

~~THE~~ IMPACT OF BALANCED DIET ON CHILD
GROWTH AND DEVELOPMENT

BY

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AUGUST, 2010

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**A RESEARCH REPORT SUBMITTED TO THE INSTITUTE OF OPEN
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EDUCATION AND PRIMARY OF
KAMPALA INTERNATIONAL
UNIVERSITY**

AUGUST, 2010

DECLARATION

Dwidhi Charles Ongere, Registration Number: BED/21755/81/DF do hereby declare that this Research report is my original work and has never been presented, published or submitted for the award of any degree in any University before. I did it with minimal external assistance other than that of my supervisor.

Signature: Charles
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Date: 20-4-2010

APPROVAL

This project has been submitted to the University with the approval of my
supervisor

Signature _____



S. SSENTAMU CISSY

Date 5/5/2010

DEDICATION

my beloved spouse Elizabeth Anyango Ongere and my sister Esther Atieno for
their tireless support during my project work.

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My desire is that this report will provide vital information for researchers, policy makers and parents in improving parenting and child care.

ABSTRACT

The study was carried out in 30 pre-schools in Homa Bay district in Kenya in September 2009. The purpose of the study was to investigate the impact of balanced diet in mental growth and development of a child below six years. The Kenya Ministry of Education records show that, Homa Bay district had a total of 100 Early Childhood Education Centres (DICECE). Most of the centres were attached to public primary schools. Others were privately owned. The pre-schools studied represent 20 percent of the schools.

The Early Childhood Development and Education (ECDE) study, collected data from many sources and used different data collection techniques – both quantitative and qualitative.

Well questionnaires were prepared, printed and taken to pre-schools where they were used to collect raw data from pre-school teachers who dealt directly with young children in their learning centres. In depth interviews were used to collect data from nutrition technicians and parents in the area of study. In some cases, direct observation of children who were suffering from malnutrition was done during the visits.

The study established that, most of the poorly performing children were seriously under fed. They were intellectually inferior as compared to their peers. Early cessation of breast feeding, hunger and starvation, overdependence on carbohydrates, were cited as the main causes of this problem. Children in this category came from poor families with very low incomes.

Most pre-schools attached to public primary schools had no feeding programme. Such schools were overenrolled with very many pupils. Most of the pupils looked very weak. Their performance in class also reflected a lot of weaknesses. Fighting, crying, thumb sucking, absentism was very common. Their performance was generally poor.

ood performance was, however, noted in ECDE centres where snacks were
vided. The study revealed that the young children in these centres were
otionally stable and were both active in both in door and out door activities. It
is therefore established that a child below six years should be fed on a well
lanced diet for proper mental growth and development.

ACRONYMS

ESCO	-	United Nations Educational, Scientific and Cultural Organization.
ICEF	-	United Nations International Children's Education Fund.
C.	-	Teachers Service Commission.
DE	-	Early Childhood Development and Education.
D	-	Early Childhood Development.
NGOs	-	Non Governmental Organizations.
MoEST	-	Ministry of Education, Science and Technology.
FGDs	-	Focus Group Discussions.
KIU	-	Kampala International University.
PEM	-	Protein Energy Malnutrition.
	-	Intelligence Quotient

CHAPTER ONE

1.0 INTRODUCTION

1.1. Background Information

Nutritionally related problems are being experienced in most parts of the world. However, the problem has been more common in third world (developing) countries. Such countries are hard hit by problems e.g. environmental degradation, drought and famine outbreaks, political instability, corruption and unemployment.

All the above factors have contributed to poor economic growth in most countries of Africa, where the most affected group is young children. In Kenya, where this research was conducted, most people rely on agriculture as their main source of income. However, the peasant farmers who rely on rain for crop production, have been greatly affected in the last few years.

This study was specifically carried out in Homa Bay district in Kenya. Most people who rely on farming were found to be living below poverty line. Such people had low levels of education, large families with poorly fed children.

Emerging issues e.g. HIV and AIDS pandemic had resulted in several partial and total orphans. The caregivers in charge of such children were found to be either too old or very young.

The post election violence in December 2007 in the country made matters worse. This explains why most pre-schools in the district had no feeding programme. The study has revealed that most children in this district were depending on carbohydrates as their staple food. Evidence revealed many cases of children with protein energy malnutrition (PEM) related problems. There were many cases of Marasmus, Kwashiorkor and so on.

Most children in the pre-schools visited were seen to be starving. They reflected dismal performance in both in door and out door activities.

1.2. STATEMENT OF THE PROBLEM

Poor mental and physical growth is as a result of imbalanced diet.

A lot has been said about the necessity of a balanced diet for a healthy body but little has been said and very few people have pondered over what effects balanced or imbalanced diet has on the brain. From the available literature, brain growth begins during conception.

The brain has the greatest importance to the normal functioning of the body as compared to all the other systems of the body. All body activities are controlled by nervous impulses received from the brain and spinal cord.

Children who are malnourished have low intelligence quotient as compared to their peers. They also have low attention spans and are highly irritable. Above all, they have stunted growth. All the above indicators show that the food you give to your child can therefore, determine whether he will grow into a super star or a disappointment brain wise.

It was due to all the above reasons that the researcher felt that there was a need to study this important part of the body in relation to dietary habits, in Homa Bay district.

1.3. PURPOSE OF THE STUDY

The purpose of the study was to investigate:

- .3.1. Whether there is a relationship between balanced diet and mental development.
- .3.2. Whether parents and caregivers are aware of the impact of balanced diet on mental growth and development of a child of age six years and below.
- .3.3. Find out the income of across-section of parents in Homa Bay District.

1.4. OBJECTIVES OF THE STUDY

1.4.1. General Objectives: The overall aim of the study was to analyse the impact of balanced diet in child growth and development.

1.4.2. Specific Objectives: The specific objectives of the study were as follows:

- 1) Investigate how balanced diet has impacted on child mental growth and development.
- 2) Find out whether there is relationship between balanced diet and mental development.
- 3) Establish whether there is a difference in performance between a well-fed child and an under-fed child.
- 4) Investigate whether the parents and caregivers are aware of the impacts of balanced diet on mental development of a child of age six years and below.
- 5) Find out the income of a cross-section of parents in Homa Bay District.

1.5. HYPOTHESIS

Poor diet for young children is the cause of poor physical and mental growth in pre-school children.

1.6. RATIONALE

The purpose of the study was to investigate the impact of balanced diet on child's mental growth and development. The findings should be useful to parents and caregivers under whose care the child is supposed to be. It should be useful in improving children's diet, hence proper mental development. This report has unearthed problems e.g. poor and inferiority in intellectual development of the brain due to lack of a balanced diet in young children. The study should help policy makers in introducing feeding programmes in ECDE centres. The study was

also aimed at improving parenting and care given to children below six years of life.

1.7. LIMITATIONS

- 1) Lack of funds: The researcher did not have enough money for carrying out the project.
- 2) Limited Time: Being an in service student, the researcher was committed on regular teaching and other duties. He had also to read and go out to the field to carry out the research.
- 3) Lack of textbooks: Since there was no public library in the nearby area, the researcher had a problem of getting text books for reference.
- 4) Lack of Cameras and Tape recorders: There was lack of these important resources for recording during interviews or focus group discussions during the study.
- 5) Fear and unwillingness by respondents: Some respondents were not willing to give full information during the interviews. They feared blames. Others saw it as additional work load, others wanted money in order to answer the questions.

1.8. DELIMITATIONS

- 1) Accessibility : The sampled schools and college lecturers at Homa Bay DICECE, could be easily reached by the researcher. This made the study successful as consultations could be made whenever there was need.
- 2) Good Climatic conditions: Enhanced easy movement of the researcher to various schools during the study.
- 3) Cordial relationship with colleagues: Made the work very successful especially during the discussions.

- 4) Knowledge of the languages of the catchment, English and Kiswahili: Made it easier for the researcher to communicate effectively while interviewing the respondents.
- 5) Availability of Health Centre: In the area of study, made it easier for the researcher to interview medical experts on the depth of malnutrition and its effects on mental and physical growth in young children. It also made it possible for the researcher to make observations on actual cases and access medical records showing the number affected.

1.9. RESEARCH QUESTIONS

The study was guided by the following questions:

- 1) Is there any relationship between balanced diet and mental development in a child of age 6 years and below?
- 2) Are parents and caregivers aware of balanced diet?
- 3) How does balanced diet affect mental development?
- 4) What differences are there between the performance of well fed children and those who are not well fed?
- 5) What are some of the effects of parents income on children's mental development in relation to their feeding?

1.10. OPERATIONAL DEFINITIONS OF TERMS

- Balanced diet - A meal which contains all nutrients required by the body.
- Child - A human being below 6 years old.
- Growth - Is the physical increase in size, weight and height.
- Development - Is a gradual change of functions in an individual mentally, physically and holistically from simple to complex.
- Caregivers - Are people taking care of young children.
- Pulses - Are second class proteins e.g. beans.
- Cereals - Are grain crops such as maize, millet e.t.c.
- Malnutrition - Bad feeding
- Cognition - The process by which knowledge and understanding is developed in the mind.
- Myelin - A substance that forms a covering increasing the speed at which messages travel.
- Neuron - A cell that carries information between the brain and the other parts of the body.
- Deficiency - The state of not having enough of something.
- Immunity - The ability to resist diseases
- Vulnerable - Weak and easy to hurt physically or emotionally.

1.11 CONCEPTUAL FRAMEWORK

Nutritionally related problems have many negative impacts on a child's mental growth and development. It has led to over-aged children in classes below their ages. These children do not fit well with their peers. Because they do not perform well in class, they are frustrated. Such children are known to be repeating classes. They are indiscipline. They end up dropping out of schools before acquiring the

basic literacy skills. This contributes, to a larger extent, illiteracy and low completion rates

On the other hand, malnutrition is the cause of deficiency diseases like marasmus and kwashiorkor. Children, who are exposed to those diseases, die before attaining age six. Those who survive are known to be suffering from malformations, which sometimes may affect their lives permanently. Such cases include poor brain development; a condition which can not be reversed at later stages.

Inevitably, the government ends up spending a lot of money in an attempt to provide for the welfare of those vulnerable children. This occurs during the provision of medical services e.g immunization, vaccination, giving food supplements and general treatment of nutritionally related diseases. Educationally, it is very expensive, school drop-outs consume a lot of government funds and end up being either teenage parents, drug addicts or dangerous criminals.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1. INTRODUCTION

In this chapter, the researcher presented related literature review that provide the information on the relationship between balanced diet and mental growth and development in a child aged six years and below.

“The marasmus baby is not getting food. The Kwashiokor baby is getting enough porridge but not getting the high proteined foods he needs. The healthy baby is fed on breast milk and other balanced diet.” (Disease and world health) Mance Lui Fyson.”

3.T. BATSFORD L.T.D. LONDON (Passim)

It was in this context, that the researcher wished to quote various scholars contributions.

2.2. The impacts of balanced diet on a child's mental growth and development
According to Campbell et al (2004), malnutrition is a deficiency of one or more of the essential nutrients. The deficiency may be caused by inadequate intake or medical problems (such as metabolic or digestive abnormalities). Due to lack of education about diet, even some affluent people eat badly enough to have vitamin or mineral deficiencies. On global scale, however, it is protein deficiency - insufficient intake of one more essential amino – acids that causes the most of human suffering, mainly in less – developed countries. Protein deficiency is concentrated in geographic regions where there is a gap between food supply

and population size. The most reliable sources of essential amino – acids are animal products but the foods are expensive. People forced by economic necessity to get almost all the calories from a single plant staple, such as corn or potatoes will suffer deficiencies of essential amino – acids.

Most victims of protein deficiency are children, who, if they survive infancy are likely to be retarded in mental and physical development. The syndrome is called "Kwashiorkor," a Ghanan word for "rejected one". The disease begins when a child is weaned from the mother's milk and placed on a starchy diet after a sibling is born.

The problem of protein deficiency in some less developed countries has been compounded by a trend away from breast feeding altogether. This unfortunate cultural change has been encouraged by the aggressive marketing campaigns of companies that make baby formula. Impoverished mothers often "stretch" the expensive formula by diluting it with water, often to such an extent that the protein content is insufficient.

2.3. The relationship between balanced diet and mental development

According to PARENTS MAGAZINE (1990)

"For the first three months after pregnancy and the first eighteen months after birth, a balanced diet with adequate protection for mother and infant is essential; otherwise, the baby's brain may be stunted."

Severe deficiency of proteins, some vitamins and other nutrients influence mental stability. This may result in mental and nervous disorders like depression. Such problems may affect the child's performance in class and cause failure leading to untold repetition. This leads to over – aged children in classes below their ages.

Such children are indisciplined and do not fit well with their peers. They end up as school drop outs and finally become miserable or criminals or street children.

From the internet: Source <http://www.fao.org>. Many factors impact on growth and development, but malnutrition impair both physical, mental and intellectual development.

Iron is required for optimal growth, skeletal development, cellular immunity and cognitive function. Iron deficient children also have poor cognitive function and educational achievement and are less attentive and playful. The mechanism of these may be associated with the role of iron in myelination or the level of brain neurotransmitters.

Children from iodine sufficient regions have higher IQ scores than children from iodine poor regions. Iodine status plays a crucial role in the intellectual development of children.

According to Hickman (1993), undernourishment and malnourishment rank as two of the World's oldest problems and remain major health problems today, afflicting an eighth of the human population. Growing children and pregnant and lactating women are especially vulnerable to the devastating effects of malnutrition. Cell proliferation and growth in the human brain are most rapid in the terminal months of pregnancy and the first year after birth. Adequate protein or neuron development is a requirement during this critical time to prevent neurological dysfunction.

The brains of children who die of protein malnutrition during the first year of life have 15% to 20% fewer brain cells than those of normal children. Malnourished

children who survive this period suffer permanent brain damage and cannot be helped by later corrective punishment.

2.4. The difference between a well – fed child and an underfed child

From the internet: www.tutorvista.com "For the healthy growth of the individual, a nourishing well balanced diet is required. A diet which has nutrients in the right proportion ensures proper growth and development of both body and mind. If the nutrients are inadequate or not in the right proportion, nutritional disorders may occur.

Protein energy malnutrition (P.E.M)

Protein energy malnutrition leads to two types of diseases, marasmus and kwashiorkor.

Marasmus is due to Protein deficiency and food calories intake. In developing countries like India, it is common in infants below one year of age. The causal factor may be due to early replacement of mother's milk by other foods of low protein and calorific value. This may happen if the mother has a second pregnancy when the older infant is still too young.

Kwashiorkor

Children between 1 – 3 years of age must consume 1g protein/1Kg body weight. If they consume below this quantity they can suffer from this protein deficiency disease.

Children who are well-fed are more healthy. They are active both in class and out – door activities in school. Intellectually, they are more superior as compared to their peers who are underfed.

According to assessment report UNESCO (2005)

"It is naïve to expect hungry children to learn and perform well in school.

Failing to feed these children is failing them in their learning."

Hunger makes children very weak. In the pre-school class, children's attention span is greatly affected. Crying, fighting for snacks is very common. Lack of proper feeding interferes with the child's mental health and may lead to stress, growth retardation e.t.c.

According to UNICEF (1946),"Mothers should be encouraged to breastfeed their babies for as long as possible. Mother's milk is the best food for the baby as it is nutritious and the baby is not likely to suffer from malnutrition."

Breast feeding is important to the baby because breast milk is nutritious, it is readily available, clean and at body temperature. Early cessation of breast feeding causes diseases like Kwashiorkor or Marasmus in young children. Such conditions lead to growth retardation. This affects the brain and leads to poor performance in school.

According to Farrant et al (1980)

"The physical environment can be a powerful force for good or ill in a child's learning."

Children are fed from resources obtained from the environment. If well utilized, a child can easily be fed from locally available foods from the surrounding. Poverty, which is a major contributing factor towards malnutrition may therefore not be felt. Environmental degradation leads to famine and this affects greatly, the children. If well used, it is also a resource for children's learning.

CHAPTER THREE

3.0 METHODOLOGY

3.1 INTRODUCTION

The study was conducted in Homa Bay district of Nyanza Province in Kenya in September and October the year 2009.

It employed the use of survey design as the main method of research. This was due to the financial resources available, the limited time factor and the size of the area of study. Specifically, the study selected this method because it was most appropriate for use with questionnaires and interviews as tools of data collection.

3.2. POPULATION AND SAMPLE

The study was conducted in 30 out of 150 ECDE centres in Homa Bay district in Kenya. The ECDE centres visited represent 20 percent of the total number of schools in the district. Out of the thirty pre-schools visited, fifteen had feeding programme while the rest did not have.

3.3. SAMPLING METHOD

The study employed the purposive sampling technique because of its relevance and suitability to the topic of the study. More specifically, the study targeted a representative sample of the ECDE centres in the district.

The sampling design was done in stages. In the first stage, the sample drew 30 out of 150 pre-schools in the district. From the thirty, 15 pre-schools with feeding programme were drawn. Eight of the sixteen were drawn from Rangwe Division and 7 from Asego division.

In the second stage, 15 schools were drawn from the district. These were pre-schools without feeding programme. This was done following the knowledge of schools i.e. private and public ECDE centres with and without feeding

programme. It was also done purposely with a view of capturing the divisional pattern in terms of economic potential which consequently influences the poverty levels and to some extent, academic performance.

3.4. SAMPLING PROCEDURE

At this stage, a group of 30 pupils was taken to represent each school in the district. The researcher then wrote the papers of which 15 were "Yes" and 15 were "No". The pupils were then allowed to pick up one paper each. Those with "Yes" were taken to represent the fifteen schools with feeding programme and those with "No" were taken to represent the schools without feeding programme; in which the research was to be conducted.

3.5. METHODS OF DATA COLLECTION

3.5.1. The study employed the use of questionnaires to collect some of the raw data. A questionnaire is a set of questions in paper form, which the respondent is required to address by completing the relevant sections. The questionnaires were given out to head teachers and ECDE teachers. That was in September 2009. They were gotten back between October and November 2009 after being filled by the respondents.

3.5.2. The researcher also used oral interviews as a method of data collection. An interview is an introspective technique that involves oral responses from the subjects. The researcher interviewed nutrition technicians in the area of study, parents and ECDE teachers. Most of the interviews were based on the type of food eaten, malnutrition causes and effects on the physical growth and development on a child below six years.

Why some children perform poorly as compared to their peers in both outdoor and indoor activities and so on. These interviews were carried out on October 2009.

3.5.3. In some cases direct observation was done on young children who are seriously affected by malnutrition. This was done during the visits of ECDE centres.

3.5.4. Abstraction from existing records: There are important records from which some important information has been abstracted. These ranges from magazines, journals and other related sources of information.

3.6. DATA ANALYSIS AND TECHNIQUES

Data has been arranged arithmetically from table 1 – 13.

Percentages, bar graphs, pie charts and histograms have been used because of their importance for comparison of data.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1. INTRODUCTION

This chapter outlines the findings based on the topic of study, i.e. "the impact of balanced diet on child growth and development."

4.2. THE RESULTS AND FINDINGS

The sampled schools were grouped as A and B.

GROUP A

The schools that were classified in this group had no feeding programme. The study established that parents whose children were in this category of schools were very poor. Most of them lived below poverty line. Such parents had little or no education at all. They had large families. Most of them were engaged in self employment, but with very little income. As a result of this, they were unable to sponsor feeding programme in the schools where their children learn. Most of them were against providing snacks for their children in schools. Some said they did not have enough food even at home. Others said that they could not sustain it, even if they started. Others suggested that the government should provide food. Those who were positive only accepted to provide porridge. As a result, the children in this ECDE centres were exposed to long periods of hunger and starvation. Some were showing clear signs of Marasmus. Others were overgrown but were in classes below their ages. Such children were indisciplined . A greater percentage were retarded in growth. This group included both partial and total orphans. A further inquiry on the status of their parents revealed the consequences of HIV and AIDS. Most of them were dead. The few that were still here were terminally ill.

The orphaned children were under care of their close relatives, who also had their own children in this schools. The over burdened parents could not provide enough and well-balanced diet to the children under their care. This implies that, the ECD teacher was not well paid. As a result, the children in this category of schools performed poorly in both class and out-door activities.

All the above is supported by facts on the literature review section – UNESCO (2005:59), "It is naïve to expect hungry children to learn and perform well in school."

GROUP B

The schools in this category had feeding programme. Such schools were very few, out of the total number of sampled schools. The feeding programme was sponsored by parents who were somehow able. Others were sponsored by non governmental organizations (NGO's).

The parents in this category had good income. Most of them were learned. Some were engaged in good business and were exposed to a wide range of experiences.

The children in this schools were generally healthy. They were smartly dressed and were in school uniform. Such children were seen to be very active in class; and out door activities. Their performance was ranging from good to very good. They enjoyed playing with apparatus and stayed in school for longer periods of time. Emotionally, they were very stable, unlike their counterparts in group 'A'. A detailed investigation of some of these children, who were very bright revealed that they were well breastfed. Some respondents said children from the same parents who were not breastfed for more than six months after birth were very weak. This was evident in their performance in class. UNICEF (1946 – 1980) in the literature review section, is in full support of this. It says; "Mothers should be encouraged to breastfed their babies for as long as possible."

4.3. ANALYSIS AND DISCUSSION

Question 1, 2 and 3 of the questionnaire were investigating on the enrolment and the classes in the sampled schools / ECDE centres in the district. The results were recorded in the table below.

Table 4.1 A sample of ECDE centres in Homa Bay District

Response	Frequency	Percentage
Yes	12	100
No	-	-
Total	12	100

According to the above table, all the sampled schools in the district had ECDE centres attached to them.

Table 4.2 Distribution of enrolment in schools with feeding programme in Homa Bay District.

SCHOOL	CLASS			
	BABY	NURSERY	PRE-UNIT	TOTAL
A	11	09	20	40
B	11	10	08	29
C	-	-	28	28
D	11	07	10	28
TOTAL	33	26	66	125

According to the above table, the pre-unit class has a higher enrolment. It is seconded by baby class which has a half of the enrolment of the pre-unit class. The least enrolled class is the nursery class which indicates a high drop out rate. School 'C' has no baby class or the nursery. It has the highest enrolment in the pre-unit class.

**Table 4.3 Distribution of enrolment in sample schools without feeding programme
– Year 2009.**

SCHOOL	CLASS			TOTAL
	BABY	NURSERY	PRE-UNIT	
W	19	23	30	72
X	05	15	20	40
Y	18	08	10	36
Z	27	20	32	79
TOTAL	69	66	92	227

OBSERVATION

School 'Z' has the highest overall enrolment. It is indicating a very high drop out rate in the nursery class. The pre-unit class, is however, the highest enrolled. The baby class is the least enrolled. School "W" follows it closely. Its enrolment increases just as that of school "X". However, school 'Y' which is reflecting an outstanding drop out rate is the least enrolled of the four schools.

The same information on table 2 and 3 is shown on the bar graph on the next page.

DATA PRESENTATION

Figure 4.1 Proportion of enrolment of schools with and without feeding programme.

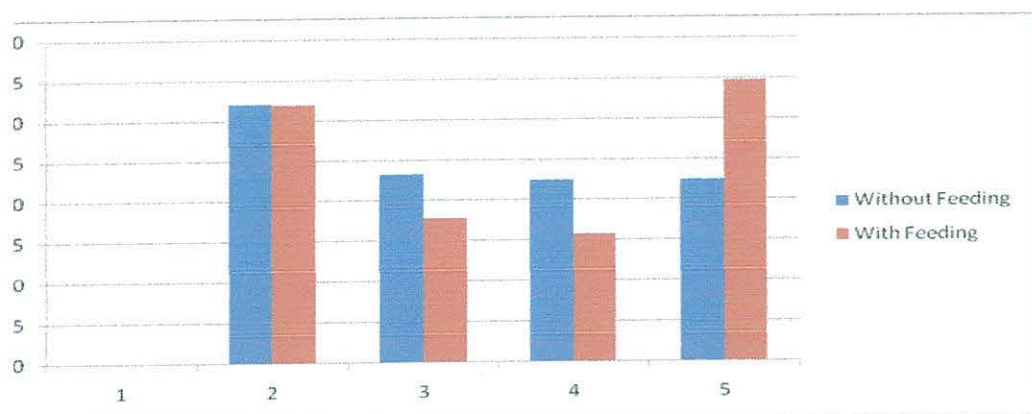


Figure: 4.1. Illustrates the proportion of enrolment in schools with feeding and without feeding programme. The schools with feeding programme are reflecting low enrolment except school "Z". This shows that most parents are poor and can not afford to pay for snacks in schools.

Table 4.4 Distribution of ECDE children by age and gender in sample schools,

2009

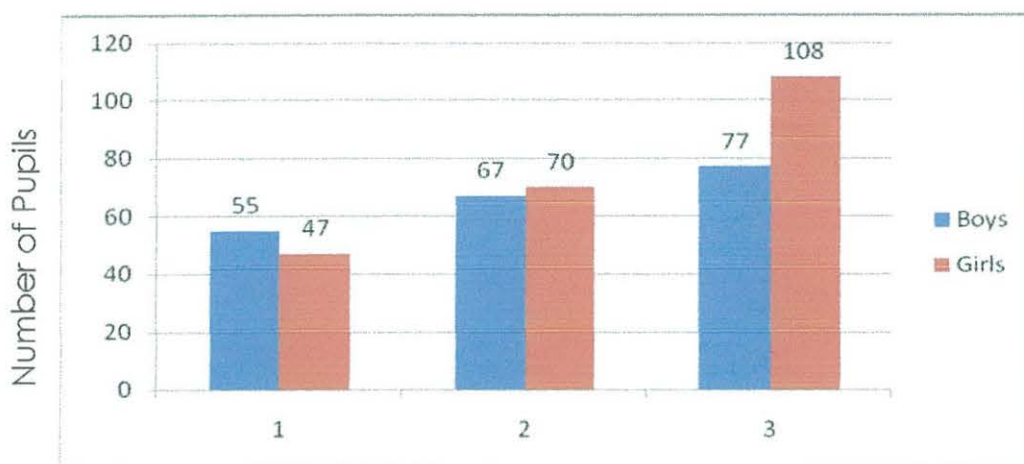
Age (Years)	GENDER			Class
	Boys	Girls	Total	
4	55	47	102	Baby
5	67	70	137	Nursery
6	77	108	185	Pre-unit
	199	225	424	

According to the above table, there are more girls in the ECD centres than boys. Children of age six are more than any other age, in both sexes. It is

closely followed by age 5 and then finally age 4. The increase on age and enrolment reflects the pattern in which children begin going to the schools / ECD Centres. A majority of girls of age 6 are still in the pre-units class.

This implies that any amount of repetition will lead to overgrown children in classes below their ages. The low enrolment of boys could be as a result of high infant mortality rate. The above information is presented on a histogram as shown on below

Figure 4.2 A Bar graph showing number of Children by age and gender in Homa Bay



	AGE	4	5	6
BOYS		55	67	77
GIRLS		47	70	108

The figure illustrates that there are generally more girls than boys in ECD centres in the sampled schools. Age six is the mode. Children of age 4 are fewer as compared to age 5 and six. This applies in both sexes. However, the enrolment increases as it advances towards age 6.

Question 6 of the questionnaire was investigating the sponsors of feeding programme in schools offering snacks in the division. The results were analyzed and presented in the table below.

A sample of sponsors of feeding programme

Table 4.5 A sample of sponsors

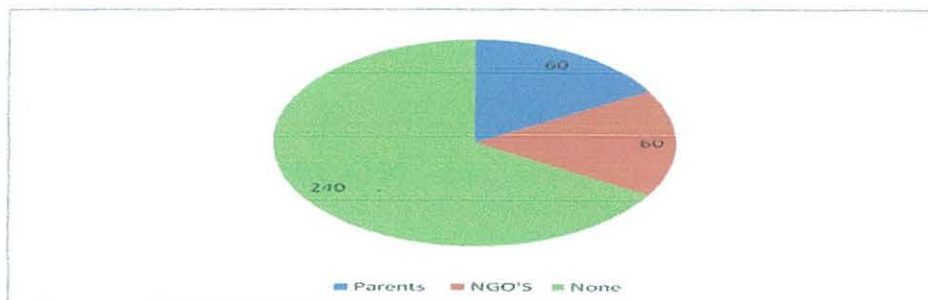
SPONSOR	FREQUENCY	PERCENTAGE	DECREE
PARENTS	2	16.7%	60°
NGO'S	2	16.7%	60°
NONE	8	66.6%	240°
TOTAL	12	100%	360°

OBSERVATION

From the table, it was observed that out of 12 ECDE centres, only 2 had feeding programme, sponsored by the parent. The other lucky two were sponsored by NGO's (Non Governmental Organizations) each representing 16.7%, which is equivalent to 60°, 66.6%, of the ECDE centres, which forms a greater percentage had no sponsors. This indicates that a majority of ECDE children are starving.

The information above can be presented in a pie chart as shown below:

Figure 4.2 A sample of sponsors of feeding programme



The children who are starving are exposed to high chances of suffering from deficiency diseases. They are likely to suffer from Marasmus, Rickets and growth retardation since they lack feeding programme in their schools.

Question 7 of the questionnaire was investigating the types of food eaten by pupils in the ECDE centres offering snacks in the districts. The results were recorded in the table below.

Table 4.6 A sample of diet in schools in Homa Bay District.

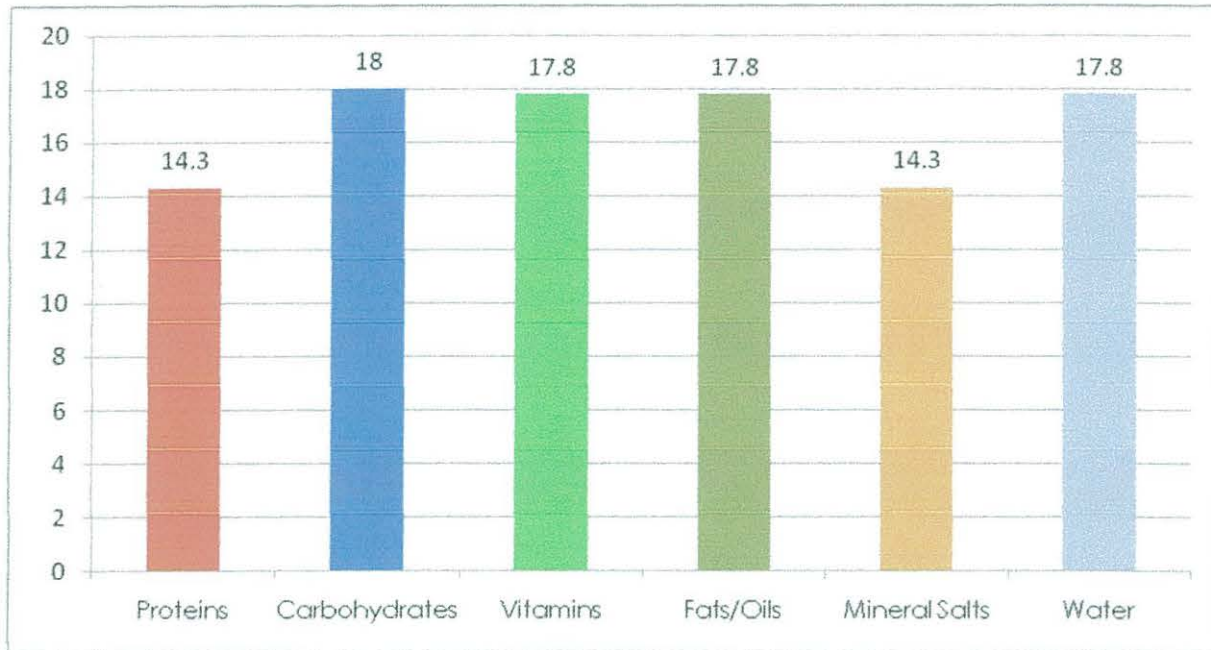
SCHOOL	Types of food eaten in (Frequency) Percentage						Total
	Proteins	Carbohydrates	Vitamins	Fats/Oil	Mineral salts	Water	
A	14.3	18.00	17.80	17.80	14.30	17.80	100
B	11.40	18.70	14.80	18.30	18.10	18.70	100
C	19.23	19.23	3.85	19.23	19.23	19.23	100
D	0.00	33.40	0.00	33.30	0.00	33.30	100
TOTAL	44.93	89.33	36.45	88.63	51.63	89.03	400

OBSERVATION

From the above table, school 'C' provides the highest amount of proteins as compared to the others. Generally, it provides the fairest diet. It is followed by school A,B and finally school D, which provides no protein, vitamins or mineral salts. The worst school providing the poorest snack is therefore school 'D' in terms of diet. From the vertical totals of the food classes provided, carbohydrates is leading. This implies that the staple food in the sampled schools representing the feeding habit (diet of the area is carbohydrates). It is closely followed by water, fats and oils, mineral salts, proteins and vitamins. Out of the six food types or classes, protein is ranking fifth in the table. Vitamins is the least provided nutrient in the diet.

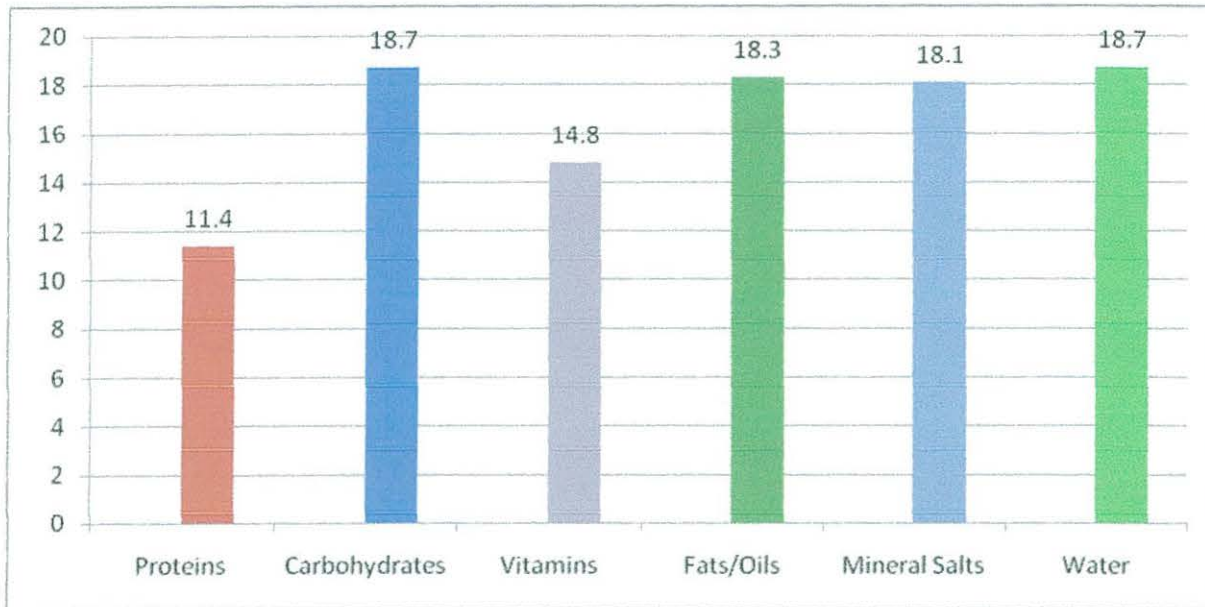
The information above is presented in the figures below.

Figure 4.4 A Bar graph showing percentage of food in school 'A'



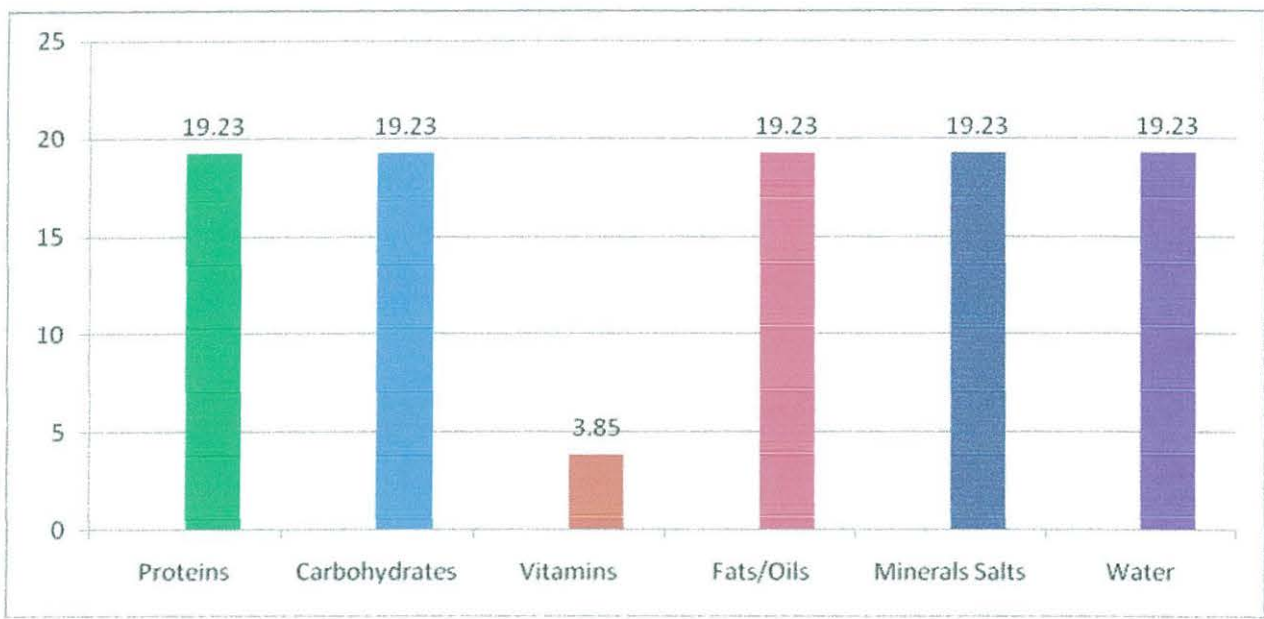
From the figure above, the largest percentage of food eaten in school 'A' is carbohydrates. It is closely followed by water, vitamins, fats and oils. However, protein and mineral salts are the least offered nutrients.

Figure 4.5 A Bar graph showing percentage of food in school 'B'



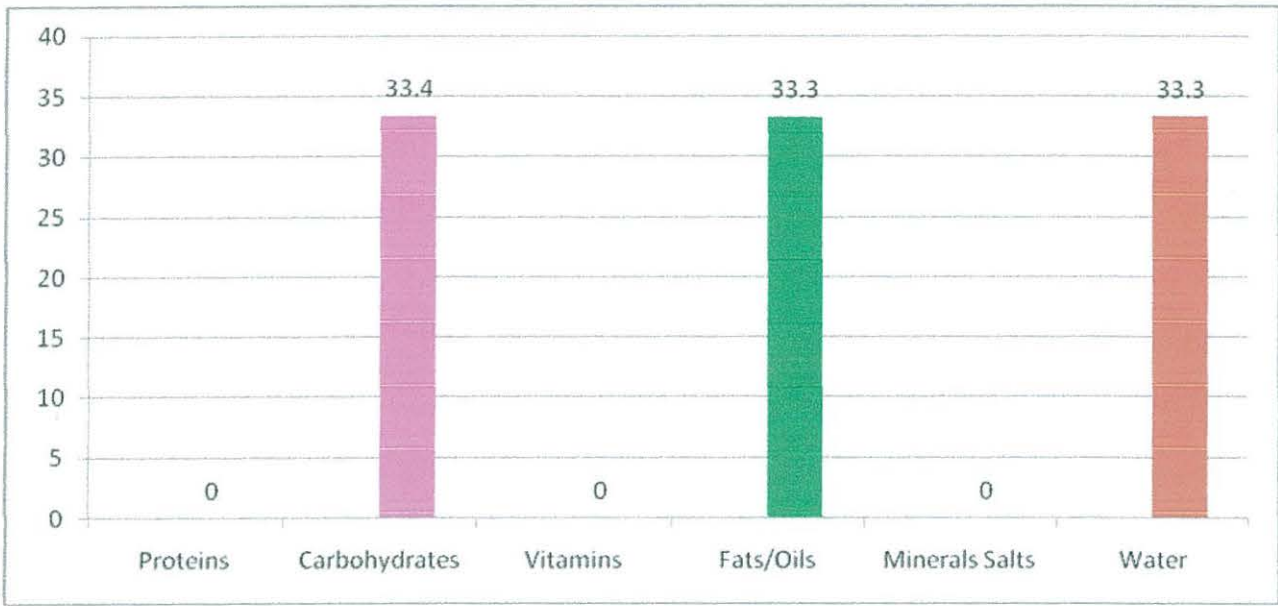
From the above figure, Protein, which is the most required nutrient for proper growth of an ECDE child is least provided. The highest nutrient is carbohydrates and water. Fats and oils, mineral salts follow respectively with vitamins being second last to proteins.

Figure 4.6 A Bar showing percentage of food in School 'C'



The above figure is showing the menu of school 'C' in the area of study. The diet is fairly balanced; but the amount of vitamins provided is too low amounting to 3.85%. This can influence, to some extent, vitamin related deficiency diseases among the ECDE children in that centre if additional supplements are not provided.

Figure 4.7 A Bar graph showing percentage of food in school 'D'



From the above graph, it is clear that school 'D' is majorly depending on carbohydrates. The fats and oils are definitely quantified from the source of carbohydrates which is their main food. The other component of their diet is only water. There is no protein, no vitamins or mineral salts provided.

The children in this centre, though not completely starving, are likely to suffer from deficiency diseases such as Marasmus, Kwashiokor and so on.

Question 8 of the questionnaire was investigating on the time of provision of meals in sample schools with feeding programme and how it impacts on the child's performance. The results are recorded on the table below.

Table 4.7 A sample of meal times in schools with feeding programme.

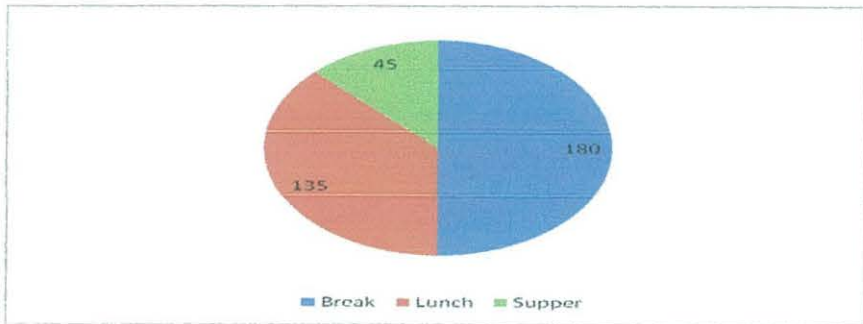
MEAL TIME	FREQUENCY	PERCENTAGE	DEGREES
Break	20	50%	180°
Lunch	15	37.5%	135°
Supper	05	12.5%	45°
TOTAL	40	100.0%	360°

OBSERVATION

From the above table, the most well distributed food is breakfast. It is clear from the table that lunch is relatively lowly distributed in the sample schools. The least offered is supper.

The same results can be presented in pie chart as shown below:

Figure 4.8 A Sample of meal times in school with feeding programme in degrees.



The table below shows the reasons given by parents and caregivers whose ECDE Centres had no feeding in the sampled schools in Homa Bay district (Kenya).

Table 4.8 Reasons given by caregivers in schools with no feeding programme

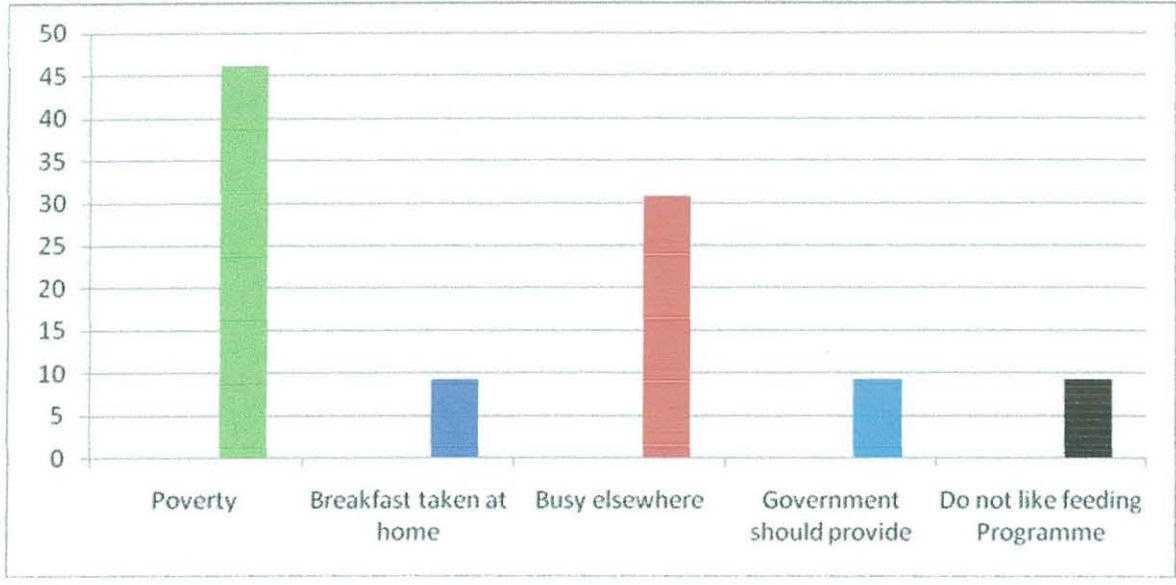
REASONS (RESPONSES)	FREQUENCY	PERCENTAGE	DEGREES
1. Poverty	6	46.15%	166.15°
2. Pupils take breakfast at home	1	9.23%	27.69°
3. Government should provide food	1	9.23%	27.69°
4. Too busy elsewhere	4	30.76%	110.78°
5. Do not like the feeding programme	1	9.23	27.69°
TOTAL	13	100.00%	360°

OBSERVATION

According to the above table, the main reason why ECDE Centres lack feeding programme is poverty. A number of parents and caregivers are also seen to be busy elsewhere.

However, those taking snacks or breakfast at home, those who feel it is government responsibility and those who do not like the feeding programme are equal in number. The above information can be presented on a bar graph as shown on the next page.

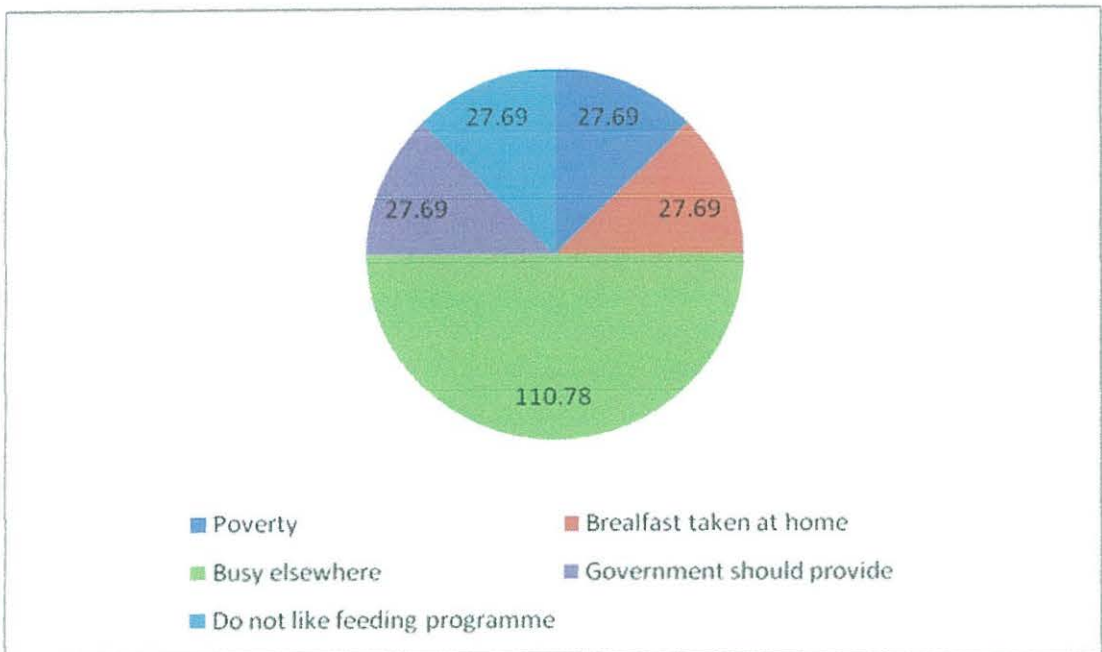
Figure 4.9 A Bar showing reasons given by parents and caregivers in ECDE Centres without feeding programme.



The above figure provides the main reason for lack of feeding programme in ECDE Centres as poverty, which stands at 46.15%. This is equivalent to 166.15%. It also indicates that parents and caregivers are busy elsewhere. This is represented by 30.76% which is equivalent to 110.78%. Those who do not like the programme, those whose children take snacks at home and those who feel the government should provide feeding programme are indicated as being 9.23% which is represented by 27.69%.

The above information can also be shown on a pie chart as shown below;

Figure 4.10 A pie chart showing reasons given by parents in schools without feeding programme in Homa Bay district.



From the above figure, there is evidence that apart from poverty, a larger number of parents claimed to be busy elsewhere, and they had no time to prepare food for their children at school. They failed to provide reason as to why they could not employ other caregivers to take charge of the same responsibility. This can be due to a number of reasons. First, it can be attributed to low education standards or ignorance on the importance of feeding young children. Secondly, it can be due to child abuse and neglect. This is because some parents feel it is government responsibility to provide food for young children at school.

Because of this negative attitude, there is enough evidence to support the fact that most children in this particular area are malnourished.

From the above figure, we can conclude that a part from poverty, the problem of unemployment and economic hardship amongst parents contributes to lack of proper diet in early childhood centres. This is so because the parents who claimed to be busy elsewhere could not employ other caregivers to provide food for their children. It may also portray child abuse and neglect. Those who do not like school feeding programme have negative attitude towards it. This could most likely be due to illiteracy or ignorance on the importance of feeding young children at school.

In question 10 of the questionnaire, the researcher was investigating the types of food found locally in the sample area of study. The results are recorded in the table below.

Table 4.9 Types of food found locally in Homa Bay District in the year, 2009

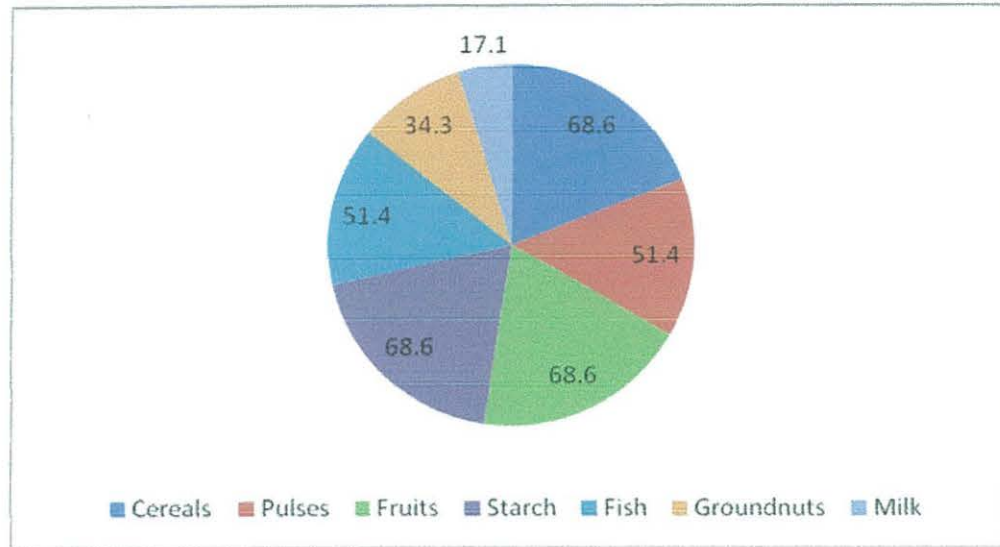
Type of food	Frequency	Degrees
Cereals	4	68.6 ⁰
Pulses	3	51.4 ⁰
Fruits	4	68.6 ⁰
Starch	4	68.6 ⁰
Fish	3	51.4 ⁰
Groundnuts	2	34.3 ⁰
Milk	1	17.1 ⁰
TOTAL	21	360⁰

OBSERVATION

According to the above table, the commonest types of food are cereals – 68.6⁰, fruits 58.6⁰ and starch – 68.6⁰. Pulses, which are second class proteins, tie with fish at 51.4⁰. Groundnuts, which is a source of fat and oils, is second last

with 34.3%. The most important food -Milk is the least available and it forms only 17.1%. This information can be on the pie chart as shown below.

Figure 4.11 A pie chart showing Locally available foods in Homa Bay



The information in figure 4.12 seems to indicate that the types of food found locally in Homa Bay district mainly consist of cereals and starch, which constitutes 68.6% each. However, I tend to disagree with the fact that fruits also fall in this category, since their supply is very seasonal. In most cases, they are out of season. This is further illustrated on table 4.10, which shows a higher frequency of children with scurvy.

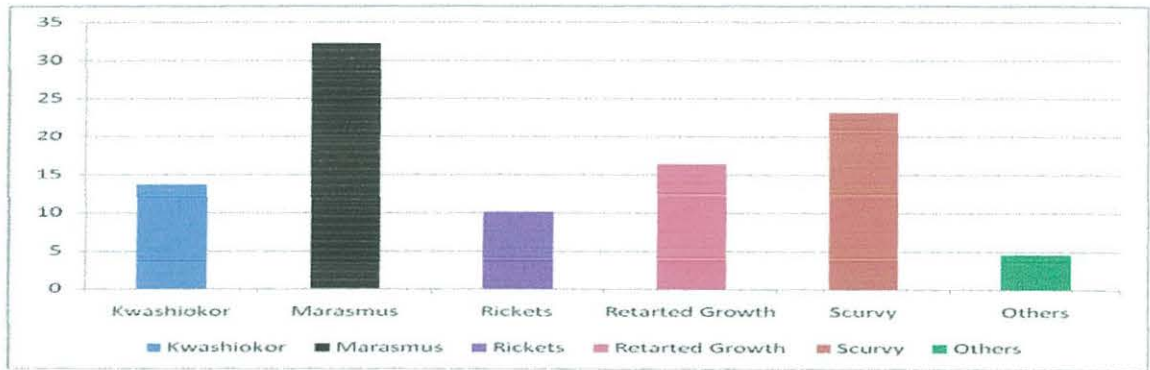
In question 11, the researcher was investigating some diseases related to the feeding of children in the area of study. The results are shown on the table below.

Figure 4.10 Shows deficiency diseases related to the feeding of ECD Children

Deficiency Diseases	Frequency	Percentage
Kwashiorkor	3	13.70%
Marasmus	7	32.10%
Rickets	2	10.10%
Retarded growth	4	16.40%
Scurvy	5	23.10%
Others	1	4.60%
TOTAL	22	100.00%

From the table above, Marasmus cases are more prevalent with 32.1% it is followed by scurvy with 23.1%. The third one is retarded growth with 16.40%, Kwashiorkor is ranking 4th with 13.70%. The last deficiency diseases are others represented by 4.60%. The information is shown on the bar graph below.

Figure 4.13 Shows deficiency diseases related to the feeding of children.



The information given by a majority of respondents indicates that Marasmus is more prevalent amongst the ECDE children in this particular area of study. It has a frequency of 32.1%. This means that children of this area are not getting a balanced diet.

In this case, the researcher was investigating whether there were pupils suffering from deficiency diseases and their ages. The results were recorded in the table below.

Table 4.11 Number of pupils with deficiency diseases by age.

Age (yrs)	Kwashiorkor	Marasmus	Rickets	R/Growth	Scurvy	Others
3	2	1	-	2	-	-
4	3	5	-	1	2	-
5	1	1	1	3	2	-
6	-	1	1	8	-	1
TOTAL	6	8	2	14	4	1
% Age	17.14	22.85	5.71	40	11.43	2.87

From the above table, 40% of the ECDE children are suffering from retarded growth. A greater percentage with this problem are 6 years of age. Second to that are Marasmus cases with 22.85%. The problem is more frequent in age 4 as indicated in the table. The third ranking deficiency disease is kwashiorkor labeled (Kwa). Its percentage stands at 17.14% it is closely followed by scurvy - 11.43%, Rickets (Rick) AT 5.71%, with other deficiency diseases finally closing the table at 2.87%. The results are shown on graph shown below.

From the above figure, Kwashiorkor affected children up to age of four. Marasmus affected children of up to age of five. Rickets, retarded growth and other deficiency diseases affected infants up to age six. Scurvy affected children of up to age five. It is therefore clearly shown that children below six years are highly vulnerable to deficiency diseases.

Question 14, 15 and 16 of the questionnaire the researcher was investigating whether there is difference in performance between well fed and poorly or under fed children. The results are shown on the table below;

Table 4.12 Performance of well – fed and under – fed children in Homa Bay District.

Children	PERFORMANCE			
	Poor	Fair	Good	Very Good
WELL – FED				
a) In class	X	X	/	/
b) Outside	X	X	/	/
c) POORLY FED				
a) In class	/	/	X	X
b) Outside class		/	X	x

OBSERVATION

From the above table, the performance of well fed children ranges from good to very good. This shows that they are keen in class most of the time and are more active in out doors activities. On the other hand, the performance of poorly fed children is shown to be ranging from poor to fair.

Question 17 of the questionnaire was investigating other reasons why some children might be suffering from deficiency diseases. The responses are shown on the table below:

Table 4.13 Other reasons why children suffer from deficiency diseases in Homa Bay District.

REASON	FREQUENCY	PERCENTAGE
Poverty	4	40%
Food taboos	1	10%
Lack of awareness	3	30%
I don't care attitude	2	20%
TOTAL	10	100%

From the above table, the main reason why children suffer from deficiency diseases in this district is poverty which is represented by 40%. It is closely followed by lack of awareness of balanced diet at 30% . This can be due to lack of proper education, or low learning standards of the parents. The third reason given is I don't care attitude of the parents or caregivers, who seem to have no interest in providing balanced diet to the children under their care. This may be due to large and unplanned families, adoption of orphaned children left behind by the HIV/AIDS victims or extended families with many children competing for food and other resources. The least provided reason is food taboos which is only represented by 10%.

The last question of the questionnaire was investigating the income of the parents in the sampled schools / ECDE centres. The findings were recorded and analyzed as shown below.

Table 4.14 A sample of parents income in Homa Bay District

PARENTS INCOME	FREQUENCY	PERCENTAGE	DEGREES
Poor	8	66.7%	240 ^o
Average	4	33.3%	120 ^o
Rich	-	-	-
TOTAL	12	100%	360^o

According to the table above, most of the parents are poor. They are forming a greater percentage of 66.7% which is equivalent to 240^o. The average parents form 33.3 % (120^o). The rich are not represented in this table. This is because their children do not learn in the category of schools where the research was conducted. A further investigation into the reason why poverty is rampant in the area of study revealed that there were very many orphans left behind by parents who died out of HIV/AIDS.

CHAPTER FIVE

4.0 CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION

5.2 SUMMARY

This research was carried out purposely to investigate the impact of balanced diet on the child's mental growth and development. It was to establish whether there is a relationship between balanced diet and mental development of a child of 6 years and below. It was also aimed at finding out whether parents and caregivers are aware of the impact of balanced diet on mental development. The study was also aimed at investigating the level of education of the parents and caregivers and how it affects the care given to the young children below the age of six years.

The data herein was collected by the use of questionnaires, which were prepared and distributed to the sampled schools by the researcher. They were later collected for analysis and presentation.

However, in some cases, the respondents were interviewed orally and the findings recorded. In other cases, direct observation was made on the pupil's suffering from severe cases of malnutrition or overgrown pupils in classes below their ages. The data collected was analyzed in form of tables, percentages, degrees, graphs, pie charts, frequencies and so on.

5.3 MAJOR FINDINGS

The major findings of the research were as follows:

1. Most of the ECDE centres did not have school feeding programme. This category of ECDE centres were mostly attached to public primary schools, offering Free Primary Education.

2. There were a number of cases of children suffering from Marasmus as compared to any other disease. Growth retardation was another one. However, cases of scurvy, Kwashiokor and Rickets were evident.
3. Children suffering from the above named diseases did not perform well in class and outdoor activities. Instead, they looked withdrawn, tired and weak. Most of them were absent from school.
4. There were more girls than boys in most ECDE centres. This implies that most baby boys might have died during their infancy period.
5. There was a high drop out in schools without feeding programme. This was especially in baby and middle class. Some schools had neither of the two named classes. Instead, they had only the pre-unit class.
6. Most parents whose children learn in these schools were poor. They had large families under their care. Among their children were orphans adopted from the dead relatives. Most of the dead relatives were reported to have died of HIV/AIDS and other related diseases.
7. Most of the schools with feeding programmes had carbohydrates in greater percentage as compared to any other food. Protein, which is a major requirement in a child's diet, was inadequately provided. Milk was the least type of food found locally.
8. Children in schools offering balanced diet preformed well in class. Their performance was ranging from good to very good.
9. A very negligible percentage of parents were very rich. Their children were neither in school A nor school B.
10. Most of the poor parents generally had no or little education. Their children were in schools without feeding programme.

5.4. CONCLUSION

It has been established that poor performance is as a result of imbalanced diet. This implies that there is a need to address the problems leading to such situations.

5.5 RECOMMENDATIONS

The government should as a matter of priority provide free early childhood education at least from the nursery level. It should ensure that ECDE teachers are employed by Teachers Service Commission (TSC). The government should provide free feeding programme at the ECDE level. This should be in form of school milk, in order to curb problems of deficiency diseases that affect the young children.

The parents should be sensitized on the importance of using locally available foods to improve the diet given to young children.

To improve parenting and care given to young children, the Ministry of Education should reinforce adult education by organizing seminars and workshops at the local community level. This will make illiterate parents aware of balanced diet.

To make learning more exciting and interesting, the government, through the Ministry of Education, should provide learning materials needed at the ECDE classes.

The Ministry of Health should visit ECDE centres in liaison with education officers to evaluate and monitor the health conditions there. During this process, they should find out whether all the children have undergone all through the immunization schedule. They should give vitamin supplements during the process.

The government should provide clear policy guidelines on the roles of parents, sponsors and local authorities in line with ECD Class.

The government should intensify the campaign against HIV/AIDS and other related diseases. This will help to reduce poverty.

Nutritional guidelines help people obtain a balanced diet. However, the overwhelming diversity of foods available in supermarkets and the easy availability of "fast food" can easily lead to poor nutritional choices, the Kenya government should develop recommendations and goals for the average Kenyan citizen. This guideline should be summarized in a table form for easy understanding.

The causes of food shortage e.g. rapid population growth, soil erosion, loss of ground water, should be addressed globally. This will help to reduce malnutrition.

Refugees' children suffer from malnutrition mainly because of wars, political instability and civil unrest. The United Nations should fight very hard to restore peace in such places. The United Nations High Commission for Refugees (UNHCR) and the International Red Cross should give first hand help to the children in refugee camps to curb malnutrition.

There is a need to conduct further research on whether the impact of malnutrition on a child's mental growth and development can be reversed or not. Can they lead to permanent mental impairment?

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Hickman R., Larson (1993): *Integrated Principles of Zoology*, Mosby.

UNICEF (1946): *A Manual for Pre-School Teachers*, (1946 – 1986)

UNESCO (2005): *Challenges Facing the Implementation of Free Primary Education in Kenya*, Assessment Report, Nairobi.

From the internet

Nutritional Disorders

Available at www.tutor.vista.com

The necessity for a balanced diet in children: *physical, mental and intellectual development*

Available from <http://www.fao.org>.

APPENDIX I

RESEARCH QUESTIONS

1. Is there a pre-primary section in your school.....
2. Into how many sections is your pre-school divided? (Put a tick as appropriate)

Baby Class Nursery Pre-Unit

3. Which class are you teaching?
- Baby Class Nursery Pre-Unit

4. What is the enrolment of your class? (Put your answer in the table below)

Table 1.0 Enrolment of Pupils

BABY CLASS		NURSERY		PRE-UNIT	
BOYS		BOYS		BOYS	
GIRLS		GIRLS		GIRSL	
TOTAL		TOTAL		TOTAL	

5. Is there a feeding programme in your school? (Put a tick in the box).
- Yes No

6. Who caters for this programme.....

7. What are the types of food provide? (Record them in the table below).

Table 1.1. Types of food eaten by pupils

MONDAY	
TUESDAY	
WEDNESDAY	
THURSDAY	
FRIDAY	

8. When are the meals provided: (Tick as appropriate).

Break time

Lunch time

9. If there is no feeding programme, what are the reasons given by the parents of care givers?

i)

ii)

iii)

iv)

v)

10. What types of foods are eaten locally?

i).....

ii).....

iii).....

11. What are some of the diseases related to feeding?

i).....

ii).....

iii).....

12. Are there pupils in your class showing signs of diseases related to bad feeding? (Tick) Yes No

13. If there are pupils suffering from diseases, how many are they?
(Record in the table below)

DEFICIENCY DISEASE	NUMBER SUFFERING	AGE (YEARS)
KWASHIOKOR		
MARASMUS		
SCURVY		
RICKETS (KNOCK KNEE)		
RETARTED GROWTH		

14. What can you say about the performance of pupils who are affected by malnutrition in your class? (Tick as appropriate).

Poor Average Good Very Good

15. What can you say of the performance of well fed children in your class?

Poor Average Good Very Good

WELL FED		UNDER FED	
ACTIVITY AREA	MARKS	ACTIVITY AREA	MARKS
TOTAL			TOTAL

17. What do you think are some of the reasons why some children might be suffering from deficiency diseases in this particular area? (Tick as

appropriate).

a) Poverty

b) Food taboos

c) Lack of awareness of balanced diet

d) I don't care attitude by parents and caregivers

18. What can you say about the general income of parents of pupils in your class in relation to their occupations?

Most of them are (Tick the options below as appropriate)

Poor

Average

Rich

APPENDIX II
BUDGET PLAN

ITEM NO	ITEM	DESCRIPTION	AMOUNT IN KSHS
1	Supervisor	Consultation	2,500.00
2	Stationery	3 Reams of Duplicating papers @ 600/=	1,800.00
3	Typesetting	53 page @ 40/=	2,012.00
4	Pencil	2 HB @ 25/=	50.00
5	Binding	2 Books @ 100 per Book	200.00
6	Photocopying	100 pages of 2 Books @ 3/=	300.00
7	Transport	Fare	3,000.00
8	Subsistence	Food	1,000.00
9	Browsing	Time spent at the computer	500.00
10	Miscellaneous	Photographs e.t.c.	400.00
		TOTAL COSTS	11,870.00

APPENDIX IV

NYATIENGA PR. SCHOOL,
P.O. BOX 85 NYANGWESU,
CODE 40311.

RE: ACCEPTANCE LETTER

Mr. Owidhi Charles Ongere (Registration number
BFD.21755-81 DE) has been accepted to carry out a research
within the school compound as at September 2009 upto October
2009.

Yours Faithfully,



Omenda Walter
(TEACHER)

APPENDIX V

ATILI PRIMARY SCHOOL,

P.O. BOX 374

HOMA BAY.

RE: ACCEPTANCE TO OWIDIHI CHARLES ONGERE

REG. # BED/21755/81/DF

The above named teacher has been accepted to carry out a research within the School Compound as at September 2009 up to October 2009.

Yours Faithfully,

James O. Omala

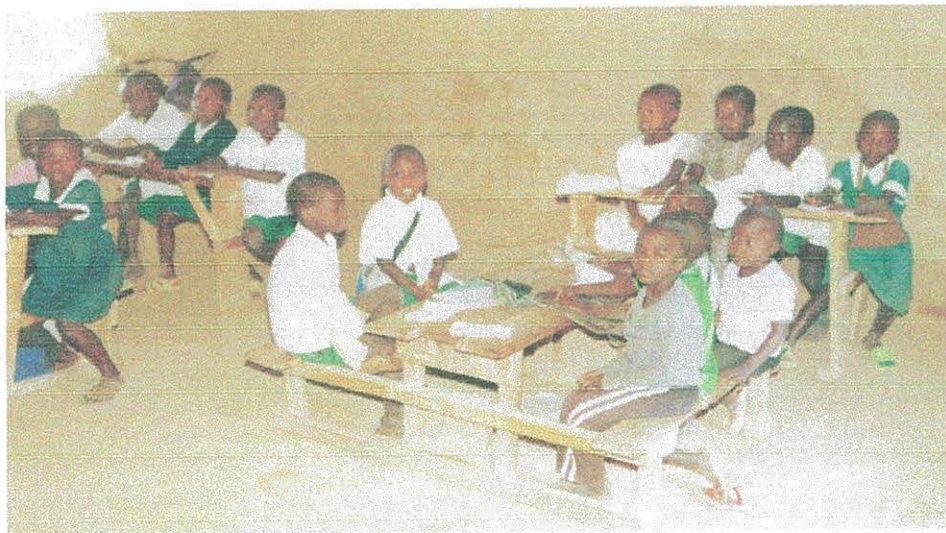
APPENDIX VI

PLATE I



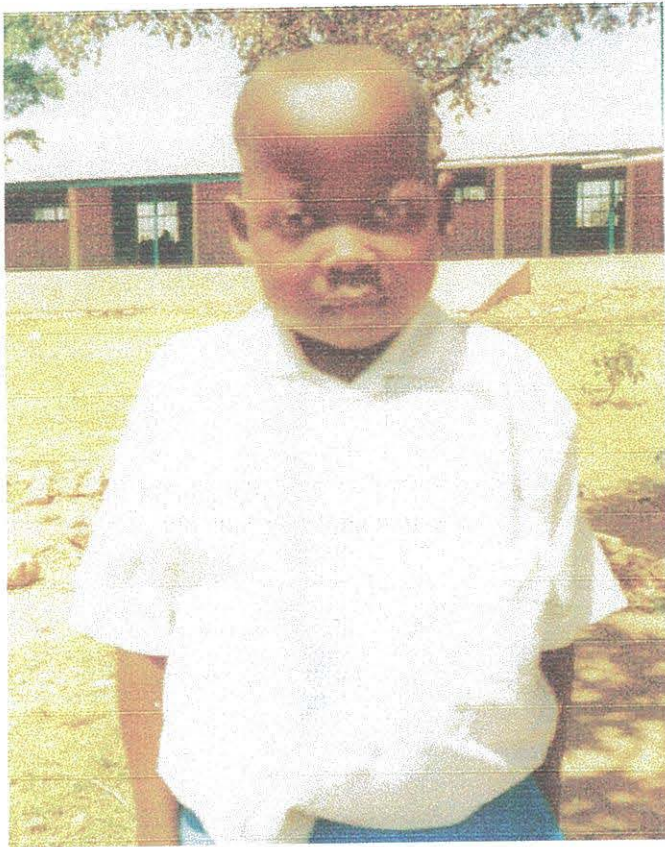
A Teacher observing Nursery Children in Class

PLATE II



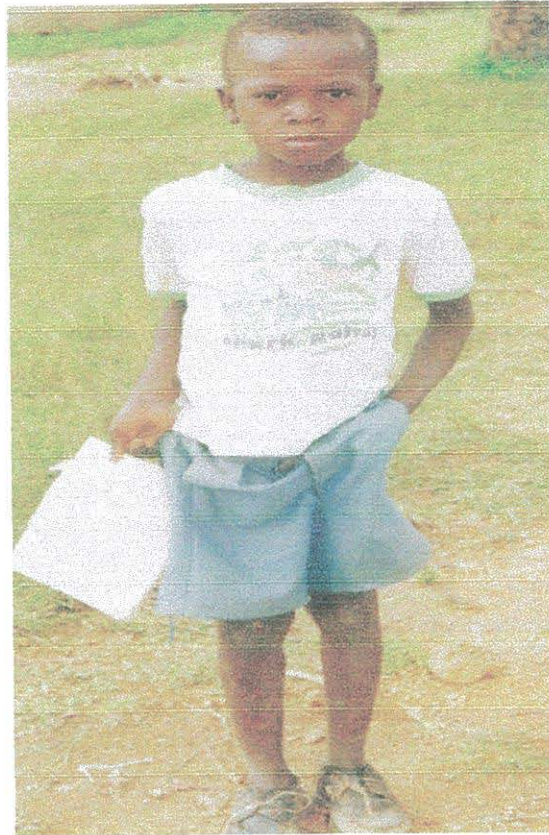
Nursery School children in class: ECDE Centre with no feeding programme

PLATE III



An ECD Child with retarded growth
Class

PLATE IV



An underfed boy in Nursery

APPENDIX V

MAP OF KENYA



