

**ASSESSING THE ROLE OF THE SCHOOL FARMS TOWARDS
SUSTAINING THE SCHOOL FEEDING PROGRAMS IN PRIMARY
SCHOOLS IN SIAYA COUNTY, KENYA.**

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By

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ABSTRACT

As a reaction to pledges in the Millennium Development Goals by the 189 nations of the United Nations member states, the Kenya government established a School Feeding program to deal with feeding of children in primary schools. This purpose of the study was to assess the performance of the programme in Siaya County. The specific objectives of the study were: To examine the adequacy of the National Schools Nutrition programme design and implementation, to compare academic performance of those schools with and those without feeding programs and finally to establish the viability of school farms as an alternative source of sustainable food supply to primary schools in Siaya county. The study focused on Siaya and Bondo Districts in consideration that the two districts are of typical rural poor environment setting. The conceptual frame work of the study was based on the premise that an effective feeding program should be sustainable, that nutrition and academic performance are directly related and finally that a well developed school farm would offer a viable and sustainable food source. Multistage sampling was applied in three levels involving purposive, proportionate and random sampling. The study sample comprised 14 schools picked across the two districts. Data collection tools comprised questionnaires, interviews and focus group discussions. The study findings established that of the 27 schools which had nutrition programs 5years ago, only 14 had the program still running; but with support from parents and schools Board of Governors. Interview by Quality assurance officers from both Bondo and Siaya districts confirmed lack of government support to any feeding program in the county. It can therefore be concluded that government feeding program lacked sustainability mechanism inbuilt in both design and implementation. Research has shown that well nourished children, all factors being equal, exhibit better performance in academics. On the basis of the schools mean score over a 5year period between school with and those without feeding program, the study showed that performances were comparable. It can therefore be concluded there is no direct influence on academic performance between schools with and those without school feeding program in this county. Previous researches also show that with as low as 1.0 acres of farmland, and using modern farming methods and technology, it is possible to provide lunch to as many as 200 children all through the academic period when schools are in session. From the findings, all school sampled, had at least 5 acres of farm land. It can therefore be concluded that the schools in Siaya County have the potential to generate adequate food supply to students. This study thus recommends that the schools should embrace modern farming methods, as an initiative to grow food crops and thus realize sustainable feeding programs in primary schools in Siaya County.

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CHAPTER ONE: INTRODUCTION

1.1 Background to the study

The 1996 World Food Summit (WFS) held at FAO headquarters in Rome, and the World Food Summit five years later in Rio de Janeiro reaffirmed the right of everyone to have access to safe and nutritious food and to be free from hunger (FAO, 2004). In 2000, 189 nations of the United Nations member states made a promise to free people from extreme poverty and multiple deprivations (UN, 2008). This pledge resulted into setting up of the eight Millennium Development Goals. The need to overcome hunger, poverty, and illiteracy is included in the two first Millennium Development Goals. Goal 1 pledged: Eradicating Extreme poverty and hunger (EPPH). Goal 2 pledged: Achieving Universal primary education (UPE) with one of the objectives being... "offer free meals and health services in schools to improve children's health, nutrition and cognitive development". This was in realization of the fact that a high incidence and severity of poverty in many countries results in hunger, high school drop-out rates and low levels of learning; problems which affect millions of primary school children. Children who come to school hungry, or are chronically malnourished, have diminished cognitive abilities that lead to reduced school performance (FAO, 2004). This was the typical situation in marginal areas which fall under the Arid and Semi Arid Lands (ASAL).

As a response to the two goals, the Government of Kenya formulated two strategy papers relevant to food security and hunger reduction namely Economic Recovery Strategy and Strategy for Revitalization of Agriculture In order to address health and nutrition issues of both pri- and primary school children, the through Ministry of Science and technology

set up nutrition and health sections. Furthermore the established three school nutrition programs: School Feeding program Enhanced school Feeding Programs and Early Childhood Development program to specifically deal with feeding of school children. The various program designs were based on the funding source, geographical area of operation and specific need being addressed. School Feeding Program provided for school lunch to pupils and funded by World Food Program (WFP) through the government. Enhanced School Feeding Program provided both food and non food resources to socio-economic deprived and nutritionally vulnerable pupils in Arid and semi arid lands (ASAL) areas of Kenya; and funded by American Global Initiative through WFP. Early Childhood Development Program targeted pupils of between 0-6years who required special nutritional needs like Vitamin A supplements and de-worming.

1.2 Problem Statement

The school milk program dubbed “Nyayo” milk of the 1980,s was a typical government feeding model established in partnership between GOK and Kenya Cooperative Creameries (KCC) as an attempt to give school going children a wholesome meal. Started in 1979. The basic objective was to attract and retain primary age school going children. The program targeted about 4.3million children in 11000 primary schools. Each was to be provided with 200ml. of milk twice a week. By 1998 the demand for milk rose to 6.3million per year with no corresponding increase in supportive infrastructure. With high operating costs due to poor road network, limited capacity to handle the operations, transit losses and inadequate accountability, the program was no longer sustainable and therefore collapsed.

Among the successes of the school nutrition program include: enhanced access and attendance especially from disadvantaged areas, increased awareness in health and nutrition issues, enabling the construction of resource centers for nutrition and health information dissemination and capacity building through training of teachers in Early Childhood Development Program (Hongo and Amolo, 2004). Similarly in their findings, they identified implementation challenges attributable to program design. From their findings the design did not incorporate sustainability strategy as a means of ensuring complete realization of the original program objectives. Instead the design solely relied on external funding to support the program. As was the case in Nakuru (Foeken and Owuor, 2006) use of school farms could have been incorporated in the design as a possible means of raising cheap and familiar foods sustainably.

1.2 Problem Statement

Studies show that the Government sponsored National School Feeding program failed to realize initial program objectives (Hongo and Amolo, 2004) of attraction and retention of primary going school children. This was attributed to both inadequate and irregular food supply to schools either due to poor access, high cost and poor management among others. Information obtained from the Siaya County Quality Assurance officer indicated that currently there is no school benefiting from a feeding program sponsored by government. Observations at the study area indicated that schools providing meals to students was an initiative of individual parents together with school Boards of Governors. Interviews conducted on students, teachers and other food handlers showed that issues of adequacy, reliability of provision, poor quality were rampant in most schools.

Observations of sampled schools during lunch showed that maize and beans was the main meal except one school (Got Matara) which provided Ugali and vegetables, to form four class.

1.3 Main Objective

The main objective of the study is to assess the role of the school farms towards sustaining the school feeding programs in Siaya County, Kenya.

1.3.1 Specific objective

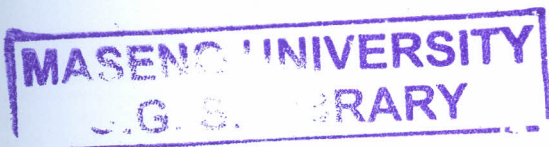
- i. To examine the National School Feeding program design in terms of adequacy of food supply, ease of access and implementation arrangement that would ensure sustainability of the program
- ii. To examine academic performance of schools with school feeding programs against those without; as an indication of positive impacts of providing meals to school children.
- iii. To examine the viability of school farms as a source of low cost and easily accessible food supply to primary schools in Siaya County.

1.4 Research Questions

- i. How adequate was the National schools nutrition program design to realize sustainability
- ii. What is the performance of schools with feeding programs as compared to those that do not?
- iii. In what ways can school farms enhanced food availability towards feeding programs in schools?

1.5 Justification

Studies show that extreme poverty in many developing countries has directly contributed to poor nutrition and therefore poor health. Poor health in turn may impact on cognitive development. Where food is available, sustainability of regular supply has been a challenge as has been observed by NSFP as currently being implemented (Hongo and Amolo, 2004). Use of school farms if feasible, could be adopted as a cost effective source of reliable food supply to schools. There is however no single model of a school feeding program that fits every situation. Each program therefore has to be situation specific (FAO, 2004). Lessons learned from this study may be used to inform policy as well as provide useful information resource for development of a suitable program for this area as well as other similar areas.



CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Hilary Benn reported in the Guardian Newspaper, 5th January 2010. "Food security is as important to this country's future wellbeing, and the world's, as energy security. We need to produce more food. We need to do it sustainably. And we need to make sure what we eat safeguards our health,"(Murray *et al*, 2005).

United Nations MDG Goal 2 committed to "Achieve Universal Primary Education". One of the things that needed to be done to realize this commitment was to "Offer free meals and basic health services in schools to improve children's and cognitive development" (UN, 2008).

Roughly 80 percent of Kenyans live in rural areas and eke out a living as farmers. Poor land quality and chronic water shortages have put the country in a constant state of food insecurity although its economy boasts a sizeable agricultural sector (mainly focused on exports of first-world luxuries like flowers, tea, and coffee), Kenya is a food-deficit country with less than 20 percent of its land suitable for successful cultivation (International Nutrition Foundation, 2008).

2.2 School Feeding Programs Overview

Children who come to school hungry, or are chronically malnourished, have diminished cognitive abilities that lead to reduced school performance (FAO, 2004). School farms or gardens could provide a source of easily accessible source of food to school children. The possibility for establishing effective School garden programs however will depend on the existence of the necessary political commitment and consequent national policies to support school gardens in the country and enable the development and implementation of “garden activities” in schools (Ohene, 2005). Previous attempts to establish school garden programs often failed to give adequate attention to the importance of the institutional framework. Institutionalization of school gardens is the key to the sustainability of these programs (Hijazi *et al* 1986).

In order ensure that school gardens achieve a significant educational impact, however, may require adjustments in the national school curriculum, the production of training materials, teacher training and the provision of funds to meet physical and human resources costs for such activity (Langinger, 2011). From studies by Karen Block and Britt Johnson, (2009) from Melbourne University, one of the findings was that school feeding improved cognitive ability. However a general observation was that “.....the relatively limited numbers of established cooking and kitchen garden programs has resulted in an even greater deficiency of evaluative studies and represents a significant gap in the current literature”

In 2005 Government of Nigeria (GON) in partnership with Tetrapak launched a school a pilot program in primary schools with fortified nutritional supplement using locally grown food crops (maize and soy) and fortified by deficient elements like Fe, Zn and Vitamin A. In his report on 'Home grown School Feeding program-Ghanian model', Dr Ohene emphasizes the importance of a clear cut policy on the program as key to success. He further stresses the need for community involvement as primary to sustainability. (Ohene, 2005).

In his report on the 'Evaluation of the National School Nutrition Program' (NSNP), Schangweni, 2008), professor Shangweni noted that development of adequate infrastructure and capacity building for implementers were key to sustainability of the program. Dan, (2009), proposed that there is need to consider comprehensive outcomes when evaluating the effectiveness school feeding programs with specific reference to cost effectiveness and whether the benefits can be achieved by other programs. Studies by Lavinger, (1986), indicate that there is still no conclusive findings regarding the impacts of garden based programs in schools, and several researchers have noted the need for more reliable research based on strong evidence and rigorous methods of evaluation. The relatively limited numbers of established cooking and kitchen garden programs has resulted in an even greater deficiency of evaluative studies and represents a significant gap in the current literature (Karen *et al*, 2009).

FAO, (2004) thus concludes that there is no single model of a school garden program that fits every situation. School garden programs must be well adapted to local customs and needs and to the specific socio-economic, climatic and environmental situation of the country or region concerned.

2.3 School Feeding Programs in Kenya

School feeding programs have been implemented in Kenya since the 1980's with varying degrees of success. Used primarily to entice the enrollment and retention of rural children and girls, subsidized meal programs have played an integral part in realizing the country's goal of universal primary education. The program has been implemented as School Feeding Program (SFP), Expanded School Feeding Program (ESFP) and Early Childhood Development program (ECD) (WFP, 2008a). Historically, the involvement of large foreign players has greatly limited the Kenyan government's role in the direction and stewardship of these programs. Heavy reliance on foreign aid and management has subjected the programs to fluctuating, and often conditional, international support. In an effort to transition toward a more sustainable and nationally integrated alternative, the Kenyan government in its Economic Recovery Strategy paper (ERS), (2001a) introduced the Homegrown School Feeding Program (HGSFP) in 2009. Though financial strains and infrastructural challenges have called into question Kenya's ability to successfully fund and operate its own school feeding program, the country's renewed commitment to education, agriculture, and rural development shows great promise (Langer,2011).

In a survey conducted in Nakuru municipality schools (respondents in schools interviewed indicated the wish to expand the provision of lunch to all pupils, the major

obstacle being the high prices of food at the market in the face of high enrollment rate. Other challenges identified during the study included limited farm size, inadequate rainfall, lack of professional support and leadership (Dick et al, 2010). From studies by Hongo and Amolo, (2004), the successes of the school nutrition program include:

- a) Enhanced access and attendance especially from disadvantaged areas
- b) Increased awareness in health and nutrition issues
- c) Construction of resource centers (over 200) for nutrition and health information dissemination
- d) Capacity building through training of teacher in ECD

Among the challenges include:

- a) Lack of clear policy for all schools
- b) Access in remote parts
- c) Limited resources capacity to cope with increased student population
- d) Impact of HIV and AIDs on families and teachers
- e) Equity in resource allocation
- f) Sustainability

The Gap

Part of the challenges to current National School Feeding program has been largely attributed to sustainability and lack of clear policy for all schools (Hongo and Amolo , 2004). Questions have been asked whether the benefits of NSFP as currently designed could be gotten through other programs (Gilligan, 2009). Apart from the Nigerian case where school farm program was started with the main focus being increasing nutritive

value of foods and the Nakuru situation (Dick, et al, 2010) where the program was for providing lunch, there is limited information as to a rural based school with an established school farm for the purpose of improving nutrition to school pupils. The few schools which have school gardens, use them mainly as an extracurricular activity and not for feeding (Foeken and Owuor, 2005). Karen Block and Britt Johnson, (2009) re-emphasizes this position stating that the limited cooking and Kitchen garden programs have resulted in greater deficiency of evaluative studies and represents a significant gap in the current literature. As concluded in (FAO, 2004), there is no single model of a school garden program that fits every situation. A re-examination of the government sponsored school feeding program as currently is will be the main focus of this study.

2.4 Conceptual Frame Work

The conceptual framework (Fig.1) is developed on the premise that in an educational institution, adequate quality food, good nutrition practices and health are mutually interrelated and that both impact on performance of school children; all the other intervening variables being equal.

Used primarily to entice the enrollment and retention of rural children and girls, the program had heavy reliance on foreign aid and management, and thus subjected it to fluctuating, and often conditional, international support. Even the Homegrown School Feeding Program (HGSFP) introduced in 2009 did not in its design adequately address financial strains and infrastructural challenges which are key to sustainability and thus calling into question Kenya's ability to successfully fund and operate its own school

feeding program. Incorporating use of school farms in the design and implementation would have been a key consideration in ensuring sustainability of the program.

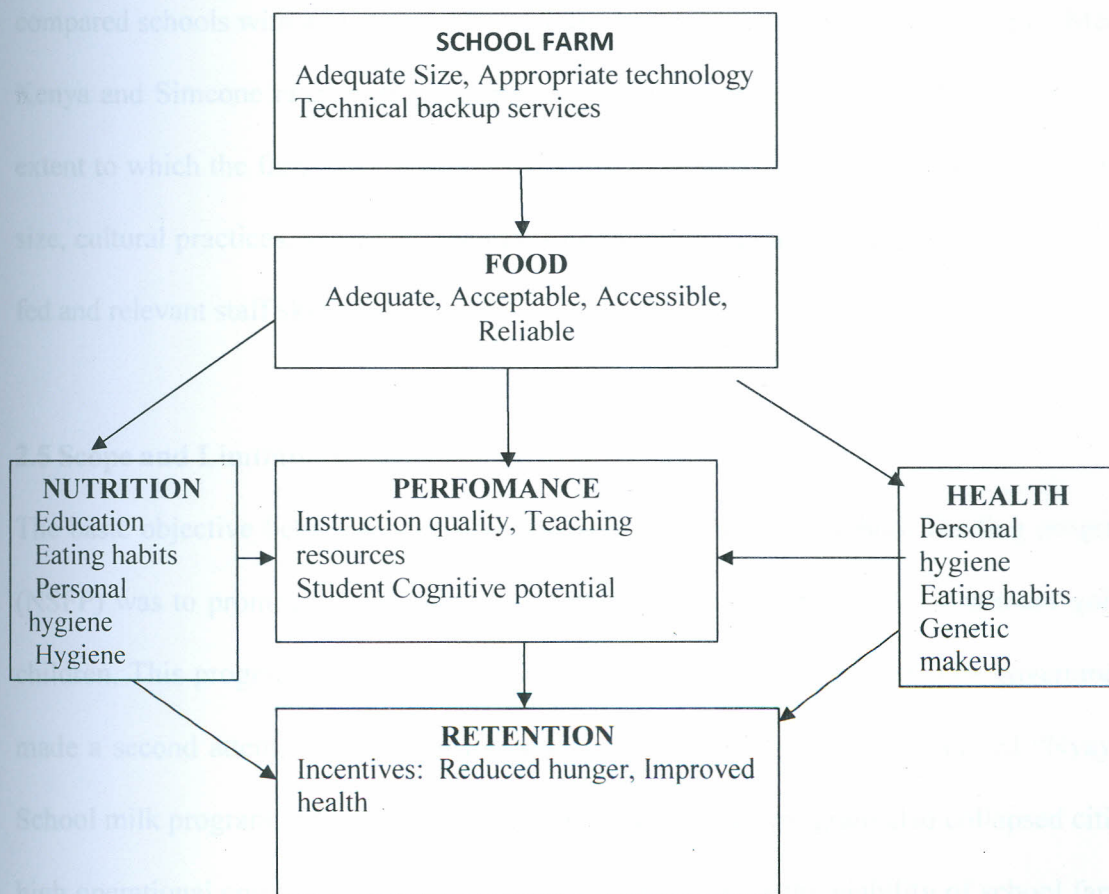


Figure 1: Conceptual Framework showing independent and dependent variables

Adopted from Donabedian Model (1966)

This framework therefore defines four broad and mutually interlinked thematic areas: school farm, food production, child health and class performance (Pollit, 1990). School farm constitute the main independent variable. Under each thematic area are the respective dependent variables. School farm constitutes the independent variable upon

which food production is dependent. Similarly, performance as a dependent variable will be based on health status of a pupil, nutrition practice and individual cognitive potential. This position is supported by both International Nutrition Foundation, (2009) which compared schools with and those without nutrition programs in Nyambene district, Meru, Kenya and Simeone *et al* (1989). In both cases the school farm will be the driver. The extent to which the farm will be able to produce food will however be based on the farm size, cultural practices, seeds and seedlings quality, farm inputs, whether irrigated or rain fed and relevant staff skills.

2.5 Scope and Limitations

The basic objective behind the government supported National School Feeding program (NSFP) was to promote child retention in schools by providing meals to primary going children. This program could not be sustained and therefore collapsed. The government made a second attempt in 1989 of introducing school milk to schools dubbed “Nyayo” School milk program. After 20 years of implementation, the program also collapsed citing high operational costs. The scope of the study was to assess the viability of school farms as an alternative, accessible, cost effective and sustainable source of food to primary school going children in Siaya county. The assumptions were that each school had a section of its land dedicated to farming activity. The study required an analysis of the reason behind the collapsed attempts, in terms of adequacy of program design. One major limitation was inadequacy of reliable evaluative data. The second major constraint was the variation in feeding arrangement in each school. This made it difficult to make appropriate comparisons. Similarly the perception of use of school farms differed with

different schools. While some schools believed they could be used for food production as well as a learning tool, some saw it as a source of punishment to children. In spite of the limitations, the study will help expose the weaknesses in the government sponsored NSFP. Such information may be used to inform policy and thereby come up with a sustainable school feeding program.



CHAPTER THREE: METHODOLOGY

3.1 Study Area

The study was conducted in Siaya and Bondo districts county, Nyanza province in the western part of Kenya. Siaya County borders Busia County to the North, Kakamega County to the Northeast, Vihiga County to the East, Kisumu to the South East, with lake Victoria to the South and West. It covers an area of 2,530.5 Km², with a population of 842,304 (Male – 47 %, Female – 53 %). It has an annual rainfall of between 1,170 mm and 1,450 mm with a mean annual temperature of 21.75 °C ranging from 15 °C and 30 °C. The proposed county capital is Siaya Town.

The main economic activities/industries comprise subsistence farming, livestock keeping, fishing, rice farming and small scale trading. According to district demographic survey data 2002), poverty level for rural is 57.9 % while that for urban (Siaya Township) is 37.9%. As at 2007, the county had 656 primary schools with an enrollment of 259,945 pupils and a teacher to pupil ratio of 1:53 and 148 Secondary schools with an enrollment of 22,042 and teacher pupil ratio of 1:31.

The main road Road Network comprises a 30km bitumen road connecting Bondo and siaya town. A tarmac extension connecting Siaya to Kisumu-Busia road at Rangala is under construction. From documentation by the Study for Revitalization of Agriculture(SRA) ,(2001) the main health facilities comprise 2 District Hospitals, 3 Sub-District Hospitals, 83 Dispensaries, 26 Health Centers and 10 other health facilities. Prevalent diseases comprise Malaria, HIV/AIDS, Diarrhea and respiratory disorders.

According to constituency boundaries of 2007, the county has five locations namely: Gem, Alego, Ugenya, Sakwa and Asembo. Fig.2a is a map showing location of Siaya county in the country Kenya. Figure 2b shows the county boundaries together with the two districts(Siaya and Bondo) constituting the county. The two districts constitute some of the poorest areas in the country, and are also predominantly rural. The study therefore, found it appropriate to focus on these two locations as being ideal representation of a typical rural set up and which can be used to assess the role of school farms in the context of sustainable school feeding program to schools in rural areas.

Figure 2a: Map of Kenya showing the location of Siaya county.



Figure 2b: Map showing the boundaries of Siaya and Bondo districts within Siaya county.



Figure 2a: Map of Kenya showing location of Siaya County

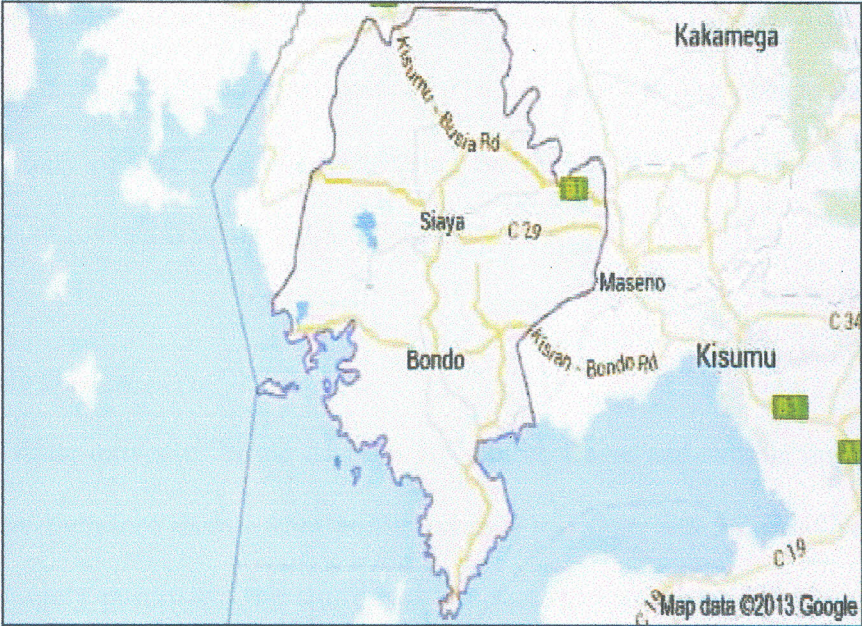
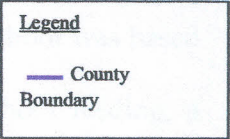


Figure 2b: Siaya County showing Siaya and Bondo Districts



3.2 Research Design

The study employed different design methods to obtain both qualitative and quantitative data; The main methods used were basically corroborative and diagnostic in nature. Primary and secondary data sources were used using appropriate tools. Primary sources tools involved questionnaires, focus group discussions and personal interviews. Secondary sources comprised published reports and other research findings from other studies. Under the design, the parameters of consideration comprised Study population; Sample design;(Sample size and sampling procedure; Sampling frame, Data Collection, Data analysis and presentation of results.

3.2.1 Study Population

The study population comprised the primary schools in Siaya County. The county has 656 primary schools, with total enrolment of 259,545 pupils and teacher to pupil ratio of 1:31. The county comprises two districts being Bondo and Siaya. Out of the two districts, 130 schools are in Bondo while 131 are in Siaya.

3.2.2 Sample Design

This was a finite universe. Based on both the sample frame and sample units, the study samples were therefore drawn from public schools in Alego and Sakwa. Given that the study was largely purposive, the study was conducted on schools identified as offering meals and those that do not. Main considerations in picking a particular school was based on location and whether day or boarding. To serve as a control on school feeding, a boarding school was selected. Similarly two day schools offering school meals were also

picked to compare with typical day schools with no feeding programs. Finally the number of schools per location was identified based on weighting according to the number of schools on the particular location.

3.3. Sampling Frame

The sampling frame was Siaya and Bondo districts of Siaya county with particular focus on Alego Central and Sakwa constituencies. The two locations are considered to be representative of the study site in terms of geography and demographic characteristics.

Table 3.1: Sampling Frame

Districts	Divisions	Location
Bondo	Bondo	Bondo town
	Usigu	East Imbo
Siaya	Karemo	Township
	Boro	South East Alego

Study units comprised schools. Sampling was done in 3 levels involving district, divisions and locations. The following table, shows schools from which samples were taken:

Table 3.2: Schools from which sample population were drawn

	SCHOOLS
1	Siaya central
2*	Ngiya Girls
3	Siaya Township
4	Karapul
5	Ngiya mixed
6	Kirindo
7	Sigana
8	Uuna
9	Gombe Komolo
10	Nyakasumbi
11	Bar Kowino
12	Yieke Fidel
13*	Matangwe
14*	Got Matara

From the above schools, schools with and those without school feeding programs were identified and are given on Table 3.4.

Table 3.4 Schools with and those without feeding program per district

SIAYA		BONDO	
SFP	NO SFP	SFP	NO SFP
Ngiya Girls	Karapul	Got Matara	Gombe Komolo
Ngiya mixed	Kirindo	Matangwe	Nyakasumbi
Siaya central	Siaya Township		Bar Kowino
	Sigana		Yieke Fidel
	Uuna		

3.3.1 Sample Size and Sampling Procedure

A trial sample was done using Area sampling method to get standard deviation. The divisions in the district constituted the sampling areas. Based on the feeding arrangement the number of schools offering meals for each division was computed. These numbers were then used to compute the standard deviation from:

$$\sigma = \sqrt{\frac{\sum(x_i - x)^2}{N}}$$

.....Eq. (1)

where:

x_i = number schools offering lunch in each division

x = mean number of schools per division

N = total schools in the county

From the above equation, the sample size n can be computed from equation by Kothari (2004):

$$n = \frac{z^2 * N * \sigma_p^2}{(N - 1)S.E^2 + z^2 * \sigma_p^2}$$

.....Eq.(2)

where: n = size of sample

N = size of population

$S.E$ = acceptable error (the precision)

σ_p = Standard deviation of population

z = standard variate at a given confidence level.

The number of school per district, n_i was computed from:

$$n_i = Pi(N_i) \quad \text{.....Eq. (3)}$$

Where:

n_i = proportion of allocation by district

N_i = is the sample size

i = is the strata (ie district)

P_i = represents the proportion of schools included in stratum against the total.

3.4 Data Collection

Data collected were both qualitative and quantitative and collected from Primary and secondary sources. Primary data was obtained using structured and semi structured questionnaires. Secondary sources included documented material and library sources. The respondents comprised head teachers/deputies, and District quality assurance officers. Data on adequacy of NSFP was obtained from questionnaires tailored to school heads and Quality assurance officers. Information on performance trends were obtained from secondary documentation at the Quality assurance office. On objective three qualitative data was obtained from Focus Group Discussions conducted in schools with feeding programs.

3.5 Data Processing

Incomplete, missing or contradictory information were encountered during the study. This required some processing to ensure accuracy, consistency and tabulation so that the data is amiable to analysis. The activities involved in the processing comprise editing, coding classification and tabulation. For example non availability of some performance grades for year 2009 warranted the data for this year to be omitted and use 4 year results instead of the anticipated 5years.

3.6 Data Analysis

The analysis was basically multivariate with focus being in determining any correlations. Given the small sample size, simple Cross Tabulation, using Statistical Package for Social Sciences (SPSS) soft ware was adopted to analyze various variables. The results were then presented in tables and charts as percentages and means.

CHAPTER FOUR

PRESENTATION OF THE RESULTS AND DISCUSSIONS

4.1 An overview

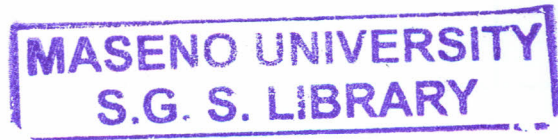
This study had three basic objectives. On the first objective, the aim was to first establish whether the national school program was being implemented in the study site and if so, the general opinion and/or any recommendations from beneficiary perspective which in his/her opinion would help the program achieve its original purpose. Earlier studies showed that sustainability has been a major concern in school feeding programs. Some of the contributory factors to sustainability issues have been accessibility (particularly in rural areas), adequacy and regularity of supply. Raising foods within the school was thought of as a possible solution to the above issues. In the second objective the aim was “to establish whether there exists difference in academic performance between schools providing meals and those that do not” the study aimed at establishing whether feeding of primary school children has had any impact on their academic performance.

The above scenarios led to the third objective which was to “To establish the viability of school farms as an alternative source of food supply to schools in this area”. This chapter therefore aims at providing the outcomes from the study by responding to the research questions as outlined in the study objectives. Similarly the chapter provides the analysis of the outcomes on both the objectives of this study and previous studies.

4.2 Characteristics of the Respondents

The selection of the respondents was purposively done. In looking at the characteristics, the main consideration was to ensure that the information given was official and given by the person authorized to do so. This was the case with head teacher or deputy as respondents. Another consideration was whether the respondent was directly affected and/or involved, and thus having first hand information. This is key to both authenticity and reliability of data as was the case of picking food handlers (cooks) and individual students as respondents. Similarly focus group discussions as applied to students were a useful tool in gauging the general feel and as a means of validating the official position. For each school, the various respondent characteristics were established from the questionnaires and allocated accordingly. The main characteristics of interest comprised:

i. Age group



The aspect of age was important in ensuring that the opinions given cut across the various age sectors. During survey it was observed that about 60% of the respondents were never born when the NSFP was established and therefore could not give any useful input. The 40% vividly remembered the program given that they either were beneficiaries or took part in the running the program at institution level. The same principle applies to students, where a particular age group tends to have similar influence and therefore tend to hold similar view on a given issue. This enabled getting data from both historical and current perspectives. Table 4.3 gives the average age group for students. From the table, it is observed that in all but two schools have average age of students being between 10-16 years.

Table 4.1: Enrollment Age Group

SCHOOL	AGE GROUP			
	Less than 10 years	10-16	More than 16years	
Ngiya Girls		x		
Karapul		x		
Kirindo			x	
Got Matara		x		
Nyakasumbi		x		
Matangwe			x	
TOTAL		4	2	

ii. Level of education of teachers

This was key in objective two. From conceptual framework it can be observed that all other factors being equal, performance is dependent on instruction quality and teaching resources, which again is dependent on level of education of teachers. Table 4.1 show the level of education of teachers.

Table 4.2: Teachers Level Of Education

SCHOOL	LEVEL OF EDUCATION				Total
	Primary	Secondary	Post secondary(tertiary institution)	University	
Ngiya Girls			x	x	12
Karapul			x		8
Kirindo			x	x	10
Got Matara			x		9
Nyakasumbi			x		12
Matangwe			x		10

iii. Enrollment according to gender

Gender consideration is key in ensuring that there is no bias in data collection. Studies have shown that the extent of gender distribution may impact on outcomes as either gender has unique way of observing an issue. Table 4.3 shows gender distribution based on comparison of enrolment statistics over a 5year period. Table 4.3 shows gender distribution both current and 5years ago.

Table 4.3 Enrollment by Gender

SCHOOL	ENROLLMENT			
	2012		5 years ago	
	Boys	Girls	Boys	Girls
Ngiya Girls	-	243	-	227
Karapul	835	889	814	801
Kirindo	299	330	237	266
Got Matara	327	290	190	160
Nyakasumbi	309	375	30	34
Matangwe	210	225	183	206
TOTAL	1910	2352	1454	1694

From the table it can be observed that for mixed schools there is a general increase in registration both for boys and girls in each school between 5 years ago and now. There is however higher percentage increase in the girls than that of boys being 15% and 11% respectively.

4.3 Sampling and Sample Size

From the 656 primary schools in the county and bearing in mind that this is a finite universe, population Standard deviation was computed using Eq.(1) ie

$$\sigma = \sqrt{\frac{18427.04}{656^2}} = 5.3$$

Based on above, the confidence level was taken as 95% giving a z value of 1.96 and sampling error limited to 3. From this, sample size n was computed using Eq.(2),ie

$$n = \frac{1.96^2 * 656 * 5.3^2}{(3)^2 + 1.96^2 * 5.3^2} = 11.7 \text{ say } 11$$

Based on Eq.(3), P_i for Bondo and Siaya were computed as 0.49 and 0.5 respectively given that the Bondo has 130 schools and Siaya 131. On the basis of sample size, 5 schools were allocated to Sakwa and 6 to Siaya. Applying simple random sampling (Kothari, 2004), the 11 schools were picked. From the county education office, a school each exhibiting best feeding arrangement for a typical rural school was picked for each district. Ngiya girls boarding school was also purposively picked to serve as a control. This brought the total study sample to 14. Table 3.2 shows the schools used for the study.

4.3 The adequacy of the design and implementation of schools nutrition programme

Findings:

In evaluating the adequacy of the design, the following parameters were taken into consideration:

4.3.1 Existence of School feeding program

This formed the first consideration in assessing adequacy. Where existing, the source of food and challenges (if any) and proposed solutions. The main respondents were the head teachers who were asked to fill the questionnaires coupled with direct face to face interviews. Tables 4.4 and 4.5 provide the outcomes of the analysis on existence and source respectively.

Table 4.4: Existence of SFP

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	8	57.1	57.1	57.1
No	6	42.9	42.9	100.0
Total	14	100.0	100.0	

Source: SPSS Output, 2013

From the table, 57.1% of schools have SFP but out of this only 19% have benefited from government support albeit irregularly; and 81% relying on either parents or goodwill from donors (Table 4.4). Observation of some meals revealed little or no consideration on

nutritive value of foods as some were wholly starch and others little or no protein content depending on individual family economic status. Results from focus group discussions show that while over 80% of students have no problem with quantity, the same percentages do not like the quality. Information gathered from county office indicated that the program is there in books but not in practice. Reports from some of the schools visited revealed that the program started in earnest but could not be sustained and therefore died off. From the above analysis, it can be concluded that National Schools Feeding program as originally intended did not take root in Siaya County. This could be attributed to several factors: From Hijazi et al, (1986), “previous attempts to establish school garden programs often failed to give adequate attention to the importance of the institutional framework. Institutionalization of school gardens is the key to the sustainability of these programs”). The same position is held by Hongo and Amolo, (2004) , who cites “lack of clear policy for all schools” as one of the reasons for unsustainability of many school meal program. In his report on the ‘Evaluation of the National School Nutrition Program’ (NSNP), Schangweni, (2008), professor Shangweni noted that development of adequate infrastructure and capacity building for implementers were key to sustainability of the program. Dan, (2009), proposed that there is need to consider comprehensive outcomes when evaluating the effectiveness of school feeding programs with specific reference to cost effectiveness and whether the benefits can be achieved by other programs.

4.3.2. Source of food for SFP

Table 4.5 shows different food sources for the schools with feeding program sampled.

From the table it is observed that about 43% of the schools relied on school farm for food supply, with only 21% getting some food supply from the government.

Table 4.5: Source of Food for SFP

Source of food	Frequency	Percent	Valid Percent	Cumulative Percent
Valid School farm	6	42.9	42.9	42.9
GOK	3	21.4	21.4	64.3
Parents	3	21.4	21.4	85.7
Farm& donor	2	14.3	19.0	14.3
Total	14	100.0	100.0	100

Source: SPSS Output, 2013

Figures 4.1 below show that 43% of the schools do not have farms and therefore do not grow any crops while only 36% grow a variety of crops which can support school feeding programme. From the above figure, it is evident that of the 57% of the food crops that

may be used for feeding, only 29% is actually used for school feeding and 28% being used for either income generation or both income and feeding (Figure 4.2).

On the basis of common foods grown, Fig. 4.1 indicates the proportions of the various food crops grown. Table 4.6 gives the responses obtained from focus group discussions with respect to meals.

Table 4.6: Responses from Focus Group Discussions

Parameter School	Nos. of students	Acceptable quantity	Acceptable quality	Quality & quantity not acceptable
Ngiya girls	55	30	10	15
Matangwe	35	15	5	15
Got Matara	45	40	5	0
Siaya Township	30	30	0	0

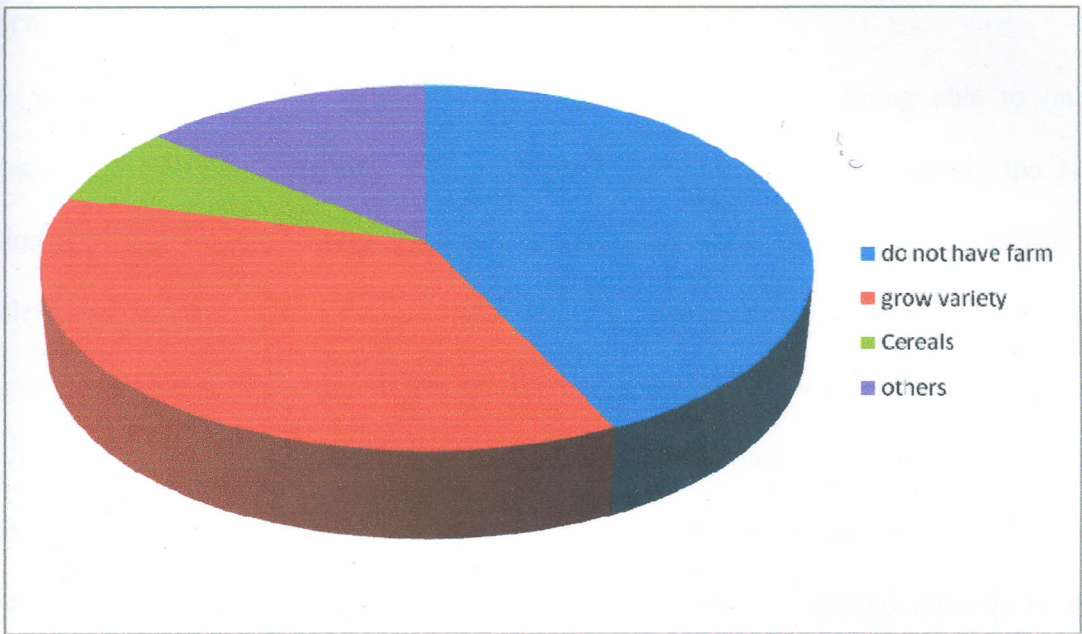
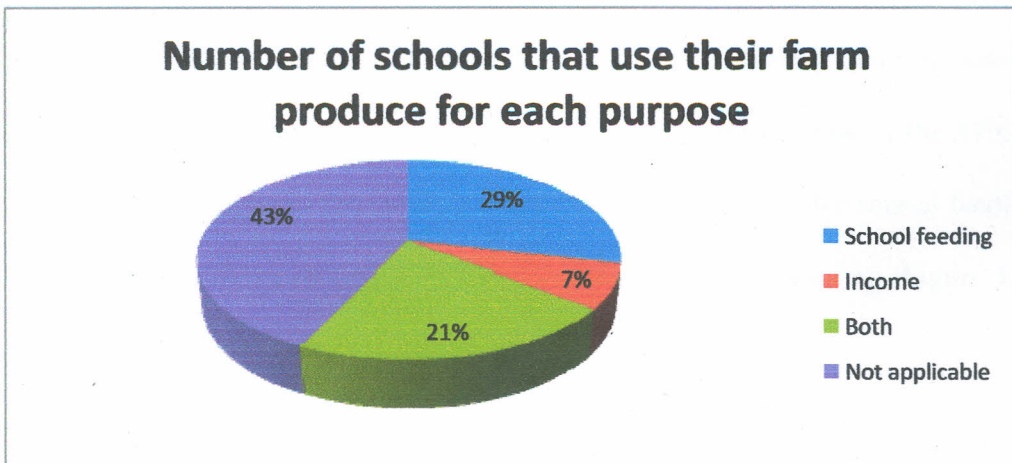


Figure 4.1 Proportion of Crops Commonly Grown

Source: SPSS Output, 2013



Source: SPSS Output, 2013

Figure 4.2: Proportions of Utilization of Farm Produce

Discussions:

The success of a program is its ability to meet its objectives. Being able to meet objectives depends on program design. Kenya being a member state among the 189 nations and signatory to the UN charter under took to respond to the objectives of Millennium Development Goals (MDG). Goal 2 pledged to: "Achieving Universal primary education (UPE) with one of the objectives being...offer free meals and health services in schools to improve children's health, nutrition and cognitive development". This led to establishment of School Feeding Program under the then Ministry of Education Science and Technology in 2004. The program was geared towards public primary schools in the whole country by providing foods with high nutritive values to all primary school going children in Kenya.

From figures 4.2 it was found that that 43% of the schools do not have farms and therefore do not grow any crops while only 36% grow a variety of crops which can support school feeding programme. From the figure, it is evident that of the 57% of the food crops that may be used for feeding, only 29% is actually used for school feeding and 28% being used for either income generation or both income and feeding (Figure 4.2).

From the Table, 57.1% of schools have SFP but out of this only 19% have benefited from government support albeit irregularly; and 81% relying on either parents or goodwill from donors (table 4.6). Observation of some meals revealed little or no consideration on nutritive value of foods as some were wholly starch and others little or no protein content depending on individual family economic status. Results from focus group discussions

show that while over 80% of students have no problem with quantity, the same percentages do not like the quality. Information gathered from county office indicated that the program is there in books but not in practice. Reports from some of the schools visited revealed that the program started in earnest but could not be sustained and therefore died off. From the above analysis, it can be concluded that National Schools Feeding program as originally intended did not take root in Siaya County.

The above scenario shows lack of curriculum design and/or policy guidelines to schools with regard to the implementation of the feeding program through the use of school farms. This confirms the position held by both Hijazi et al, (1986) and Hongo and Amolo, (2004). Similarly the fact that 43% of schools have not dedicated part of their available land for farming shows lack of institutionalization of farming in schools through primary school curriculum review (Foeken and Owuor, 2005) and (Karen Block and Britt Johnson, 2009) or policy of partnership between schools and host community or even private sector. Such were the cases in Nigerian where government partnered with 'Tetrapak' in implementing a school feeding program with reported success. Similarly in his report on 'Home grown School Feeding program-Ghanian model', Dr Ohene stressed the need for community involvement as primary to sustainability. (Ohene, 2005)

Conclusion

Going by the above findings it can be concluded that the implementation of the school feeding program in Siaya County is largely absent and thus has the government failed to meet the objectives for which the program was designed. This failure may be attributed

either to poor program planning and development, lack of goodwill, bad politics, inability of the government to implement the program due to lack of capacity or all the above. As concluded in (FAO, 2004), there is no single model of a school garden program that fits every situation. Therefore as it may try to develop a national policy framework for school feeding there will be needed to design a program that is situation specific.

4.4 Academic Performance and Schools Feeding Programme

This constituted objective two. The aim was to establish whether there exists difference in academic performance between schools providing meals and those that do not by evaluating their respective mean scores over a given period. The basic parameter in evaluating academic performance of a school is its mean score.

Findings

Table 4.7 shows the mean scores for the various schools

Table 4.7 : Mean score for 17 Schools in Bondo and Siaya Districts over a four year period.

SCHOOL	M/S 2008	M/S 2009	M/S2011	M/S 2012
Siaya central	352.68	360.49	353.12	341.10
Ngiya Girls	337.23	317.77	326.38	324.96
Siaya Township	301.64	308.84	317.55	319.25
Karapul	295.81	295.27	310.17	293.27
Ngiya mixed	289.34	276.96	293.39	288.34
Pap Nyadiel	234.94	260.7	279.85	272.57
Oseno	250.71	221.06	253.00	252.38
Kirindo	227.90	241.96	226.86	245.42
Sigana	226.06	248.96	243.86	240.31
Uuna	276.86	248.76	244.48	239.45
Gombe Komolo	263.52	258.66	259.53	236.13
Got Matara	243.31	262.89	254.27	283.24
Nyakasumbi	285.89	280.26	246.96	267.71
Bar Kowino	275.06	258.73	231.36	261.80
Yieke Fidel	220.28	205.93	199.00	253.74
Matangwe	243.47	226.94	236.42	238.36
Minya	269.95	255.40	238.53	235.21

Source : Siaya County K.C.P.E results , Siaya County Education Office, 2013

Discussions

A higher mean score is a measure of improved performance. Researches have shown that nutrition is directly related to a students cognitive ability. From studies by Karen Block and Britt Johnson, (2009) from Melbourne University, one of the findings was that school feeding improved cognitive ability particularly when the students themselves take part in growing the food crops. However this requires “established cooking and kitchen garden programs” in the schools’ curriculum and supportive infrastructure. Table 3.3 gave the identified schools and their classification on the basis of feeding arrangement. The parameters of interest were location (ie whether rural or town based); whether day or boarding; whether there was a feeding program and who provided it; and finally for each school, obtaining school’s performance data in the Kenya Certificate of Primary Education examinations (KCPE) as provided by the respective district Quality Assurance Officers. The scores were plotted in a scatter diagram for each school and a graph plotted of mean score for each school over a four year period. This resulted into a performance trend as shown in Figure 4.4 below.

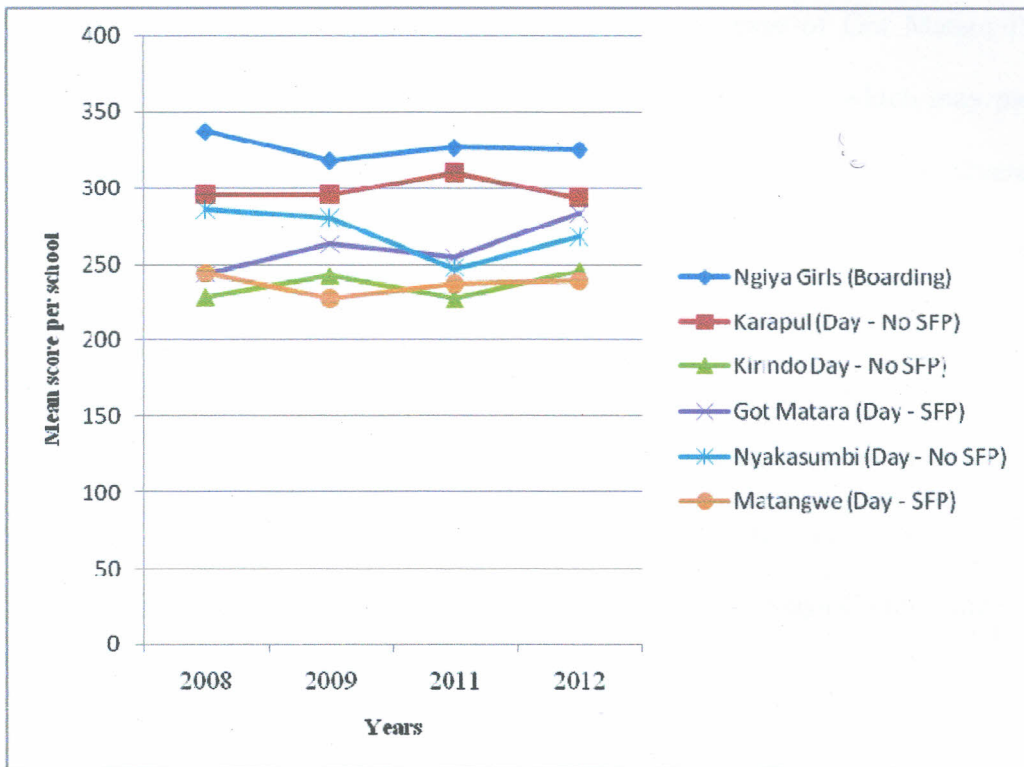


Figure 4.3: Graph showing performance of different categories of selected schools over a period of four years

Source : Siaya County K.C.P.E results , Siaya County Education Office, 2013

From the figure it can be seen that the boarding school (Ngiya Girls') has consistently high performance index as compared to the other schools. Observation of the school indicated that it is much more well established in terms of infrastructure both in human resources and physical facilities. This could give it advantage over the others hence better performance as compared to Matangwe and Got Matara both of which offer meals. Karapul which has no feeding program has higher performances than Matangwe which has feeding program. Both are both day schools. Out of the day schools, it can also be seen that schools that have feeding programme have steady performance as for the case

of Matangwe and an improving performance as for the case of Got Matara Primary School. The rest of the day schools have fluctuating performance which may partly be contributed to by lack of school feeding programme among other factors. Overall it is observed that generally, performance is fairly steady over the years both for schools with SFD and those that do not. In terms of respondent characteristics such as student ages, gender or teachers level of education, there is no specific characteristic which could be attributed to a specific performance based outcome. However, in this study, it is observed that those schools with and those without school feeding exhibited a similar performance trend, and thus leading to the conclusion that in Siaya County, the students' performance was subject to other factors other than meals.

Conclusion

From the analysis it can be shown that there is no direct link between school feeding and academic performance in Siaya County. For example, an examination of performance index of various categories of schools (Figure 4.1), it can be observed that there was no significant difference in performance between schools with a feeding program and those without. Comparing performance of Matangwe primary school which offers meals and Karapul which has no feeding program, the performance of Karapul has remained better than Matangwe over the years. The same case applies for Nyakasumbi which although has no feeding program, has better performance than Matangwe. However as much as it does have influence on performance as established from previous studies (Karen *et al*, 2009) and Dan 2009, this is not necessarily the case in County, School feeding can only be considered as one among possible factors that influence academic in primary schools

in the county. One other finding from the study is that there is a general poor performance, in KCPE exams in Siaya County given that over a four year period none of the studied schools had a student scoring the minimum 400 qualifying mark to join a national school .

4.5 The viability of school farms as an alternative source of food supply to schools

From table 4.8, below, 64.3% of the schools had farms.

Table 4.8: Existence of School farm

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	8	64.3	64.3	64.3
	No	6	35.7	35.7	100.0
	Total	14	100.0	100.0	100.0

Source: SPSS Output, 2013

From Table 4.8, of the 64.3% schools with land, 37.5% had land more than 5acres

Table 4.9: Size of Farm

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	> 5 acre	3	37.5	37.5	37.5
	1-5 acres	4	50.0	50.0	87.5
	<1acres	1	12.5	12.5	100.0
	Total	8	100.0	100.0	

Source: SPSS Output, 2013

Inspection of school farm at one of schools doing farming (Got Matara) indicated that the school practiced traditional farming methods thus limiting exploiting full economic potential. As to why the school was not utilizing modern farming methods, cost factors, were cited as the main explanation given the prevailing climatic (low agricultural potential) conditions. Dan, (2009), proposed that there is need to consider comprehensive outcomes when evaluating the effectiveness school feeding programs with specific reference to cost effectiveness and whether the benefits can be achieved by other programs. Similarly, Gilligan, (2009), observed that questions have been asked whether the benefits of NSFP as currently designed could be gotten through other programs. In the case of Got Matara the school opted to asking parents to bring food to supplement farm produce. Plate 4..1 shows parents serving lunch to students at Got Matara primary school.



Plate 4.1: Parents Serving Lunch

From (Table 4.10), 75% get support. Of the support, 50% was financial and 33% being financial and technical in form of seeds, fertilizer, extension services or complete package of the input and technical back-up (Table 4.10) provided by government (Table 4.10).

Table 4.9: Support for Farming

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	6	75.0	25.0	25.0
No	2	25.0	75.0	100.0
Total	8	100.0	100.0	

Source: SPSS Output, 2013

Table 4.11: Type of Support

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Financial	3	50.0	50.0	50.0
	Fin/Technical	1	33.3	33.3	83.3
	Technical	1	16.6	16.7	100.0
	Total	6	100.0	100.0	

Source: SPSS Output, 2013

Table 4.12: Source of Support

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	GoK	8	57.1	57.1	57.1
	NGO	2	14.3	14.3	85.7
	Both	1	7.1	7.1	78.6
	None	3	21.4	21.4	100.0
	Total	14	100.0	100.0	

Source: SPSS Output, 2013

Table 4.12 shows that majority of the schools use farmyard manure which is locally available or brought by the pupils. Fertilizers on the other hand are supplied mainly by the Government (42.9%). However the fact that technical support is lower shows that

technical empowerment to enable schools embrace modern farming methods is hampered.

Table 4.12: Farm inputs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fertilizers	6	42.9	42.9	42.9
	Farmyard	7	50.0	50.0	92.9
	Both	1	7.1	7.1	100.0
	Total	14	100.0	100.0	

Source: SPSS Output, 2013

Table 4.13: Source of Inputs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	GoK	6	42.9	42.9	42.9
	Bought	1	7.1	7.1	50.0
	NGO	1	7.1	7.1	57.1
	School	4	28.6	28.6	85.7
	Students	2	14.3	14.3	100.0
	Total	14	100.0	100.0	

Source: SPSS Output, 2013

Discussions

From studies by Simeone *et al* (1989), it was observed that ‘the extent to which the farm will be able to produce food viably is based on such factors as the farm size, cultural

practices, seeds and seedlings quality, farm inputs, whether irrigated or rain fed and availability of relevant staff skills'. These therefore formed the parameters of interest. This section addressed the third objective which was "to establish the viability of school farms as an alternative source of food supply to schools in this area". This was informed from previous studies which showed that adequacy, access and reliability of food supply had been some of the challenges to successful implementation of government initiated SFP. The parameters of interest in this study therefore were to establish which schools had grounds that could be used as school farms, and whether they were actually being used for farming. If so what types of farming, whether for commercial purposes or for growing food crops to feed pupils. And if for food crops, the type of crops. Finally another area of interest was why the schools that were having adequate land were not using them for growing food crops and instead opted for alternative options like relying on donor or parents.

From the foregoing it can be observed that: (i) land is not a constraint in most schools, (ii) there exists some form of government presence and support but these do not seem to be adequately exploited, (iii) the government support seem to be more as a routine extension service and not specifically targeting school schools, (iv) most schools use farm work as a mode of punishment or extracurricular activity not necessarily with deliberate purpose of raising food for students, (v) farming is a local initiative by school teachers and not anchored in curriculum, (vi) farming methods used are basically traditional methods as none of the schools visited was using modern farming methods.

Conclusion:

From the foregoing it can be concluded that school farms can provide a viable source of alternative source of food supply to primary schools in Siaya County. There is enthusiasm and potential but capacity is lacking. For this to succeed , however there will be need for capital infusion, infrastructural support and a supportive policy framework, taking into consideration both socio economic and socio cultural factors of a particular place.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

The three objectives of the study were to be able to answer the following research question:

- i. How adequate was the National schools nutrition program design to realize sustainability
- ii. What is the performance of schools with feeding programs as compared to those that do not?
- iii. In what ways can school farms enhanced food availability towards feeding programs in schools?

5.1 Summary of Findings

Objective1: To examine the adequacy of the schools nutrition programme design and implementation

Going by the above findings the study has shown that implementation of the school feeding program in Siaya County is largely absent and thus has the government failed to meet the objectives for which the program was designed. This failure may be attributed either to poor program planning and development, lack of goodwill, bad politics, inability of the government to implement the program due to lack of capacity or all the above. As concluded in (FAO, 2004), there is no single model of a school garden program that fits every situation. Therefore as it may try to develop a national policy framework for school feeding there will be needed to design a program that is situation specific.

Conclusion

From the study findings, it can be safely concluded that the implementation plan of NSFP as was designed and currently practiced is inadequate and therefore ineffective, in Siaya county.

Objective2: To examine academic performance of schools with school feeding programs as a comparison to those without

From the analysis it can be shown that there is no direct link between school feeding and academic performance in Siaya County. For example, an examination of performance index of various categories of schools (Figure 4.1), it can be observed that there was no significant difference in performance between schools with a feeding program and those without. Comparing performance of Matangwe primary school which offers meals and Karapul which has no feeding program, the performance of Karapul has remained better than Matangwe over the years. The same case applies for Nyakasumbi which although has no feeding program, has better performance than Matangwe. However as much as it does have influence on performance as established from previous studies (Karen et al, 2009) and Dan 2009, this is not necessarily the case in County, School feeding can only be considered as one among possible factors that influence academic in primary schools in the county. One other finding from the study is that there is a general poor performance, in KCPE exams in Siaya County given that over a four year period none of the studied schools had a student scoring the minimum 400 qualifying mark to join a national school .

Conclusion

From the analysis of data with respect to this objective, it has been demonstrated that there is no direct link between school feeding and academic performance in Siaya County.

Objective 3: To establish the viability of school farms as an alternative source of food supply.

On the basis of this objective, the study found that: (i) land is not a constraint in most schools, (ii) there exists some form of government presence and support but these do not seem to be adequately exploited, (iii) the government support seem to be more as a routine extension service and not specifically targeting school schools, (iv) most schools use farm work as a mode of punishment or extracurricular activity not necessarily with deliberate purpose of raising food for students, (v) farming is a local initiative by school teachers and not anchored in curriculum, (vi) farming methods used are basically traditional methods as none of the schools visited was using modern farming methods.

From the finding of the analysis, all the schools have some land available which could be used for farming. Similarly, farm size is not a constraint given the rural setting. It is further established that government extension services are available to provide technical support in use of modern farming methods and technologies. There is potential and enthusiasms in schools as observed during the study. What was visibly lacking was infrastructure and supportive policy framework for all schools. This will require deliberate interventions providing the required human resource, curriculum review and setting up school garden activities and school kitchen such as proposed by Ohene, (2005)

and Karen Block and Britt Johnson, (2009). From the above perspectives it can be concluded that “Yes” school farms can enhance food availability in schools in Siaya County.

Conclusions

From the foregoing it can be concluded that school farms can provide a viable source of alternative source of food supply to primary schools in Siaya County.

5.2 Recommendations

It can therefore be said that this study has revealed very useful insights into the kind of challenges experienced in a typical rural school in the Kenya. The results of the study can be used to inform policy and thereby come up with a more responsive policy frame work towards realizing the pledges both in United Nations MDGs and Kenya Government Vision 2030. As concluded in the report by Food and Agricultural Organization, there is no single model of a school garden program that fits every situation and therefore each design has to be situation specific (FAO, 2004).

For the program to be effective and seen to be so, it is recommended that the government will need to carry out a review of the current policy on schools feeding program with a bid to develop a National School Feeding Policy framework together with an implementation design adoptable to counties as devolved.

The study has also revealed several areas which will require further research:

- i. On the general low academic performance in the county, there may be need for research into the factors which lead to this level of performance.
- ii. Secondly the study has also revealed that over the four years the enrollment trend indicated a higher enrollment rate for girls than boys in most schools. It is not clear whether the same is the case in high schools. Therefore there may be need for comparative study targeting high schools to establish whether the trend is the same or different and reasons for the same.
- iii. Another area of research as observed by Dan, (2009), is that there is need to evaluate the effectiveness school feeding programs with specific reference to cost effectiveness and whether the benefits can be achieved by other programs.
- iv. Finally, studies by Lavinger, (1986), established that there is still no conclusive findings regarding the impacts of garden based programs in schools, and several researchers have noted the need for more reliable research based on strong evidence and rigorous methods of evaluation. For example in Kenya there are no known established cooking and kitchen garden programs in schools. This has resulted in an even greater deficiency of evaluative studies and represents a significant gap in the current literature (Karen et al, 2009). This will require a review of the current primary schools syllabus to incorporate setting up school farms/gardens as learning tools. As stated in FAO, (2004), each feeding program need to be situation specific. Therefore

there is need for research in this area if the country is to realize vision 2030. This can only be achieved by a deliberate effort to set up model schools in each county to conduct further researches in the finding of this study.

REFERENCES

- Cochran W. G., (1977). *Sampling of Populations: Methods and Applications*, 3rd edition, New York.
- Dan J, (2009). *Evaluating Effectiveness of School Feeding Programs*. American journal of nutrition, 142 (10),1879-1880. International Food Policy Research Institute (IFPRI).
- Dick F.S, Owuor S.O, Mwangi A. M. (2010). *School farming for school feeding: experiences from Nakuru Kenya, Urban agriculture*. The Journal of field Actions, special issue no.1
- FAO, (2004). School gardens concept note: *Improving child nutrition and education through the promotion of school garden programs*. Rome,
- FAO, (2004). *Special Program for Food Security (SPFS)*. Food and Agriculture Organization of the United Nations Summit. Rome.
- Foeken, F.D, Owuor S.O. (2006). "Farming as a Livelihood Source for Urban Dwellers: Results from a Research Project in Nakuru, Kenya." Leiden:African Studies Centre, ASC Info Sheet no. 1, April 2006
<http://www.ascleiden.nl/Pdf/infosheet1.pdf> .
- Gilligan G., (2009). *School Farm Programs in Developing countries*. Government of Ghana (2006), 2007-2010, Accra.
- Donabedian, A. (2005). "Evaluating the quality of medical care. 1966". The Milbank quarterly 83(4):691-729
- Donabedian, A. (1988). "The quality of care. How can it be assessed?". *JAMA* 121(11): 1145-1150

- Hijazi, S.S., Abdulatif D. (1986). "*The Nutritional Impact of a School Feeding program in Mafraq, Jordan,*" Journal of Tropical Paediatrics, Vol. 32, No. 4, Oxford University Press, Oxford, pp. 174-180.
- Hongo T. and Amolo J, (2004). *National School Feeding Program in Kenya.*
- International Nutrition Foundation (2009). *Schools with and without Feeding Programmes in Nyambene District, Kenya*", (2009). Food and Nutrition Bulletin, Vol. 19, No. 4, Boston, pp. 334-342.
- Karen B., Britt J. (2009). *Final Report to: The Stephanie Alexander Kitchen Garden Foundation.*
<http://home.healthyschools.gov.uk/>
- Kothari C, R. (2004). *Research Methodology, Methods & Techniques*
- Levinger, B. (1986), *School Feeding Programs in Developing Countries: An Analysis of Actual and Potential Impact, Bureau for Food and Voluntary Aid.* Washington DC.
- Murray S. et al, Angela G (2005). *The Living Classroom School Farms in the UK: A mapping survey.*
- Langer N., (2011). *School feeding programs in Kenya: Transition to a Home grown approach.* Stanford Journal of International relations, Vol. XIII, No.1 m.saunders@lancaster.ac.uk
- Ohene D.,(2005). *Home Grown School Feeding Program-Ghanian Model*

Pieters J.J.L., (1977). "*Effects of School Feeding on Growth of Children in Kirinyaga District, Kenya*", East African Medical Journal, Vol. 54, Medical Association of East Africa/British Medical Association/Kenya Medical Association, London/Nairobi, pp. 624-629.

Pollitt E. (1990), *Malnutrition and Infection in the Classroom*, UNESCO, Paris.

Republic of Kenya (2001a). *Poverty Reduction Strategy Paper for the Period 2001-2004*. Ministry of Finance and Planning, Nairobi.

Republic of Kenya (2001b). *Economic Survey 2001*, Government Printer, Nairobi.

Simeon, D.T., S.M. Grantham-McGregor (1989), "*Effects of Missing Breakfast on the Cognitive Function of School Children of Differing Nutritional Status*". American Journal of Clinical Nutrition, Vol. 49, pp. 646-653.

UN, (2008). *Fact Sheet: End poverty 2015. High level Event on Millennium Development Goals*. UN Headquarters, New York 25th September.