Poverty and Malnutrition in Urban Sub-Saharan Africa: A Systematic Review

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by
Mercy Susan Nyawira Muriuki

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Declaration page

This work is original and has not been previously submitted in support of a Degree, qualification or other course.

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Research Question

What strategies have been put in place to combat poverty and malnutrition, and why have they worked or not worked?
Abstract

Poverty contributes to many problems globally and its resultant effects are many,, varied and have their greatest impact in poor countries. One of the major effects of poverty is malnutrition, which has a hold on all facets of life due to the vicious cycle associated with it. In sub-Saharan Africa, malnutrition is rampant and as a result has led to morbidity and mortality, has affected cognitive development and physical growth and has also diminished physical work capacity. The main purpose of this study was to explore the strategies that have been used to combat poverty and malnutrition in sub-Saharan Africa and to also be able to understand the reasons why those strategies worked or did not work. To do this, articles written on the topics related to poverty and malnutrition from sub-Saharan Africa were reviewed. From this it has emerged that poverty should be addressed and that education would have the greatest impact in doing so. Community participation has also emerged to be instrumental in ensuring that the poverty and malnutrition combating strategies are embraced and accepted by the community in general. The reason for this is that, a community will participate actively only if it can relate to the objectives of the project or programme being set up and also be involved in the planning, negotiations and implementation of the strategies.

Keywords: poor, undernutrition, Africa, kwashiorkor, marasmus, urbanization
# Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
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<td>CHPS</td>
<td>Community -based Health Planning and Service</td>
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<td>CIA</td>
<td>Central Intelligence Agency</td>
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<td>CNP</td>
<td>Community Nutrition Project</td>
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<td>CSRC</td>
<td>Crisis State Research Centre</td>
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<td>CZ</td>
<td>Control Zone</td>
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<td>DDS</td>
<td>Diet Diversity Score</td>
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<td>DFID</td>
<td>Department for International Development</td>
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<td>DHS</td>
<td>Demographic and Health Survey</td>
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<td>DPT</td>
<td>Diptheria Pertusis and Tetanus</td>
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<td>FAO</td>
<td>Food and Agriculture Organisation</td>
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<td>FVS</td>
<td>Food Variety Score</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GMP</td>
<td>Growth Monitoring and Promotion</td>
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<tr>
<td>HIPC</td>
<td>Highly Indebted Poor Countries</td>
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<tr>
<td>HIV/AIDS</td>
<td>Human Immunodeficiency Virus/Acquired Immunodeficiency Virus</td>
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<tr>
<td>IFAD</td>
<td>International Fund for Agricultural Development</td>
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<td>IFPRI</td>
<td>International Food Policy Research Institute</td>
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<td>IMF</td>
<td>International Monetary Fund’s</td>
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<td>IRD</td>
<td>Institute of Research for Development</td>
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<td>IZ</td>
<td>Intervention Zone</td>
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<tr>
<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>MAR</td>
<td>Mean Adequacy Ratio</td>
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<tr>
<td>NCHS</td>
<td>National Centre for Health Statistics</td>
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<td>NUFU</td>
<td>Nordic Africa Institute, the Norwegian Research Council and the Norwegian Universities, Committee for Development Research</td>
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<tr>
<td>PAP</td>
<td>Poverty Alleviation Plan</td>
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<td>PEM</td>
<td>Protein Energy Malnutrition</td>
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<td>RCA</td>
<td>Regional Centre for Africa</td>
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<td>RTHC</td>
<td>Road To Health Chart</td>
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<tr>
<td>TEE</td>
<td>Total Energy Expenditure</td>
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<td>UK</td>
<td>United Kingdom</td>
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<td>UNESCO</td>
<td>United Nations Educational Scientific and Cultural Organization</td>
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<td>UNICEF</td>
<td>United Nations Children Fund</td>
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<td>UN</td>
<td>United Nations</td>
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<td>US$</td>
<td>United States of America Dollar</td>
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<td>USAID</td>
<td>United States Agency for International Development</td>
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<td>WFP</td>
<td>World Food Programme</td>
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<td>WHO</td>
<td>World Health Organisation</td>
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Chapter 1: Introduction

1.1. Background

Africa’s nutritional problems do not differ greatly from those of other parts of the developing world like Southern Asia, South and Central America and the Middle East (Cook, 1966). One of the more significant contributing factors to malnutrition in the developing world is poverty (Delisle, 2008; Uthman & Aremu, 2008) and it is rampant in most of the urban areas in these countries. This phenomenon continues to thrive despite the fact that most of the economic activities occur within the urban areas. Globally there has been an overall dramatic growth of urban populations within the last few decades (Fotso, 2007; Masika, de Haan, & Baden, 1997). This urban growth culminates from both the natural population growth and rural-urban migration of which the latter continues to be a significant factor (Masika, et al., 1997).

Additionally, the growth can be attributed to the influx of refugees from politically unstable neighbouring countries. For instance Chad, has hosted 255,000 refugees from the Sudan Darfur region and about 77,000 refugees from the Central African Republic (United Nations, 2008).

In 2003 forty eight percent of the world’s population lived in urban areas (United Nations, 2004). It was estimated that from the year 2007 to 2050 the world’s population would grow by 2.5 billion from the previous total population of 6.7 billion to 9.2 billion
At the same time, the urban population is projected to increase by 3.1 billion, passing from 3.3 billion in 2007 to about 6.4 billion in 2050. Consequently the world’s urban areas will absorb most of the growth population expected over the next four decades while at the same time still absorbing some of the rural population. Most of these population growth in the urban areas is expected to be in the towns and cities of the less developed regions, in which Asia is expected to experience a population increase by 1.8 billion, Africa by 0.9 billion and Latin America and the Caribbean by 0.2 billion thus population growth has become largely an urban phenomenon mainly seen in the developing world (United Nations, 2008). Unfortunately this urban growth mainly constitutes disadvantaged families or individuals who may end up having a tougher time coping in the urban areas than they would have had in the rural areas (Sastry, 2004). In Africa and specifically in sub-Saharan Africa rapid urbanization was noted as early as the 1960s (Potts, 1995) and, regrettably, this rapid urbanization has been taking place alongside declining and stagnating economies (United Nations, 2004). Urbanization has historically been associated with growing economies. However, the same does not hold for sub-Saharan Africa where urbanization has occurred without growth (Fay & Opal, 1999).

Malnutrition and poverty is still rife in rural areas, however there is increasing deprivation in urban areas of many developing countries which is a worrying trend (Maxwell, Levin, Armar-Klemesu, Ruel, Morris, & Ahiadeke, 2000).

The incidence of extreme poverty has been attributed to a number of factors which include, unemployment, low wages (Aliber, 2003; Hanmer, Pyatt, & White, 1999). Other causes are low quality education and lack of learning opportunities (Burnette, 2008). This
extreme poverty and lack of proper education has an impact on the feeding habits of the affected resulting in malnutrition. In a study by Delpeuch, Traissac, Martin-Prevel, Massamba & Maire, (1999) carried out in Brazzaville, the capital city of the Republic of Congo, whose aim was to find out how the importance of maternal/prenatal and socioeconomic factors affect the nutritional situation of children less than six years of age several years after economic crisis. The socioeconomic information was gathered through random sampling of 1368 households, anthropometric measurements were taken using a standard technique on preschool children who were 2373 in total and their mothers who were 1512 in number. It was found that children born in poor economic households and whose mothers had little or no schooling were more likely to be at a risk of having stunted growth.

1.2. Definition of Poverty

Definition of poverty has proved to be a task, it has been seen to feature in many development-based agendas and debates (Iyenda, 2007). Several key words or terms have featured prominently in various definitions of poverty by policy makers and economists; relative deprivation, lack of basic needs, vulnerability, livelihood unsustainability, ill-being, lack of capability and function, social exclusion, income or consumption poverty and human under development (Maxwell, 1999). The United Nations Millennium Development Goals project has accepted the extreme poverty definition as “living on less than one dollar per day” while poverty is defined as “living on less than two dollars per day” as per 1990 purchasing power (Osberg, & Xu, 2008). According to the Asian Development Bank (ADB) (2004), poverty is “the deprivation of fundamental facilities and vital opportunities to which every human being should be entitled to”. The measure
for poverty is in terms of health care, nutrition, basic education, water, sanitation, income and employment (ADB, 2004).

Poverty can be categorized so as to understand its different natures; Income Poverty is the lack of adequate income to meet minimum consumption needs, Human Poverty is the deficiency of important human capabilities mainly nutrition and literacy while Absolute Poverty is that degree of poverty below which the minimal requirements of basic survival cannot be met (ADB, 2004).

For the definition of urban poverty two complementary methods have been used: economic and anthropological interpretations. To categorize poor people, economic interpretations utilise income and social indicators such as life expectancy, nutrition, infant mortality, the fraction of the household income spent on food, the literacy rates, and access to drinking water and health facilities (Masika, et al., 1997). The anthropological interpretations have been developed by social planners and allow for variation in the definition of poverty and incorporate social demarcation and non-material deprivation (Satterthwaite, 1995).

Official statistics show that the magnitude of urban poverty in many of the low and middle income nations used by governments and international agencies seems to be under-rated. This is thought to be due to the definition and measurement of poverty not depicting the real picture on the ground regarding urban poverty (Satterthwaite, 1995). Poverty hits children the hardest creating an environment that is detrimental to the development of children in every way; mentally, physically, emotionally and even spiritually (UNICEF, n.d.).
In developing countries undernutrition contributes to 53 percent of the 9.7 million deaths of children under the age of five years. This implies that there is a child dying every six seconds as result of malnutrition or due to its complications. Those who survive it continue to suffer from its scars many years even after childhood (World Food Program, 2008).

1.3. Definition of Malnutrition

Malnutrition is a term used to describe disorders due to inappropriate/incorrect intake of food nutrients. These disorders range from the diseases caused by over-nutrition such as obesity to those diseases due to under-nutrition such as kwashiorkor and marasmus. Traditionally, over-nutrition has been associated with the developed countries while under-nutrition has been associated with developing nations. However, the occurrence of over-nutrition related disorders has been on the increase in developing nations due to the changing lifestyle and diet of the working class.

Generally, undernutrition and overnutrition are due to chronic positive or negative energy balance which is secondary to disease. Energy balance is the difference between energy as a result of food intake and that of total energy expenditure (TEE). Positive energy balance indicates that there is excess energy that can be stored by the body while a negative energy balance leads to oxidation of body tissues in search for energy to carry out the body’s functions requiring energy and therefore leading to faltering growth (Reilly, 2002).
Malnutrition also describes imbalanced nutrition, having one or several micronutrients or mineral deficiencies (Allison, 2000). Malnutrition is an issue of great public health concern mainly in the developing countries and is related to significant increase in the risk of mortality and morbidity, in which children and women are mainly the most affected (Uthman & Aremu, 2008). Malnutrition impedes children from growing to their full genetic potential, children below the age of five years in almost all populations other than pygmies have shown the potential to grow as tall as children from the United States of America. This is an indication that children in the less developed countries are short because of poor nutrition and not due to factors related with genetics (USAID, 1982).

Malnutrition also increases children’s susceptibility to diseases of infections, and impairs the child’s mental ability by affecting cognition. This may result in diminished concentration spans especially in school thus leading to poor performance and also in reduced physical capacity (Susilowati & Karyadi, 2002).

1.4. Assessment of Malnutrition

The internationally accepted method for the assessment of malnutrition in populations is the use of anthropometric measurements mainly weight and height. From the combination of these anthropometric measurements, indices are formed and are important for the interpretation of the measurements because measurements such as weight alone without age or height have no meaning. In children there are three common anthropometric indices used; height for age, weight for age and weight for height. These anthropometric indices are expressed either in terms of z-scores, percentiles or as percent of median and
can therefore be used to compare between groups of children with a reference population (WHO, 1995; de Onis & Blossner, 2003).

In children who have not reached the right height and weight for age and gender the terms stunting and wasting are used respectively (WHO, 1995). Stunting denotes long term nutritional deprivation or chronic or recurrent illness while wasting shows a short term nutritional insufficiency or it could also be due to a recent illness for example diarrhoea. A height for age or weight for age of more than two standard deviations of the median of the National Centre for Health Statistics (NCHS) international reference population for children for the same gender is categorised as stunting and wasting respectively (Miller & Rodgers, 2009).

1.5. Causes of Malnutrition

Globally malnutrition contributes to more half of the deaths in children and as such is an important risk factor for illness and mortality (Black, Morris, & Bryce, 2003). The causes of malnutrition are many, diverse and inter-related, they maybe social, cultural and economic factors (Fotso, & Kuate-Defo, 2005). These factors interact in ways that leave people being vulnerable, the factors include insufficient food supply, limited power of purchasing, poor health conditions and the lack of nutritional knowledge, these factors too are related to poverty (Susilowati & Karyadi, 2002). The lack or poor education in general is an extremely important factor causing malnutrition and particularly, women’s education (Smith & Haddad, 2000). Poverty creates a conducive environment in which all of these factors intermingle giving rise to products of each other (WHO, 1995). The bottom line is that poverty contributes to malnutrition; however malnutrition also does
contribute to poverty by increasing morbidity, impairing children development and also diminishing their capacity for work and also their productivity (Pace, Seal & Costello, 2008).

1.6. Insufficient food supply

Adequate food availability is essential in having good nutrition. Food security has been defined as when every person, at all times, has the ability to have access both physically and economically to sufficient, safe and nutritious food thus meeting their dietary and preferences of food for an active and healthy lifestyle (FAO, 1996). With increasing world population great pressures are being placed on arable land, energy, water and biological resources to increase the food supply and still be able to maintain the ecosystem’s integrity (Pimentel, Huang, Cordova & Pimentel, 1997).

1.7. Limited Purchasing Power

In the developed world food takes a relatively small amount of the household income about 10% to 15%. Nevertheless in poor countries, many household’s income, usually a large proportion of their income (around 40% or more) is usually set aside to buy food. For this reason, the rise in food prices has undesirable outcomes that affect the purchasing power of the poor by reducing real income. Consequently the increases in price affects the amount of food and quality of food bought and consumed which may end up increasing the family’s risk to malnutrition (Pace et al., 2008)

1.8. Poor Health Conditions
The high prevalence of a wide variety of bacterial, parasitic and viral diseases in the developing world is a great contributing factor to malnutrition (Samie, Guerrant, Barret, Bessong, Igumbar, & Obi, 2009; FAO, 2004). The malnutrition caused as a result of chronic or acute illness is known as secondary malnutrition (Rudolph, Rudolph, Hostetter, Lister, & Siegel, 2002). There are various ways in which disease can cause malnutrition for instance through malabsorption, diminished utilization of nutrients, drugs antagonism (for example antibiotics anatagonise the effect of vitamin K) or even through vomiting and diarrhoea as the nutrients are not assimilated (Stratton, Green, & Elia, 2003). Additionally malnutrition also increases one’s susceptibility to infections or diseases (FAO, 2004; Murray, & Lopez, 1997; Reilly, 2002).

1.9. Education

Education is the major backbone to any country’s development. Educating women plays a key role in improving the health of children (Saito, Koezenika, Jekel, & Bhattacharji, 1997). Educated women are more aware of the nutritional problems that may affect their children, will be in better positions to seek health care services if the children need them and will know how to provide better child care than women who have no education (Fotso, & Kuate-Defo, 2005). It is however ironical that poor or no education leads to poverty which is a major underlying cause of malnutrition (Muller & Kranwinkle, 2005) and yet malnutrition in itself can diminish the learning abilities of children by reducing the concentration spans of the child (Susilowati & Karyadi, 2002) resulting in a vicious cycle. For this reason it is important that child health is improved increasing the child’s
learning ability (Muller & Kranwinkle, 2005) and in so doing breaking down the vicious cycle and thereby having a positive impact on productivity and even wages.

1.9.1. Lack of Nutritional Knowledge

The lack of nutritional knowledge is another cause associated with malnutrition and this can be seen more as a result of inadequate education. Women’s nutrition-related knowledge, attitudes and practices are strongly linked with the nutritional status of their children (Saito et al., 1997).

Figure 1. Prevalence of stunted children in Africa (from de Onis & Blossner, 2003).
This review summarizes the strategies that have been put in place to combat poverty and malnutrition in urban, sub-Saharan Africa and also to try and explain why some worked and why some did not. As seen in (Figure 1) the prevalence rates of stunting in most parts of sub-Saharan Africa is at least 20% and above, this is a matter that serious needs attention so as to reduce this malnutrition rate.
Chapter 2: Methods

The review method used was adapted from the Hastings Report prepared for the UK Food Standards Agency on the impact of food promotion and advertising on children’s nutrition (2003). The first stage in the process was literature scoping, this involved checking the area or range covered by this subject matter or topic. Next, the review questions were set and a search strategy was then developed. With the search strategy in place electronic databases, search engines were searched so as to check for articles relevant to the topic. The next step that was followed was to check the articles for relevance against the inclusion criteria that had been set. Those articles that did not match or fulfil the inclusion criteria were excluded from the study, while those articles that met the inclusion criteria were reviewed once more for relevance and quality. If the articles passed the last review for relevance and quality they were proceeded on to data extraction and analysing of the data.

Relevant articles were located using electronic databases which included Pubmed, Cinahl, SocIndex and Science Direct. The search was designed to obtain articles published from 1994 to 2009.

Pubmed is a bibliographic database providing literature for both medical and biosciences and normally has abstracts and links to full text of some articles (www.ncbi.nlm.nih.gov/pubmed/).
Cinahl is an index to nursing and allied health literature. It includes article summaries as well as some full text (www.ebscohost.com/cinahl/).

SocIndex is a comprehensive database on sociology encompassing some sub-disciplines and other closely related areas of study (www.ebscohost.com/thisTopic.php?marketID=1&topicID)

Science Direct, provides full text access to medical and science journals (www.sciencedirect.com/science/journals)

The key search words used were:

- Malnutrition AND urban Africa
- Marasmus AND urban Africa
- Kwashiorkor AND urban Africa
- Low Income AND malnutrition
- Strategies combating malnutrition in urban Africa
- Strategies to combat malnutrition that have worked in urban Africa
- Undernutrition AND sub Saharan Africa
- Poverty and malnutrition in urban Africa
- Nutrition programme urban Africa

From the Pubmed database, a further search was performed on articles related to the retrieved articles. Additionally other articles were searched for in the Pubmed database by using the authors’ name. To ensure that as many studies were reviewed in this systematic review, relevant articles were also hand searched. This was in addition to using the
various searches from the databases (Pubmed, Cinahl, Soc Index, Science Direct). Journals that were hand searched were identified from the following search engines:

- www.google.com
- www.scirus.com

Journals were also individually searched for articles that assessed either poverty interventions or malnutrition interventions in urban Africa.

**Study Criteria**

The initial search retrieved 337 articles in total, with 324 articles being retrieved from the bibliographic databases and thirteen articles from search engines. Articles were excluded from this if they did not meet the following inclusion criteria:

- Articles written in English.
- Papers relevant to subject area (Poverty and malnutrition in sub Saharan urban Africa).
- Articles written on the subject area during times of political stability and not during times of political instability. The Fund for Peace and the Crisis State Research Centre (CSRC) were consulted to ascertain this aspect. (see Appendix II for summary notes)
- Articles written during a period of climatic disaster were also excluded by making reference to the CIA Fact Book country profiles that includes a record of natural calamities such as droughts, earthquakes, etc. (see Appendix II for summary notes).
Isolation of the articles took place in five steps as shown in figure 2 below. The first step entailed excluding articles that were not written in the English language, the second step eliminated the articles written before the year 1994, the third comprised excluding articles whose titles were not explicitly referring to poverty in urban sub-Saharan Africa. Next, articles written during a period of climatic disaster were excluded using the guidelines or specifications of the CIA Fact Book and finally articles written during a period of political instability were eliminated using the specifications of the Fund for Peace and the Crisis State Research Centre (CRSC).

Figure 2. A flowchart on how the review articles were selected

The articles that met the inclusion criteria were accessed through the electronic free full text facilities. If the articles were inaccessible through electronic free full text facilities they were obtained through a number of methods which included:

a) Through the interlibrary loan from other universities
b) Using the University of Chester online IBIS facility
c) Purchasing the articles electronically or a hard copy of the article from the published journal
d) Through the use of hard copy journals available at the University of Chester

The ten articles retrieved for this review were summarised (please refer to appendix) in a systematic manner creating a database which made use of some particular themes/issues and they included:

i) Setting/ Location

ii) Funding

iii) Study objectives

iv) Study design

v) Number of households

vi) Target group

vii) Bias control

viii) Strategies to combat poverty and malnutrition

ix) Statistical analysis

x) Results

xi) Conclusion

These themes were chosen as they give a general basic overview of the articles, through them they address the setting of where the study was carried out, if the study received any financial assistance, they address the reason why the study was carried out, they also give a brief description of how the study was carried out, the target group for the study, how bias was controlled, the statistical analysis, results and finally the outcomes of the study is
also addressed. The theme on strategies to combat poverty and malnutrition was chosen specifically because it addresses the research question of this review.

These themes/issues were important as through them the review articles were summarised, they therefore inform the review that follows on chapter 3. As the aim of this study is to find out what strategies alleviating poverty and malnutrition have been put in place in urban sub-Saharan Africa, the heading known as strategies to combat poverty and malnutrition was used. From it several key themes emerged and they are discussed at length in chapter 3. The themes are:

a) Community Participation
b) Income generating projects
c) Education
d) Empowering women
e) Child spacing
f) Nutrition Promotion
g) Growth monitoring and promotion
h) Training
i) Good breastfeeding and weaning practices
j) Improved farming methods

The outcomes of the review were then presented in a model (Figure 3) which was then used to make the basis of the discussion.
Chapter 3: Data Review

The occurrence of abject poverty exists predominantly within sub-Saharan Africa and parts of South Asia. For this reason the goal of poverty alleviation has become a global priority and now encompasses a wide range of development policies (Bardhan, 1996). The various strategies to achieve this have been implemented with mixed results. The main objective of this review will be to investigate the poverty and malnutrition alleviation strategies that have been put in place in sub-Saharan Africa and to identify those strategies that have worked and the reasons for their success. With this in mind it is important to consider articles that have documented various strategies implemented and measured their impact. The ten articles reviewed in this study will be the basis for argument. However in as much as the main focus of this review is on sub-Saharan Africa other relevant examples from some other parts of the world have been cited and referred to as a way of providing supporting evidence.

The various strategies that are outlined in the reviewed articles are discussed below. An important issue to note regarding these strategies is that they are all inter-related and form part of the solution to aid in the alleviation of poverty and malnutrition. It is therefore not easy to separate them and discuss them singly as they complement each other. For example community participation is inter-linked with income generation, urban agriculture is also related to income generation. However for the purpose of this review each strategy will be discussed individually though there will be areas where the interconnection will be self evident.
3.1. Community Participation

A community maybe defined as the people residing in a certain geographical region, or it may refer to a group of people sharing a specific culture, politics or ideology (Graham & Clark, 2005). Despite the fact that its definition is not fully agreed on, community participation has been identified as a fundamental ingredient to the sustenance of any development programme. The various definitions include, one which refers to community participation as encompassing voluntary contribution by individuals to public projects in which they had no part in shaping the programme. Another defines it as the involvement of people in determining, implementing and evaluating the projects (Rifkin & Kangere, 2001). Finally community participation has also been referred to as a process where the recipients have an influence on the project outcomes and in so doing they gain personal growth (Oakley, 1989).

Community participation has been deemed as a relentless theme in issues pertaining to development as a whole. In the search for sustainability and equity particularly for the deprived in society, community participation in the 1960s and 1970s became pivotal to development programmes (Rifkin & Kangere, 2001). It is also seen by many governments worldwide and non-governmental organisations including United Nations agencies as vital to programme planning and consequently poverty eradication (World Bank, 1996).

The community will only participate actively if it identifies and addresses its own needs in the order that it sees fit. A community programme can only become resilient when the people in that community develop, plan, discuss and implement the strategies (Arole,
Additionally, a study by Paul (1987), on Community Participation in development projects highlighted several key issues on community participation:

a) Community participation is suitable when the project is for the people’s empowerment and also for their own capacity building.

b) Community participation is also fitting if the project beneficiaries are able to run or manage a part of the project operations thus giving them a sense of ownership.

c) The community will also be more enthused to be part of the project if there is interaction among the beneficiaries as they address their concerns, needs preferences and negotiate the way forward in the implementation of the strategies toward development.

d) The participation of the community can only prevail if the governing body of the country supports the project thus enabling it to achieve its goals. It is crucial that governments do not act as a hindrance to its running but instead ensure the success of such project by acting as a motivator or activator.

e) The development project should be such that it is practicable technologically, meaning that there is no technological impediments to its functioning. If the developmental project requires high technological know-how then the implementers should be well-versed with its working and be ready to impart that knowledge to the beneficiaries of the project. If this is not done the community may fail to identify it as their own and therefore will not be enthused to participate in it. Furthermore if the technological know-how is not imparted to the community then the project will become redundant once the implementers are no longer around.
An example where community participation has been successful in meeting the set goals or objectives of the development projects though not from Africa but could be viewed as potential solutions to similar problems in Africa include, the North Karelia Project in Finland whose main objective was to lower the blood cholesterol levels of the people in that region. The project was able to meet its objectives as the cholesterol level of the population was reduced by 18% and coronary heart disease for men aged 34 – 64 years decreased by 73% twenty five years after its onset. This success was achieved through health promotion and community organization (Puska, 2002).

Another success story of a participatory programme, this time for the reduction in malnutrition, is that of Thailand as cited by Tontisirin and Bhattacharjee, (2008). Thailand, a developing country, has been successful in decreasing the prevalence of malnutrition and has been able to maintain this for about 30 years. For instance during the period of 1982 to 1991, Thailand’s malnutrition was reduced from above 50% to below 20% among preschool children (Tontisirin & Gillespie, 1999). This was possible through setting up of development projects to alleviate poverty which had strong support from the Thai people through community participation. To do this a community based health care approach was used to tackle malnutrition and the involvement of other sectors was called upon such as the ministries of agriculture, public health and education. Malnutrition was also seen as a symptom of poverty and all the efforts and focus were put in place to eradicate poverty and consequently its symptom, malnutrition. For the eradication of poverty, the Poverty Alleviation Plan (PAP) was established so as to improve the quality of life for 7.5 million poor people. Through participatory development between the community and the local government workers ways to improve nutrition and income generation were tackled (Tontisirin & Bhattacharjee, 2001).
The Navrongo and Community-based Health Planning and Services (CHPS) in Ghana is also another example of a far-reaching intervention in reducing rural child mortality and improving reach of family spacing services in the rural area of Navrongo. Navrongo is a secluded, deprived and traditional area with high fertility rates. Over 70% of the population in Ghana live more than eight kilometres from a health centre and as a result, rural child mortality is 40% higher than in the urban areas. This is because health services are found in district headquarters and sub-district clinics which are a long distance away (Phillips, Jones, Nyonator & Ravikumar, 2003).

This project involved the community by the health management staff approaching the leaders of the community and by asking the community leaders to provide accommodation and working space for the health officials. The community health workers visited their patients on motor bikes and through this they were able to provide primary health care services including vaccinations, family spacing services, treatment of common ailments and reproductive health. Through the involvement of community leaders so as to reach the community, child mortality reduced by 38% and the average fertility rate also dropped to one birth per woman (Phillips, et al., 2003).

3.2. Income Generating Projects

Income generating projects are programmes that allow the community to better themselves financially. They are fundamental in reducing poverty and consequently malnutrition (Walsh, Dannhauser, & Joubert, 2001). Economic engagements of parents, particularly maternal economic engagement has been shown to be more beneficial in
curtailing childhood malnutrition, however, this income generating engagements need to be structured in a way that does not compromise the mother’s child caring practices such as breastfeeding (Mahgoub, Nnyepi, & Bandeke, 2006).

Despite this important caveat, the practicality of maternal engagement in income generating activities without interfering with good child care practices is difficult in the sub-Saharan Africa context. This is because employment is generally hard to come by and therefore if one gets a job it usually involves having to forego a number of things so as to maintain that position. A common example is that where the place of employment is far from home leaving mothers with no option but to sacrifice travelling the long distance to go to work and due to travelling costs it may not be cost effective for mothers to leave their work places during lunch breaks to go home and breastfeed the baby.

There have been instances where income generating projects have been able to improve the nutritional status of the population. A good illustration is that of The International Fund for Agricultural Development (IFAD) which has financed projects aimed at improving and increasing food production thus promoting household food security and income generation in the rural areas (IFAD, 1992).

Income generating projects encourage community participation (Hendricks, Le Roux, Fernandes & Irlam, 2003). This is because community participation entails fulfilling the needs of the people in that community, as the community is only motivated to participate if its needs are addressed (Askew, 1989). The Northern Cape Province, South Africa where the study by Hendricks et al., (2003) took place was a poor region with higher than average national malnutrition rates (21.6% for stunting, 10.3% for underweight and 3.7%
for wasting) according to the National Centre for Health Statistics. It is for this reason that the income generating projects would have led to the programme attracting much more community participation and its impact would have been much greater.

Allowing of credit to members of a community with a convenient paying period (Olaleye, 2007), could also be another way of encouraging the growth of income generating projects. Individuals can then invest the borrowed cash into projects that would be able to give them a decent livelihood enabling them to better themselves and subsequently leading to poverty and malnutrition reduction. The loan acts as a reminder that they have a responsibility that they need to fulfil thereby they handle the cash given seriously and invest intelligently. However, in the study by Olaleye (2007) the co-operative also assisted the members to acquire household credit and this is disadvantageous as the household commodities do not bring back any tangible long-term benefits. They only offer comfort or fulfil short-term obligations and end up pushing the members to more debt and poverty. It would have been better if the co-operative society gave them credit to as to invest in income generating projects or in property that appreciates in value in the long term such as land.

There have been programmes that have used cash-transfers as interventions to alleviate poverty and malnutrition; Progresa was the name of one such initiative in Mexico (Sridhar & Duffield, 2006). Though it was not located in Africa, it could serve as a potential solution in poverty and malnutrition alleviation. The project was funded by the Mexican federal government and reached 140,000 households in three cities in the southern state of Campeche in 1997. These households were from a database of beneficiaries of two existing subsidised programmes for milk and tortilla. The 1997
project availed US$ 7 per month through electronic cards. In 2000, Progresa’s yearly budget was US$ 1bn and was reaching 2.6 million households in thirty-one states of Mexico, the cash transfer from 1999 had increased from the US$ 7 per month in 1997 to US$ 13 per month.

This cash transfer was about a third of the average household income of the beneficiary. The aim of Progresa was to improve the nutritional and health status of members of poor households and to also promote school enrolment, attendance and performance. The transfer of cash to the poor families was pegged on the families fulfilling certain conditions which included; preventative health care was to be received by every member of the family, expectant women were to attend five pre-natal checkups, lactating mothers had two health checks annually and monitoring of their nutritional intake was also done, Growth Monitoring and Promotion monitoring was done every two months on children under the age of sixty months. Children aged below sixty months, expectant and lactating mothers who had been found to be malnourished were given nutritional supplements on monthly basis.

Education was another condition that the beneficiaries had to fulfil. Families were awarded grants whose conditions were school enrolment and regular attendance of school (at least 85% attendance of school per month and per year). Those who did not fulfil these conditions were not given the cash transfers.

This programme had a significant impact; there was an average growth of 1cm in children aged six months to three years when compared to those in the control group, GMP visits increased by 30 to 60 % and children participating in the programme from birth to five
years had a reduced incidence of disease when compared to children not in the programme, (Sridhar & Duffield, 2006). This showed that the availing of cash has the potential of improving children’s nutritional status.

3.3. Education

There is a significant amount of data attesting to the positive relationship between education and poverty alleviation (UNESCO, 2003; Khan & Williams, 2006). This is because education is an important tool for the reduction of poverty and, consequently, malnutrition (Walsh, et al., 2001) and inequality. It promotes productivity, the key factor needed for economic growth. It has been reported that there is a close correlation between education and a higher earning potential which results in the improved quality of life for an individual (Khan, & Williams, 2006).

Education can be looked at in two broad categories; Formal education and the informal education. Formal education entails an organised system of gaining knowledge and skills that starts at the lowest learning level and finally progresses to a higher level. In this system a curriculum is followed and adhered to. In the informal education there is no strict curriculum to be followed and the main participants are those who did not have a chance to attend regular school during their school-going years. Formal education is important as it targets the young people and as such can be instrumental in alleviating poverty and malnutrition as the young people will be much more employable after graduation from school. It is critical in that it promotes education of the girl-child with long-term benefits extending beyond her taking care of her younger siblings (Armar-
Klemesu, Ruel, Maxwell, Levin & Morris, 2000) by equipping her for the future to make wise decisions as pertains to her life, better job opportunities and thus better income.

Female secondary education has been associated with higher age at marriage (Bardhan 2005; Grown, Gupta & Pande, 2005), lower fertility and mortality, good child care practices and decreased vulnerability to HIV/AIDS (Grown, et al., 2005). Investing in women’s literacy as well as health education and family spacing has been shown to result in sustainable improvement in the nutrition of families and the communities at large (Sheikholeslam, Abdollahi, & Haghighi, 2004). Better education for women is associated with improved or better nutrition, the ability for the women to provide better child care Mahgoub et al., (2006), and better work opportunities.

Informal education is also important especially when it comes to educating those who had no opportunity of going through the normal channels of education. It allows for the dissemination of information that is essential to peoples’ general well-being. Such information includes nutrition education, family spacing and general health care information.

Certain key time reference points should be followed especially with relation to nutrition education (Armar-Klemesu, et al., 2000). Education should be received in good time, before the three main stages of a young girl to motherhood which include; pre-conception, pregnancy stage and the motherhood stage. The imparting of education before these stages would be crucial as it would prepare the woman for her upcoming stage and shed light on problematic areas for example on issues of breastfeeding and even on weaning. Prenatal and antenatal clinics should be seen as good grounds for the
dissemination of information. In the prenatal clinics, the expectant mothers can be educated on good child care practices ranging from how the expectant woman can take care of herself nutritionally while she is pregnant to issues pertaining to breast feeding after the birth of the baby (Armar-Klemesu, et al., 2000). The antenatal clinics can also be used to motivate the mother to breastfeed the baby for at least six months after the birth of the baby and also feed the baby on complementary foods (Armar-Klemesu, et al., 2000).

It has been demonstrated that educating mothers has more positive effects on children’s growth than the socioeconomic situation of the family (Sheikholeslam et al., 2004). In terms of a child’s nutritional status the mothers’ education has a greater impact than that of the fathers’ (Kabubo-Mariara, Ndenge & Mwabu, 2009).

There have been several studies suggesting that educating mothers in general, and specifically about nutrition, reduces the number of underweight children and also decreases the levels of child mortality. The lack of proper education coupled with extreme poverty has a resultant impact on the feeding habits of the affected culminating in malnutrition (Kikafunda, Walker, Collett, & Tumwine, 1998).

Miller & Rodgers (2009) carried out an investigation in Cambodia whose findings could be relevant applicable to Africa. The study took its data from the Cambodia Demographic Health Survey of 2005 to determine the connection between children’s nutritional status and their mothers’ education, the data is a representative sample of women between the age of 15 and 49 years and members of their households. The number of children observations in the 2005 Cambodian Demographic Health Survey was 8290 who were between the age of zero and 59 months of these only 3542 children were included in the
sample as all their measurements of height and weight were available in the data while for the rest their measurements were missing.

Three pointers to poor nutritional status were used; small birth size, which pointed to factors during gestation, stunting and wasting attributed to factors after birth such as poor nutrition and illness. The percentage of children who were small at birth and born to mothers with at least a secondary education were only 9.5% while those who were small at birth and born by mothers with no education were 18%. This indicated that twice the number of children who were small at birth were children of non-educated mothers. Additionally the stunting percentage was no different, for mothers who had at least a secondary education their children stunting percent was 22% while for those with no education it was almost double (46%). This study found that there was a strong relationship between a mothers’ low level of education and risks of her child being underweight and stunted.

The choices that mothers make with regards to what to feed their babies during weaning may not necessarily be dependant on the family income because even though weaning foods are to be purchased they would only take a small proportion of the family’s income to provide the baby with a nutritionally adequate diet. These choices are predominantly dependent on the level of the mother’s education (Armar-Klemesu, et al., 2000).

A study was carried out by Turyashemererwa, Kikafunda, & Agaba (2009) to determine the factors influencing childhood malnutrition in Kabarole District, a peri-urban region in Western Uganda. The study design that was used was a cross sectional descriptive survey that made use of qualitative and quantitative data. Ninety-three randomly selected
caregivers or mothers of children aged between six months to 59 months were issued with questionnaires. The questionnaires sought to find out what factors could have been affecting the nutritional status of their children.

From the data collected caregivers who were 20 – 24 years had 31.2% children aged six to 59 months, while those who aged 15 – 19 years and 25 – 29 years had 24.7% of children falling under the age of study (six months to 59 months). Mothers/caregivers who were 40 – 44 years had only 1.1% of children in the age of study. The information about the education level of the caregivers/mothers also showed that 49.4% had primary education, 5.4% had acquired secondary education and only 2.2% had a tertiary education. The results indicated that stunting was high at 41.6%, while children who were underweight were 15.7% and wasting was 3.7%. According to this study the level of education of a mother/caregiver has a significant effect on the stunting of her children (p=0.02).

The study also found that stunting and under weight in children was much higher when the parents did not have any education. An ironical aspect in this study is that Kabarole District, Western Uganda, is a highly fertile area and produces a high per capita of most foods, yet the level general level of stunting is at 41.6% which is a clear indication that women’s poor level of education contributes to the lack of knowledge on proper nutrition (Kikafunda., et al., 1998). When the mothers or caregivers were assessed on factors that could be contributing to the poor nutritional status of their children only 59% of them could relate it to poverty, 28% could not identify the causes of malnutrition while another 12% cited insufficient food availability and were also not aware about the proper nutritional needs for growing children.
These findings are in themselves are quite worrying because if only 59% of the mothers or caregivers could see the link between poverty and their children’s poor nutritional status then the remaining 41% would not appreciate the value of being involved in income generating projects. This is despite the fact that such opportunities would improve their general lifestyle through making them more employable by education or through money generated from the projects.

A pilot study by Faber and Benade (2003) in Kwa-Zulu Natal, South Africa sought to find out if home-gardening projects could lead to improved maternal knowledge on vitamin A and if the consumption of vitamin A rich foods would also increase in this region leading to higher serum retinol concentrations in children aged two to five years.

To evaluate the project, there were two surveys, a baseline survey at the beginning of the study and a second survey twenty months after the inception of the project. The surveys were carried out to determine the maternal nutritional knowledge on vitamin A and for children aged two to five years, their serum retinol concentrations were estimated. The control was a neighbouring village which shared the same tribe as that under the study. After twenty months of the project inception there was improved maternal knowledge as pertains to vitamin A. Mothers knew its importance in the diet, could name at least one symptom related to its deficiency and also from what foods it could be obtained from unlike their counterparts in the neighbouring village who could not even name any foods rich in vitamin A. In terms of dietary intake, the children from the experimental village showed that their serum retinol concentration levels had improved as it was significantly higher than at baseline (p<0.01), compared to that from the control village (p=0.005).
Opportunities to provide education to mothers should be aggressively sought to enlighten
to mothers/women on how to provide better child care for both their born and unborn
children. These opportunities may present themselves during prenatal clinics as
recommended by Armar-Klemesu et al., (2000). Recommendations for appropriate times
that would enhance health worker interaction with mothers include during the DPT
immunizations which require three visits for three dosages of immunizations given to the
baby during the first three months of life. This education to girls/women and mothers
should be extensive and should also include their own health in particular as hunger and
malnutrition have been reported to increase the occurrence and fatality rates of risk
factors and may result to a maternal death (Uthman & Aremu, 2008).

Additionally obstetrical complications have been found to increase considerably in
malnourished and stunted women and due to these complications they may end up losing
not only their lives but those of their babies too (Seipel, 1999). A healthy pregnancy is
dependant on the nutritional status of a woman before and during pregnancy (Black,
Allen, Bhutta, Caulfield, de Onis, Ezzati, Mathers & Rivera, 2008). Malnourished
mothers have a greater likelihood of giving birth to babies with low birth weight who are
at a higher risk of dying in infancy (Uthman & Aremu, 2008). It has also been noted that
the chances of having miscarriages and still-births are higher in poorly-nourished
expectant women (Seipel, 1999). Low weight for height at birth and later adult diseases
such as hypertension, diabetes mellitus and cardiovascular diseases have been noted to be
interrelated especially so in cases of intra-uterine growth retardation (IUGR) (Duggan,
2003).
It has been noted that improving of maternal nutritional knowledge in combination with food aid is much more beneficial in improving weight-for-age compared to just having food aid alone (Walsh, et al., 2001; Gartner, Kameli, Traissac, Dhur, Delpeuch, & Maire, 2007; Gartner, Maire, Traissac, Kameli & Delpeuch, 2006). Gartner, et al., (2006) not only agreed with this but also added that the weight-for-age improvement was specifically noted in underweight children whose mothers frequently attended the sessions on nutrition provided by the Community Nutrition Project (CNP).

3.4. Empowerment of Women

Any improvement in a community can not be achieved without the empowerment of women because they hold a very important place in households therefore they should be given the opportunity to gain knowledge and the necessary skills that may be of benefit to their future and that of their families (Oldewage-Theron et al., 2005). Women empowerment can be achieved through education, whether formal or informal education, promotion of sexual and reproductive health and also the access to economic wealth thereby promoting gender equality. Additionally improved infrastructure particularly water, sanitation and transport can be of benefit in enhancing the health of women (Grown et al., 2005). This is because improved transportation would mean that women and children can be able to go to the health clinics, while the improved sanitation and the availability of water would mean better hygiene for the whole household.

3.5. Child Spacing
Child spacing is an important way of regulating population growth and also has a tremendous impact on child survival. This is mainly because an infant does not have to deal with competition for food and childcare with another baby (Greenspan, 1993). Households having more than one child being under the age of three years old have been noted to have a negative relationship as pertains to undernutrition, among households with two children under three years old the percentage of underweight is 27.8% which is significantly higher (p<0.01) than those households with only one under three years old child which had a percentage of 14.8% (Maghoub, et al., 2006). Additionally, it been shown that children of multiple births have a greater likelihood of being malnourished than singletons; a multiple birth child’s height will probably be 0.6 z-scores lower than that of a singleton and this could be attributed to competition for nutritional intake (Kabubo-Mariara et al., 2009).

Child spacing also allows the mother to recover from the strains of pregnancy, child birth and breastfeeding (Greenspan, 1993). This enhances the survival chances for the next born child.

The use of contraceptives to plan future family size has been documented as an important determinant of a child’s nutritional status. A study by Kabubo-Mariara et al., (2009) used Kenya’s pooled Demographic and Health Survey (DHS) data from 1998 and 2003 to investigate the determinants of the nutritional status of children. The 1998 DHS had collected information on 7881 women in the aged between 15 – 49 years and 5672 children aged less than 60 months, however, only 2914 children aged less than three years were included in the study due to missing information.
The 2003 DHS had information collected from 8195 women aged 15 to 49 years, the children were 5949 in number aged less than 60 months but for the study only 2956 children aged less than 36 months were included. This study suggested that with contraception use the height for age of children would increase by 27% and stunting would drop by at least 14% this is thought to be due to the increased birth interval between one child and another therefore allowing the mother more time to breastfeed and take good care of her young child before the conception of another.

However, there is the matter of social acceptability of family spacing especially so in Africa where in a lot of communities, many children are a symbol of wealth and prowess of manhood. One such example can be found in a study by Olawoye, Omololu, Aderito, Adeyefa, Adeyemo, and Osotimehin, (2004) in Nigeria whose objective was to investigate the social structure of masculinity and manhood and gender socialisations of major ethnic groups in Nigeria. The findings of the study were that manhood is closely linked with the social position in the family, the physical ability to satisfy their wife/wives and also the ability to produce many children.

In one particular Nigerian ethnic group, the Yoruba, the measure of masculinity is to marry several wives with the hope of having many children, particularly male children, as male children are the only ones with the mantle to perpetuate the man’s lineage. Yoruba men who have attained this (many children and wives) are highly praised. It is apparent that the introduction of the use of contraceptives and its advantages would be extremely challenging in such an environment as there is a strong cultural viewpoint that associates many children with the prowess of manhood.
This challenge has been overcome in some instances such as with the Navrongo Family spacing and Health Project in Northern Ghana, not too far from Nigeria, which was successful in promoting the use of contraception. This was made possible through the use of the implementers of the family spacing project approaching traditional leaders who in turn encouraged community participation of their people (Bawah, Akweongo, Simmons, & Phillips, 1999).

3.6. Nutrition Promotion

The promotion of nutrition can be done through nutritional education which is the dissemination of knowledge and information to an individual or community about various foods and their benefits to the human body. This empowers the individual/community to make more informed decisions based on the gained nutrition knowledge regarding their dietary choices and enhances their well-being. As a result, the risk of developing chronic dietary-related disorders is greatly reduced (Arora, 2005). These disorders may range from the extreme of over-indulgence, for example obesity, to undernutrition, such as marasmus and kwashiorkor.

However it is important that the promotion of nutrition is done by organisations which have the children’s welfare at heart and are not just interested in furthering themselves economically at the expense of innocent children’s health and life. The dairy industry, which was formalised at the beginning of the 20th century and was flourishing by the 1950s, is one such culprit. According to the WHO in 1975, four developing countries namely, Ethiopia, Nigeria, Philippines and India spent over US$ 125 million on infant formula. By 1978 over US$ 600 million was spent in the developing world on infant
formula (Chetley, 1979). The dairy industry was enjoying booming business as the promotion and advertising of the infant formula was heavily done, using the terms of one author ‘the market was bombarded’. There were 135 thirty second adverts for Lactogen (Nestle) that were broadcast in Sierra Leone in the month of August, for Unigate another milk formula company there were 45 thirty second adverts for their formula (Chetley, 1979). The worrying trend was that the adverts were heavily focussed on the developing world, and this is where not many people have had the opportunity to be educated and especially so in those days of the 1970s therefore many parents fell for this and it is no wonder these companies made lots of money at the expense of the health of these children.

Nutrition promotion left in the hands of the appropriate people or organisations has been seen improve the nutritional status of children for instance the weight of children improved after combining food aid and nutrition education (Walsh et al., 2001). Additionally, nutrition promotion should also advocate for a diverse nutritionally adequate diet to prevent malnutrition and its effects (Hatloy, Torheim, Oshaug, 1998). To ensure that sufficient amount of nutrition is available especially for the children, communities that eat food from one bowl should use separate bowls. This is because not all people eating from the same bowl have the same speed in eating and children, who are not usually fast eaters, may end up not having a nutritionally adequate diet not because the diet was not nutritionally adequate but because the children were not able to eat at the same pace as the other people with whom they were sharing the bowl of food. It is not enough to say that the children in the household should share the bowl of food together because then the same issue arises, some children are generally faster eaters than others and as such the same scenario would be repeated as of sharing the bowl of food with
adults. Therefore, people should have the access to their own bowl of food to ensure that adequate nutrition is taken by each member of that particular household.

Nutrition education is very important as the knowledge it provides can be used to curtail the vicious cycle of malnutrition such as that of undernourished girls and women giving birth to underweight and even stunted babies. These infants have a limited ability to learn and are eventually likely to end up becoming parents to children who are underweight and with intra-uterine growth retardation thus increasing their risk of suffering from chronic diseases in their adult life (Susilowati & Karyadi, 2002).

3.7. Growth Monitoring and Promotion (GMP)

Growth Monitoring and Promotion (GMP) are the nutrition interventions that measure child weight and height and also represent that weight on a chart and finally use the gathered facts to advise parents on how to improve the children’s growth (WHO, 1986). Consequently GMP plays the role of a screening programme for undernutrition (Roberfroid, Kolsteren, Hoeree & Maire, 2005a; Garner, Panpanich, Logan, & Davies, 2000). In the developed countries it also screens for over nutrition (Garner, et al., 2000).

There is little scientific evidence to support Growth Monitoring and Promotion (GMP) programme. In spite of this they are deemed as a valid approach to nutritional problems and have been encouraged particularly in developing countries as it has been hoped that regular weighing of children would lead to early detection of retardation in growth. Additionally, it has been proposed that the growth charts generated would act as a teaching tool creating awareness to both the health workers as well as caregivers on the
current state of the child’s growth, the growth chart acts as a pictorial tool making the child’s growth visible to the health workers and the care givers and as such encourages the communication between them (Roberfroid, Lefevre, Hoeree & Kolsteren, 2005b). In case of growth faltering, the chart would help identify thus from this the appropriate measures can be taken to improve the child’s nutrition and immediately started and followed (Roberfroid, et al, 2005a). In growth charting several anthropometric measurements can be used, weight, height, head circumference, mid upper-arm circumference and chest circumference, however the weight for age has been noted to be more sensitive to change than the other measurements (Kapil, Joshi & Navar, 1994). However, mid upper-arm circumference is simple and rapid.

Growth monitoring has several objectives among them being the detection of faltering growth, promotion of children optimal growth and possibly the early identification of those who may be at risk of malnutrition (Kapil, et al., 1994). Additionally, it helps in providing nutritional education to the caregivers as well as informing them on their child’s current nutritional status (Garner, et al., 2000). For the objectives of growth monitoring to be met, the taking of the anthropometric measurements should be done correctly, with the right instruments that have been calibrated and standardised to avoid errors which could be fatal, for example by failing to detect a malnourished child. This also raises another important view which is that of staff training (health workers in this case); the staff should be well trained on how to use the instrumentation for anthropometric measurements and also how to plot and read the charts to avoid incorrect results.
Despite the many positives that are associated with growth monitoring it also has been found to cause harm especially to the caregivers, making them be anxious for no particular reason. This is particularly true in cases where the anthropometric measurements were not carried out correctly. This anxiety may impede the care givers from providing good child care (Garner et al., 2000).

3.8. Training

Training in this case is two–faced; first, the implementers/facilitators of the poverty and malnutrition intervention strategies should be well trained and, second, the community within which the programme is being implemented needs to be trained.

Implementers, who are most likely in this case to be health workers, should undergo rigorous training especially as pertains to nutritional health and the symptoms associated with poor feeding. Training has been cited as crucial in propelling a community based project to success (Askew, 1989). The health workers should be well taught on how to read and plot growth charts which are very crucial in GMP and which are an important tool in noting faltering growth. The staff should be motivated and supported in whatever ways deemed necessary so that their overall output and focus is placed on the community that they are serving.

The staff should be well supervised and not left at their own devices. Some programmes have failed to meet the intended objectives mainly due to staff inadequate training, a good illustration is the study by Hendricks, et al., (2003) whose main aim was to find out the efficacy and impact of (PEM) scheme, a take-home nutrition supplementation programme
whose main target were pre-school children, expectant and lactating women in Northern Cape province, South Africa. As a result of poor training a third of the clinic staff could not detect pregnant and lactating women who were nutritionally at high-risk and therefore there was low coverage of this group.

Then again in GMP, there have also been cases of underutilisation of the “Road To Health” Chart (RTHC), poor plotting of the growth charts where the RTHC has been used and lack of entry of important nutrition information. In one instance, this laxity of health workers caused 84- 95% of nutritionally at risk children eligible for the food supplementation and nutrition monitoring programme to be left out of the intervention programme (Schoeman, Hendricks, Hattingh, Benade & Laubscher, 2006). Another pertinent issue with training is inaccuracies in weight measurement as a result of poor maintenance, calibration and the standardisation of scales. Additionally, there can be weight measurement inconsistency as was in the case in the study by Schoeman, et al., (2006) between that taken by the nurses and that of the researcher. In this study the difference of weight measured between the nurses and the researcher ranged between 200 g and 600 g. This difference can affect the nutritional assessment of individual children, children maybe viewed to have normal weight when in actual sense they are underweight and this may result in fatality as they may not be detected in good time for them to recover from malnutrition.

To address this training should not only be for the top officials running the programme but also be for the junior staff who will be implementing the programme at the grass root level. Failure to do this means that the programme as a whole will not meet its objectives and target audience.
Insufficient training, laxity and demotivation are not the only factors that hinder health workers from performing their duties satisfactorily. There could also be elements of the health workers being apathetic because they are not any different, socially, economically from the people/patients they see in the clinics because they too were raised and live in the same deprived conditions as their patients and are therefore unable to internally visualise the objectives.

The community where the strategies are being implemented to eradicate poverty and malnutrition also requires training so that they can be equipped with the skills required to sustain and produce efficiency to the community based interventions set up (Oldewage-Theron, Dicks, Napier, & Rutengwe, 2005). Among many other skills that should be trained to the community members are such as record keeping, thrift and banking (Olaleye, 2007) as these skills would be beneficial in poverty alleviation.

3.9. Good Breastfeeding and Weaning Practices

Breast milk has been found to confer protection from the mother to the baby enabling the immune system of the baby to fight off infection better than that of a non breast fed child (Morley, Cole, Powell, & Lucas, 1988). Breastfeeding is crucial for infant development including the mental development of the child (Latham, 1999). There is a close relationship between breastfeeding, the health status of an infant and its survival (Lantz, Partin, & Palloni, 1992). According to UNICEF about 1.3 million lives are lost annually as a result of insufficient exclusive breastfeeding and another 600,000 due to discontinuation of breastfeeding once complementary foods have been introduced.
Furthermore, one third of malnutrition has its roots from inadequate infant and child feeding practices (UNICEF, 2008).

The WHO recommends exclusive breastfeeding in the early months of life up to six months with the introduction of complementary foods and continued breastfeeding thereafter. The complementary foods should be safe, nutritionally adequate and appropriate. WHO Expert consultation on the optimal duration of exclusive breastfeeding recommends that infants can be exclusively breastfed even at six months. This is provided that certain problems are tackled such as nutritional issues of pregnant and lactating mothers or the micronutrient status of infants living in areas with high deficiencies for example vitamin A, zinc, and iron. Another crucial problem area that should be tackled in having exclusive six months breastfeeding is the primary health care of infants, assessment of growth and signs of micronutrient deficiencies (WHO, 2001).

Mothers should be encouraged and supported to breastfeed their babies (Armar-Klemesu, et al., 2000; Walsh, et al., 2001; Mahgoub et al., 2006) and the introduction of complementary foods should be timely (Mahgoub et al., 2006). The giving of complementary food should be accompanied by breastfeeding.

3.10. Improved Farming Methods

A substantial contributor to the economies of many African countries producing more than half of the annual Gross Domestic Product (GDP) is agriculture (USAID, 1982). Despite this the poor in Africa still face chronic food insecurity (Sere & Rege, 2005). It is for this reason that improved farming methods should be used to increase agricultural
productivity ensuring household food security and reduction in poverty (USAID, 1982). Only a limited number of countries can boast of having had economic growth without agricultural growth either preceding it or accompanying it (Matsuyama, 1991).

Agriculture biotechnology is one of the ways in which improved farming methods may offer a significant opportunity to speed up the development of plant varieties that can withstand the harsh conditions of some of these areas such as drought and pests (Sere & Rege, 2005). Additionally, agriculture biotechnology has the capability of coming up with higher yielding plant varieties and also has the prospect of developing vaccines and targeting animal diseases which limit livestock production in these countries. Improved farming methods also promote increased agricultural productivity and land development thereby addressing household food insecurity (Oldewage-Theron, et al., 2005).

Farming may also be enhanced by governments through their ministries of agriculture supplying better quality seeds at subsidised prices to small scale farmers. In so doing the government authorities would encourage the growth of health and safe consumables crops which would be a good contribution in poverty and malnutrition alleviation. This is because the small scale farmers can either produce this for their own consumption plus use it as a source of income.

On the same note, livestock breeding can be improved through the use of genetic markers which would be manipulated to include important traits such as better quality animals, disease-resistant livestock, as well as improved productivity (Sere & Rege, 2005). In this review where the context is urban sub-Saharan Africa, there have been several studies done that have shown that urban agriculture has a favourable impact on children’s nutritional
status. However, agriculture biotechnology as a whole may not be possible for the poor people without the help of other financiers such as the government and other nongovernmental organisations. This is mainly because this kind of agriculture biotechnology in itself requires enormous sums of money which the poor cannot afford and again, the poor also lack the basic education thus the biotechnology strategy is just too complicated for them. It can only be practicable if other people, for instance the government with the funds and also with the appropriate education or know how assisted in setting up this form of agriculture.

Fan, (2002) in an article written on agricultural research and urban poverty in India for the Environment and Production Technology Division, International Food Policy Research Institute (IFPRI) argues that agricultural growth leads to reduction of urban poverty. Fan (2002), continues to give proof of this by using an econometric model which could estimate urban poverty equation, a price determination function and an agricultural production function. The econometric model was used because agricultural investments influence food prices, which consequently has an effect on poverty. It would otherwise have been difficult to depict this relationship in a single equation. The results of this (econometric model) indicated that with increase in agricultural output food prices fall. Food prices have a major impact on urban poverty. A one percent drop (increase) in food prices results in urban poverty lessened (increased) by 0.35%; furthermore urban poverty drops by 0.21% for every increase in agricultural research.

In most African countries urban farming has provided some form of food security and survival strategy for the poor (Foeken, Sofer & Mlozi, 2004; Deelstra & Girardet, 2000). Urban agriculture not only acts as a means to provide food but also provides direct and
indirect income. Directly, farm produce is sold to provide cash which can then be used to buy other essential commodities while indirectly, most of the households are able to save money by consuming the products that they grow (Foeken et al., 2004). Other ways in which agriculture can be of benefit to the poor is through greater employment opportunities to the surrounding community thus raising living standards, lowering of some food prices especially of the food that is being cultivated or grown in that area, and greater access and availability to more fresh and nutritious foods as they are their own produce. In addition, agriculture has the ability to empower the poor by providing a route through which they are in a position to increase decision-making processes that they can implement and get some benefit (Ryan, 2004).

A study was conducted by Maxwell, Levin & Csete, (1998) at Kampala (an urban city which is also the capital of Uganda), for the Food consumption and Nutrition Division, International Food Policy Research Institute. The objective of the study was to find out the relationship between nutritional status and semi-subsistence urban food production. A survey was carried out in Kampala in 1993 included 360 households that were selected into a multi-stage, random sample. The data was collected during two periods, the rainy season (April) and during the harvest time (July-August). The results of the study revealed that the prevalence of stunting and being underweight were lower in children coming from farming households especially those from low socioeconomic status. Therefore urban agriculture has an unquestionable positive influence on public health through improved nutritional status of children, predominantly among those of a lower socioeconomic status.
In Lusaka, Zambia’s capital city, urban agriculture has made a significant impact to the urban population by providing sustainable urban development, food security and poverty alleviation (Simatete & Binns, 2008). However not many governments encourage urban agriculture for instance in Nairobi, Kenya, livestock keeping is illegal within the city (Baharoglu & Kessides, 2001).

Other important issues when considering the success of poverty and malnutrition intervention strategies is that the environment in which the programme alleviating poverty and malnutrition should be paid attention to (Gartner et al., 2007), as the environment may contribute to other external events that may lead to indirect effects on the impact of the programme. For example in the study by Gartner et al., (2007) there was a high rate of migration in and out of Diourbel, Senegal. The in-migration maybe attributed to the fact that Diourbel is located near a holy place that offers support to poor people. Other issues that could lead to migration are due to natural disasters and political or civil conflicts. Globally there are over 26 million refugees and internally displaced people and these people also need proper nutrition (Sulisowati & Karyadi, 2002) and as such when programmes are being developed to alleviate poverty and malnutrition in regions where there are refuges and displaced people they too should be considered.
Chapter 4: Discussion

Whereas the previous chapter examined some strategies that have been employed to eradicate malnutrition in sub-Saharan Africa, this chapter will collate these strategies and examine their inter-relationship. The findings from the review section are summed up in a proposed model.

Figure 3: Model showing the causes of malnutrition and the possible interventions that maybe used to curb it.

The model depicted in figure 3 showing the causes of malnutrition and its possible intervention strategies will be the basis of my discussion about trying to break the vicious
cycle associated with poverty and malnutrition. It should be emphasised that this model is an over-simplified representation of the various interactions of causes that could potentially combine and leave the afflicted people vulnerable.

Models depicting malnutrition and its causes have been previously proposed and drawn such as Susilowati and Karyadi (2002). However, to truly give an adequate presentation of all the various interactions could result in a diagram that would be extremely complex even though it may contain just a few causes and intervention strategies.

There are many more interactions that maybe drawn from this model such as sequential models, cyclic models and spiral cyclic models. An example of a cyclic model is that of a mother with no education who has few chances of getting employed and also has no idea on how to take good care of herself nutritionally or otherwise. This results in intra-uterine growth retardation during pregnancy giving rise to a poorly nourished infant who, even if has the opportunity to go to school, has diminished learning abilities due to poor diet and as such is not better placed in the society. This child ends up being poor just like the mother and continues to perpetuate the vicious cycle.

The greatest issue here would be how to put an end to these interactions; which part of the link would be easier to break therefore putting a stop to the other cascading effects of the interacting factors leading to poverty and malnutrition? This in itself is a question that may have numerous answers; nonetheless, solutions must be sought. As poverty has been identified as being the major cause of malnutrition and its determinants (Sachs & McArthur, 2005), it is my viewpoint that poverty should be addressed in every way possible.
The model uses the nebula cloud to present the probable interventions that could provide solutions to the causes of malnutrition. “Nebula is a region or cloud of interstellar dust and gas appearing variously as a hazy bright or dark patch” (Nebula, 2008). The reason behind using the nebula cloud is that though the interventions in themselves are not vague, it is difficult to have a clear cut definition of what intervention may truly curb a certain cause of malnutrition due to the inter-linkage of the various elements that lead to malnutrition. It is for this reason that all the interventions can only be seen to work if they are combined and not separated in the alleviation of poverty and malnutrition.

It is observed that though the articles that were reviewed in this review were from different countries in sub-Saharan Africa, the interventions that were put in place or recommended were not that different as evidenced by the “clouds” in the model. Similar issues or intervention strategies seem to have been considered. This clearly indicates that the problem is the same and that it is only the region of the world or Africa that differs. The most recommended poverty and malnutrition intervention strategy was education. It appears in every “cloud” in the model (Figure 3), (Armar-Klemesu et al., 2000; Walsh et al., 2001; Oldewage, et al., 2005; Gartner et al., 2006; Mahgoub et al., 2006; Gartner et al., 2007). This shows the magnitude that education has in the alleviation of poverty and malnutrition. UNICEF acknowledges that the equal access to education is the basis for attainment of all other Millennium Development Goals; however, statistics still indicate that for every 100 boys not in school there are 117 girls in the similar predicament (UNICEF, n.d.).
Education prepares individuals in an all round manner and it is therefore a doorway to better employment, better health, better child caring practices, better hygiene and improved nutritional status for not only the children in the family but also for the family as a whole and thereby the whole community. It also allows the educated person to make informed decisions on life and issues pertaining to general living.

Education can be instrumental in reducing the causes of malnutrition starting with its major cause, poverty. It can do so by tackling unemployment by imparting knowledge to people on how to use credit well in order to generate income. Many people in poor societies are intimidated by taking loans from money lending institutions for fear of not knowing how to utilise the credit borrowed enabling them to be able to pay back the credit and still make a livelihood for themselves. Then again, not many money lending institutions would be willing to lend credit to the poor as they have no collateral and as such are afraid of ending up in bad debts. Despite this there has been a co-operative society that has lent credit to the deprived people in Kenya’s Korogocho slums known as Akala Designs. With the help of the credit extended to the slum dwellers, the poor people in this slum have been able to manufacture Ecosandals® and export them to different regions of the world (Ecosandals, n.d.). Education has the ability to not only impart knowledge to people on how to handle credit but also on how to get the best out of the so received credit.

Secondary malnutrition can also be prevented by education as education enlightens people on how to prevent certain diseases; understanding the cause of a disease makes its prevention much easier. For example, through education women or the community in general can understand how to prevent food contamination by various parasitic and
bacterial micro-organisms through personal and food hygiene practices such as boiling of water, hygienic food handling, proper food preparation techniques and also the good use of proper waste disposal. Through this, secondary malnutrition may be reduced as it is a disease-related malnutrition.

High food prices can cease to have a serious effect on the poor if the poor have education and understand what other food groups can be used to provide them with the adequate nutrition they require other than that from the food experiencing high market price. This is because nutrients that the body requires can be found in several foods for instance carbohydrates, which is one of the basic macronutrients that the body requires, can be found in various foods such as maize, rice or plantain (cooking banana). Therefore when there is a high market price for maize, then the carbohydrate alternative can be used as it would still provide the same nutrients as the maize. However, this would only be practicable if the people are educated to understand what food can act as an alternative for another in the case of high food prices.

Education not only makes daily living better but it stretches forth into the future. It seeks to prepare the educated person or community to want a much better life for their offspring. It does this by encouraging broadmindedness of the educated, into wanting to build a better life for those to come in the future and for this reason, the educated has an understanding for instance as to why to space children, breastfeed longer and even why it would be beneficial to empower women.

It is interesting to note that of the ten articles reviewed in this study only one article (Oldewage-Theron et al., 2005) cites improved farming methods as an intervention
strategy for the alleviation of poverty and malnutrition. This could be as a result of the opposition agriculture has received in many African cities from the various city authorities. For example urban agriculture in Kenya has been made illegal by both the colonial and post-colonial administrations. During the colonial era, particularly during the Mau Mau rebellion in the 1950s, urban agriculture was illegal as the crops were thought to be hiding grounds for fugitives whereas during the post-colonial times, crops in the cities are seen as places where thugs hide (Freeman, 1991). It could also be as a result of inadequate land spaces to practice farming as most of the poor in cities live in slums that are crowded and therefore there is no land available for farming. Numerous slum areas exist within Nairobi and contain a large proportion of the city’s population.

Of the interventions that have been mentioned it has been quite apparent that it is hard to identify a strategy that reduces poverty without it reducing malnutrition too (Alderman, Appleton, Haddad, Song & Yohannes, 2001). Poverty eradication should be a task taken up by all who have any form of authority be it the governments of these countries or even the non-governmental organisations. This fight should not only be left to those in power but it should be a mantle that should be taken up by all citizens of a country regardless of how big or small or how young or old they are. This would only be possible if everyone was to fully take up their responsibilities; for instance the government should try and provide good education for its people at an affordable rate, meanwhile the parents should take their children to school and the responsibility of the child would be to work hard in school and excel. Unfortunately, such a sequence of events would only happen in a utopian environment as there will always be cases of people or persons not taking up their responsibilities either in their individual capacities or even in their capacities within
governments. On the other hand, the term “affordable” is relative, because what would be affordable to one maybe very expensive to another.

In as much as it is important that there is a concerted effort between the citizens of a country together with the authorities in poverty and malnutrition eradication. The role of government is crucial as it has the ability to either provide good or bad governance which would either influence poverty and malnutrition positively or negatively. Good governance brings about good management of resources, good performance, a reliable custodian of public funds, good public engagement and eventually leads to good outcomes (Langlands, 2005).

The limitations in the study include, the difficulty experienced when trying to search for articles written on the subject area despite the numerous projects that have been implemented in Africa by both governmental and non-governmental organisations. This difficulty in tracing the articles leaves one wondering why once programmes have been implemented to alleviate poverty and malnutrition in Africa, they are not reviewed to check the kind of impact they had on their target population. Implementing a programme is not enough without checking if the objectives of the programme were met and how the programme helped in alleviating poverty and malnutrition.

From this, I recommend that more feed back from the implementers or facilitators of the programme and also the feedback from the benefiting community should be investigated and even documented. As a programme would only be of benefit to the target communities if any previous teething problems in its implementation have already been addressed. Another recommendation is that the governments or any respected authority
for that matter, of the countries experiencing poverty and malnutrition should be in the forefront in supporting the running of these programmes and they too should offer good leadership.
Chapter 5: Conclusion

Poverty eradication would lead to the reduction of malnutrition. As seen in the diagram (Figure 4), the arrow coming from poverty reduction brings about improved child nutrition which in turn results in enhanced human capital and eventually growth in the economy. Human capital is the stock of skills and knowledge embodied in humans which enable economic growth (Hayami, 2009). The eradication of poverty would involve many elements such as nutrition, health, and even education, however, the key element here is education. This is because human capital can only be achieved through the educational attainment of the labour force thereby contributing to future economic productivity (Benhabib & Spiegel, 1994). This can only happen if governments and non-government organisations join in the cause to help the citizens and ensure that education, health and nutrition programmes are in place and well run, as improving the nutritional status of children is a national priority and crucial for future economic developments (Martorell, 1999).
Figure 4. A diagram showing the link between improved child nutrition and economic development (taken from Martorell, 1999).

Reduction of poverty and ultimately malnutrition can be tackled through community participation, income generation projects, childspacing, GMP, nutrition promotion, breast feeding and good weaning practices, empowering women and improving farming. A noteworthy point is that many of these strategies to eradicate poverty and malnutrition can all be encompassed under the umbrella of community participation.

Community-based projects which involve the community from the beginning to end in the implementation of the strategies seem to have a much greater impact in the alleviation of poverty and malnutrition. This is mainly due to the fact that they have the support of the community, in the implementation and in their operation. Additionally community-based projects have been shown to have a much greater impact if they receive support not only from the community benefiting but also from the authorities as seen in the case of Thailand (Tontisirin & Bhattacharjee, 2008). Even though this is not an example from
Africa, ministries such as agriculture, public health and education were engaged to reduce malnutrition.

Another successful example in community-based projects that also received support from authorities (the cultural leaders) of the community is the Navrongo Family Spacing and Health Project in Northern Ghana, which was able to promote the use of contraceptives in a high fertility traditional region (Phillips et al., 2003). Through the help of the traditional leaders, community participation was able to promote child spacing in a region which would have otherwise not accepted to space their children due to cultural norms.

Community-based participation can also be very instrumental in promoting education to the members of the community, however this will be dependant on the community’s appreciation for education (Nafukho, Amutabi, & Otunga, 2005). The community’s appreciation for education may either encourage or dissuade the general community including the children from seeking education. Education enhances personal development as well as community development through participation in economic activities thereby raising or uplifting the living standards of the community.

Through the community-based projects also another very important element in the elimination of poverty and malnutrition is addressed which is that of raising or uplifting the living standards of the beneficiaries of the project by the encouraging and implementation of income generating projects.
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Appendix I – Data Review
**Author:** Hatloy et al., (1998)

**Title:** Food variety – a good indicator of nutritional adequacy of the diet? A case study from an urban area in Mali, West Africa

<table>
<thead>
<tr>
<th>Setting/Location</th>
<th>Koutiala Town, Southeast Mali</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Funding</strong></td>
<td>Nordic Africa Institute, the Norwegian Research Council and the Norwegian Universities, Committee for Development Research (NUFU).</td>
</tr>
<tr>
<td><strong>Study Objectives</strong></td>
<td>To find out if a simple food count and food groups can assess the dietary nutritional sufficiency of a poor country</td>
</tr>
<tr>
<td><strong>Study Design</strong></td>
<td>Dietary data was collected between April and August 1995 by four local research assistants under the supervision of a nutritionist. For over three consecutive days, the food intake was weighed for 67 children while for the other nine children the food intake was weighed over two days. Soehnle kitchen scale was used to weigh all foods and beverages consumed, during the preparation of a meal the ingredients were weighed too. To ascertain the amount of food consumed weighed portions of food were served to individual children and the left over was also weighed, so as to determine the child’s net intake</td>
</tr>
<tr>
<td><strong>Number of Households</strong></td>
<td>77 households</td>
</tr>
<tr>
<td><strong>Target Group</strong></td>
<td>77 children aged 13 to 58 months</td>
</tr>
</tbody>
</table>
| **Bias Control**       | • The participants in this case were children who were selected randomly, the first household in each administration sector was picked randomly through a residence list from the town hall, the other households were picked randomly by taking the neighbour household next-door at left-hand side.  
• Statement indicating that there was no manipulation of the quantity and quality of foods given to the children by the caregivers  
• The Food Variety Score (FVS) and Diet Diversity Score (DDS) were checked for specificity and sensitivity using the Mean Adequacy Ratio (MAR), a gold standard for nutritionally adequate intake |
| **Strategies Combating Poverty and Malnutrition** | • Encouraging of communities that eat from the same bowl to use separate bowls.  
• Nutrition promotion |
| **Statistical Analysis** | There was a positive correlation between FVS AND MAR and between DDS and MAR. The cut-off points for FVS were at 23 while for DDS was six, |
| **Results**            | These indices are capable of detecting people with a nutritionally inadequate diet, as FVS should be at least 15 or DDS at least five so as to give a MAR that is satisfactory. |
| **Conclusion**         | Food scoring is an important tool in evaluating the nutritional adequacy of a diet (mainly so when FVS and DDS are combined) for vulnerable groups in areas where people usually eat from shared bowls. |
**Author:** Armar-Klemesu (2000)

**Title:** Poor Maternal Schooling is the Main Constraint to Good Child Care Practices in Accra

<table>
<thead>
<tr>
<th>Setting/Location</th>
<th>Accra, Ghana</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Funding</strong></td>
<td>World Health Organization, the Rockefeller Foundation, the International Development Research Centre and the Canadian International Development Agency.</td>
</tr>
<tr>
<td><strong>Study Objectives</strong></td>
<td>The aim of the study was to find out between the two, maternal and household factors, which was more constraining in the providing of quality child care in an urban, African setting</td>
</tr>
<tr>
<td><strong>Study Design</strong></td>
<td>Data obtained from a representative quantity survey of households with children less than three years was used. The data tested hypothesis on what constraints between maternal and household factors hindered good child care</td>
</tr>
<tr>
<td><strong>Number of Households</strong></td>
<td>556 households</td>
</tr>
<tr>
<td><strong>Target Group</strong></td>
<td>Children less than three years old</td>
</tr>
</tbody>
</table>
| **Bias control** | - A two-stage sampling technique was used to control selection bias  
- Double entry of data was done to minimize data entry errors. |
| **Strategies combating poverty and malnutrition** | - Maternal education, mothers should receive the education before the birth of a child, thus the promotion the girl child education is crucial. The promotion of the girl child is a fundamental step towards the alleviation of poverty and malnutrition reason being if when the girl child is not yet a mother she is left the responsibility of taking care of the younger child, therefore she too needs to be enlightened on good child care practices.  
- Breast feeding should be encouraged for up to four to six months after the birth of the baby.  
- Prenatal clinics should be used to educate mothers on good child care and child feeding habits. The study even gave a good illustration as to when the prenatal clinics may have a better opportunity to have a much better interaction between health workers and the mothers was during the DPT immunizations which requires three visits for three dosages or immunizations given during the first three months. |
| **Statistical Analysis** | ANOVA test was used for the childfeeding index while Chi-square test was used for the health and hygiene indices |
| **Results** | Mothers/child-carers nutrition education and good child care practices are important tools to nutritionally healthy children. |
| **Conclusion** | Child feeding practices were more reliant on the mother’s education than on economic and household food availability. |
**Author:** Walsh et al., (2001)

**Title:** The Impact of a Nutrition Education Programme on the Anthropometric Nutritional Status of Low-Income Children in South Africa

<table>
<thead>
<tr>
<th>Setting/Location</th>
<th>Free State and Northern Cape Province, South Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Funding</strong></td>
<td>Centre for Science Development</td>
</tr>
<tr>
<td><strong>Study Objectives</strong></td>
<td>To assess the impact of a community-based nutrition education programme using community nutrition advisors who had been previously trained</td>
</tr>
<tr>
<td><strong>Study Design</strong></td>
<td>The study was carried out over a period of two years in four study parts of Free State and Northern Cape Province. As a food aid programme was being implemented at the same time as the nutrition education programme, two controls were set up so as to compare the effects of the two. Height for age, weight for age and weight for height were measured and standard deviations from the NHCS reference median was used.</td>
</tr>
<tr>
<td><strong>Number of Households</strong></td>
<td>Not presented.</td>
</tr>
<tr>
<td><strong>Target group</strong></td>
<td>Mixed-race children aged between two and five years old</td>
</tr>
<tr>
<td><strong>Bias Control</strong></td>
<td>The control used were two rural areas in close proximity with the study areas which had not experienced the Nutrition Education programme.</td>
</tr>
</tbody>
</table>
| **Strategies Combating Poverty and Malnutrition** | • Improving of nutritional knowledge combined with food aid is more advantageous in improving weight-for-age than just having food aid alone with no nutritional education, and this is especially so when the nutritional education is focused on mothers, expectant and lactating women and in general child carers.  
• Good breast-feeding and weaning practices should be encouraged.  
• Unemployment issues should be addressed as well as poor housing and healthcare.  
• Promoting of income generating projects so as to raise the living standards of the poor.  
• The level of literacy should also be improved so as to alleviate poverty and consequently malnutrition |
| **Statistical Analysis**         | Not presented                                       |
| **Results**                      | The weight-for-age improved for all the areas studied however there was a significant difference in the urban dwelling children (both boys and girls) and was only significant in boys in one rural area. Weight-for-height in the urban area also significantly improved but there was no significant height-for-age improvement for any area. |
| **Conclusion**                   | Both the food aid programme and the nutrition education programme were successful in improving the weight of the children, however failed to show an improvement in terms of the stunted status. |
**Title:** Evaluation of a Nutrition Supplementation Programme in the Northern Cape Province of South Africa.

<table>
<thead>
<tr>
<th>Setting/ Location</th>
<th>Northern Cape Province, South Africa</th>
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<tr>
<td>Funding</td>
<td>Health Systems Trust</td>
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<tr>
<td><strong>Study Objectives</strong></td>
<td>The purpose of this study was to determine the efficacy and impact of a take-home nutrition supplementation programme, known as the Protein Energy Malnutrition (PEM) Scheme targeting expectant and lactating women and pre-school children in the Northern Cape Province, South Africa.</td>
</tr>
<tr>
<td><strong>Study Design</strong></td>
<td>Cross-section descriptive study was carried out for more than six months in the six areas of Northern Cape Province. Health personnel and programme managers in charge of executing the PEM scheme were interviewed. Children aged six months to six years old, clinic records were also checked so as to assess the impact of the PEM scheme on growth</td>
</tr>
<tr>
<td><strong>Number of Households</strong></td>
<td>Not presented</td>
</tr>
<tr>
<td><strong>Target Group</strong></td>
<td>Children aged six months to six years old, pregnant and lactating mothers.</td>
</tr>
<tr>
<td><strong>Bias Control</strong></td>
<td>The data was gotten from both the personnel implementing the PEM scheme and also from the clinic records of the children</td>
</tr>
</tbody>
</table>
| **Strategies Combating Poverty and Malnutrition** | • Promoting of community-based income generating projects would have led to community participation and involvement.  
• Growth monitoring, nutrition promotion and training by the implementers of the PEM Scheme would have brought about a greater impact of the programme  
• There was low turnout for expectant and lactating mothers as a result of inadequate training of the clinic staff, therefore it’s not enough to only train the top people implementing the nutrition programme but it is also of critical importance that the juniors are trained as well |
| **Statistical Analysis** | In 25% of the sample there was an improvement in weight for age z-scores after enrolment into the programme having a significant difference (p<0.001, t=4.8) between the mean baseline weight for age z-scores and during follow up |
| **Results** | In the province, 85% of health facilities were involved in the PEM Scheme. The approximate coverage of malnourished children was 50% while for lactating and pregnant women was 60%. |
| **Conclusion** | There were several problems with the implementation of the PEM scheme, therefore some recommendations were made so as to improve its efficacy in the province. |
### Author: Oldewage-Theron et al. (2005).

### Title: A Community-based Integrated Nutrition Research Programme to Alleviate Poverty: Baseline Survey

<table>
<thead>
<tr>
<th>Setting/Location</th>
<th>Vaal Triangle, South Africa.</th>
</tr>
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<tbody>
<tr>
<td><strong>Funding</strong></td>
<td>The National Research Foundation, Department of Education and Health in the Vaal Triangle, Sedibeng local council and the Vaal University of Technology</td>
</tr>
<tr>
<td><strong>Study Objectives</strong></td>
<td>The purpose of this study was to investigate situation analysis prior to designing intervention.</td>
</tr>
<tr>
<td><strong>Study Design</strong></td>
<td>The study design was a community participatory one, which entailed five phases: Phase One: plan of operation, Phase Two: baseline cross-sectional survey, Phase Three: situation analysis, Phase Four: implementation of community-based intervention studies and Phase Five: impact measurement. The data was collected through the use of a pretested demographic structured health questionnaire.</td>
</tr>
<tr>
<td><strong>Number of Households</strong></td>
<td>357 randomly selected households in an informal settlement</td>
</tr>
<tr>
<td><strong>Target Group</strong></td>
<td>People living in informal settlement in the region of Vaal Triangle, South Africa.</td>
</tr>
<tr>
<td><strong>Bias Control</strong></td>
<td>Random selection of households</td>
</tr>
</tbody>
</table>
| **Strategies to combat poverty and malnutrition** | - Promotion of improved farming methods so as to increase agricultural productivity, this will serve as a way of tackling household food insecurity  
- Nutrition education should be provided to the community at large  
- Training programs which will equip the community with the skills required to sustain and produce efficiency to the community based interventions  
- Women hold a very important place in households and therefore should be empowered with knowledge and the necessary skills to uplift their living standards and also gain expertise in matters of health and good child care practices |
| **Statistical Analysis** | Not presented |

| **Results** | 100% of the participants saw the need of such a project, 74% recognized the need of planning the workshop while 64% comprehended the importance of sustainable community development. At base-line, 33% of respondents had a household size of six people or more, 18.5% had households of five people, 21.3% households with four people, while households with three people or less was 27.2%. Respondents living in zinc shacks were 89% at base-line; 32.2% with two rooms or less, 41.5% with three to four rooms and 26.3% with four rooms or more. |
| **Conclusion** | Poverty and household food security were key problematic issues |
**Title:** Determinants of nutrition improvement in a large-scale urban project: a follow-up study of children participating in the Senegal Community Nutrition Project.

**Setting/ Location**  
Diourbel, Senegal

**Funding/ Support**  
Supported by the Institute of Research for Development (IRD).

**Study Objectives**  
The aim of the study was to assess the benefit of the Community Nutrition Project (CNP) by checking for improvement in weight-for-age in the participants (children) who had been involved in the study two years earlier.

**Study Design**  
CNP child monitoring data was used in the follow-up study. Monthly growth monitoring, promotion and weekly food supplements were provided with the condition that the mothers attended the weekly nutrition education sessions.

**Number of Households**  
Not presented

**Target Group**  
4084 children who participated in the first two years of the CNP aged six to 35 months old and were nutritionally at-risk

**Bias Control**  
Bias was controlled by comparing with the initial sample.

**Strategies Combating Poverty and Malnutrition**
- Amalgamating food supplementation and nutritional education produced better weight-for-age effects especially in the underweight children and this was especially noted in the underweight children whose mothers regularly attended the nutritional education sessions, an indication that the mothers awareness of nutrition had being raised by attendance to the nutritional sessions.
- The CNP food supplement should not replace the normal feeding of children, but rather it should act as a supplement.

**Statistical Analysis**  
Not presented

**Results**  
The mean weight-for-age between recruitment and follow-up ranged from 2.13 to 1.58 (SD 0.82). The increase in weight was tremendously noted in the children who were extremely underweight however they still did not reach the expected weight for their age during the six months of the study. Of the underweight only 61% recovered (six months was too short a period for them to catch-up growth.

**Conclusion**  
Six months of CNP intervention may not be adequate for severely underweight children to catch-up growth, longer duration of the CNP services may be required to produce maximum benefit.

Title: Factors Affecting Prevalence of Malnutrition Among Children Under Three Years of Age in Botswana.

<table>
<thead>
<tr>
<th>Setting/ Location</th>
<th>Urban and sub-urban areas of Gaborone, Kweneng, Maun and Tutume districts, Botswana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding</td>
<td>Not indicated</td>
</tr>
<tr>
<td>Study Objectives</td>
<td>The goal of the study was to evaluate and report on three commonly used indicators of malnutrition (stunting, wasting and being underweight) evident in malnourished children. The study also looked into other factors that are related to malnutrition such as breastfeeding practices, child birth weight, family headship, food intake frequency and maternal nutritional knowledge.</td>
</tr>
<tr>
<td>Study Design</td>
<td>To establish the nutritional status of children zero to three years of age a structured questionnaire and measurements of weight and height were used in a cross-sectional descriptive survey. The modified EPI cluster method was used to select two study areas from the four districts of Gaberone, Kweneng, Maun and Tutume. The method for sampling used was intended to reach fifty households with children aged less than three years old.</td>
</tr>
<tr>
<td>Number of Households</td>
<td>400 households</td>
</tr>
<tr>
<td>Target Group</td>
<td>Children less than three years old</td>
</tr>
<tr>
<td>Bias Control</td>
<td>Cross sectional study was used</td>
</tr>
</tbody>
</table>
| Strategies Combating Poverty and Malnutrition | • Child spacing is important as the study discovered a negative relationship as pertains to undernutrition in households that had more one child being under the age of three years old.  
• Maternal education and nutritional status of the child are important in curbing undernutrition.  
• Income generating programs should also be set-up so as to increase family incomes more so maternal income has been shown to be useful in curtailing children malnutrition. This income generating engagements should be tailored in such a way that they do not compromise the mothers child caring practices such as breastfeeding.  
• Breast feeding should be encouraged as it has important nutritional benefits to children and the introduction of complementary foods should be timely |
| Statistical Analysis | Children from single family households significantly suffered from being underweight (p<0.01) than children living with two parents. |
| Results           | The percentage of stunting was the highest (38.7%), followed by the level of being underweight which was 15.6% and wasting was 5.5% |
| Conclusion        | Higher levels of malnutrition were noted in children under the age of three years in households of single parent family, households with parents with low education and households with low earning. |
**Title:** The targeting of nutritionally at-risk children attending a primary health care facility in the Western Cape Province of South Africa

<table>
<thead>
<tr>
<th>Setting/ Location</th>
<th>Western Cape Province, South Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding</td>
<td>Not indicated</td>
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<tr>
<td>Study Objectives</td>
<td>The purpose of the study was to evaluate how primary health care (PHC) nurses identified nutritionally at-risk infants and children at a PHC facility for intervention purposes.</td>
</tr>
<tr>
<td>Study Design</td>
<td>The PHC nurses underwent through a structured interview so as to assess their understanding on case management guidelines. The socio-demographic status of the caregivers was also determined through the use of interview. To distinguish nutritionally at-risk children the PHC nurses used standardised nutrition case management guidelines.</td>
</tr>
<tr>
<td>Number of Households</td>
<td>Not indicated</td>
</tr>
<tr>
<td>Target Group</td>
<td>134 nutritionally at-risk children of less than six years (0 to 72 months)</td>
</tr>
<tr>
<td>Bias Control</td>
<td>Cross-sectional study was used</td>
</tr>
</tbody>
</table>
| Strategies Combating Poverty and Malnutrition | • In order to target more nutritionally at risk children household food insecurity identification should be strengthened so as to reach and provide support to those children for example through food supplementation  
  • Proper training of health workers especially on nutrition education and signs and symptoms associated with macro and micro nutrient deficiencies should be ensured so that they do not miss to diagnose nutritionally at-risk children.  
  • Income generating projects should be put in place to cater for factors that contribute to malnutrition such as unemployment.  
  • Growth monitoring and promotion (GMP) instruments should be well maintained, calibrated and standardised. Additionally the proper use of these instruments should be taught to the health workers so as to avoid inaccuracies.  
  • Proper supervision of health workers should be done to ensure that they provide the right kind of care to the community that they have been employed to serve. |
| Statistical Analysis         | Not presented                       |
### Results

The mean ages of the caregivers was 29.5 (SD 7.5) years and of these only 38% were married. Unemployed caregivers were 77%, those whose household had poor food security were 46% and 40% of the caregivers were financially dependent on non-family members. There was a significant nutritional risk to children if the caregiver was unemployed (54%) than when the caregiver was employed (32%) \( p=0.04 \). Children were also significantly more nutritionally at-risk when household food insecurity (63%) as compared to when there was household food security (37%) \( p<0.004 \). Children were not significantly at nutritional risk if the caregiver was supporting themselves financially or being supported by their partner (61%) when compared with those who received financial support from non-family members (35%) \( p<0.003 \). Weight measurements for the children taken by the nurses and the researchers differed significantly as the two used different scales and weighing techniques. Identification of nutritionally at-risk children also differed between the nurses and the researcher, according to the researcher identified (50%) of infants and children were nutritionally at-risk while the nurses only had only identified (10%) from the same group of infants and children. The nurses poor detection of nutritionally at-risk children was due to not plotting weights on the weight-for-age chart and not following the Road to Health Chart.

### Conclusion

- Addressing of problems identified in the PHC nurse’s practice so that nutritionally at-risk children can be identified and supported in good time so as to prevent morbidity and mortality.
- The socioeconomic criteria should be well identified and should be keenly looked into so as not to miss nutritionally at-risk children.
**Setting / Location**  
Diourbel, Senegal

**Funding**  
Project funded by the World Bank and executed by a private agency Agence Execution des Travaux Interet Public (AGETIP-Senegal).

**Study Objectives**  
To determine the effect that the Community Nutrition Project (CNP) had on the poor urban population of Diourbel, Senegal

**Study Design**  
Two cross-sectional surveys (pre and post) were conducted simultaneously for both the control zone (CZ) and the intervention zone (IZ). The base-line was carried out in 1995 just before the implementation of the CNP while the second survey took place eighteen months later which evaluated if there were any positive changes in weight, wasting and stunting in the 6 to 35 months old children.

**Number of Households**  
Not presented

**Target group**  
Underweight children who are six months to 35 months old, and their mothers. Children 36 to 59 months old also participated in the second survey

**Bias Control**  
- Pre and post comparison in the IZ and CZ, the IZ was a poor region known as Keur Cheikh Ibra and it was the target of the CNP while the control area was an area less poor than the intervention zone but was close in proximity to the intervention zone and it was not targeted by the CNP.
- Statement indicating that the same team that carried out the base-line survey was still the one that carried out the second survey eighteen months later and they used the same methods in the second survey as they had used in the base-line survey.
- Anthropometric measurements were performed as per the standardized procedures ensuring validity and reproducibility.
- To determine the correct age of the children, official documentation was used.
- The World Health Organization (WHO)/ National Centre for Health Statistics reference indices were used to interpret anthropometric data (weight-for-height, weight-for-age and height-for-age), from this children with extreme anthropometric values were excluded from the study.
- The data entry was validated by double entry
- Data was analyzed by other investigators and not the CNP officials or staff

**Strategies Combating Poverty and Malnutrition**  
- The environment in which the program alleviating poverty and malnutrition is taking place should be considered well in advance and attention should be paid to other external events that could lead to an indirect effect on the target and evaluation of the programme for example migration both in and out of the area, which consequently acts as a barrier to true assessment of the programme.
- Nutritional education, growth monitoring and food supplementation were all provided. The combination of food supplementation and education on nutrition have been noted to have a good outcome with respect to improving the malnutrition status of children.
| **Statistical Analysis** | • Socioeconomic comparisons between the two zones was done using analysis of variance for continuous variables and for categorical variables a generalized logit was used  
• The impact of the CNP was analysed using a modified Poisson regression model, where the prevalence ratio of malnutrition in the IZ to the ratio of prevalence of malnutrition was the main measurement. |
<table>
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</thead>
<tbody>
<tr>
<td><strong>Results</strong></td>
<td>There was no significant difference in stunting between the two zones, in the CZ there was a reduction in wasting. There was disappearance of wasting, stunting and low weight the children in the IZ. There was a positive socioeconomic impact in the CZ that was unaffiliated to the CNP.</td>
</tr>
<tr>
<td><strong>Conclusion</strong></td>
<td>There was a reduction in malnutrition in the intervention zone but no impact was of the programme was observed in the second year of the programme (control zone)</td>
</tr>
</tbody>
</table>
**Author:** Olaleye, (2007)

**Title:** Strategies of Co-operative Societies in Poverty Alleviation Among Urban Dwellers Communities in Ibadan, Oyo State, Nigeria.

<table>
<thead>
<tr>
<th>Setting/ Location</th>
<th>Ibadan, Oyo State, Nigeria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding</td>
<td>Not indicated.</td>
</tr>
<tr>
<td>Study Objectives</td>
<td>To examine the level of effectiveness of twelve strategies set up by the Co-operative Societies in Ibadan, Nigerian as well as make recommendations of how to enhance the performance of the co-operative societies in meeting their goals.</td>
</tr>
<tr>
<td>Study Design</td>
<td>Sample population selection was done by using the multi-stage procedure. Ibadan was stratified based on the eleven local government areas, random sampling was then used to select two co-operative societies from each of the three types of societies involved in the study and 60% (1276 in number) of the members of these societies participated in this study. Data collection was by use of questionnaires.</td>
</tr>
<tr>
<td>Number of Households</td>
<td>Not presented</td>
</tr>
<tr>
<td>Target Group</td>
<td>1276 members of the co-operative societies</td>
</tr>
<tr>
<td>Bias Control</td>
<td>Multi-stage sampling</td>
</tr>
</tbody>
</table>

**Strategies Combating Poverty and Malnutrition**
- Allowing credit to members of the co-operative societies with a convenient paying period, was rated by the members as a very effective strategy scoring a percentage of 91.2% for the credit allowance and 89.7% for the convenient pay back period.
- Training of members to acquire vocational skills was rated by the members as very effective and had a percentage of 55.8%
- The co-operative societies helping the members acquire motorvehicles for commercial purposes was seen as an effective strategy scoring 72.2%
- Members being trained in thrift and banking was ranked as effective and had a 53.8%
- The introduction to members to profitable ventures scored 42.8% with it being graded as an effective strategy
- The co-operative societies assisting the members in acquiring household items was another strategy that was regarded by the members as effective scoring 47.7%
- The training of the members in record keeping was also seen as an effective strategy in poverty alleviation and it scored a percentage of 35.7%

**Statistical Analysis**
- Not presented

**Results**
- Twelve strategies for poverty alleviation were identified by the members of the co-operative society and from the twelve strategies the members were also able to identify the strategies that they thought were most effective by using percentage ranking of the strategies; Credit allowance was ranked the most effective with a 91.2%, convenient pay back time was ranked second with 89.7%,

**Conclusion**
- For better performance, the co-operative societies should concentrate on fewer strategies to alleviate poverty and not on all the twelve that they normally have set in place.
Appendix II – Information on the Crisis State Research Centre and the Fund for Peace

The Crisis States Research Centre (CSRC) was launched in 2001 as an interdisciplinary centre which researches on processes of war, the collapse and also the reconstruction of fragile states. It is funded by a grant from the United Kingdom Department of International Development Fund (DFID) and is based within the Development Studies Institute (DESTIN) of the London School of Economics and Political Science. Its first research phase ran from its inception to the year 2005 and it is currently in its second phase of research, running from 2006 to 2010. The themes in the second phase are three and are interrelated; development as state-making, cities and fragile states and regional and global axes of conflict. CRSC aim is to explain at a given point in time whether a state is politically stable or is at the brink of disaster and this it does by looking at various systems of the state; security, administrative, legal, politics and economic management (www.crisisstates.com).

The Fund for Peace is an organization whose mission is to prevent war by alleviating the conditions that cause war. It does this by assessing conflict using its Conflict Assessment System Tool (CAST). In so doing the Fund for Peace organization releases a publication in the Foreign Policy magazine on failed states known as the Failed States Index (FSI), which is a publication whose focus is on various risk indicators based on the CAST software from numerous electronically available reports and articles. The Fund for Peace operates by looking into four lethal world conditions which include: chaotic human rights
status, deterioration of the environment, overpopulation and unequal distribution of resources. The risk indicators that the Fund for Peace utilizes are classed into three groups: Social indicators, Political indicators, and Economic indicators. These have then been split into twelve smaller categories, for example Economic decline, Violation of human rights, delegitimization of the state, to name but a few (www.fundforpeace.org/web/).

Apart from the Fund for Peace publishing the FSI, it also issues country alerts for countries experiencing instability or facing difficult circumstances that are related with the risk indicators. Additionally, it creates country profiles which act as a comparative tool of analytical change in the political or military indicators, and the social indicators between the previous years and the current year. The Fund for Peace also produces country assessments report service on request which is useful in assessing the stability and political risks of countries by considering key political, social and economic indicators (www.fundforpeace.org/web/)


The justification behind using these three bodies or organizations (CRSC, the Fund for Peace and the CIA fact book) is that they are recognized globally. The FSI from the Fund for Peace has been used internationally to describe the epidemiological homicide of media workers by investigating country level risk factors (Riddick, Thomson, Wilson &
Purdie, 2008). The CIA fact book has also been used in a previous published study on Cross-national variation in violent crime rates: race, r-K theory, and income. This study utilized information from the International Crime Statistics which had been published by both the 1999 CIA fact book and the INTERPOL (Rushton & Witney, 2002).
Appendix III – Profiles of the Countries Reviewed
(Information from the Fund for Peace website)

South Africa:

South Africa has a population of around 44 million, with 79.5% of this population being black, 9.2% white, 8.9% coloured (mixed race) and 2.5% of Indian or Asian decent. In the 1970s and 1980s it experienced political instability but was able to come out of this by negotiating a political shift from the white minority rule to black majority rule by having apartheid laws repealed in 1991. In 1994 South Africa had its first democratic election. This election installed a majority rule government under Nelson Mandela.

South Africa is rich in natural resources mainly minerals such as gold, platinum, chromium and diamonds. It has the strongest economy in sub-Saharan Africa with a GDP per capita of US$13,300 and for this reason it is a magnet for many of Africa’s refugees for example from Zimbabwe, the Democratic Republic of Congo, Somalia and Angola. The economy relies on manufacturing, mining, agriculture and service industries. However development is uneven as a consequence of the apartheid era and for this reason poverty remains widespread particularly among the black population.

Half of the South African population live under the poverty line and over 25% are unemployed. Complicating this is the high prevalence rate of HIV which is 18.8% and as a result life expectancy has dropped to 47 years.
In the matters of political /military indicators South Africa had a high state legitimacy since the 1994 transition but of late this has been watered down by corruption and by scandals of people in government. Law enforcement and the prison sector have had problems, for example the police force were accused of exercising excessive force against suspects and detainees. Crime is still a big problem too.

**Senegal**

Senegal has had a stable democracy though there was a lingering dispute between the government and a Casamance region separatist group that was resolved in 2004 after the signing of a peace agreement. One of Senegal’s economic activities is fishing which predominantly takes place in the coastal region. Senegal has a GDP of US$1,800 per capita. According to 2001 estimates 54% of the population live below the poverty line and 48% are unemployed. The poverty situation is exacerbated by the land situation in Senegal which has only 12% of arable land that frequently experiences droughts. Consequently, Senegal relies heavily on donor funds and it is also under the International Monetary Fund’s (IMF) Highly Indebted Poor Countries (HIPC) debt relief program which hopes to eradicate at last two-thirds of its debt. Senegal’s government is rated as transparent with a relatively low level of corruption. However, there have been complaints raised about the security forces and their abuse and torture on detainees.

**Ghana**

Ghana gained its independence in 1957 and was one of the first sub-Saharan countries to gain its independence in colonial Africa. It has a population of over 23 million people.
mainly found along the coast region especially so in the areas of Accra and Kumasi. It has a GDP of US$1,425 per capita, According to World Bank poverty levels in Ghana in 2007 reduced to 52%. This has made Ghana to be one of the few African countries on the pathway to meeting the Millennium Development Goal by half by 2015. On the other hand 45% of the population live on less than a dollar per day and 20% of its population are unemployed. The economy is mainly agriculture-based and this sector contributes to 35% of the GDP. Estimates of 2007 indicate that at least 53% of Ghana’s population were employed.

With respect to corruption, 67% Ghanaians have the view that their government has been successful in curbing corruption but opinion polls from 2005 indicated that 93% of the citizens had claimed that corruption was rampant in Ghana. On the public services sector, 25% of the population still have no access to a better water source and 18% do not have sufficient sanitation facilities. Nevertheless, Ghana’s literacy rates increased to 53% in 2006 though enrolment rates are still low in some rural parts of the country.

The Ghanaian military forces have a reputation of being the most professional armed personnel in West Africa and for this reason are leading contributors to peace keeping missions.

**Mali**

Mali has a population of 12 million with a 2.7% population growth rate and an infant mortality rate of 106 per 1,000 live births. Life expectancy is at 49.5 years and is one of the ten poorest countries of the world. Its GDP is US$1,300 per capita. Mali has refugees
from Mauritania, Democratic Republic of Congo, Sierra Leone, Cote d’Ivore and Liberia. The main economic activities are agriculture, fishing and trading. The unemployment rate is 14.6% and 64% of the population lives below the poverty line. This has been compounded by the civil unrests in Cote d’Ivoire since landlocked Mali relies on Cote d’Ivoire’s ports to ship its goods. As a result of poverty Mali is heavily reliant on foreign aid. In terms of politics, since 1992 the democratic elections have been free and fair. In the current National Assembly there are 15 women, and there also female cabinet ministers.

In the public service, adult literacy is 46.4% and 1,740 community schools have been built by USAID program and in 2003 the primary enrolment rates were 71% which was an increase from the 1995 rates of 39%, having 43% of the primary enrolments being girls.

**Botswana**

Botswana gained its independence in 1966 from Britain and has a population of about 1.84 million with an infant mortality rate of 44 deaths per 1000 births. It is one of Africa’s most stable countries and practices multiparty democracy with generally free and fair elections. It has the region’s least corrupt government and enjoys a relatively good human rights record. Botswana has a GDP of US$15,800 per capita. There was a high refugee influx from South Africans fleeing apartheid during the 1970s and 1980s and, more recently, an influx of Zimbabweans with the recent economic and political crisis in Zimbabwe.
The unemployment rate in 2007 was low (7.5%) and one of the country’s major economic activities is mining. In the public service sector over 95% of the population have safe drinking water access not more than two kilometres from their residences and 88% have access to health services. 81.2% of the population is literate though about 47% of Botswana’s population still live below the poverty line

**Nigeria**

Nigeria gained its independence from Britain in 1960 and has a population of 149.2 million with a population density of approximately 164 people /km². Nigeria has many refugees the majority of them coming from Chad, Sudan, Liberia and the Republic of Congo. Approximately 70% of Nigerians live below the poverty line whereas many government officials are wealthy through the embezzlement of public funds. Nigerian has a GDP of US$ 2,300 per capita and the economy is highly reliant on oil and it accounts for 20% of the GDP however corruption is rampant in the oil industry. Basic services such as water and electricity are not available to much of the population in Nigeria. Health services and infrastructure too are lacking as a result of corruption. This corruption is also found in the police force where police extort civilians.