

PRIMARY SCHOOL QUALITY AND PERFORMANCE 'THE CASE OF  
KENYA'. //

By  
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## DECLARATION

This paper is my original work and has not been presented for a degree in any other university.



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This research paper has been submitted with our approval as University supervisors.



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May God bless you all.

## **ABSTRACT**

In developing countries low levels of student achievement persist. This study reviews the importance of school quality in increasing level of school performance and thus its influence on economic growth. Improvements are discussed in terms of defining school quality, improving school quality and showing the benefits of primary school education in developing countries. Evidence suggests that low school quality accounts for low literacy levels and achievement in developing nations and that slight progress has occurred in improving school quality especially in the poor areas. Definition of school quality focuses on characteristics that influence primary school performance. Studies are reviewed to observe practices that enhance school quality and thus steps to be taken to increase school quality which in essence will improve performance are identified. The study utilized the production function economic approach in terms of returns of certain inputs. The data has been estimated using OLS and the results reflect that presence of a feeding programme, class size- measured by the ratio of teachers to pupils, school infrastructure and sanitation have a significant effect on the performance of primary school pupils.

The study recommends continuous support to the schools by the government, donors or through community projects to facilitate provision of meals (mainly lunch), construction of adequate classrooms, latrines/ toilets and safe drinking water. The study also emphasizes on deployment of more teachers so as to maintain a reasonable teacher pupil ratio.

## **LIST OF ABBREVIATIONS.**

AFHK - Action for Healthy Kids.

ASAL - Arid and Semi Arid Land

BANBEIS- Bangladesh Bureau of Education Information & Statistics

CSR- Corporate Social Responsibility

FPE - Free Primary Education

GAR - Gross Attendance Ratio.

GCE - General Certificate of Education

GDP - Gross Domestic Product

GER - Gross Enrolment Ratio.

GOK- Government of Kenya

HIV - Human Immunodeficiency Virus.

IMP - Instruction Materials Programme

INSET - In-service Teacher training

KCPE- Kenya Certificate of Primary Education.

KESSP- Kenya Education Sector Support Programme

KIHBS - Kenya Integrated Household Budget.

KRT - Key Resource Teachers

MDG's - Millennium Development Goals.

MOEST- Ministry of Education Science & Technology.

NGO - Non Governmental Organisation.

UPE - Universal Primary Education.

UNESC - United Nations Economic & Social Council.

UNESCO - United Nations Economic

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# CHAPTER 1

## 1.0 INTRODUCTION.

In the developing countries the education sector's contribution to national development has been widely recognized since World War 2. Government policy makers and development groups have emphasized the importance of increasing the quantity of education that is building more schools, hiring more teachers and enrolling more children. However quality of teaching and learning in a number of schools remains low, in developing countries e.g Kenya, Tanzania, Sifuna (2007), Bangladesh (2005), among others thus increasing public concern over school quality.

In recent years, from year 2002, there has been a challenge as regards the current school policy in terms of cost, effectiveness and fairness of the current schooling structure which is a public issue. In several studies to analyze the determinants of enrolment, retention and achievement of the set goals it has not been possible to measure school quality directly nor separate the critical elements of quality that matter, for example Hanushek (1986), Fuller (1986), Glewwe, Paul and Jacoby (1994) among others.

With reference to Hanushek (1986), school and achievement may be viewed as the production function versus efficiency in economics. The performance or achievement of schooling can be seen through the graduation rate to the next level of schooling. Also schooling inputs refer to the total expenditure incurred per pupil, changes in the way of operation of a school is reflected as the impact on the students performance.

In his recent study Hanushek (2008), good quality education is seen to have a strong positive correlation with economic growth; it is not just going to school but learning something there that matters.

In developing countries studies have shown that basic education mainly education in the primary school level has a positive impact towards the general economic performance of the country. Lloyd, Mensch and Clark,(2000), women who have attended the primary level of schooling are better placed in making of family planning decisions and hence able to control intensities of infant mortality and other child care



issues. This also facilitates understanding of other critical health matters like HIV/Aids and thus able to minimise infection and death from the scourge. Most developing countries have agriculture as the backbone of their economies, farmers with basic education are perceived to be more productive as they have a higher ability to interpret instructions on fertilizers and other farming products unlike their non-knowledgeable counterparts.

Gertler and Glewwe (2006), say that, perceived benefits of attending school influence enrolment because cognitive skills as measured by performance in school are highly rewarded in the labour market. In developing countries the labour market is very competitive as employment opportunities are scarce thus individual students demand for the best quality of education to earn them a better position in the employment world. Education is an investment in human capital which is important in development, therefore when the investment is low it is widely considered as an obstacle to economic growth and poverty eradication.

Education is an important tool to measure the accumulation of human capital which determines the level of growth. When Kenya's government introduced free primary schooling in 2003, vast numbers of additional pupils were brought into the education system overnight, putting an increasing steep school enrolment curve.

It has enabled 1.3 million poor children to benefit from primary education for the first time through the abolishment of tuition fees. The gross enrolment rate in primary education jumped from 86.8% in year 2002 to 101.2% in 2004, republic of Kenya (2007).

Inspired chiefly by the belief that education, through its output of trained manpower, is an important element in fostering economic growth, many third world governments encourage their citizenry to seek more education. It is noted by Fuller (1991) however, that the state encounters severe constraints in providing these services. In this respect he argues that state resources are out of step with the growing enrolments, a situation that has led to overcrowded and dilapidated schools and poorly trained and underpaid teachers (Fuller, 19991). Under such circumstances, the specialized attention that needs to be given to the training of future participants in the labor force often becomes no longer possible in the indiscriminately large classrooms that result from accelerated educational expansion.

UNESCO (2005), stipulates that the main challenges facing primary school education in Kenya are large pupil teacher ratio, shortage of infrastructure, lack of standards of academic achievement and limited monitoring of teaching- learning process and yet there are no policies in place to address these challenges which are a threat to the quality of education. The report further says that even after developing a sector wise approach to manage education, indicators show that quality of primary education is still poor. Unless urgent measures are taken to address these challenges, the quality of education is bound to degenerate, thus jeopardizing the country's development goals. From the same study UNESCO (2005), it is stated that it is important to focus on all factors affecting education quality namely: learner characteristics, an enabling context, enabling inputs such as teaching methods, class size, assessment methods, teaching and learning materials, physical infrastructures and facilities, school governance and human resource. Countries that have focused on educational outcomes and paid attention to these factors have seen quality of their primary education systems improve.

It has been a great concern that as much as there is free and equal funding of education by the government in the country, some areas especially the marginal areas and slums, continue to exhibit poor/ low performance.

### **1.1 Background Information.**

In Kenya, with reference to the vision 2030, the government aims at achieving a just and cohesive society enjoying equitable social development in clean and secure environment. One of the key issues the document, vision 2030, aims to achieve is improvement in human capital as a well educated and healthy population is important to increase productivity and overall performance of economy. An example of interventions considered to attain this is, measures to achieve 100% enrolment at primary level, enhancing secondary education by expanding bursaries to cater for at least 10% enrolled students, rehabilitating laboratories and classrooms and standardizing teacher student ratio at 35.1

Children's health and education in Kenya need to be given key importance if the vision 2030 will be a reality. Unlike poverty in general, child hood poverty may have life long consequences: disability, illness, death and growth retardation of the population. The vision should comprise of policies to increase enrolment and advance universal primary education, reducing gender disparities in access to primary and secondary education, increase transition rate form primary to secondary schools , raising pupil text book ratio and additional class room units (Kulundu, 2007)

Primary education is the one of the first stage of compulsory education which aims at achieving basic literacy among all children, to ensure that by the year 2015 all boys & girls complete a full course of primary schooling: being one of the objectives of Millennium Development Goals (MDG's). Meeting the education goal will speed progress toward every other MDG, in the logic that educating children helps reduce poverty and promote gender equality, lower child mortality rates and promote concern for the environment. Therefore education is inextricably linked to gender parity which is another MDG, just by definition universal primary education by definition requires gender parity and free primary education for all children id a fundamental right to which governments committed themselves under the 1989 Convention of the Rights of the Child, United Nations Economic and Social Council (UNESCO).

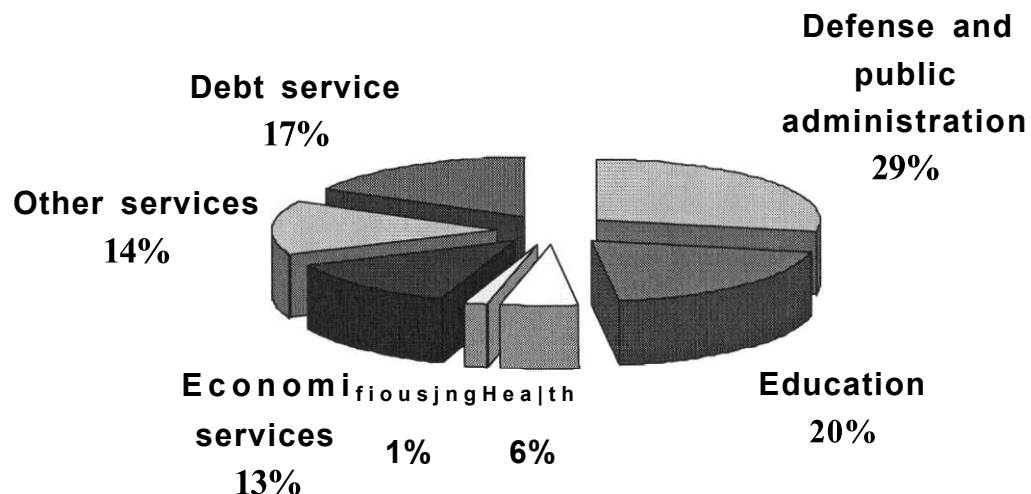
However recent statistics show that for every 100 boys out of school, there are still 117 girls in the same situation. Until equal numbers of girls and boys are in school, it will be impossible to build the knowledge necessary to eradicate poverty and hunger, combat disease and ensure environmental sustainability. And millions of children and women will continue to die needlessly, placing the entire of the development agenda at risk. Vision 2030 is in line with the MDG's, where reduction of illiteracy level is one of the objectives.

According to the Ministry of Education Science & Technology (MoEST) in Kenya, the overall sector's objectives are to ensure equitable access, attendance, retention, attainment and achievement in education, science, research and technology by ensuring affordability of services, Republic of Kenya (2006). The MoEST seeks to mobilize resources for sustainable and efficient delivery of relevant educational research, technological and other educational services. The Ministry will ensure co-ordination of the provision of education and training for efficient delivery of services between government, donors, NGOs and communities. It will promote and popularize a Science and Technology Culture.

The study by Bold, Kimenyi, Mwabu & Sandefur (2009), depicted that, much as the gross primary school enrolment rate increased by about 14.4% it important to note that total enrolment in the public schools dropped by about 2.4% as that of the private schools increased by 5.8%. Republic of Kenya (2004), states that, the government overall expenditure in the social sector increased by 16.6% from 93,975.47 million in 2002/2003 to 109,570.16 million in 2003/2004 financial year. The increase was due to implementation of FPE. School enrolment in primary schools increased from 6,131.0 thousand in 2002 to 7208.1 thousand in 2003, with a massive influx into public schools. The number of teachers increased slightly from 178,037 in 2002 to 186,322 in 2003 while the pupil teacher ratio worsening from 34:1 in 2002 to 40:1 in 2003. Also the number of adults who registered for K.C.P.E increased threefold to 6,634 in 2003

Government spending is about 22% of GDP and education supposedly takes the second largest share of government spending that is about 20% as shown in the diagram 1 below.

**Share of Public Expenditure by Sector: 2002/2003**



*Source: Saitoti (2004), MOEST*

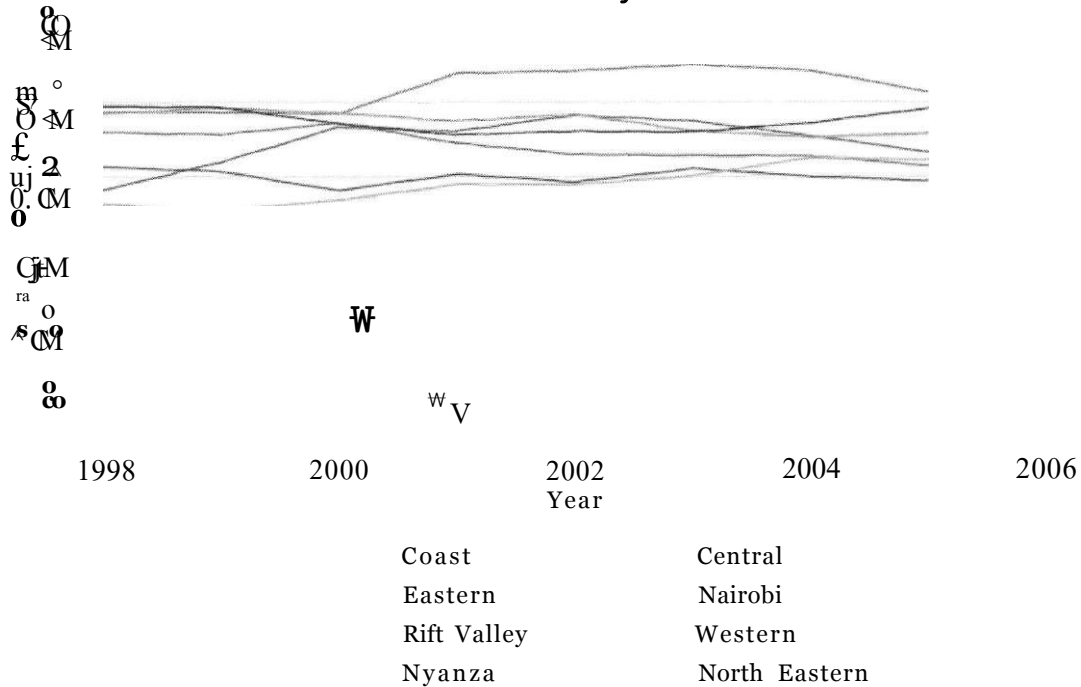
As regards education policy in Kenya: From the year of independence 1963, the republic decided to fight against illiteracy making education to be considered a crucial factor for development. After independence The British education system was adapted, where currently it is the 8:4:4 system. This system was created to help those students who do not plan to pursue higher education, leave primary school and find employment.

According to the Republic of Kenya (2006), the main objectives of education in Kenya are; to enhance the ability of Kenyans to preserve and utilize the environment for productive gain and sustainable livelihood, to develop quality human resource, to ensure equitable access to education and training for all children including the vulnerable groups and fourthly education is necessary for development and protection of democratic institutions and human rights.

Out of all children in Kenya about 85 percent of children attend primary school, 24 percent of children attend secondary school, and 2 percent attend higher institutions. Formal education in Kenya is categorised into primary (Standard 1 to 8), secondary (Form 1 to 4) and tertiary schooling that is vocational training and university education, Republic of Kenya (2006).

In Kenya, since the early 1990s, the education sector has been laden by an array of problems mainly, low grade attainment, declining enrolment, regional and gender disparities in enrolment and grade attainment, late entry into school and high dropout and repetition rates. Kabubo and Mwabu (2006), say that poor performance in school leaving examinations in Kenya remains a major hurdle and indicates the need to improve the quality of teaching in schools holding child cognitive ability constant. The figure below presents the performance trend in Kenya both before and after the introduction of the free primary education. It is evident that for all provinces except North Eastern, the performance either stagnated or decline after the year 2002

## KCPE Trends by Province



Source: Bold et al

The government with an aim of achieving the 2<sup>nd</sup> Millennium Development Goal (MDG) that is universal primary education (UPE), it introduced the free primary education programme in year 2003.

Republic of Kenya (2007), states that Kenya's free and compulsory education has increased the gross enrolment rate nationally but the poor children still cannot afford to attend school.

It stipulates that about 9 out of 10 children from poor households fail to complete their basic education with an increasingly dropout rate in especially in the slums and drought affected areas.

The Government doesn't give much for free secondary education. In the programme, the Government is giving Sh10,265 a student a year. Parents are supposed to pay not more than Sh18,000 a student a year. Whereas the Government is meeting Sh3,600 tuition fees, food and boarding costs are not part of the subsidized secondary education. As it is currently, the cost of free primary education is beyond the current budget allocation for education thus making implementation of the policy to heavily depend on donor support.

According to Bold, Kimenyi, Mwabu & Sandefur (2009), parents have lost sense of ownership of the schools since they no longer pay fees with the authority to hire and fire being totally on the ministry of education that have little information on the school management.

The key education indicators include school attendance, highest grades completed, type of school attended and current adult literacy.

Republic of Kenya (2005/6), 93% of the school going age population (6-17 years) attend school for at least 1 term with a higher proportion being from urban areas as compared to the rural areas. No major disparity has been recorded currently as regards the proportion of male to female who have ever attended school as compared to previous reports. However lower proportions of attendance are still observed in the Arid and semi arid lands (ASAL).

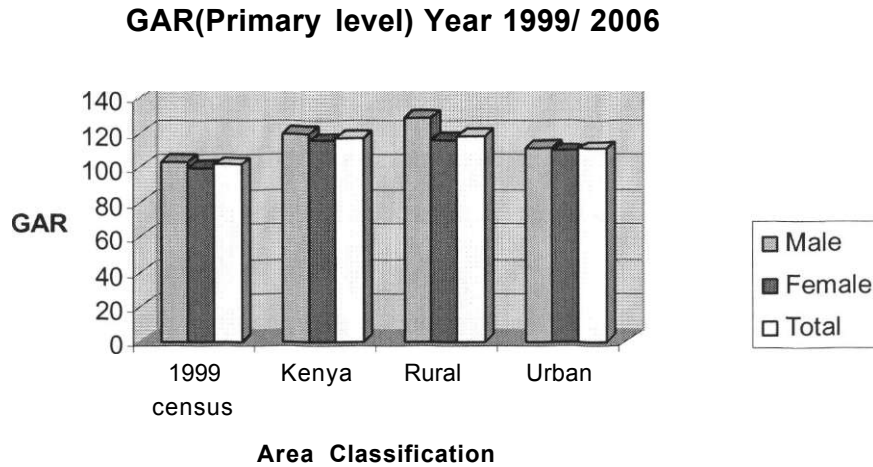
On the other hand about 6.2% of the school going age population has never attended school with more than one third of them being from the North Eastern region. Among the reasons for non-attendance were the parents still believed that the child was very young despite attaining the school going age of 6 years (12.6%), 19.8% (Mainly of age between 6-9years) was due to lack of money for school expenses reflecting that even after implementation of FPE, incidental costs to schooling like school uniform and feeding are still a huge burden to some parents. 29.1% and 22.4% non-attendance was as a result of declination by parents and the need to work or help at home respectively. Also in some area like Migori, Suba and Turkana major reason for non-attendance was due to family illness.

The following figures (1 & 2), reflect the gross attendance ratio (GAR) in both primary and secondary levels based on the 1999 population and housing census and 2005/6 KIHBS. GAR refers to the total number of primary or secondary school pupils expressed as a percentage of the official school age population in each level respectively.

In consideration to the entire country as reflected in diagram 1, the GAR is extremely high in the Primary level owing to the introduction of FPE programme. However from diagram 2, the GAR in Secondary schools much as it relatively increased as compared to the year 1999's findings it is still lower as compared to the increase observed in the

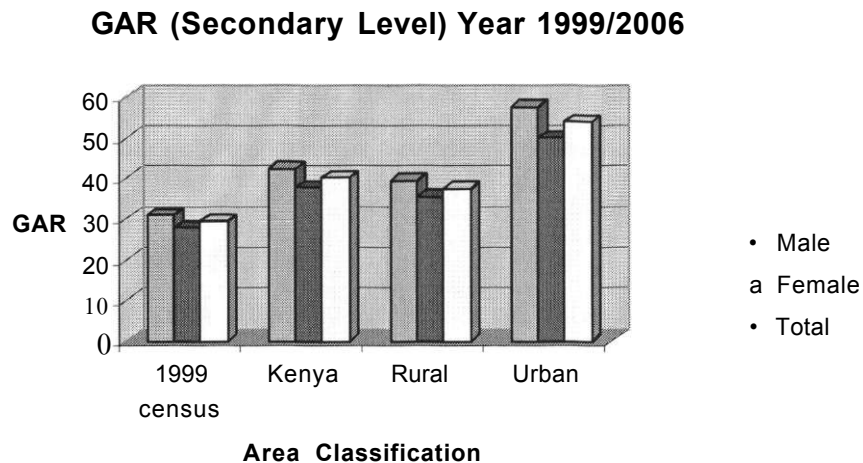
primary school level. Also as reflected in table 1, secondary school attendance ratios show a high degree of disparity across districts and sex.

Figure 1-Gross Attendance Ratio in Primary School level.



Source: Republic of Kenya (KIHBS), 2006/2007.

Figure 2-Gross Attendance Ratio in Secondary School level.



Source: Republic of Kenya (KIHBS), 2006/2007.

As regards adult literacy over about 90% of urban residents can both read and write as compared to about 75.7% of the rural population. Much as the younger population is expected to be more literate, there is no adherence to this in certain instances. For example the highest ability to read and write among males is exhibited at the age of 23 years as compared to those aged 15/16 who would rank 4<sup>th</sup> and 7<sup>th</sup> respectively, as



portrayed in the Republic of Kenya, (2005). In addition majority of students attend government institutions across all school levels except for those in vocational and professional training whereby most students are absorbed by private institutions.

Republic of Kenya (2005), through the education overview policy paper reflects that, following the implementation of FPE, there has been an upsurge in enrolment in public primary schools, resulting in a GER of 99% in 2003 (102% for girls and 97% for boys). Every effort is, therefore, required to sustain the current enrolment and address the key issues of improved access, equity and quality.

The education sector in Kenya is faced by several challenges for example in the primary level, it has not been possible yet to have all the school going age enrol in schools and at the same time the completion and enrolment rate to secondary schools is still quite low especially in the rural areas and urban slums. Mostly being girls affected by HIV/AIDS and working children

In addition, the increased attendance due to FPE has led to a shortage of teachers and classrooms with children not getting sufficient attention from teachers due to overcrowding which affects the quality of service delivered. AS a result demand for low cost private schools increased and thus parents who could afford to pay the fees could send their children to learn in a better environment.

## **1.2 Statement of the problem**

Quality of schooling can influence the individual choices of education and thus affect the enrolment rate in schools. Government policies play a great role in either the reduction or increase of school enrolment in an education system.

Saitoti (2004), depicts that the government spends about 22% of the GDP on education hence together with other donors investing in the venture need to ensure maximisation of returns (example performance).

From previous studies, school quality, that is measured in-terms of its variables example teacher student ratio, ratio of textbook to students, school equipment and facilities for example the type of classrooms (permanent or temporary), presence of a school feeding programme, accessibility to safe drinking water and availability of latrines or toilets among others which affects school performance (mean scores)

which is an output of the variables interaction, holding constant the cognitive ability of the pupil (for example: Case and Deaton 1998; Glick and Sahn 2004; Hanushek 1986; Mariara and Mwabu 2006 ;). None of the studies has focussed specifically on quality of primary schools in Kenya in relation to their performance score.

Education performance in some areas of the country (Kenya) has continued to deteriorate even after the introduction of free education. This raises alarm to those who invest in primary education as the returns (measured through performance scores) are not fine as expected. Investors in education include parents/guardians and donors either domestically or internationally. The former investor depending on their financial strength will opt for private schools or international schools which have a different curriculum of education for example G.C.E (General Certificate of Education), which will portray lack of confidence in our own education system as a country. On the other hand the latter investor will be forced to pull out her support as there will be no point of committing its funds to a non-performing project thus sooner or later their attention towards provision of education in a country will shift to other development projects which require donor funding.

This research aims to examine the impact of school quality to performance scores with school quality being measured in terms of various variables for example teacher to pupil ratio, textbook ratio, presence of a school feeding programme access to safe drinking water among others.

### **1.3 Objectives of the study**

#### **1.3.1 General objective**

The main objective of the study is to investigate the impact of primary school quality on primary school performance in Kenya

#### **1.3.2 Specific objectives**

- To examine the relationship between school quality as per the defined variables and school achievement in terms of K.C.P.E performance scores within primary schools in Kenya.
- Make policy recommendations based on the research findings, to improve primary school performance in Kenya.

#### **1.4 Justification and importance of the study**

This study was conceived as a matter of concern on the fact that primary school performance is affected by other factors besides cost of tuition. After introduction of FPE by the government the level of enrolment in primary school level has been increasing though the increase is not similar in the secondary level where the enrolment rate has been relatively low especially in the substandard areas. The paper has taken a closer look to several schools (448 schools), across the country and has compared their performance vis a viz their quality in terms of the noted common and basic variables.

This study will be important to the stakeholders in education of this country mainly the government and parents/guardians who heftily invest directly or indirectly in the sector through provision of FPE and payment of taxes respectively.

The results from the study to begin with will contribute to bridging of the knowledge gap through provision of literature on primary school quality and performance in Kenya. In addition, based on the findings, the study will offer policy prescription to education policy stakeholders on issues related to the management and planning for education.

#### **1.5 Outline of the proposal**

The research focuses on the impact of perceived school quality on the student's performance in developing countries with a narrower study of Kenya in the period 1999 to 2006. The following chapter of the study through Theoretical literature aims at reviewing past literature as regards quality of schools after which the empirical literature reflects the various outcomes of the studies, that is to what extent the variables under study contribute to primary school performance.

## **CHAPTER 2.**

### **LITERATURE REVIEW**

#### **2.1 Theoretical literature**

The literature about the relationship between measures of schooling quality and subsequent attainment is ambiguous. The analyses available are often crude empirical ventures that are difficult to replicate and to evaluate in a definitive manner. While these studies offer an important perspective on how to observe educational outcomes, they do not currently provide firm guidance about appropriate contemporaneous measures of quality that might be directly used in production function analysis. Surveys by Hanushek (1986), for developed countries, and (1996), for developing countries, argue that school facilities have at best tenuous effects on outcomes, particularly on test scores.

According to Fuller (1986), school quality is often indicated by school characteristics which are unrelated to student performance. The school characteristics should be able to improve the achievements by the students and encourage more efficient management of material inputs by local school staff. The study further stipulates that in developing countries quality of a child's school influenced his or her academic performance unlike in the industrialized nations where school quality has been eclipsed by the child's family background.

Hanushek and Kain 1973, with reference to the Coleman report, say that difference in schools has little to do with difference in students' performance.

The outcome of the schooling process that is achievement of an individual student is a straight relationship to a series of inputs for example characteristics of schools, teachers, and curricula among others which are directly controlled by policy makers. There are other inputs however those of family and friends and the natural learning capabilities of the student which are uncontrollable.

In some cases the decision to send or not to send a child to school or not is influenced by factors i.e Household characteristics e.g household income, parents education, gender of the household head; Individual characteristics and Community characteristics e.g quality of schooling which affect the expected utility of the decision choice, as widely debated in the literature (Gertler and Glewwe, 1990; Glewwe and Jacobby, 1994; Strauss and Thomas, 1995).

According to the study by Kabubo and Mwabu 2007, community characteristics that reflect the future return to education for example both direct and indirect proxies of the quality of schooling, measured by pupil teacher ratios, ratio of trained secondary school teachers to students and conditions of the school facilities are potentially important.

Significant number of studies into educational production relationships has employed other quantitative measures as student attitudes, school attendance rates, college continuation or drop out rates which are substitutes for more fundamental outcomes. This is due to the belief that educational outcomes are not adequately quantified. Further, while achievement may be measured at discrete points in time, the educational process is cumulative; inputs applied sometime in the past affect students' current levels of achievement.

According to the study done by Lloyd, Mensch and Clark, (2000), completion of primary school plays a major role not only in economic returns but also with many social returns like, in the case of women, lower fertility, lower infant and child mortality, better child health and education, reduction in gender inequality within the family and later ages of marriage. They further say that school effectiveness especially on the basic level depends on factors that encourage attendance and retention than on factors directly linked to achievement of cognitive competencies. School quality from the aspect of retention at the teenage child age is also affected by the sex difference of the children. It is noted by them that as the children approach the age of 15-19 years the level of school drop out increases with the number of girl child drop out being relatively higher.

In addition to, the classroom environment matters greatly towards good performance. The extent of student participation, value of the interactions between student and teacher and the manner in which classes are clustered example either randomly or by ability, will affect both the student in skills development and the teacher in impartation of knowledge. A slight ignorance of the academic capabilities of any student raises the chances of school drop out.

With further review the government of Kenya with its aim of achieving the MDGs through investment in human capital increased its budgetary allocation to social services by 16.5% from 126.7 billion in year 2005/2006 to 147.6 billion in 2006/2007( Economic survey 2007). The sectors' recurrent expenditure increased by 13.2% from 110.2 billion in 2005/2006 to 124.8 billion in 2006/2007. The number of primary schools increased by 476 units to 20229 units in 2006 out of which 337 were by the private sector.

Hanushek (1986), also says that, school quality is also affected by the total spending per student. According to his study total spending per student is significantly affected by the teacher to student ratio in the sense that the higher the number of students per teacher the lesser the cost and thus enrolment expected to be higher. However our study considers the teacher to student ratio as an independent variable whereby the higher the number of students per teacher the lower is the perceived quality of the school and thus level of enrolment will decrease.

## **2.2 Empirical Literature**

In recent years there have been several studies that have sought to analyze school performance in relation to school quality. A number of these studies have examined impact of; teacher student ratio, teachers' remuneration, school facilities and equipment, parents level of schooling and household income on performance.

To begin with Hanushek (1986), says that the history of educational production function is traced to the 1996 Coleman Report on *Equality of Educational Opportunity*. Commonly the report claims that differences in student performance have little to do with the differences in schools but instead with family background

and with the characteristics of other students. This reports finding generated extensive critiques for example by Hanushek on which we relate the arguments of our study.

According to Fuller (1986), material inputs directly linked to instructional process consistently influence pupil achievement. Out of 22 studies of impact of textbooks 14 were found to have significant effect on performance. In the same study it was found out that out of 18 studies on presence of school libraries 15 discovered high significance to pupils' achievement.

Considering school quality in developing countries led to a keen look on the teacher to student ratio as one of the indicators. Dupas, Duflo and Kremer (2006), note that improvement of the teacher to pupil ratio (that is to a smaller sized class per teacher), leads to improvement in test scores which is expected to be higher in a case whereby pupils are put in more homogeneous classes or assigned to extra teachers.

Secondly from the study done by Action for Healthy Kids-AFHK (2004), nutrition plays a major role in academic performance, in their research done in New York, many students experienced malnutrition that was too slight for clinical signs yet still affected their intelligence and academic performance.

Duflo (2006), in the Kenyan based study, also notes that the level of participation of pupils is higher in schools where free breakfast was given.

Thirdly, Kabubo et.al. (2006), stipulates that the cost of education decreases the probability of sending a child to school, more so in rural areas. However from the study there is no significant difference between the impacts of cost on the probability of boys and girls enrolling in school.

From the same study, it reflects that the presence of more (a higher) grade teachers in a school, raises the probability of enrollment whereas presence of low skill teachers (P2 and P3) lowers the probability of enrolment especially in the rural areas. Therefore parents could be basing their decision to send their children to school on the quality of schooling as proxied by the teacher skill level.

Kremer also noted that the presence of trained teachers in a school leads to 0.4 significance improvement in scores.

Miguel and Kremer (2004), notes that presence of a deworming programme in a school would lead to decrease in absenteeism by 25% and increase schooling by about 0.15% per pupil per year.

In addition to, parents' education increases the probability of enrolment, Kabubo et.al. (2006). Findings from the study note that, fathers' education is a more important determinant of primary school enrolment than mothers' education across regions and across gender of the child. Parental education is important for girls than for boys' enrolment. The coefficients for fathers being employed were found to be negative but insignificant implying that fathers' employment status may not be an important determinant of enrolment.

### **2.3 Overview of Literature Review**

Most of the education literature that we have analyzed has tended to agree on the factors that determine school quality. For example parent's Income level, qualification of the teachers, teacher student ratio, presence of a school feeding programme among others.

*The next section looks at the methodology used in the study.*



## CHAPTER 3.

### RESEARCH METHODOLOGY

This chapter shows the method of data collection, analysis and emphasis of the relationship between the dependent variable (Primary school KCPE performance scores) and other factors influencing it (Teacher to student ratio, textbook to student ratio, Quality of teachers, Existence of a school feeding programme, Sanitation facilities, School infrastructures, Quality of school management and background of the pupil in terms of poverty levels).

This chapter reflects the economic theory adapted by the study and the explanation of the expected flow of cause and effect of the variables under study. The relationship of the dependent and independent variables is further demonstrated through a mathematical representation referred to as the model.

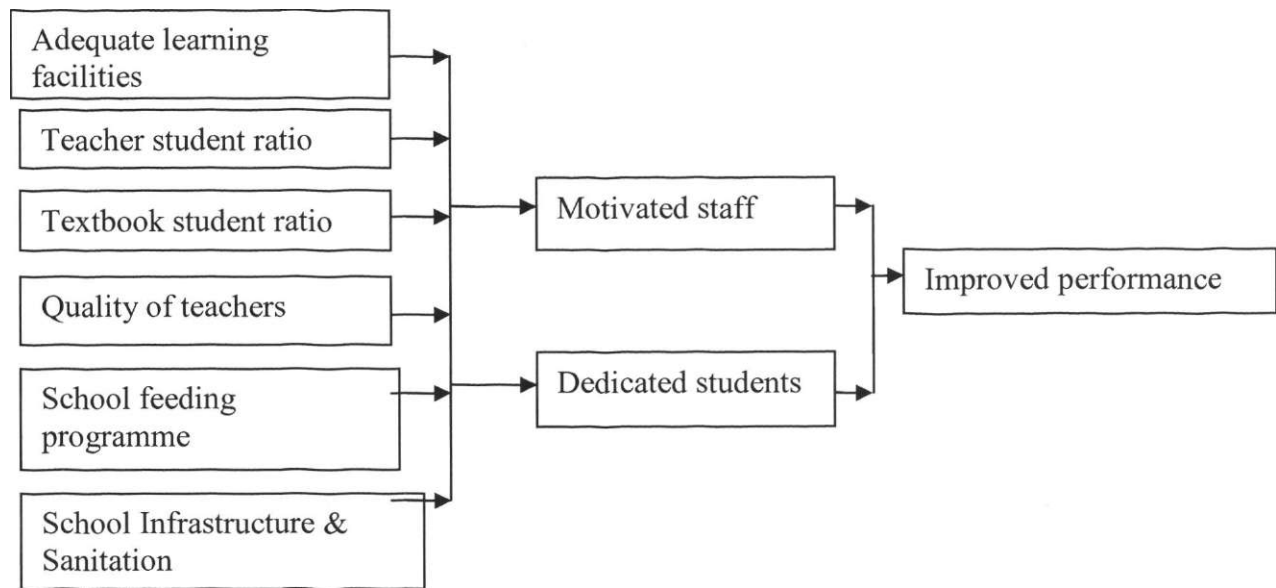
#### **3.1 Theoretical framework**

Hanushek (1996), as earlier mentioned approaches schooling from the aspect of a production function. A production function shows the relationship between the number and units of inputs that a firm employs and the resulting units of output that result. (Spencer 1983).

#### **3.2 Conceptual framework**

The conceptual framework is a representation of the process followed in the study. The study looks at the impact of primary school quality on performance through test scores. The study was aggravated by the stagnated performance of pupils from schools in Kenya besides presence of free education offered by the government.

**Process of Analysis of impact of school quality on performance and Recommendations of the way forward.**



*The description of data and the expected results is further presented on table 3.*

**3.3 The Model**

In this study we will borrow the firm's theory of production approach. A production function specifies the output of a firm, industry or entire economy for all combinations of inputs. It enables to determine the most efficient and feasible practice for production of a specific product hence maximization of output from the given inputs. Using the production function we prove that school quality is not only affected by tuition fees but also by the following factors: teacher to pupil ratio, teacher's pay, textbook to student ratio, presence of health programme (doctor) in a school, Presence of school feeding programme, family background (parents schooling level, parents income) and sanitation facilities.

Taking school achievement to be measured in terms of performance (P),

Hence  $P=f(\text{School Quality})$  i.e  $P=f(Q)$

*Therefore:*  $P=f(\text{Teacher to pupil ratio, Teachers pay, Textbook to student ratio, Presence of health programme, Existence of school feeding programme, Sanitation facility, School equipment, Competence of teaching staff in terms of their qualifications})$

The variables are considered to be continuous and not discrete. We will further estimate the data collected using the Ordinary least squares model (OLS) which has the following assumptions:

**Assumptions of the classical linear regression model.**

- The model specifies a linear relationship.
- There is no exact relationship among the independent variables.
- The expected value of the error term  $e$  is not a function of any of the independent variables ( $E[e_i] = 0$ )

**The model:**

$$P = f(Q)$$

Where  $Q =$  sum of all the variables that explain quality.

$$P \sim f(\beta_0, X_1, X_2, \dots, X_n)$$

**Therefore:**

$$P = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + e$$

The model aims at maximization of performance subject to the quality variables, thus aims at improvement of the variables which determine quality.

Each economic agent has an economic objective. A school which in this case acts as a firm seeks to maximize the performance of the school through various measures like: making available the required learning facilities, raising the teacher to pupil ratio, textbook to pupil ratio, school feeding programme, health facilities among others.

Where:

$\beta_i =$  Coefficient of  $X_i$

$X_i =$  Independent variables (Such as teacher to student ratio, sanitation facility, school feeding programme among others.)

$e =$  Error term

$P =$  the dependent variable that is performance scores ( $>0$  or  $<500$  marks)

**Specific definitions:**

$P =$  School's education Performance scores (Year 2005 KCPE marks obtained)

$X_1 =$  Teacher to student ratio (Total number of teachers / Total number of pupils)

$X_2 =$  Text book to student ratio (Text book ratio for class 8 pupils)

$X_3 =$  Quality of teachers (Academic qualifications & acquisition of training)

X4 = Existence of school feeding programme

X5 = Sanitation facility (Presence of safe drinking water, number of toilet/ latrines)

X<sub>6</sub> = School infrastructure (Permanent classrooms, library)

X<sub>7</sub> = Back ground of a child (Dummy for schools with high/ low poverty index)

X<sub>8</sub> = Lost books replacement policy (A variable for quality of school management)

### **3.4 Data sources**

This study has made use of the primary data collected from some primary schools within the country by the MoEST in 2006 and the 2005 Kenya Certificate of Primary Education data set as a result of the limited student level data base. The data has been analysed using STATA and the results presented using tables with utilization of descriptive statistics and regression analysis.

### **3.5 Study site and justification**

FPE was introduced in Kenya in year 2003 and has been of a great concern and monitoring of its viability and returns to the country. The study aims at identifying the relation or impact of the noted variables to KCPE exams performance bearing in mind the introduction of FPE.

Kenya is one of the developing countries whose government has taken a bold step to offer free primary education. Achievement of universal education is one of the millennium development goals and it will also facilitate the realization of Vision 2030. The study thus needs to ascertain other factors that will improve performance in the primary schools besides the cost of tuition.

# CHAPTER 4.

## STUDY RESULTS

In this section we present the descriptive statistics and the results of the regression equation. We begin by presenting the descriptive statistics followed by the regression results.

### 4.1 Data Collection Methods

The research has been carried by way of examination of secondary data, administration of sample questionnaires and observation in relation to primary schools, with a sample size of 448 schools.

The various independent variables, their description and the expected results in the dependent variable under study, after increase of the independent variable used in the analysis are as defined in table 3 in the annex.

### 4.2 Descriptive statistics.

Currently the primary school curriculum has 5 testable subjects with a total score of 500 marks. The staffing norms study (GOK, 2005) puts the optimal size between 40 and 45 pupils.

The descriptive statistics are as shown below. On average the 2005 KCPE mean score for the sample schools was 244.74 with minimum mean score of 126.6 and a maximum mean score of 356.66. From a sample size of 448 schools, the mean of the number of pupils enrolled in class 8 during year 2005 is 39.35, whereas from a sample size of 403 schools the general mean number of pupils is 39.685. The mean of the total number of teachers i.e both TSC & PTA teachers was noted to be 11.93 with a standard deviation of 7.309. We also note that from 430 schools about 72.79% of the teachers have qualifications of 'O' Level and only 2.33% have attained either the 1<sup>st</sup> degree or have a higher qualification e.g a Masters degree.

On the other hand only 176 schools responded to the question as regards teachers trained in special education, having a mean of 1.608. 51.14% of the schools have only 1 teacher trained as refers special education with 21% having 2 teachers.

With the entire sample size, 94.87% of the schools have a textbook replacement policy where the parents must buy the books lost by their children with only 0.67% of the schools allowing replacement by the school.

As refers sanitation in respect to accessibility to safe drinking water and the number of latrines (toilet) in a school, the response was from 445 and 437 schools respectively where 76.85% confirmed accessibility to safe drinking water and a mean of 14.05 as regards presence of latrines. In addition to it was revealed that 16.29% of the schools in the total sample size have a library.

The mean of the pupils who are from poor families is 68.35 with a mean wage of Kes 132.48 per day for labourers from 442 observations made.

With a sample size of 444 schools, 48.42% schools were found to be implementing a school feeding programme.

### **4.3 Regression results**

The regression results for the estimated parameters based on the school level ordinary least square and mean regression are presented on table 5. The dependent variable is school performance which is measured by the KCPE mean examinations scores for each school in the sample.

Some variables are unobserved for example the household characteristics like parental support or income, parent level of education among others and pupil capability which are household and individual based variables which are not included in the regression. Nevertheless, the variables under the study give a depiction of some of the important factors in determining performance in the primary schools. The F- statistic of the results was 3.3 whereas the adjusted R<sup>2</sup> was at 0.0756 hence it reflects that the variables under study when considered jointly highly influence performance of primary schools by about 33%.

#### ***Teacher pupil ratio***

Teacher pupil ratio is an efficiency indicator that shows the level of teacher utilization together with teacher to pupil contact time. In learning and teaching situation, the teacher is faced with learners (pupils) of different learning behaviour in terms of their understanding capabilities thus calling for variation in how to tackle each of these pupils at a closer level so as to build their strong areas and strengthen their

weaknesses. High TPR would mean low teacher utilization however there could be a relatively high teacher student contact and less work load for the teachers hence they are likely to be more effective though not necessarily cost effective. Further more, a small class size is associated with effective teaching and learning. Despite this advantage, there exists an economic threshold beyond which economic costs of smaller classes outweigh the learning benefits associated with such classes.

Regression results show that teacher pupil ratio has a positive and significant influence on performance, whereby increase of the teacher to student ratio by 1 unit will improve performance scores by 5.4397. The higher the pupil teacher ratio the higher the probability of the teacher pupil contact and this is likely to have a positive impact on the out put. The assumption is that such contacts are used effectively for the purposes of teaching and learning hence improved / increased performance.

#### ***Quality of teachers.***

Teachers are one of the main inputs in our production function (in an education system). From the sample size we note that most of the teachers have an 'O' level qualification, however the quality of the teachers is of most importance which is improved by training so as to advance their skills and academic qualifications. The study reveals that improvement of the qualifications of the teachers by 1 unit through further training for example specialization into a specific subject, leads to a 1.8181 improvement in the performance scores. This is evident from the higher contribution of 35.2% on K.C.P.E performance scores by KRT's in a school as compared to 5.4% from the general teachers.

#### ***Quality of the school management***

This variable was measured by looking at the schools policies in place for example presence of the textbook replacement policy and frequency of the school management committees. A well managed school is able to create and permit a superior environment for both the pupils and teachers to engage in the teaching and learning process. The study notes that schools that have more than 3 management meetings in a year are able to attain performance scores of 248.48 as compared to 241.31 in schools which hold less than 3 school management meetings in a year. The regression results reflect a stronger relationship as refers the presence of the lost book

replacement policy where its presence leads to improvement of performance scores by 5.84 units thus having a positive and significant effect on performance scores.

### ***Existence of a school feeding programme***

Hungry and malnourished pupils are unable to concentrate on learning on learning due to a short concentration span as a result of low calories in their body system. Presence of a school feeding programme is a short term intervention on hunger and malnutrition. Provision of meals in schools especially in areas characterised by abject poverty and food insecurity is likely to promote learning.

A dummy variable that indicated the existence of a school feeding programme or lack of it was used to measure this variable. Results showed that, existence of a school feeding programme contributes to 24.5% to the schools performance scores, schools with a feeding programme attained a mean score of 247.849 in 2005 as compared to 242.124 in the schools without the feeding programme.

### ***Quality of school infrastructures and other school facilities***

The school environment effects with regard to availability and quality of physical facilities in a learning environment are captured by the number of permanent classrooms and sanitary facilities (e.g presence of safe drinking water, toilets or latrines) in a school. It is expected that poor school infrastructure tend to hamper effective teaching while the opposite is true. The study notes a minimal difference in performance scores between schools with a higher latrine to pupil ratio as to those with a lower ratio having a mean score of 245 marks and 242 respectively. The study shows that schools with permanent classrooms attained a mean score of 245 marks as compared to 240 marks in schools with temporary classes. However on the other hand the study reveals that performance of schools which do not have access to safe drinking water was a mean score of 247 as compared to 244 in schools that have access to safe drinking water.

Presence of permanent classrooms contributes to 12.2% of the performance scores as compared to 6.1% contribution by access to safe drinking water hence more significant.



***Socio economic back ground of the pupil.***

The study showed a positive and significant relationship between the poverty dummy variables and KCPE 2005 mean score. The contribution of schools from high poverty stricken areas to performance was higher at 7.606 as compared to 5.504 from schools in the areas moderately affected by poverty being 49% and 44% respectively. This reflects that students from Schools in relatively poor areas are performing relatively well in KCPE examinations which could be explained by the overall Free Primary education interventions that have enabled schools from relatively poor areas to enjoy equal access to education. In essence then it is evident that pupils in schools from poor backgrounds can enhance performance given an equal opportunity of access to education.

## CHAPTER 5

### CONCLUSIONS AND RECOMMENDATIONS

This study investigated impact of school quality in terms of the defined variables (teacher pupil ratio, quality of teachers, school feeding programme, school infrastructure, quality of the school management and socio economic background of the pupil) to performance scores. The key findings were that, performance score in KCPE is higher when there is existence of school feeding programme, good school sanitation & infrastructure, improved teacher pupil contact , regular teacher training and excellent school management policies in place for example the frequency at which the school management holds their meetings, presence of policies regarding replacement of lost textbooks among others.

#### 5.1 CONCLUSIONS

In regards to the study findings the following conclusions are drawn:

a) *Provision of school meals:* - Presence of a school feeding programme in a primary school increases the performance scores. This is a short term hunger and malnutrition intervention and highly promotes learning especially in areas characterized by abject poverty and food insecurity.

b) *School management.* - School management was established to be an important input that influences the performance of pupils. Schools with strong policies as regards the operation of the school e.g presence of textbook replacement policies and adoption of regular school management meetings to monitor on progress of the school were noted to have higher performance scores as compared to the others.

c) *School infrastructures.* - The findings of the study depict a positive relationship between performance scores and the infrastructures in a school. The number of permanent classrooms was found to have a higher significance to performance as compared to availability of safe drinking water, presence of latrines and toilets and school library was found to have a significant impact to performance.

There is need to expand the physical infrastructures of the schools especially the ones that are made use of jointly (at the same time) by a larger number of the pupils in the school for example the number permanent classrooms.

d) *Teacher pupil ratio:* - The study noted a positive relationship as refers the number of pupils allocated to one teacher. With the introduction of FPE, there was a very high level of enrolment as compared to the level of teachers employed resulting to very large classes of pupils per teacher. Primary school performance scores improve with a decreasing pupil to teacher ratio.

## **5.2 RECOMMENDATION**

Based on the study findings, the following recommendations are made:

a) The government of Kenya (GOK) should continue to identify and include the more needy schools into the school feeding programmes especially primary schools in the needy areas that is the arid & semi arid areas and the slums. On the other hand parents from the medium and high agricultural areas should be enlightened on the importance of their school going children having at least one meal in a day.

b) In view of school management, it is necessary to initiate a rewarding scheme to the school managers in this case the head of schools, for example they could have a performance contract, which will ensure that they always act and make decisions that are to the best interest of the school as refers policy formulation and implementation. In addition to the GOK may introduce active school audits through an independent body with a detailed report on the individual schools as regards their strengths and weaknesses with regards to their performance. This will enable apt fund allocation to the various primary schools with a specific objective in mind to be met.

c) Improvement of infrastructures could be feasible through community projects or government funding under the Kenya Education Sector Support Programme (KESSP). However it is critical that the expansion adheres to the class size norms and is linked to the schools with inadequate critical resources like safe drinking water and latrines. This in the long run will enable the country to have a relatively equal learning standard/ grounds for all the primary school going pupils' hence equal learning opportunity.

d) There is need for employment of more teachers and investment in their training during service, besides their plain academic qualifications. This will enhance paying of closer attention to the pupils by the teacher and also nurture their talents and other abilities from an early age. The GOK may organize for these training at a very subsidized cost to teachers which will be developing their careers and at the same time give back to the society through the schools.

e) Higher penetration into the arid, semi arid and the slums is encouraged as refers provision of free primary education and its sustainability. Corporate sponsorship though Corporate Social Responsibility programmes (CSR) is encouraged to fund the FPE programme as achievement of universal primary education is a responsibility of the entire nation and not just the GOK.

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## **APPENDIX.**

**Table 1**

**Gross attendance Ratio (GAR) by type of school, sex and region**

Region	Primary School				Secondary School			
	Male	Female	Total	Total Count	Male	Female	Total	Total Count
1999 census	103	99.8	101.4		30.7	27.8	29.3	
Kenya	119.1	115	117	7705335	42.2	37.7	40	3665751
Rural	128.5	116	118.3	6495689	39.3	35.4	37.4	3085574
Urban	111.4	109.4	110.4	1209646	57.5	49.9	53.7	580178
Nairobi	103.2	113.3	108.4	416899	82.7	69.5	76.5	167765
Central	119.7	120.8	120.2	849203	55.5	50.4	52.5	454842
Coast	117.6	104.5	111	720996	25.4	20.4	22.9	343491
Eastern	123.1	128.2	125.6	1275155	35.5	33.2	34.3	634490
North Eastern	87.2	53.8	71.5	321307	20	8.8	15.3	116870
Nyanza	132.2	117.6	124.7	1119020	46.3	46.3	46.3	549220
Rift valley	115.1	110.9	113	1974913	41	37.2	39.2	902811
Western	125.7	124.3	125	1027842	40.9	29.8	35.2	496264

**Table 2.**

**Gross attendance Ratio (GAR) by type of school ,sex and region based on 1999 census**

Region	Primary School			Secondary School		
	Male	Female	Total	Male	Female	Total
Kenya	103	99.8	101.4	30.7	27.8	29.3

**Table 3*****Description of Data (Expected)***

<b>Variable</b>	<b>Description</b>	<b>Expected results +ve or -ve</b>
* Performance	Dependent variable. Measured in terms of average school score	
Teacher to Student ratio	Captures the number of teachers relatively to the number of pupils. Variable is obtained from total number of teachers & pupils in a school.	+ve (Llyod, Mensch & Clark;2000, Hanushek;1986)
Text book to pupil ratio	Capture the number of pupils sharing one textbook. This variable to an extent reflects the capability of a pupil to do private revision when at home.	+ve(UNESCC);2005, Fuller; 1986)
School feeding programme	Nutrition plays a key role in a child education cycle. It is one of the determinants of a school's pupil retention capability. Variable incorporated in the function as a dummy variable where Presence of the programmed Absence =0	+ve (AFHK;2004,UNESCO;2005)
Health-facilities (School doctor)	Captures ability of a school to be able to deal with health emergencies e.g accidents during interactions of the school members. Mainly refers to a health unit or school doctor.  Also build confidence of parents on a school since the child spends more time in the school than with the parents at home.	Either +ve or -ve
School equipment & sanitation facilities.	The variable is a reflection of other sub-variables (toilet/latrines, library, access to safe drinking water, playing ground). Measurement based on the common	+ve (UNESCO;2005,)



	variables, e.g toilet/ latrine i.e ratio of total number of pupils to the total number of toilets/ latrines	
Competence of teaching staff	Aims to observe on capability of course delivery, richness and relevance. Measured by depicting the total number of Key resource teachers in each school. Also the qualification and quality of the teachers	+ve (Kabubo et.al;2006)
Dummy for schools in localities moderately affected by poverty	This is the poverty level index taking value 1 for medium poverty level and 0 otherwise	
Dummy for schools in localities highly affected by poverty	This is the poverty level index taking value 1 for high poverty level and 0 otherwise	

**Table 4 Descriptive statistics (Results)**

<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>Std Deviation</b>
K.C.P.E Mean score - Year 2005	408	244.738	33.59
Total Number of pupils	403	39.685	23.294
Total number of pupils enrolled in class 8 - Year 2005	448	39.350	41.370
Total No of Teachers(TSC+PTA)	448	11.9308	7.3086
Teacher qualification	430	6.4674	1.1312
Total No of guidance & cancelling teachers	448	0.0156	0.1825
Total No of Teachers trained in special education	176	1.608	1.473
Lost book replacement policy	448	1.004	0.5361
Total No of graduate KRT teachers	425	2.955	1.564
No of desks in a school	429	156.93	144.004
Access to safe drinking water	445	1.231	0.4222

No of total latrines	437	14.05721	9.8702
Presence of a school library	448	1.8370	0.3697
Average wage per day as a labourer in the area	442	132.4774	78.2955
No of students from poor families	446	68.3486	21.835
Presence of a school feeding programme	444	1.5157	0.5003
Frequency of School Management committees	442	2.8981	1.3902
No of permanent physical classrooms	438	1.0068	0.1264
No of permanent temporary classrooms	441	1.5623	0.4967
No of permanent open air classrooms	436	1.8624	0.3449
Combined text book ratio in class 8	420	2.1714	0.5814
Dummy for schools in areas lowly affected by poverty	446	0.2847	0.4518
Dummy for schools in areas moderately affected by poverty	446	0.3946	0.4893
Dummy for schools in areas highly affected by poverty	446	0.3206	0.4672

**Table 5- Regression results**

<b>Input Variable</b>	<b>Coefficient</b>	<b>Std error</b>	<b>t statistic</b>
Teacher pupil ratio (tsratio)	5.4397	10.1397	0.54
KRT to pupil ratio (Key resource teachers to pupil ratio (kratio))	-95.8860	27.2778	-3.52
Teacher qualifications	1.8181	1.6086	1.13
Lost book replacement policy	5.8442	3.6375	1.61
Access to safe drinking water	2.8871	4.6964	0.61
Presence of a school feeding programme	-9.4247	3.8437	-2.45
Text book ratio for class 8 pupils	-1.3876	3.3118	-0.42
Number of permanent physical classrooms	-17.7365	14.5104	-1.22

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Number of temporary classrooms	4.1276	3.8444	1.07
Dummy for schools in localities moderately affected by poverty	5.5039	4.4528	1.24
Dummy for schools in localities highly affected by poverty	7.6060	4.9435	1.54
Constant	253.0546	22.4086	11.29
Adjusted R2	0.0756		
F-statistic	3.30		

**Table 6- Descriptive statistics based on the dependent variable (Performance scores)**

***a) School management Committee meetings (mean=3 meetings)***

Variable	Observations	Mean	Std Dev
Performance Scores when meetings >3	195	248.4821	33.7666
Performance Scores when meetings <3	213	241.311	33.13582

***b) School feeding programme (yes=1, No=2)***

Variable	Observations	Mean	Std Dev
Performance Scores when = Yes	180	247.8491	32.7764
Performance Scores when = No	224	242.1245	34.15654

***c) Presence of permanent/ temporary classrooms***

Variable	Observations	Mean	Std Dev
Performance Scores permanent classrooms	392	245.1519	33.8014
Performance Scores-temporary classrooms	166	240.946	33.8643

***d) Access to safe drinking water (Yes=1, No=2)***

Variable	Observations	Mean	Std Dev
Performance Scores when =Yes	326	244.2096	33.2651
Performance Scores when = No	79	247.6415	34.1748

***e) Latrine to pupil ratio (mean=1:4)***

Variable	Observations	Mean	Std Dev
Performance Scores when >4	120	242.437	34.566
Performance Scores when <4	286	245.7678	33.257

***f) Presence of a school library (Yes =1, No=2)***

Variable	Observations	Mean	Std Dev
Performance Scores when = Yes	71	241.829	34.412
Performance Scores when = No	337	245.3511	33.434