need, people should be treated, not equally but so as to make them as equal as possible.

Raphael (1989) argues that something special should be done for the poor, the sick and the disabled because they are disadvantaged as compared to most people. This view has an egalitarian purpose. It attempts to reduce inequality. This is why Munson (1996) states that justice does not only require the equal treatment of equals, but also under various circumstances it requires the converse, the unequal treatment of un-equals. In the Zambian situation it would be just to give special attention to the majority poor by distributing fortified food to them at a subsidised price. The poor must be favoured more than the rich. This is because the rich are able to get the desired micronutrients through easily purchasing the fortified food. This is justified unequal treatment of un-equals.

5.4 NEED OF EQUAL OPPORTUNITES TO ACCESS FORTIFIED FOOD

The Principle of Equality of Opportunity implies that all people must have equal opportunities as they receive benefits and burdens of society. Benefits and burdens should not be distributed on the basis of fortuitous characteristics like luck of birth (family and class origin) natural endowment, and historical circumstances. In the Zambian situation, it can be said that all people, despite their status in society and where they live, need to have a fair opportunity to access the fortified food. Fortified food needs to be available to all in a fair manner. If it means that subsidising the fortified commodity would provide an equal

opportunity, then let it be. Some philosophers say that it is considered unfair for some to have more social benefits than they need and for others to have less than they need especially on the basis of fortuitous characteristics. Unless there is real scarcity of the social benefits (in this case, fortified food), all should have enough to meet their basic micronutrient needs. This will in turn improve the nutritional status of the country.

The National Food and Nutrition Commission (2006) mentions that the key to improving the nutritional status of the nation depends solely on the following three factors: i) sustainability of the access to safe foods of sufficient quality and quantity; ii) accessibility to quality food and health services: these include having hygienic and sanitary environments, access to safe water and caring practices; and iii) adequate attention to quality of nutrients added to food vehicles. If these factors are adhered to, the nutrition status of the society improves. Many people will have enough micronutrients. This will in turn contribute positively to the economic growth of the country for there is likely to be enough work-power because of healthy citizens. For this to be attained, however, equal opportunities for all the citizens in the society have to be made available.

5.5 NEED TO STRENGTHEN POLICIES THAT GOVERN FOOD FORTIFICATION PROGRAMMES

The instability in some sectors of the programme of food fortification in Zambia has been identified as a weakness. Instability comes out strongly in the process of fortifying the locally mined salt at Kaimbwe in Kasempa District. The people, who were interviewed in Kasempa among them some Ministry of Health officials, confirmed that the supply of potassium iodate has been inconsistent. It has actually stopped. While some local people expressed ignorance as to why the supply has stopped, the Ministry of Health officials attributed this erratic supply to lack of funding from the government. There is no longer funding for this project. This has made many people to go back to their old traditional way of mining, packaging and distributing the salt. They have continued to consume the un-iodated salt putting their life at a great risk of suffering from goitres. Most of the people said they take that salt because it is cheaper. “One does not need the money to have it”, said some of the Kaimbwe villagers.

One of the points that distributive justice emphasizes is that social benefits like medical services, welfare payments and public offices should be distributed according to people’s needs: “to each according to his or her needs.” All individuals and indeed societies are entitled to fair shares of social benefits. In this case, attributing the erratic supply of potassium iodate to lack of funds entails that the individuals and the society of Kaimbwe

have been neglected. Health care as a social benefit is at stake. Many people are likely to suffer from micronutrient deficiency diseases. The society at large will be affected by the consequences of the micronutrient deficiency diseases, especially those associated with iodine deficiency diseases like goitres and hypothyroidism. This is an undesirable situation that ought to be dealt with thoroughly. Funds have been allocated to various projects but the Kaimbwe salt fortification project lacks funding. The government has neglected these people by denying them the social benefits. This is against the principles of distributive justice, especially the principle of need. Something has to be done to correct the situation before it becomes yet again another major public health problem as it was previously. The Kasempa people need the potassium iodate as much as other people from different regions need other social benefits. Something needs to be done to these people as the principle of need demands. There is need to strengthen the policies that govern the programmes of food fortification in the country, especially those that deal with the local fortification of salt like that in Kasempa. Currently the policy seems to be weak. No wonder there is an erratic supply of the potassium iodate.

John Rawls advocates for a society that has rules of conduct which are binding and where people are willing to abide by them. These rules should constitute a system of cooperation designed to further the good and improve the welfare of those who participate. Individuals in this society need the same kind of things and should share in the satisfaction of their basic needs. In other words, individuals in a just society should be equal and need to have a better life. In the case of the Zambian situation, the policies on the distribution of the fortified food and on the fortification of commodities at a local level like salt need to be strengthened so that all people have access to fortified food. The efforts from the government should not only end at encouraging the trading companies to fortify their commodities (as it appears to be) but they should ensure that the fortified food reaches the intended target. The people in rural areas and the majority poor should be accorded the opportunity to access the fortified food easily. This will entail promoting the good and the welfare of all the individuals in Zambia so that their nutritional status will improve.

According to Rawls, a policy is just if it can be accepted by people who are impartial and rational. In the case of food fortification, the policy on fortified food is therefore just if people who are impartial and rational can accept it. In Rawls' terminology, people who are in the Original Position behind the Veil of Ignorance would accept a policy that ensures that the fortified food is subsidised for the sake of the majority poor. Subsidising the fortified food for

the poor would render the policy just. It is just because rational and impartial people would not refuse to accept it.

As I have shown in the previous chapter, Rawls argues that fair decisions are made when we are deprived of personal information. In the case of decisions made on food fortification, they would be fair if the people who make them are impartial and rational. The policy makers should imagine themselves as being in the Original Position. That is, they would not know who they are or who their friends are. On this condition, the policies and decisions they make on fortified foods would not disadvantage anyone; instead they would be impartial and rational ones. For this reason these policies and decisions would be just.

Mention has already been made that compared to other alternatives that mitigate micronutrient deficiency diseases, food fortification has proved to be the most efficient and cost effective. Food fortification, though it has limitations, plays a vital role in promoting the health of individuals and hence their wellbeing. In Rawls' terminology, we can say that the policy that promotes the fortification of food is a rational decision. This is because, despite food fortification being expensive especially in its initial stages, it promotes the health of many individuals compared to other alternatives. Rawls would say that this is maximising the minimum.

5.6 SOME LIMITATIONS IN THE PROGAMME OF FOOD FORTIFICATION

From the interviews conducted, it was noted that most of the fortified food found within the country comes from outside borders. The exact number and kind of the imported fortified food is not known. This is because importers keep on bringing different kinds of food, said Mrs Aongola, a public nutritionist at the Ministry of Health. Some ethical issues can be highlighted here. First of all, as mentioned above, the imported foods are not necessarily meant to curb micronutrient deficiencies but for profit making. It is a business venture by several traders. This implies that the fortification of these foods might even be with micronutrients that are not a public health problem in the country. The danger is that these foods may have the micronutrients that may not be necessarily beneficial to the majority of the population.

According to utilitarianism a policy is morally right if and only if it promotes the welfare of all those who are affected, better than its alternatives. In this instance, not monitoring the fortified food in terms of the micronutrients that they contain does not promote the wellbeing or the health of the individuals. If the content of micronutrients in the fortified foods is not known, then the health of people is at stake. This means that in the eyes of utilitarians this

policy can be considered morally wrong. It does not directly play a role in curbing the real micronutrient deficient problems.

Another point is that this programme of importing fortified food is expensive. The food becomes too expensive to be purchased by the majority poor. This disqualifies it to be a morally right policy because many people that are affected by micronutrient deficiencies are left out. The majority in Zambia are poor. They are unable to access the expensive fortified food. The National Food and Nutrition Commission (2006) suggest that in order to promote the nutritional wellbeing of the society, food should be made readily available and accessible to the majority, if not to all. The price of the fortified commodity should also be affordable by the majority, if not by all.

Another limitation is that food fortification cannot work in isolation from the other micronutrient deficiency interventions if the desired goals of mitigating or completely eliminating the micronutrient deficiency diseases are to be met. If it were a strong programme, other interventions would not have been necessary. Fortification would have been supplying all the necessary micronutrients. Other interventions that fight for the same cause like pill supplementation, crop diversification, and proper breastfeeding in the case of infants, need to be undertaken.

We have also to note that the process of food fortification needs specific food vehicles for particular micronutrients if it is to be successful. This is a limitation. For example, salt and sugar have been identified as the good vehicles for iodine and vitamin A fortification respectively. Other food vehicles might not be able to contain these micronutrients successfully. Scientists attribute this to the different chemical formulae of both the food composition and the micronutrient to be used.

5.7 THE RIGHT TO FORTIFIED FOOD

Nowadays there is much talk about rights in general and human rights in particular. We have heard statements like having the right to life, having the right to property, having the right to worship, and so on. What about fortified food, can it be boldly put that people have a right to fortified food? Put in another way, is having access to fortified food a human right?

It has been mentioned above that rights are in different categories: there are legal rights and moral rights. In these categories there are different kinds of rights also, there are claims and liberties. Let us concentrate on moral rights and claims. It has also been mentioned that moral rights are usually understood as rights that exist prior to, or independent of, any legal rights. It is on these rights that legal rights and other rights have a basis. Human rights belong

to this category of moral rights. They do not need some institution, or a government to enact them, as legal rights do. Human Rights are rights possessed by all human beings basically because they are human beings. They are regarded as universal to all humanity and are held equally by all human beings. In Article 25 of the Universal Declaration of Human Rights, the United Nations declared that every individual has a standard of living adequate for the health and wellbeing of himself and of his family, including food, clothing, housing, medical care and necessary social services. This implies that any move that tends to promote the health and ultimately the wellbeing of human beings can be seen as a human right. In other words, the United Nations projects the right to health, per se, as a human right. The main aim of food fortification programmes is to curb the micronutrient deficiency diseases. They are there to promote the health and ultimately the wellbeing of the entire population. In this spirit of the United Nations declaration, it would not be wrong to state, therefore, that having access to adequate fortified food is a human right. Rights in the strictest sense are claims. A person's right means that he or she has a valid claim against someone, and that this someone has therefore an obligation (duty) towards that person. Since having access to fortified food can be categorized under human rights, it can therefore be argued that individuals in Zambia have a valid claim to fortified food. The Zambian government in return has an obligation towards individuals. In particular, it is the government's duty to ensure that the Zambian people have access not only to adequate fortified food but also to other social services that tend to promote the wellbeing of all the people.

This right to fortified food can be classified under economic, social and cultural rights that the people of Zambia have been demanding to have them included in the constitution. Economic, social and cultural rights are a broad category of human rights guaranteed in the International Covenant on Economic, Social and Cultural Rights and other legally binding international and regional human rights treaties (Amnesty International 2011). Nearly every country in the world is party to a legally binding treaty that guarantees these rights. As already mentioned, every Zambian has the right to the highest attainable standard of physical and mental health, including the right to healthy living conditions and available, accessible, acceptable and quality health services. The right to food, including the right to freedom from hunger and access at all times to adequate nutritious food or the means to obtain it should be

respected. Nutritious food includes fortified food. This implies that access to fortified food falls under social economic and cultural rights.

It should be re-emphasized here that states and national governments bear the primary responsibility for making human rights a reality. Governments must respect peoples' rights – they must not violate these rights. In this case of fortified foods in Zambia, the government should have a core responsibility to ensure that the majority of the people have access to the fortified food. Otherwise, it would be tantamount to violating the people's rights. Lack of resources should not be an excuse. The government needs to take steps towards fulfilling the social economic and cultural rights.

The other point which has been already mentioned is that the government must not discriminate in their laws, policies or practices when it comes to allocating resources especially those meant to promote the social economic and cultural rights. Priority needs to be given to the most vulnerable when allocating these resources.

5.8 SUMMARY

This chapter has assessed the programme of food fortification in Zambia from an ethical point of view. The point that has been emphasised is that food fortification promotes the wellbeing of all the Zambians. It has a great impact on mitigating the micronutrient deficiency diseases. This is why there is need to distribute the fortified food to all the people, especially according to individual needs. All need to be accorded an equal opportunity to access the fortified food. For this to be achieved, policies that govern food fortification should be strengthened. Above all it has to be noted that to have access to fortified food is a human right issue. This implies that the government of the Republic of Zambia should encourage all moves that promote food fortification. Its aim should be that all people access the fortified food because this entails promoting the welfare of the entire nation.

The next chapter concludes this dissertation and gives some recommendations and suggestions for further research.

CHAPTER 6
SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents a summary and the conclusion of this research. Recommendations and suggestions for further research have been given.

6.1 SUMMARY

The United Nations in their declaration of 1948 recognize that every human person on the globe has a fundamental human right to adequate food and to health (Article 25 of the Universal Declaration). All nations are therefore obliged to take appropriate steps to ensuring that this right to food is not violated. There is need to create conducive environments and equal opportunities for individuals to have access to food, in our case to fortified food. If they cannot, the government should have legal and moral responsibility to help them. If necessary, support from the international community and cooperating partners should be sought.

One of the important ways to fight micronutrient deficiency diseases in the world is fortification of foods. In Zambia, fortification of food commenced in the 1970s when salt and margarine were fortified with iodine and vitamin A respectively. The programme was intensified in the 1990s with the exclusive purpose of curbing the micronutrient deficiency diseases which were increasingly becoming the norm of the day. Fortification of sugar with vitamin A was also commenced. Efforts to start the fortification of maize meal are under way. Of late, bio-fortification of sweet potatoes with vitamin A has started in Luapula Province by Zambia Agriculture Research Institute. Another project to bio-fortify maize with vitamin A is also under way. It is still under observation.

6.2 CONCLUSION

Despite all these efforts made by the Zambian government to curb the micronutrient deficiencies in the country, micronutrient deficiencies are still common. There is much that needs to be done to further strengthen this programme of fortification. Strengthening the programme of fortification will facilitate effectively the mitigation or even the complete elimination of the micronutrient deficiency diseases.

One of the weaknesses vividly observed from the programme of food fortification involves justice. It has been observed that there is no just distribution of the fortified food in Zambia. Most of the fortified food is easily accessed by the rich and those with money and usually by those in urban areas. The poor, those without money and usually those in rural areas have

difficulties in accessing the fortified food. This leaves the majority with greater risks of suffering from micronutrient deficiency diseases. From my findings, this unequal distribution of the fortified food is necessitated by the weak policies from the government of Zambia to distribute the fortified food. The programme of distributing the fortified commodities is left at the discretion of the producing and trading companies. The companies do it mainly for profit making. To reach all those who are lacking micronutrients is not their main objective. Theirs is to make sure the commodities are sold. This is the reason why most of these fortified foods end up reaching urban areas only and semi-urban areas where there are rich people and those with money. The companies want their commodities to be sold as quickly as possible to avoid losses.

There is much that needs to be done if the micronutrient diseases are to be mitigated. The programme of food fortification needs to be strengthened. The programme of fortification can be successful due to some identifiable features like a strong political commitment, a good distributive system, social marketing and community education. For instance, the strong political support in Mongolia and Indonesia for the programmes of household fortification facilitated a good programme implementation (Rolf et al. 2009, 31). Community nutrition workers distributed micronutrient sachets free of charge each month to beneficiaries in their homes. This system enabled workers to reach the widely dispersed target population efficiently. Indonesia's success drew on the emergency distribution system established after the tsunami Employing large-scale social marketing campaigns along with community based education improves the compliance and acceptability of sachets. Initial reservations expressed in all settings can be overcome by ongoing public awareness efforts.

6.3 RECOMMENDATIONS

Below are some recommendations that are given in an attempt to improve the food fortification programmes in Zambia.

i) Those that frame laws and formulate policies, that is, those who occupy the offices of power and influence, should make decisions on food fortification in accordance with the principles of justice. It is by referring to the principles of justice that each society and its laws can be criticised. The claim that the government is failing to meet some basic needs of all its citizens and that the programme of distribution of fortified food is unfair or unjust is a powerful charge. It is an obligatory call for us all to eliminate the source of injustice, in this case by making laws and policies according to the principles of justice.

ii) A strong formal programme of distribution of fortified food to those who cannot afford to purchase it should be set. Fortified food must be subsidised and be transported to all parts of the country.

iii) The processes of fortifying food, especially those done domestically at the local level like the Kaimbwe salt fortification, must be carefully monitored and evaluated. There is need of follow-up programmes to these locally based fortification processes. This should include the increase in funding for these micronutrient intervention projects.

iv) More officials at the Ministry of Health and other departments involved in the programme of food fortification need to be trained so that they become experts in handling fortification equipments.

v) There is need to mobilize and increase funding for projects that support micronutrient programmes like the bio-fortification of the sweet potatoes and maize that are coming up. Other old projects like the fortification of the Kaimbwe salt should continue being funded too.

vi) The continued use of traditional food as another source of micronutrients should be reemphasized and encouraged among many people.

vii) The government should engage several cooperating partners, the private sector inclusive, in the fight of micronutrient deficient diseases. If the government will go it alone, the desired goals will not be met. Through the cooperating partners, the government should subsidise most of the fortified food so that it becomes affordable to the majority of the poor.

viii) There is need to strongly encourage domestic and home-based food fortification. This however should be done with strict monitoring and evaluation.

ix) A unified voice on the micronutrient priorities and strategies needs to be advocated for. The different partners involved in the food fortification programmes should speak with one voice if the micronutrient deficiencies should be curbed. Mutually agreed upon principles for interaction among the partners should be developed and set. This implies that there should be continued communication among micronutrient stakeholders.

If the above mentioned recommendations can be implemented, then the programme of food fortification in Zambia will be strengthened. A lot of set goals and among them the Millennium Development Goals might be met. Most of the micronutrient deficiencies will be curbed.

For further research, I suggest that people should look at why some people in Zambia, especially those from the rural areas, shun the use of fortified foods even when they know it is a good source of micronutrients. The aim could be to find out what the myths and beliefs

about food fortification are. This is suggested because it came out strongly during the interviews that were conducted. Some people were saying that they could not differentiate between fortified foods and genetically modified food. There is also the misconception, especially among the rural based people and the illiterate that fortified food causes impotence among men and other incurable diseases.

REFERENCES

Al-Assaf, A.H. (2007). Anaemia and Iron intake of Adult Saudis in Riyadh City In: *Pakistan Journal of Nutrition*, Asia Network for Scientific Information, Pakistan.

*Amnesty Internationa*l (2011). Available at: http://www.amnesty.org/en/economic-and-social-cultural-rights/what-are-escr (accessed 24 May 2011).

Beauchamp, T. L. (1982). *Philosophical Ethics: An Introduction to Moral Philosophy*. Georgetown University Press, George Town.

Blackburn, S. (ed.) (2005). *The Oxford Dictionary of Philosophy*. Oxford University Press, Oxford.

Carl, P. (2008). *Bio-fortification for China: Political Responses to Food Fortification and GM Technology.* Available at: http://wwwagbioforum.org/v10n3/v10n3a05-pray.htm (accessed 9 August 2010).

Cashman, K. (2004). *The Importance and Effects of Vitamin D*. Available at: http:// www.optiford.org/pdf/fortification%20-Food%20Europe%20Summary.pdf (accessed 9 August 2010).

Chaudhari, R. (2004). *Application of Custom Designed Nutrients.* Available at: http://www. optiford.org/pdf/fortification%20-Food%20Europe%20Summary.pdf (accessed 9 August 2010).

Central Statistical Office (2002). *Zambia Demographic and Health Survey*, Lusaka.

Chengo, P. (2010). Many Zambians Cannot Afford Sugar, *Sunday Post*, 22 August 2010.

Chomba, R. (2009). *Vitamin A: Vital for Pregnant Women*. Available at: http://www.times. co.zm/news/viewnews.cgi?Category=8&id=1174466748 (accessed 18 January 2010).

Copenhagen Conference (2004). *Food Fortification in Europe*. Available at: htpp://www.foodfacts.org.za/articles/fortification.asp (accessed 4 August 2010).

Donnelly, J. (2003). *Universal Human Rights* (2nd ed.). Cornell University Press, London.

Falikowski, A. (2005). *Moral Philosophy for Modern Life* (2nd ed.). Pearson Education Canada Inc., Toronto.

Global Directory (2007). *Commercial Manufacturers of Micronutrient Premixes and Supplements* (1st ed.), Lusaka.

Hornby, A.S. (2003). *Oxford Advanced Learner's Dictionary* (6th ed.). Oxford University Press, Oxford.

International Life Sciences Institute (2003). Volume 21, Number 2, April – August.

Kapekele, M. (2010). Zambia Among USAID Nutrition Project. *The Post News Paper*, Monday, 24 April, Zambia.

Kiely, M. (2004). *Fortification a Mandatory Exercise*. Available at: http://www.optiford.org /pdf/fortification%20-Food%20Europe%20Summary.pdf (accessed 9 August 2010).

King, F.S. and Burgess, A. (2006). *Nutrition for Developing Countries* (2nd ed.). Oxford University Press, Oxford.

Klugman, G. (2002). *Addressing Malnutrition in South Africa*. Available at: http://www. scienceinafrica.co.za/2002/january/food.htm (accessed 3 January 2011).

Lester, J.C. (2000). *Why Libertarian Restitution Beats State-Retribution and State-Leniency*. Available at: http://www.la-articles.org.uk/libertarian (accessed 21October 2010).

Lindsay, A. (2006a). Food Nutrition in Developing Countries In: *The Journal of Nutrition.* Available at: http//www.jn.nutrition.org (accessed 18 February 2010).

———— (2006b). *Guidelines on Food Fortification with Micronutrients*. Available at: http://www.who.int/nutrition/publications/guide_food_fortification_micronutrients.pdf (accessed 9 August 2010).

Lindsay, A., Brunode, B., Omar, D. and Richard, H. (eds.). (2009). *Food Fortification in Developing Countries.* Available at: http://www.jn.nutrition.org (accessed 17 February 2010).

Melse-Bonstra, A., Hogenkamp, P. and Lungu, O. (2007). *Mitigating HIV/AIDS in Sub-Saharan Africa through Selenium Food*, Lusaka.

Mhegera, E. (2009). *Food Fortification Vital, But Expensive.* Available at: http://www. science inafrica.co.za/2002/foodshtm (accessed 15 June 2010).

Ministry of Health (2005). *Training Manual*, a Draft, Lusaka.

———— (2006). *National Food and Nutrition Policy Implementation Plan*, Lusaka.

Munson, R. (1996). *Intervention and Reflection: Basic Issues in Medical Ethics*. Wadsworth, New York.

National Food and Nutrition Commission (2006). *Annual Report on Food and Nutrition Situation in Zambia,* 1st ed., Lusaka.

Raphael, D.D. (1989). *Moral Philosophy*. Oxford University Press, Oxford.

———— (1992). *Problems of Political Philosophy*, 2nd ed., Macmillan Press, Hong Kong.

Rawls, J. (1971). *A Theory of Justice*. Belknap Press, London.

———— (2003). *Justice as Fairness* (edited by E. Kelly). Harvard University Press, London.

Rolf, D.W.K., Harvey, P.W.J., Wainwright, E., Faillace, S. and Wasantwisut, E. (2009). *Micronutrient Forum Publication*, Bangladesh. Available at: http://www.aed.org/ Publications/upload/Innocenti-Publication-08-19-09.pdf (accessed 4 January 2010).

Solomons, N.W. (2008). *National Food Fortification: A Dialogue with Reference to Asia*, Malaysia.

Taeymans, D. (2004). *Current European Situation of Fortification of Food*. Available at: http://www.hearpro.oxfordjournals.org/cgi/content.full /20/4/375 (accessed 9August 2010).

Tasnim, N., Holmes, C.P. and Ostry, A. (2005). *Canadian Food Fortification Policies: The Case of Vitamin B*. University of British Columbia, Toronto.

Telefood: Food for All (2001). Viale delle Terme di Caracalla, Rome.

Thomson, J.J. (1990). *The Realism of Rights.* Harvard University Press, Cambridge, Massachusetts.

United Nations (1948). *Universal Declaration of Human Rights.* Available at: http://www. un.org/en/docu- ments/udhr/index.shtm/#25= (accessed 3 January 2011).

Whitehouse and Associates (2003). *The Micronutrient Initiative*. Available at: http://www. gainhealth.org/gpf (accessed 16 July 2010).

Zambia Agriculture Research Institute (2010). *Fortification of Sweet Potatoes in Mansa*. Available at: http://www.lusakatimes.com/?p=27695 (accessed 19 July 2010).

APPENDIX I

DEPARTMENT OF PHILOSOPHY AND APPLIED ETHICS
THE UNIVERSITY OF ZAMBIA

AN ETHICAL ASSESSMENT OF FOOD FORTIFICATION IN ZAMBIA

SEMI-STRUCTURED INTERVIEW SCHEDULE FOR EXPERTS
(Food and Drugs, Consumer Competition and Protection Commission, Ministry of Agriculture and cooperatives)

INTRODUCTION

1. I introduce myself……
2. Introduction of the participant

   Name ……

   Occupation……..

   Position at work place……..
3. Explanation of the purpose of the interview.
4. Expression of confidentiality of any revealed information.
5. Assuring participants that this is not an exam. All answers to the questions are neither right nor wrong.
6. I thank the participants in advance for accepting to be interviewed.

QUESTION GUIDE

1. What kind of fortified foods are within the country?
2. Which foods are fortified within the country, and which ones are fortified outside?
3. How is the distribution of these fortified foods done?
4. Are there any constraints encountered towards the distribution of the fortified foods?
5. Do you think the distribution is fairly or justly done?
6. How sustainable is the programme of distributing the fortified foods? Are there any cooperating partners?
7. Is the fortified food meeting the desired requirements of the population?
8. Is there anything being done to ensure that the fortified food reaches all the people especially the poor who are unable to buy the food?

9. Is the intake of the fortified food an obligation in Zambia? Is everyone supposed to take it?
10. Would you know the percentage of the people who have access to fortified foods, sugar, salt, margarine?
11. Is there a continued monitoring in the levels of fortificants in salt, sugar, margarine?
12. Are there any sufficient kits and funds to ensure the sustainability of fortification of local salt?
13. Does fortification affect the price of food?
14. Have there been any cases of over-fortification, or under fortification?
15. Have there been any cases of food adulteration after fortification?
16. What are the strengths and weaknesses of the programme of food fortification in Zambia?

CLOSING

1. Any final comment?
2. I thank them for participating in the interview

SIGNATURE…… **DATE**…….....

APPENDIX II

DEPARTMENT OF PHILOSOPHY AND APPLIED ETHICS
THE UNIVERSITY OF ZAMBIA

AN ETHICAL ASSESSMENT OF FOOD FORTIFICATION IN ZAMBIA

SEMI-STRUTURED INTERVIEW SCHEDULE FOR EXPERTS
(Zambia Bureau of Standards, Central Statistical Office)

INTRODUCTION

1. I introduce myself……
2. Introduction of the participant

   Name ……

   Occupation……..

   Position at work place……..
3. Explanation of the purpose of the interview.
4. Expression of confidentiality of any revealed information.
5. Assuring participants that this is not an exam. All answers to the questions are neither right nor wrong.
6. I thank the participants in advance for accepting to be interviewed.

QUESTION GUIDE

1. In general terms what does your department/organization/ministry do?
2. What role does your department/organization/ministry play where fortified foods are concerned?
3. Does this department/organization/ministry know the number of people who have access to fortified food?
4. (If yes, what percentage?)
5. Does this department/organization/ministry know the number (and kind) of fortified food that enters the country?
6. How often does the census on fortified food take place? (for CSO interviewees)
7. Are there any statistics on the current levels of poverty in Zambia?
8. Is this department/organization/ministry involved in any distribution of fortified food?

9. (If yes, how is the distribution done?)
10. (If yes to question 8, which people are targeted in receiving the fortified food?)
11. (If yes to question 8, is there any specific percentage targeted?)
12. What challenges and constraints are met in terms of the distribution of the fortified food?
13. Can we state that the programme of the distribution of fortified food is sustainable?
14. Is there a continued monitoring and evaluation of this programme?
15. What does this department/organization/ministry do in case of low standards of fortified foods?
16. Do you have any officers at various centers or industries for fortification?
17. Are there other branches of this organization in rural areas?
18. What role does this department/organization/ministry play to ensure the quality of fortified food in the country?

CLOSING

1. Any final comment?
2. I thank them for participating in the interview

SIGNATURE…… **DATE…….……..**

APPENDIX III

DEPARTMENT OF PHILOSOPHY AND APPLIED ETHICS
THE UNIVERSITY OF ZAMBIA

AN ETHICAL ASSESSMENT OF FOOD FORTIFICATION IN ZAMBIA

SEMI-STRUTURED INTERVIEW SCHEDULE FOR CONSUMERS

INTRODUCTION

1. I introduce myself……
2. Introduction of the participant

   Name ……

   Occupation……..

   Position at work place……..
3. Explanation of the purpose of the interview.
4. Expression of confidentiality of any revealed information.
5. Assuring participants that this is not an exam. All answers to the questions are neither right nor wrong.
6. I thank the participants in advance for accepting to be interviewed.

QUESTION GUIDE

1. Tell me what you know about food fortification.
   (If they do not know I explain what fortification is in brief).
2. Do people still mine the salt at Kaimbwe?
3. Does the fortification of salt still take place?
4. If it is still there, who dose it?
5. If no, why not? If yes, how?
6. Do you get any other fortified food to meet your daily nutritional requirements?
7. Do you get the fortified food for free or it is bought?
8. What would you recommend for further improvements in the programme of food fortification?

CLOSING

1. Any final comment?
2. I thank them for participating in the interview

SIGNATURE…… **DATE**…….……..

APPENDIX IV

DEPARTMENT OF PHILOSOPHY AND APPLIED ETHICS
THE UNIVERSITY OF ZAMBIA

AN ETHICAL ASSESSMENT OF FOOD FORTIFICATION IN ZAMBIA

SEMI-STRUTURED INTERVIEW SCHEDULE FOR EXPERTS
(Ministry of Health and National Food and Nutrition Commission)

INTRODUCTION

1. How do we understand fully the nutritional status in Zambia?
2. How has Zambia achieved both food and nutrition security?
3. How do we assess the micronutrient deficient status in Zambia?
4. What are the common micronutrient deficient diseases in Zambia?
5. Does Zambia need any micronutrient malnutrition control programme?
6. What are the causes of the common micronutrient efficient diseases in Zambia?
7. Would you state the percentage of the people that have enough to eat in Zambia?
8. What is the Zambian government doing to address the issues of micronutrient deficiencies?
9. Has the MoH sensitised any people about the importance of fortifying food especially the locally mined salt?
10. Is the process of fortifying the salt on-going? What about the mining of this salt, is it on-going?
11. If it is not, why has it halted?
12. If yes, did the MoH train any people to do the fortification of salt?
13. Is there constant supply of intermittent pills of vitamin A?
14. How are people encouraged to improve and expand their dietary intake?

CLOSING

1. Any final comment?
2. I thank them for participating in the interview

SIGNATURE…… **DATE**…….……..…