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Analysis of efficiency in resource utilization and cost reduction measures in public secondary schools in Mwala Subcounty, Machakos Country, Kenya

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Abstract
Proper use of the available resources and putting in place cost reduction measures in schools could ease the financial burden placed on parents and make secondary education cost effective, affordable and accessible to an increased number of people. Educational needs for secondary education in Kenya has been on increase since the introduction of Free Primary Education in 2003 and free secondary education in 2008. The purpose of this study was to analyze the efficiency in resource utilization and cost reduction measures in public secondary schools in Mwala sub County of Machakos County. The study was guided by four objectives: (i) to determine the level of efficiency in school resource utilization and how it impacts on cost reduction in secondary school education provision, (ii) determine the cost reduction measures and their effects on secondary education provision (iii) find out the challenges public secondary schools face in implementing cost reduction measures. The study targeted the 40 public secondary schools in the sub county of which a total of 8 schools were sampled for the study. The study employed descriptive survey design. Target population included, head teachers, Board of Management (BOM) of public secondary schools in the Sub County, Parent Teachers Association (PTA) and teachers. These were included because they have the overall responsibility of running operations in secondary schools. The study was guided by theory of production function in education. The main data collection instruments were questionnaires that were administered to the head teachers, B.O.M, P.T.A chairpersons and teachers. Document analysis was also used to extract data from school records. The researcher sought expert opinion in assessing the validity of the instrument. The reliability of the instruments were established using test-retest method through computing Pearson Product Moment Correlation Co-efficient. Data collected from field was analyzed using descriptive statistics in which frequencies and percentages were used. The data was presented in tables, pie charts and graphs from which generalizations and conclusions were made. The study established that secondary schools are facing resource utilization challenges. From the findings 55 percent had a class size of below 40 hence a clear indicator that schools were experiencing high unit cost? Many of the schools studied, 60.6 percent had a pupil-teacher ratio below 25:1. Further only 55 percent of schools undertook repairs and maintenance of their facilities, only 68.75 percent had income generating activities to substitute school revenue, very few schools, 25 percent made purchases in bulk, in some schools account records were not updated as required. The study recommend for efficient utilization of available resources, improvisation of facilities, innovative ways of income generation, bulk buying of school requirements, Sharing of facilities amongst schools such as laboratory facilities and books to reduce cost especially the neighboring newly established secondary schools.

Keywords: Efficiency, effectiveness, Resources, utilization, cost reduction

1. Introduction

Background of the problem

Education is viewed as the root source of human, social, cultural, and economic capital and is perceived as legitimate in terms of both individual and collective good. Due to its importance it has taken an increasing share of national budgets across the world. This however is associated with considerable levels of financing, improved organizational and delivery structures. Lack of adequate financing, institutional structures, and effective delivery systems have been associated with low participation rates observed in developing economies (Lucas, 1997) [36]. Psacharopoulos and Woodhall (1985) noted that the ever growing demand for education has resulted to expansion of educational systems, rising costs in education because of inflation and the need for more and more sophisticated (and thus more expensive) equipment, have all led to massive increases in spending on education all over the world. The majority of governments however have not been able to meet the rising cost of education hence seeking alternative ways of funding education. This include diversity of funding sources and efficiency enhancing measures which are required to cover the significant financial investments for expanding access and improving the quality of secondary education (Gropello, 2006; IBRD, 2005) [25]. This also requires the countries to put in place cost sharing strategies and to complement supply side interventions with demand side financing mechanisms.

For instance, although public-private sector funding is expected to constitute a greater share of funding, families and communities should play an important role in financing secondary education. Other demand - side and supply - side mechanism include use of vouchers and scholarships targeting students from poor households, girls and minority communities, reducing cost of secondary education, improving efficiency in utilization of existing resources; and balancing the ratio of per-student public spending across the

three levels of education (Gropello, 2006; IBRD, 2005) [25].

In Kenya, the adoption of cost sharing policy in education meant sharing the cost of education between the government and the service recipients. For schools, the government was left with the responsibility of providing teachers while the other costs in schools including provision of physical facilities, buying books and other stationery were to be met by parents and the community at large. This was meant to be the main aim of the cost- sharing policy and it was also to reduce the cost burden on the government while ensuring the effectiveness in the utilization of educational facilities, materials and personnel, with a clear distinction between the government financing responsibilities and those expected of its partners. In addition to cost sharing in the public system, partners (especially NGO's), communities and the private sector are expected to continue providing education and training at all levels including pre-primary education, technical education, informal education and tertiary education (Gropello, 2006) [25]. On average, the household funding of secondary education contributes 60% which government financing contributes 40% of the aggregate secondary financing. To a large extent, implementation of the cost sharing policy at secondary school level gave leeway for schools to charge high fees compared to the fees guideline provided by the Ministry of Education thus, secondary education has continued to burden households despite the already high levels of their contributions (Gay, 1992). Faced with competing social needs, a household has to make a choice at various levels of consumption. First in most poor families, education comes a distance fourth after basic needs such as food, shelter and clothing. Second in Sub-Saharan Africa, large family size are common. The total fertility rate in Kenya is estimated at 4.9 (CBS, 2005). Households are therefore faced with a choice between paying school fees for younger children or older children and a choice between education for boys and girls. Third, households have to choose between different levels of education. While primary education appears to be a preferred choice due to its low cost and heavy public subsidy, access to post primary education for low income families is limited by their meager disposable income, provision of bursaries, family support and expected returns of such kind of education is low to the immediate family.

Inflation has contributed to the high cost of education, physical, human and financial resources in schools could be efficiently utilized to reduce unit costs hence make education affordable. This includes proper use of available school space, equipment, teaching and non-teaching staff and finance (Ngware, Onsumu and Muthaka, 2007).

An observation made by the World Bank (1980) regarding reducing unit costs by improving the efficiency of the education system shows that, the need to improve efficiency is particularly important at the middle and tertiary levels where rapidly increasing enrollments are accompanied by high unit costs. Possible approaches for increasing efficiency as pointed by World Bank are improvements in the use of staff by increasing the teaching load and the ratio of students to staff and by eliminating unnecessary diversity or duplication of courses using school space more efficiently; introducing accelerated courses of study; year round programs and shorter intensive training periods,; reducing non-teaching costs of boarding and improving the student selection procedures and student aid policies; lowering costs of boarding and improving management through effective program budgeting, cost analysis and procurement practices. Other views on efficiency include that of Njoka (1995) the then Director of Education in Kenya who called for proper management of school funds to ease the financial burden placed on parents. He decried unnecessary expenditure like the purchase of luxury school buses saying such expensive undertakings did not contribute to a school academic performance. Abagi and Odipo (1997) further pointed out that the slow rate of economic growth that Kenya had experienced was likely to limit resources available for education. Therefore, in order to develop education and training, the government and its partners have to ensure that the education system is efficiently managed at both national and school levels.

The Ministry of Education (MOE) gives guidelines on management of secondary schools including utilization of resources. As regards school fees, Ministry of Education (MOE) provides standardized school fees structure for public secondary schools at the end of every year, in an effort to control the cost of secondary education so as to make it more affordable to the majority of parents. In relation to this, schools are required to adhere to MOE's guidelines on the vote heads. Further guidelines on financial management, physical and human resources are provided. These guidelines are intended to enhance efficiency in the management of schools (Republic of Kenya, 1988). Prohibitive fees and other levies charged by educational institutions have had a negative impact on access resulting to lowered enrollment rates and high drop-out rates as pointed out by the Koech Report (Republic of Kenya, 1999). Parents have questioned and complained about high fee charges, which they find exorbitant. For instance as reported by Kagwa (1999), parents questioned the high fees structure at Lenana school. In another case according to Ndanyi (1995), parents accused head teachers of mismanaging school finances entrusted to them. This raises the question whether funds and other resources (physical and human) are efficiently managed and utilized in schools as this would help make education affordable and accessible to an increased number of people.

Statement of the problem

In Kenya, education has continued to consume an increasing share of governments' budget and parents' money in form of school fees but the extent to which these resources are utilized remains unclear. Despite many public secondary schools having abundant resources there are increasing concerns regarding the extent to which resources are utilized to reduce cost of education. Whereas several educational researches have focused on ways of mobilizing additional resources of funding education, few have focused on proper use of these resources to cut on cost. As a result secondary education has become expensive with 70 percent of household income going to education. Against this background and considering the vitality of the problem, the unanswered question remains, are schools utilizing resources efficiently to reduce cost of operations and increase internal efficiency? This study therefore sought to analyze efficiency in resource utilization and cost reduction measures in public secondary schools.

Purpose of the study

The purpose of the study was to analyze efficiency in

utilization of school resources and cost reduction measures in public secondary schools in Mwala sub County of Machakos County.

2. Objectives of the study

The specific objectives of the study were to;-

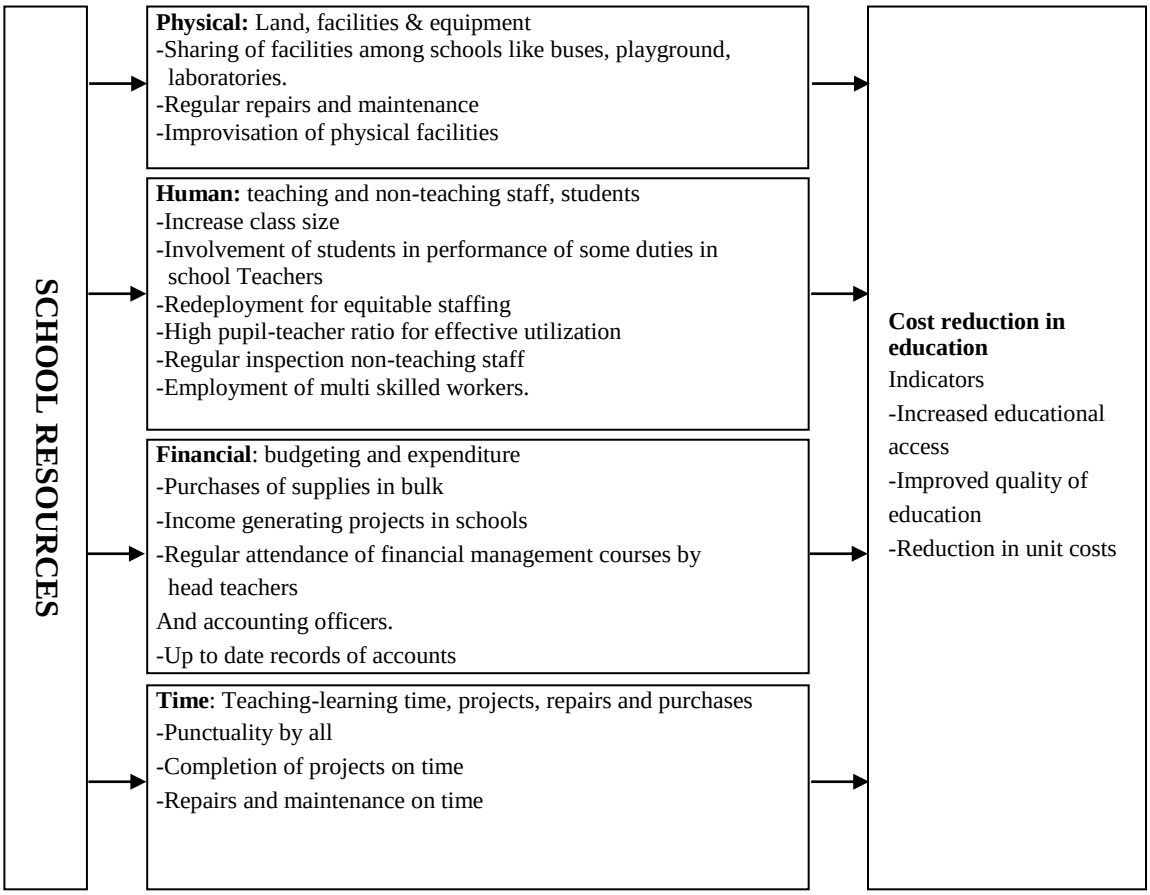
i) Determine efficiency in utilization of school resources in public secondary schools in Mwala sub County of Machakos County.
ii) Determine cost reduction measures and their effects on cost of secondary education in public secondary schools in Mwala sub County of Machakos County.
iii) Find out the challenges public secondary schools in Mwala of sub county Machakos County face in utilization of resources and implementation of cost reduction measures

Theoretical framework

This study was guided by the theory of production function in education. An education production function is an application of the economic concept of a production function to the field of education. It relates various inputs or resources affecting a student's learning. (Schools, families, neighborhoods', school resources etc) to measured outputs including subsequent labour market success, graduation rates. Schools can be cost effective by proper utilization of available resources to cut on cost and save instead of profit maximization. An education production is a relationship between school and student inputs and a measure of school output. It is used in human capital formation and in determining optimal resource allocation. Schooling has a unique effect on labour productivity, earnings and development of cognitive skills and attitudes. We may also be able to relate the development of productive skills and attitudes to school policies concerning allocation of scarce resources. A production function relating school inputs or resources to the development of productive capacity give us a better indication of why the more educated are better qualified for productive roles. In school policy and educational planning knowledge of educational production is essential to efficient resource allocation. The educational production function considers an educational institution as a firm transforming inputs into outputs. The inputs refer to teaching and learning environment while the outputs are defined in terms of test scores.

Conceptual Framework

Measuring educational performance and understanding its determinants are important for designing policies with respect to such varying issues as educational resources, financial systems in schools, teacher accountability and school integration. The model in figure 1 shows that school resources including physical, human, financial and time, when utilized well could reduce unit costs and make education affordable and accessible to an increased number of people.



***Source*:** Researchers conceptualization

Fig 1: conceptual framework showing the relationship between the variables

Indicators of efficient utilization of resources include savings and low unit costs which lead to improved quality of education in schools. Savings made could be used to improve the quality of education by increasing/providing learning materials and other teacher support services such as laboratory, library and workshop assistants while some may be left for expansion. Physical resources like school halls, school buses could be used by community at a fee. Income generating activities like maize, vegetables and livestock production could also be used to cut on costs by increasing savings. This means in case of savings, priority should be given to learning resources and other teacher support services. On the other hand, inefficient utilization of school resources could result in high unit costs, making education unaffordable and inaccessible to a large number of people. Savings may not be made to help improve the quality of education and for expansion. Ultimately, inefficiency results to low quality education. Indicators of inefficiency include lack of savings, high unit cost and reduced accessibility to education. Physical resources include land, facilities like classrooms, laboratories and libraries, books and other learning materials and equipment. Human resources include teaching and non-teaching staff. The recommended class size of 40 students could ensure maximum use resources including physical and human resources like teachers. Financial resource is a core resource in the running of schools hence school finance should be well managed by ensuring proper budgeting and expenditure. Time is equally an important factor in cost saving. Efficient use of teaching-learning time could enhance good performance in national examinations while at the same time, help reduce wastage especially in repetition and related costs. Completion of school projects on time, are among ways through which extra expenses could be controlled.

3. Review of related literature

Economic and Social Justification for Investment in secondary Education

Education is related to improved macroeconomic performance in the form of higher levels growth rate through the associated levels of productivity and per capita income of the country level (UNESCO, 2005; Lewin and Caillods, 2001). However, bray (2002) notes that the levels of education financing, both by public and private sector (including households) indicate a defacto of priorities. To a large extent, such financing priorities are based on the political, social and economic factors. Arguments on possible impact of education investment on economic growth and development are mainly based on the social and economic returns on human capital development. It is argued that there may be a vicious cycle of greater investments in education leading to higher economic growth, which in turn provides financial support for even greater investments in education as it happened in East Asia. There may be also a vicious cycle in which inattention to education ensures that a country remains poor, like in Latin America (US Department of Labour, 2000).

Mingat and Tan (1996) estimated the full returns to education in various economies between 1960 and 1985. The study allowed for many externalities that normally accrue to the society, such as spillover effects of workers enhanced productivity and the general level of education of the workforce. It concluded that education of workforce expands productivity by facilitating the discovery, adoption and use of more economically rewarding processes. The generalized recommendation from the two studies is that low- income countries tend to benefit more from primary education investment, while middle income countries, including those about to achieve universal primary education tend to gain highest social returns from expansion of secondary education. On the other hand, high income countries derive highest returns from tertiary education. These derive highest returns from tertiary education. This is however complicated by the weak labour structures in most low-income countries. Wei, Tsang and Chen (1999) established that rates of return to education vary across countries and tend to be high in developed economies where secondary education has higher returns compared to primary education. Bray (2002) advanced the argument that financing of education requires government spending on sectors of education that yield more returns. The total social benefits of educating children equal the sum of the benefits that accrue individually to the children and their families plus benefits to society that arise from interaction with educated individuals. The benefits to education have been shown as going directly to an individual and the society. This includes such benefits as increased adult wages and income, increased participation in the political process, greater charity donations, and reduced dependency on social support programmes, reduced criminal activity, increased savings, better health, lower mortality rates and increased life expectancy.

Lewin and Caillods (2001) underscore the importance of technical/vocational education at secondary school level, giving a strong justification that academic education does not provide sufficient base for labour market needs especially for learners leaving the system at secondary school level. Bennell and Segertrom (1998) feels that the reluctance of multinationals to fund vocational education and training in low income countries in the context of expanding education sector budget need to be reviewed, given the developmental stages of various countries and overarching problems in post-primary education. Bray (2002) also outlines other factors to be considered, including adopting sustainable cost-effective strategies that ensure strong linkage between formal education, their costs, labour market outcomes and international flexibility indeed, if secondary education is linked to labour market, then returns would be higher, hence justifying increased public financing of secondary education. In Kenya, private returns to education generally increase with the level of education as revealed by Manda, Mwabu and Kimenyi (2002). Human capital externality for male and female students has a positive impact on earnings for all workers. This analysis gives strong justification for design of sustainable financing mechanism for post-primary education, particularly secondary education, which is a transitional level to tertiary and university education.

Secondary education financing policy and cost of education

Investment in education has been taking an increasing share of national budget of many developing countries. This is due to the fact that education is a major agent for economic, political and social development. Over the years, countries all over the world have continued to experience rising cost of education. Ayot and Briggs (1992), points out that the ever rising demand for education, the resultant expansion of educational systems,

rising costs in education because of inflation and the need for more and more sophisticated equipment have all led to massive increases in spending on education all over the world.
Aoki (etal) 2002, further reveal that public education typically absorbs 2 to 5 percent of the Gross Domestic Product (GDP) and is often the largest sector in the overall government budget. The rising cost is however more of a burden to developing nations with a relatively high GNP. In relation to this Momanyi (1998) points out that, America, Cuba and Germany's public expenditure on education as a percentage of the GNP was more than 9 percent while Kenya's was 4 percent however, represented about 35 percent of the government recurrent budget which is relatively a very high proportion.
Following Kenya's Africanization policy in the 1960's and 1970's and the growing philosophy of basic education, the government heavily subsidized education at all levels. The increasing high expenditure on education became a burden to the country and later in 1980's cost sharing policy was introduced. In line with this, the government of Kenya (1988) recommended increased cost sharing between the government, parents and communities in the provision of educational services. The rising cost of education and training thus increasingly constrained the government's ability to provide adequate financing to other sectors of the economy hence necessitated the need to share the burden of the cost of education with the recipients. The current government policy on financing of secondary education follows the cost- sharing principle. The cost-sharing policy requires that parents and communities meet the costs of key non-salary inputs like tuition, textbooks and uniforms. The main aim of cost- sharing policy was to reduce education cost burden on the government while ensuring cost effectiveness in the utilization of educational facilities, equipment, materials and personnel, with a view to maintaining the growth, quality and relevance of education and training. Thus, the government and other stakeholders have been having specific financing responsibilities as dictated by the cost sharing policy (KIPPRA, 2006). Bursaries provision was introduced in 1993 as a way of supporting poor but bright students' access secondary school education. Until 2003, the Ministry of Education centrally administered the funds. The fund was decentralized to constituency level in 2013 under the management of Constituency Bursary Management Committees. In 2014/15 financial year, Kshs. 770 million was allocated for bursaries. Given that the population of orphaned children enrolled in secondary schools is about 13 percent (KIPPRA, 2006) of secondary schools enrollment, the fund is inadequate compared to demand and targets students already enrolled in school. Other public organizations such as the Jomo Kenyatta Foundation provide funds for needy students, but such funds are managed independently by the respective organization. The cost of education has however continued to rise despite cost-sharing and other sources of financing education like donors.

Government expenditure on secondary education in Kenya
The government provides funds for secondary education through the national budget. Table 3 and 4 shows trends on the level of public expenditure on secondary education as a percentage of total public education expenditures among other sub-sectors. For instance, education received 7.4 percent of GDP and 34.6 percent of total public in 2014/15 fiscal year with secondary education receiving 21.4 percent (1.6% GDP) of which 93.5 percent went to teachers' salaries and 6.5 percent to non-salary expenditures. The relatively high sub-sector expenditures on personnel emoluments indicate that minimal public resources are available for other important educational inputs such as learning materials, textbooks, and physical infrastructure, among others. Consequently, the burden is either shifted to households or where not covered, quality of education provided is bound to suffer. The most affected thought is provision of physical infrastructure, which takes about 1 percent of public secondary education budget. Further, data in Table 5 show that over the reviewed period, public education financing has been dominated by primary school education expenditure. For instance, in 2014/15 fiscal year, primary education expenditures constituted 55.5 percent, the largest share of aggregate education budget followed by secondary (21.4%). University education (12.3%), general administration (8%) technical education (1.8%), and 0.94 percent for other sectors The ever increasing high expenditure on education is a burden to the government considering that other sectors are competing for the same public funds. There is therefore the need to help minimize the increasing expenditure on education. This will be realized by efficiently utilizing the available resources in schools hence make education affordable and accessible to an increased number of people (KIPPRA, 2016).

Utilization of resources
Despite resources for education being scarce at national level, policy makers have options that could address the issue of financing secondary education. To alleviate the challenges associated with resource constrains and increasing cost of education, there is need for efficiency in the utilization of the available resources. Inefficiency however seems to be a major problem especially in the developing countries. It is pointed by World Bank (1974) that education systems in most developing countries do not achieve their quantitative and qualitative objectives. Hartley (1968) on the other hand states that schools had suffered because of problems in designing their programme, assessing their performance and developing suitable allocation strategies or means to determine how best to utilize limited human and non-human resources in the process of learning. Most developing countries today still experience education inefficiencies pointed out by Hartley (1968) and World Bank (1974) hence high education cost yet in many cases, low academic achievement.
Ayot and Briggs (1992) point out that concern over the increasing costs of education has also led to attempts to make education more efficient. Research has been undertaken to find out if better results could be obtained for the money spent, or at least the same results produced at less cost. Reduction of the recurrent costs of education requires efficiency in management. Any given set of input once chosen should be combined in such a way as to produce the largest attainable output.
The country can thus maintain the present levels of resources, but maximize their use. It is further pointed out by World Bank (1980), that possible courses of action on the increasing demand for education on public finance includes finding additional sources of financing and reducing unit costs by improving the efficiency of the education system. In Kenya,

more focus has been on finding additional sources of financing education than on how efficiently the resources are utilized; parents meet most of the secondary education costs. Other sources of funds including grants, fund raising and income generating activities in schools are sought, but how these resources are used is not clear.

Muya (1990) argues that apart from cost sharing being used as an alternative source of funds for Kenyan secondary schools there is need for efficient use of educational resources. In sessional paper No. 6 of 1988, the need to cost effectively use resources at the disposal of schools including land, finances, teachers, time, facilities and equipment to bring about efficient provision of quality and relevance in education is outlined. The need for efficiency is also pointed out by Republic of Kenya (1993) [48], whereby at Kenya Education Staff Institute (KESI) workshop it was repealed that, studies carried out by UNICEF in seven districts suggests that the worsening economic situation requires better management of schools and efficient use of available school resources.

Another observation by Lucas (1997) [36], shows that the cost of primary school education can simply be reduced by increasing the efficiency of school management and eliminating corruption by reducing the amount of resources being wasted through mismanagement in schools and using the resources saved to carry the activities of the school further. This is applicable at secondary school situation. As pointed out in Koech Report (Republic of Kenya 1999), Kenya compared with other countries in the region spends considerable more on education in relation to total government spending. In addition, the proportion of GDP spent on education is much higher for a country at her level of per capita income. It is revealed in the report that, it is possible to improve outcomes in the education sector without increasing the share of government expenditure on education, by improving efficiency in the use of resources. It was therefore recommended that the budget of the ministry be properly rationalized to ensure that the vast amount or resources allocated to the education sector is much more efficiently and effectively utilized.

Cost saving measures in secondary schools in Kenya

Improving resource utilization

The overall pupil- teacher ratio at all levels of education is one of the major determinants of recurrent costs, partly due to the associated teacher wage bill. The pupil-teacher ratio depends on the distribution, curriculum and staffing norms of teachers, the number of students, and the number of schools. In 2003, the pupil-teacher ratio was 1:17 at the national level with the lowest ration of 1:15 recorded in North Eastern province and a high of 1:23 recorded in Western province. However, unlike primary education where teacher establishment is based on enrollment is based on enrollment and number of classes, secondary school staffing is based on curriculum establishments (or a regime based on teacher specialty), and most teachers specialize in at most two subjects (KIPPRA, 2006).

One available option to reduce the secondary education cost burden on government is thus to gradually increase the Average Teaching Load (ATL) from 18 hours per week to 20 hours, 23 hours, and 25 hours. Ideally, the secondary school teaching load should be more than 18 hours per week, with teachers having an option of teaching a cluster of schools to at least three streams or (tracks); retraining teachers to ensure that they are able to teach high demand subjects; and offering optional subjects in specific schools with provision for small classes being handled by part time teachers.

Expansion and construction of more day schools

Comparing the proportion across school categories, teacher salaries comprise 66.0% of the day school expenditures and 37.3% in national schools, while school fees comprise 60.8% for national schools compared to 30.6% in day schools. In part, this distribution suggests that any cost effectiveness strategy in secondary education should be targeted at expanding day schools, which charge lower school fees and have lower unit costs on the part of households. The high teacher wage bill for day schools is due to the number of day schools (45.3%) compared to other categories. The boarding schools could however be justified in areas with sparse population distribution. Some boarding schools will have to be constructed in Arid and Semi-Arid lands (ASALS) and a larger proportion of employment could be encouraged by increasing the number of day students even in boarding schools, as is the case currently (KIPPRA, 2006).

Increasing class size

In 2003 secondary school class size ranged between 20 and 25 students per class. Thus to reduce secondary unit costs by enhancing cost-effectiveness in education, education policy makers could target the upper limit of optimal class size, which ensures efficient use of human and capital resources.

Improving school management systems

Although the Ministry of Education (MOE) has set clear fees guidelines, implementation and enforcement systems (including the procurement at the school level) need to be closely monitored. This step could address weaknesses in management, which lead to schools charging higher levies than official levels. The Ministry of Education could also implement mechanisms for ensuring any school revenues are efficiently utilized to ensure quality education provision. Procuring school supplies at competitive prices can greatly reduce operational costs at school level (Ngware, Onsumu and Muthaka, 2006).

Financing options

Increase overall allocations to secondary education sub-sector

Like many African countries with low secondary schools gross enrollment ratios (GER), Kenya has experienced low and /or negative growth rates over the last two decades, with the lowest GDP growth rate of -0.3 recorded in the year 2000. In 2004, the GDP growth rate was estimated at 5.8%. Although the proportion of public budget to all sectors (including education) increased over the same period, the real value may have declined or remained the same period, the real value may have declined or remained the same. Worth noting is the fact that the budgetary allocation to education has remained high over the years, estimated at about 7.2% of GDP and 27.0% of aggregate pubic budget in 2004-05. The question then remains; how appropriate, efficient and effective are the resources utilized? (Ngware, Onsumu and Muthaka, 2006).

The analysis of secondary school education by economic

activities indicates that 93.5% of secondary public financing go to personnel costs, leaving about 6.5% for development projects, operations and maintenance. Even though overall allocation to education has increased in the recent past, the resources go disproportionately to achieving universal primary education and teacher personnel costs, compared to other sectors. Expanding secondary enrolment would require clearly defined government expenditure policies and budget priorities that encourage direct expenditure to expanding secondary education non- salary expenditure such as physical infrastructure, business and targeted grants for low cost boarding schools (Ngware, Onsumu and Muthaka, 2006).

The data on secondary education projections show that to achieve a 6% annual increase in primary to secondary transition rates (70 by 2011) secondary school financing strategies should target those completing primary education and not only those who have been able to register in secondary education. This calls for an increase in bursary allocation from the current levels. The physical infrastructure will also have to be expanded. (Ngware, Onsumu and Muthaka, 2006).

Rationalize resources from other expenditure items within the sector

At national level, secondary school unit expenditures by the government averaged 4.6times those of primary school while university education unit expenditure is five times that of secondary and 20 times that of primary. Another option is that additional resources from secondary schooling can be mobilized by shifting allocation between levels. Mechanisms could put in place for redistributing expenditure from university education in favour of secondary education, particularly after 2011 when the primary school enrollments are projected to stabilize (Ngware, Onsumu and Muthaka, 2006).

Enhance bursaries and targeted funds transfers

In addition to decentralization of secondary education bursary fund to the constituency level, and gradual increase in allocation and setting of higher minimum allocation per beneficiary, it is apparent that the current bursary provisions and cash transfers should be enhanced to sustain deserving students within the system. According to the Welfare Monitoring Survey (WMS) III of 1997, 30% of the population lived under the core poverty line while 56% of the population lived below the absolute poverty level. In 2005, about 46% of the population lived below the poverty line. The bursary allocation should be improved to target deserving students leaving standard 8 (or eighth grade). Under the current system, identification of deserving cases covers only those students already admitted within the secondary education level (Ngware, Onsumu and Muthaka, 2006).

Perhaps, for sustainability purposes with both external stakeholders and communities, the government could institutionalize the secondary education fund with initial funding of bursary allocation and encourage contributions from both NGO's and development partners towards the same. This mode of allocation is more appropriate for secondary education that education loans that are more appropriate at tertiary level. Targeting mechanisms will also need to be enhanced to ensure deserving and vulnerable groups benefit (Ngware, Onsumu and Muthaka, 2006).

The government has also instituted decentralized systems aimed at channeling resources to local levels for poverty reduction and regional development. Some of the relevant programs include the Constituency Development Fund, the Poverty Eradication Fund, and Arid and Semi-Arid Lands (ASALS). Some of these programs provide funding to various community based projects, including school construction, while the bursary funds aims at increasing access to secondary education (Ngware, Onsumu and Muthaka, 2006).

Strengthen Public – Private sector partnership

Increasing public financing alone is not adequate given the envisaged expansion of secondary education both in the medium and long term. Other factors being constant funding of secondary schools should expand by 115% by 2011 and by 152% by 2012 to meet the 70% transition target by 2011 and the EFA gross enrollment ration target of 60% by 2011. In 2004, enrollment in private schools constituted 8% of the total secondary education enrolment. Thus the private sector as well will be expected to expand the provision of education at this level. The feasible financing options could include expansion of physical infrastructure and contributions towards the proposed secondary education scholarship fund at district level, targeting the poor and vulnerable groups. In the same vein, the notion of community school trust funds should be explored. This involves establishing a fund sources from all stakeholders in which prospective secondary education investors either communities and or individuals can access credit to establish not for profit secondary schools that were constructed through voluntary contributions from individuals and private sector, or Harambee spirit. This could be replicated to address the current problem.

Resource utilization and cost saving measures

Based on country level data in 1997 and 1999 on resource utilization and disparities in compulsory education in China, it was found out that while pattern of resource utilization was similar across different areas in the country, there were substantial disparities in the level of per-student spending across these areas; and between coastal regions and other regions. Although non-minority areas spend more than minority areas, the gap was relatively modest. Five measures of inequality were demonstrated and they showed a remarkable consistency in demonstrating a large degree of inequality in school spending at both primary and lower secondary levels nationwide in 1999 (KIPPRA, 2006).

Decomposition of the Theil Indexes indicated that between two thirds and three quarters of financial inequality resided in provinces and between one quarter to one third of the financial inequality existed between provinces. Comparison of 1997 and 1999 results shows that there was no significant change in the overall level of inequality in per-student total spending for the country as a whole. However in the same period, the spending gap between countries at the top-end and bottom end of the spending distribution increased. In United States, current efforts to understand more about productivity and the use of educational resources are demonstrating the importance of using refined measures of how resources flow within schools and classrooms. For example, there is growing awareness of the importance of resources flowing from either parents or peers. Some studies have focused on the direct effects of resources supplied in the home or by peers on pupil performance. Resource flows at micro-levels can be

disintegrated so that flows to classrooms and instruction can be isolated from flows to more conceptualized administrative services (KIPPRA, 2006).

In Malawi where resources are scarce, it is a priority to ensure that available resources are used optimally if the desired objectives are to be achieved. The sudden expansion in the system in 1994 allowed most children to gain access to education. This expansion however was not matched with the additional trained teachers or the essential teaching an learning materials needed to assume quality. As a result, the lower standards are characterized by large class sizes taught by mostly untrained teachers teaching in bleak environment, often under a tree. This has contributed to high repetition and dropout rates and has resulted in the wastage of a significant share of the resources allocated to the education sector. At secondary level, a little less than one quarter of public resources are wasted due to repetition and drop out (KIPPRA, 2006). World Bank (1998) pointed out that there is substantial potential in most countries for reducing unit costs at the secondary level by improving efficiency within the existing system. The World Bank further observes that given tight limits on public resources in Africa and competing claims of these resources by other parts of the education system, the key to satisfying the high demand for secondary education in Africa lies in greater cost sharing at this level combined with substantial reduction in unit costs.

Human Development Report by United Nations Development Programme (UNDP, 1991) reveals that the opportunities for cost savings are considerable in education. According to the report, a study for the World conference on "Education for All" conducted that a feasible package of reforms could reduce the recurrent costs of educational systems by 25 per cent. The package consists among other things measures to reduce repetition, more efficient use of community resources, multiple shifts, selective increases in class size and some introduction of cost recovery at the tertiary level. The quality of education should however not be sacrificed. Wolf (1984) points that, the main elements affecting unit costs are teacher salaries, student-teacher ratios and non-teacher salary cost. (Especially boarding costs). The introduction of distance education programmes and transition from boarding schools to day schools according to World Bank are important in the move to reduce unit costs in secondary education. It is further pointed out that there is usually much greater scope of unit cost reduction at the secondary level than primary.

Schools can also increase the number of pupils per teacher by operating double shifts in the same classrooms for instance one group of pupils schooling in the morning and another group in the afternoon. Double shifts will also double the teaching load for teachers if they take both shifts. According to UNDP (1991), double shifts save on teachers (if they take both shifts) and on the capital costs of building, equipment, libraries and laboratories. Within this system, Senegal has cut costs considerably and increased access to education. Multi-grade schooling is also another method of cutting the costs of education. Multi-grade teaching involves reaching children in the remote villages or regions which are difficult to access where population density is low and costs are corresponding high. Colombia, Guetmala, Burkina Faso, Zambia, the Philippines and other countries have found multi-grade schooling (one teacher several different grades in single classroom) to be most effective way of making optimal use of classroom facilities and if providing complete primary schooling in sparsely populated areas.

As revealed by Republic of Kenya (1993) [48], it was pointed out at KESI workshop that, cost effectiveness and cost reduction is realized through ensuring that quality goods and ordered and received from the cheapest suppliers, acquiring when is season and storing safely for use, stores accountability and thrift/careful use for purposes for which items are ordered and effective procedures for issue, repair and replacing appropriately. Further as regards maintaining education cost in schools, the workshops recommended that pupils should be counseled to appreciate the financial implications of careless use, damage and wastage arising out of their activities and behaviour.

According to the workshop, students should maintain the school grounds and cleanliness. Schools should purchase their supplies in bulk from the least expensive sources as a measure towards cost saving. Tendering procedures should be flexible to facilitate purchase form less expensive sources, particularly during harvesting time when foodstuffs are reasonable cheap. Schools are advised (to as far as possible) share facilities and equipment, compare budgets and votes, rate of use, sources of supplies/stores and menus, in order to minimize expenses.

The acquisition and maintenance of school vehicles are equally expensive and lead to fee increases. Where possible, schools should consider owning vehicles jointly. Raising of funds, putting it in fixed deposits and using interests realized for hiring transport when required should be considered especially by urban schools.

4. Materials and Methods

Research Design

The survey design was used in this study because the research was descriptive in nature. Orodho (2003) notes that the survey design involves collecting data in order to test hypothesis or answer questions concerning the current status of the subjects of the study. Descriptive methods was widely used to obtain data useful in evaluating present practices and providing a basis for decision making (Orodho 2003). Survey design was appropriate for this study because it enabled the researcher to collect information concerning the current situation in public secondary schools in Mwala subcounty in regard to resource utilization and cost reduction measures in public secondary schools and make conclusions from the findings of the study.

Sampling procedure and sample

Slavin (1984), observed that due to limitation in time, funds and energy, a study can be carried out from a carefully selected sample to represent the entire population. Therefore, of the 40 public secondary schools in Mwala subcounty, 20 per cent was sampled for study using stratified sampling which gave a sample size of 8 schools. From each school, 11 respondents were picked for the study who included the head teacher, the B.O.M chairperson, The P.T.A chairperson and 8 teachers hence the sample of respondents was 88 Stratified sampling technique was chosen because it guarantees representation of relevant sub-groups thus increasing the efficiency of the population estimate unlike random sampling. Stratified sampling was thus to ensure fair representation of the study population in terms of type, which is girls, boys, mixed, boarding, boarding/day and day schools. Gay (1992)

postulates that for small populations a sample size of at least 20 per cent of the population is a good representation. Therefore, of the 40 public secondary schools in Mwala subcounty District, 20 percent was sampled for the study using stratified sampling which gave a sample size of 8 schools.8 head teachers, 8 B.O.M chairpersons, 8 P.T.A chairpersons and 64 teachers were the respondents.

Research instruments

The research instruments used were questionnaires for head teachers, B.O.M and P.T.A chairperson and teachers on utilization of resources. The instrument was designed to collect data on resource utilization and cost reduction measures in public secondary schools. Items in the questionnaire comprised of structured (closed-ended) questions, and unstructured (open-ended) questions which were to measure subjective responses, hence enhance formulation of useful recommendations to the study.

The researcher used document analysis to analyze the records from the schools of study. The information that was analyzed from school records included information on school expenditure in 2011, income generating activities, profit/loss made and Kenya Certificate of Secondary Education (K.C.S.E) performance in the years 2010 and 2011.

Validity

The researcher sought expert opinion in assessing the validity of the instruments. According to Wiersma (1985), validity is the extent to which instruments measure the characteristic or trait which it was designed to.

Reliability

According to Wiersma (1985), reliability is the consistency of the instrument in measuring whatever it measures. It is the degree to which an instrument will give similar results for the same individuals at different times. To attest reliability, test-retest reliability was used. The researcher gave the two head teachers questionnaires then after two weeks, re-administered the same instrument after which the two scores were computed to establish Pearson Product Moment Correlation Co-efficient.

5. Data analysis and presentation

The data collected was categorized into information that targeted the objectives of the study. In case of open-ended items in the questionnaire, the researcher categorized the responses given. Data was then coded, computer formatted and analysed using Statistical Package for Social Science (SPSS). Quantitative data was analyzed through descriptive statistics in which frequencies and percentages were used. The results were presented in tables, pie charts and graphs from which generalizations and conclusions were made depending on the responses.

Data analysis and discussion

General Background

Most of the study schools as reflected in figure 2 were established in the period 1961- 1980 (50 percent) and 1981-2000 (25.0 percent). Between 2000 up to date 2012 (12.5 percent) and equally 1950 and before (12.5 percent)

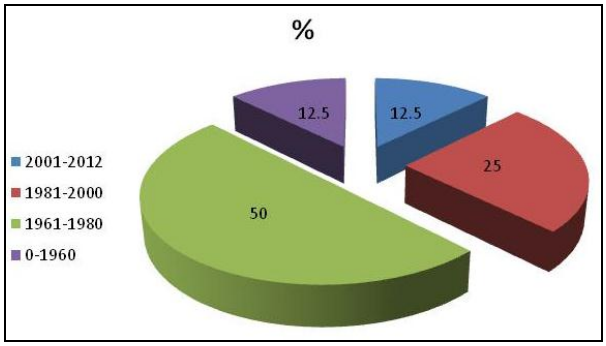


Fig 2: Number and period of establishment of school

Of the 40 public schools in Mwala subcounty, 20% were sampled for the study which gave a sample size of 8 schools. On the type of schools, most (78.9 percent) of the schools were mixed, 15.8 percent were girls' and 5.3 percent were boys schools. The majority (45 percent) of schools were day, 30 percent were boarding and 25 percent were boarding/day schools. Day secondary schools are recommended in Kenya's education system because they are affordable.

Cost reduction measures put in place in the utilization of resources in Mwala Sub County

The researcher sought to determine the cost reduction measures in place in the utilization of human, physical, financial and time resources in public secondary schools in Mwala Sub County. The findings in this section are presented under the sub headings class size, human, physical, financial and time resources.

Class Size

Increasing class size in terms of number of pupils as one way of reducing unit costs is supported by various studies. Musoga (2002) in a study carried out in Kakamega County noted that when the schools in the district incur lower unit costs as a result of having sufficient enrollment (optimal size), this would partly lower the costs that parents have to incur towards their children's education. She further reveals that sufficient enrollment would also ensure that teachers are efficiently utilized. UNDP (1991) supports the idea of increasing class size and argues that achievement test show no significant difference between children in classes of 25 and those in classes of 40. The researcher therefore sought to find out the average class size for the study schools in relation to a class size of 40, at which unit costs could be lower. This is reflected in figure 3.

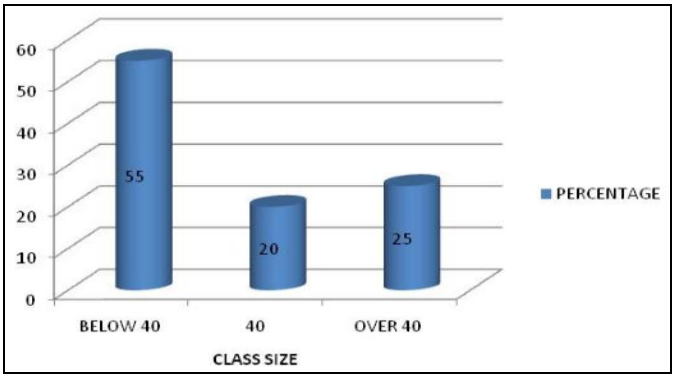


Fig 3: Percentage class size

As shown in the figure 2, 55 percent of the schools had an average class size of 40 students. Only 20 percent had an average class size of 40 and 25 percent had an average class size of over 40. It was also revealed through the response from the head teachers that some subjects that were considered expensive to offer especially technical subjects like Computer, Wood work and Home science and Physics had smaller classes. Most schools therefore must be experiencing high unit costs as a result of small classes. Musoga *et al.* (2002), view class size as an important factor in education efficiency. She reveals that the Republic of Korea and Singapore maintain an average class size of more than 40 in basic education and although this may seem high, it enables resources to be assigned to other inputs such as books, materials, and computers. They further point out that lowering class size below 40 should not be a priority use of resources in low income countries.

Although in 2004, secondary schools increased form one intake by 5 pupils from 40 to 45 in response to the growing demand due to introduction of free schooling by NARC government as reported by Wangai (2004), the then Director of Education, it was revealed by majority of head teachers that a good number of form one students had not reported due to lack of school fees. The majority of parents cannot afford secondary fees and this contributes to small classes following low enrollment and high drop-out rates. Efficient utilization of the available resources in secondary schools is one way which education could be made affordable to the majority of households hence promote and increase number of students accessing secondary education. Day schools as recommended by Republic of Kenya (1988), are affordable and could provide accessibility to secondary education.

Human Resources

Maximum utilization of human resources is an essential cost cutting measure. The researcher sought to find out how teachers, non-teaching staff were utilized in the study schools. The 1997-2010 Master Plan on Education and Training, reveals that plans to reduce on cost showed that pupil-teacher ratio of secondary education would be raised to a national average of between 25:1 and 30:1. Pupil-teacher ratios of the study schools are reflected in figure 4.

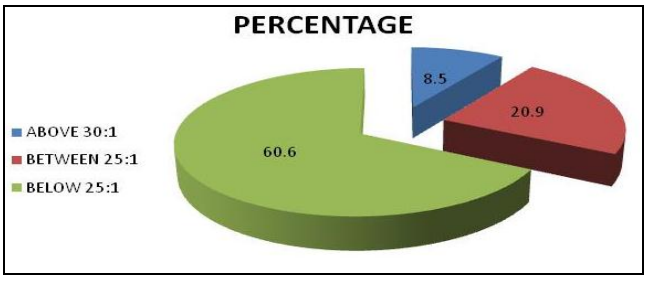


Fig 4: Pupil-Teacher Ratio

As reflected in figure 4, 60.6 percent of the schools had pupil-teacher ratios of below 25:1. Only 20.9 percent of the schools had pupil-teacher teacher ratios between 25:1 and 30:1 while 8.5 percent had pupil-teacher ratios above 30:1. The low pupil-teacher ratio in the majority 60.6 percent of schools is an indication of underutilization of the teaching staff. It was revealed that all the study schools employed B.O.G teachers with 30.4 percent of the schools employed B.O.G teachers with 30.4 percent of the schools with more than 5 B.O.G teachers which means higher costs for the schools.

Average teaching Load per week (in percentages)

Table 1: Average teaching load per week in the study schools

Subjects	Above 25 lessons	25 lessons	Below 25 lessons
Arts	28.3	21.1	54.6
Languages	22.1	43.1	38.8
Mathematics	68.4	24.1	7.5
Science	60.9	16.8	28.3
Technical subjects	11.5	22.1	66.8

Table 1 reveals that most teachers (68.4 percent) of Mathematics and (60.9 percent) of Science subjects taught above 25 lessons per week, while most teachers of Arts (54.6 percent) and (66.4 percent) for technical subjects were underutilized. A maximum of 27 lessons per week for teachers is recommended by the MOE as per the Curriculum-Based Establishment (CBE) formula in use (2004). It was revealed that all the study schools employed B.O.M teachers with 30.4 percent of the schools with more than 5 B.O.M teachers which means higher costs for the schools.

The head teachers gave understaffing in certain subjects as the main reason for employing B.O.M teachers. The problem of understaffing could however be partly as a result of inequitable staffing across schools, and counties. Cost effectiveness and efficiency through comprehensive measures including review of the current school staffing patterns and redeployment of some teachers from over-staffed counties could help to solve the problem.

Most teachers (68.4 percent) of Mathematics and (60.9 percent) of Science subjects taught above 25 lessons per week, while most teachers of Arts (54.6 percent) and (66.4 percent) for technical subjects were underutilized. Inequitable staffing among the schools was noted as contributing to understaffing in some schools and overstaffing in others. It is only after the Teachers Service Commission (TSC) fully redistributes equitably teachers across the country that the correct number of teacher shortage can be revealed.

To curb understaffing, head teachers should also be involved in teaching the required number of lessons as per the CBE formula in some schools. The CBE formula puts into consideration their administrative responsibilities hence this should not be given as an excuse for not teaching or teaching fewer lessons. According to CBE formula in use (2009), the teaching load for head teachers is 10-12 lessons in single stream (4 classes) schools, 8-10 lessons in double stream (8 classes) and 6-8 lessons in triple stream (12 classes).

Utilization of Non-Teaching Staff

Proper utilization of the non-teaching staff by schools is essential to help minimize costs. The non-teaching staff include; cleaners, security personnel, messengers, clerks and gardeners. A limited number of workers could maximally be used to carry out duties in schools. According to Musoga (2005), employing multi-skilled workers for instance could help schools save costs. Care should be taken in the utilization of workers to avoid duplication of duties. Currently, the Ministry of Education recommends a pupil-worker ratio of 30:1. This study sought to determine whether the support staff

in the schools was maximally utilized as a cost saving measure.

Table 2: Pupil-Worker Ratio

Pupil-Worker Ratio	Frequency	Percentage
Above 30:1	1	12.5
30:1	2	25
Below 30:1	5	62.5

From the table 2 above, 12.5 percent of the schools had pupil-worker ratio above 30:1, 25 percent of schools had pupil-worker ratio of 30:1 and majority of schools 62.5 percent had pupil-worker ratio below 30:1. This shows majority (62.5 percent) of the schools had a low pupil-worker ratio, an indication that the workers were under-utilized. The majority of schools are therefore over-employing workers who then absorb a high proportion of school finances in terms of salaries.

The majority (62.5 percent) of the schools had a low pupil-worker ratio, an indication that the workers were under-utilized. The majority of schools are therefore over-employing workers who then absorb a high proportion of school finances in terms of salaries. The Ministry of Education gives guidelines on how to cost-effectively manage schools including the appropriate number of workers schools should employ while leaving the management of secondary schools including employment of workers to the Board of Governors. Therefore, schools should follow the MOE guidelines to overcome problem of over employment and underutilization of workers.

Student's involvement in performance of some duties in schools

Involvement of students in performance of some duties in schools could help to cut costs.

In relation to this, Musoga (2005) pointed out that to lower operating costs of schools, chores like cleaning can be done by students.

Table 3: Head teachers' responses (%) on involvement of students in performance of some school duties

Duties	Yes	No
Cleaning	100	0
Fetching Water	35	65
Gardening	12.5	87.5

The researcher sought to determine involvement of students in performing some of the duties in schools as cost reduction measure. All head teachers (100 percent) revealed that students were involved in carrying out some duties such as cleaning and some cases fetching water. Asked why they involved students in carrying out some duties, 53.5 percent of the head teachers reported, to save on costs of employing extra staff. Another reason given by the majority of the head teachers (85.5 percent) for involving students in carrying out some duties in school was to make them responsible citizens.

All head teachers (100 percent) revealed that students were involved in carrying out some duties such as cleaning and some cases fetching water. Republic of Kenya (1993) [48], KESI workshop supported the idea of students being involved in carrying out non-specialized chores to reduce the number of support staff and hence reduce costs.

Physical Resources

The researcher focused on basic learning resources. Physical resources distinct of boarding schools were not included in the study. Basic learning resources are essential and their adequacy should be given a priority in order to enhance the quality of education in schools. However, in case of insufficiency, alternatives including improvisation and sharing could be used. Although these are cheaper ways of meeting learning needs, care has to be taken not to compromise the quality of education. The basic learning resource considered in this study included classroom, textbooks, laboratories and libraries. Information on availability and improvisation of physical resources, sharing of physical resources, repair and maintenance of facilities was sought.

Table 4: Responses on availability, adequacy and improvisation of physical resources (in percentage) from head teachers.

Physical facilities	Availability	Adequacy	Improvised
	Yes No	Yes No	Yes No
Laboratories	69.5 30.5	28 72	29.5 60.5
Textbooks	74.5 25.5	15.5 84.5	0.0 100.0
Classrooms	100.0 0.0	79.0 21.0	23.5 76.5
Library	27.5 72.5	18.5 81.5	68.5 31.5

Table 4 shows that although most of the schools had the necessary basic learning resources, they were not enough to support efficient learning. A number of schools therefore improvised some of the resources that were unavailable. From the responses. (39.5 percent) head teachers confirmed improvisation of laboratories. Majority of school had no libraries and improvised the available facilities as responded by (68.5 percent) head teachers. The head teachers' responses indicated that alternative rooms including rooms for practical subjects, the library and halls were used in cases of few classrooms and in other cases, rooms like classrooms were used to supplement the library. It was also revealed that the available resources like laboratories and libraries were poorly equipped in most of the schools.

Table 5: Responses on availability, adequacy and improvisation of physical resources (in percentage) From BOG and PTA chairpersons

Physical Facilities	Availability	Adequacy	Improvised
	YES NO	YES NO	YES NO
Laboratories	70.5 29.5	25.5 74.5	40.5 59.5
Textbooks	74.5 25.5	15.5 84.5	0.0 100.0
Classroom	100.0 0.0	80.0 20.0	22.0 78.0
Library	27.0 73.0	15.0 85.5	70.0 30.0

Table 5 shows that (40.5 percent) BOM and PTA chairpersons confirmed improvisation of laboratories. Majority of schools had no libraries and improvised the available facilities as responded by (70 percent) BOM and PTA chairpersons.

Table 6: Responses on availability, adequacy and improvisation of physical resources (in percentage) From Teachers

Physical Facilities	Availability	Adequacy	Improvised
	Yes No	Yes No	Yes No
Laboratories	68.5 31.5	26.3 73.9	36.8 63.2
Textbooks	73.7 26.3	15.8 84.2	0.0 100.0
Classrooms	100.0 0.0	78.9 21.1	21.1 78.9
Library	26.3 73.7	15.8 84.2	68.8 31.6

Table 6 shows that although most of the schools had the necessary basic learning resources, they were not enough to support efficient learning. A number of schools therefore improvised some of the resources that were unavailable. From the responses. (36.8 percent) teachers confirmed improvisation of laboratories. Majority of schools had no libraries and improvised the available facilities as responded by (68.4) percent teachers.

Sharing of Physical Resources

Cost reductions in schools could be made possible by sharing facilities to supplement the lacking ones. Heymann (1994), gives sharing of common facilities across different institutions such as libraries and laboratories as one way of more efficient use of current resources. This study therefore sought to establish whether the schools shared facilities within the school and with other schools as a cost saving measure. It was revealed that the physical resources mostly shared included laboratories and laboratory equipment, textbooks, computers, wells, playground and school buses

Table 7: Head teacher's responses on sharing of physical facilities

Facilities	Responses %	
	Yes	No
Laboratories (Sharing within school)	69.5	30.5
Textbooks (sharing within school)	100.0	0.0
Laboratory (Chemicals and equipment's)	31.5	68.5
Laboratories (sharing within school)	26.5	73.5
Other facilities e.g. computers, school bus	67.5	22.5

From the table 7, the majority of the head teachers (69.5 percent) revealed that their schools shared l zaboratories.

According to the head teachers, one or two laboratories were utilized to cater for the three science subjects, Biology, Chemistry and Physics in their schools. In other cases laboratories and laboratory equipment were shared with other schools. It was found that from the head teacher's responses (31.5) percent, shared laboratory equipment with other schools. The sharing was attributed to lack and inadequate laboratories and laboratory equipment by the majority of the respondents. It was also revealed from the responses from head teachers (67.5 percent), that computers, wells, playgrounds and school buses were among other physical resources shared with other schools. Sharing of physical resources with other schools was supported by 84.5 percent (head teachers) while 15.5 percent did not support.

Most of the respondents who supported sharing of resources said it was because some schools especially upcoming ones were unable to afford some resources because they were costly and sharing would help students in needy schools access quality education. It would also help improve cordial relationships among schools. Few of the respondents who did not support sharing of physical resources argued that schools should be self-sustaining and sharing was inconveniencing

Table 8: Sharing of physical facilities –BOM and PTA chairpersons responses

Facilities	Responses %	
	Yes	No
Laboratories (Sharing within school)	68.4	31.6
Textbooks (sharing within school)	100	0.0
Laboratory (Chemicals and equipments	28.5	71.5
Laboratories (sharing within school)	32	68
Other facilities e.g computers, school bus	70.5	29.5

From the table 8, BOGM and PTA chairpersons' (68.4 percent) revealed that their schools shared laboratories. According to the BOM and PTA chairpersons one or two laboratories were utilized to cater for the three science subjects, Biology, Chemistry and Physics in their schools. In other cases laboratories and laboratory equipment were shared with other schools. It was found that from the BOM and PTA chairperson (28.5 percent) shared laboratory equipment with other schools. The sharing was attributed to lack and inadequate laboratories and laboratory equipment by the majority of the respondents.

It was also revealed from the responses from BOM and PTA chairpersons (70.5 percent) that computers, wells, playgrounds and school buses were among other physical resources shared with other schools. Sharing of physical resources with other schools was supported by (74.5 percent) BOM and PTA chairpersons supported while 25.5 percent did not support.

Table 9: Sharing of physical facilities-teachers' responses

Facilities	Responses %	
	Yes	No
Laboratories (Sharing within school)	76.7	23.3
Textbooks (sharing within school)	100.0	0.0
Laboratory (Chemicals and equipments	36.8	63.2
Laboratories (sharing within school)	32.6	67.4
Other facilities e.g. computers, school bus	65.2	34.8

Table 9 shows that the majority of teachers (76.7 percent) revealed that their schools shared laboratories. According to the teachers, one or two laboratories were utilized to cater for the three science subjects, Biology, Chemistry and Physics in their schools. In other cases laboratories and laboratory equipment were shared with other schools. It was found that from the teachers 36.8 percent shared laboratory equipment with other schools. The sharing was attributed to lack and inadequate laboratories and laboratory equipment by the majority of the respondents.

It was also revealed from the responses from teachers (65.2 percent) that computers, wells, playgrounds and school buses were among other physical resources shared with other schools. Sharing of physical resources with other schools was supported by 83.5 percent teachers.

Cost reductions in schools could be made possible by sharing facilities to supplement the lacking ones. Heymann (1994), gives sharing of common facilities across different institutions such as libraries and laboratories as one way of more efficient use of current resources.

It was also revealed from the responses from head teachers (67.5 percent), that computers, wells, playgrounds and school buses were among other physical resources shared with other schools. Sharing of physical resources with other schools was supported by 84.5 percent (head teachers) while 15.5 percent did not support. Most of the respondents who supported sharing of resources said it was because some schools especially upcoming ones were unable to afford some resources because they were costly and sharing would help students in needy schools access quality education. It would also help improve cordial relationships among schools. Few of the respondents who did not support sharing of physical resources argued that schools should be self-sustaining and sharing was inconveniencing.

Regular repair and maintenance of facilities

Musoga (2005) maintains that regular repairs and maintenance of facilities to an extend saves on costs of purchasing new ones. Muya (1993) [48] quoted Samuel Kibe the then secretary of the Kenya Secondary Schools Heads Association (KESSHA) as having said that in some cases, the maintenance of buildings was neglected for too long which led to expensive repairs when it was almost late to save anything. He urged for regular maintenance to avoid such situations. The researcher sought to find out how often facilities were repaired and maintained in the study schools.

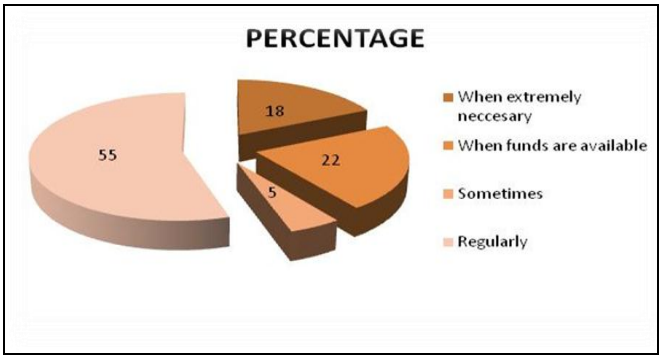


Fig 5: Repair and maintenance of facilities –Head teachers' responses

From figure 5 on the head teachers' responses (55 percent) of the schools carried out regular repairs and maintenance of facilities, 5 percent of the head teachers confirmed sometimes, while 22 percent revealed when funds are available. Repair and maintenance of facilities in most schools was determined by availability of funds.

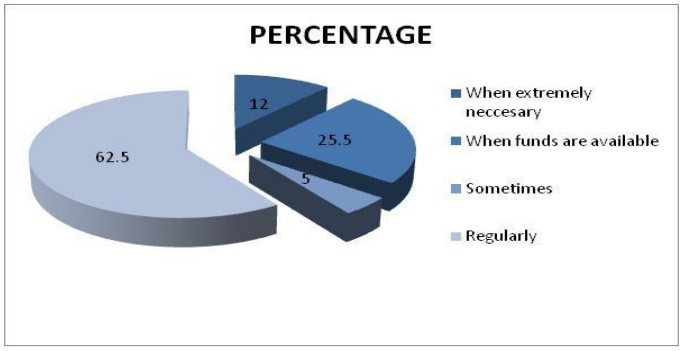


Fig 6: Head teacher' and BOM/PTAs' chairpersons responses on repair and maintenance of facilities

From the figures 6, the BOM/PTA chairpersons responded that 62.5 percent of the schools carried out regular repairs and maintenance of facilities, 5 percent BOM/PTA responded sometimes while 25.5 percent BOG/PTA chairpersons when funds are available. Repair and maintenance of facilities in most schools was determined by availability of funds. Musoga (2005) maintains that regular repairs and maintenance of facilities to an extend saves on costs of purchasing new ones. Muya (1993) [48] quoted Samuel Kibe the then secretary of the Kenya Secondary Schools Heads Association (KESSHA) as having said that in some cases, the maintenance of buildings was neglected for too long which led to expensive repairs when it was almost late to save anything. He urged for regular maintenance to avoid such situations.

Financial Resources

Finance is a core resource which should be efficiently managed by schools. Njoka (1994) called for proper management of school funds to ease the financial burden placed on parents. This study information was sought on records of account, attendance of financial management courses by head teachers, qualification of the accounts officers, audit inspection, income generating activities, purchase of commodities and savings. Finance is a core resource which should be efficiently managed by schools. Njoka (1994) called for proper management of school funds to ease the financial burden placed on parents.

Income Generating Activities

The researcher therefore sought to establish whether the study schools had income generating activities. The head teachers and BOM and PTA chairpersons were sampled.

Table 9: Head teachers' response on the existence of income generating activities

Response	Frequency	Percentage
Yes	5	62.5
No	2	25.0
No response	1	12.5

From table 9, 62.5 percent of the head teachers agreed that there were income generating activities in their schools. On the other hand 25 percent of the head teachers stated that there was no income generating activities while 12.5 percent of the head teachers gave no response.

Most of the respondents gave farming as the most commonly practiced income generating activity especially maize cultivation and vegetable farming. Hiring of school facilities did not come out as an income generating activity; and only 6.5 percent of the head teachers gave hire of school bus and school halls as an income generating activity. A few (9.5 percent) head teachers reported getting income from rental houses. Most of the school lacked proper records, making it difficult to ascertain the viability of the projects. Inadequate funds and lack of qualified manpower were cited as shortcomings in the management of income generating activities in most of the schools.

Table 10: BOG and PTA chairpersons' responses on the existence of income generating activities

Response	Frequency	Percentage
Yes	11	68.75
No	4	25.0
No Response	1	6.25

From table 10, 68.75 percent (BOG and PTA chairpersons) agreed that there were income generating activities in their schools. On the other hand 25 percent (BOG and PTA chairpersons) stated that there was no income generating activities while 6.25 percent (BOG and PTA chairpersons) gave no response. A few (12.5 percent) BOG and PTA chairpersons reported getting income from rental houses. Most of the schools lacked proper records, making it difficult to ascertain the viability of the projects. Inadequate funds and lack of qualified manpower were cited as shortcomings in the management of income generating activities in most of the schools.

Income generating activities are an essential supplementary source of income for schools. As observed by Muya (1994), while most schools charged exorbitant fees beyond the Ministry guidelines, some schools like Mang'u High School managed to keep their fees low by subsidizing through extensive farming. Muya (1993) [48] on the other hand reported that Joseph Kamotho, the then Minister for Education criticized schools for failing to use the resources they had at their disposal to offset their expenses. Kamotho specifically cited Lenana and Nairobi schools which had over 200 acres of land in premier areas of the city but did not use it commercially either through farming or putting up houses to let.

Purchases

Republic of Kenya (1993) [48], at a KESI workshop it was pointed out that schools should purchase their supplies in bulk from the least expensive sources as a measure towards cost saving. Tendering procedures should be flexible to facilitate purchases from less expensive sources, particularly during harvest time when foodstuffs are reasonably cheap. This study therefore sought to find out whether purchases in the study schools were made in bulk for commodities that required this.

Table 11: Bulk buying in schools

Response	Frequency	Percentage
In Bulk	*2*	25.0
Sometimes In Bulk	4	50.0
No Bulk Buying	2	

From table 11, only 25 percent of the schools reported making purchases in bulk, 50 percent purchased in bulk sometimes and 25 percent did not purchase in bulk. The head teachers gave limitation of funds as the main reason for inability to make purchases in bulk. Majority of head teachers reported purchasing their supplies from the least expensive sources. It was however revealed that although most of the study schools had tendering committees, some were not functioning and the responsibility of procurement of goods and services was left to the head teachers.

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Time Resource

Efficient utilization of time including punctuality and maximum use is an essential cost reduction measure. This study sought to establish how time was managed in the study schools by teachers, non-teaching staff and students and also time on completion of school projects

Table 12: Head teachers' responses on time management by teachers, non-teachings staff and students in percentages

School members	Very good	Good	Average
Teaching staff	10.5	80.5	9.0
Non-Teaching staff	2.5	78.5	19.0
Students	12.5	62.5	25.0

From the table 12, most of the head teachers rated teaching staff, non-teachings staff and students above average in time management. However, very few were rated outstanding time managers in which each case only 10.5 percent teachers and 12.5 percent students were rated very good time managers according to the head teacher's responses. Time management is a problem in many schools and this cost a lot to the schools. Lateness and time wastage are common practices. Efficient utilization of teaching/learning time would enhance good performance in national examinations and minimize wastage especially on duo-phenomena problems of repetition and dropping out which are costly.

Table 13: Teachers responses on time management by Teachers, Non-teaching staff and students

School members	Very good	Good	Average
Teaching Staff	20.31	57.81	21.88
Non-Teaching staff	0.0	71.7	28.3
Students	15.8	57.9	26.3

Table 13, according to the teachers responses, 20.31 percent teachers and 15.8 percent students were rated very good time managers. Time management is a problem in many schools and this cost a lot to the schools. Lateness and time wastage are common practices. Efficient utilization of teaching/learning time would enhance good performance in national examinations and minimize wastage especially on duo-phenomena problems of repetition and dropping out which are costly.

Completion of school development projects

Completion of development projects on time is important because delay may result to schools spending more money as a result of rise in prices.

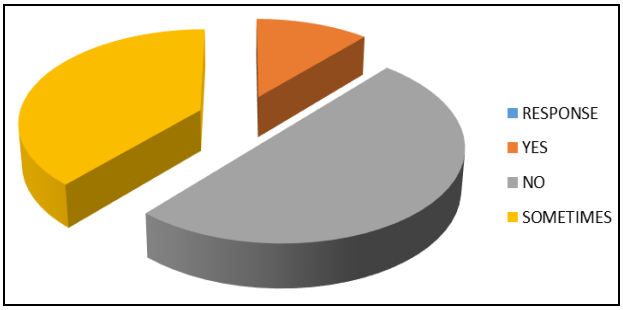

Fig 7: Head teachers' responses on completion of school development projects

Asked whether they completed projects on time, only 11.5 percent of the head teachers reported completing projects on time while 38.5 percent of the head teachers reported completing development projects sometimes on time, and 50 percent of the head teachers reported not completing the projects on time.

6. Summary of the Research Findings and Recommendations

Study findings based on the results is as presented below:

i) 55 percent of the study schools had class size of below 40. This is a clear indicator that the schools could have high unit cost.

ii) Majority of schools (60.6 percent) had a pupil-teacher ratio below 25:1 and pupil-worker ratio (62.5 percent) was below 30:1. A number of teachers, most of mathematics (68.4 percent) had more teaching load of lessons above 25 as compared to teachers of humanities and technical subjects who had low teaching load.
iii) Most of the schools shared the available physical resources or improvised them. Majority of the head teachers 69.5 per cent revealed that their schools shared laboratories.
iv) Records of accounts in the majority of schools were not up to date including books of accounts posting to the ledger and trial balance. Records on expenditure lacked details on specific items money was spent on.
v) Majority of schools (55 percent) carried out regular repairs and maintenance of facilities according to the head teachers 22 percent of head teachers said that repairs and maintenance are carried out when funds are available.
vi) Majority of head teachers (88 percent) had attended financial management courses however very few (40.5 percent) had current information on financial management.
vii) Audit inspections were not regularly carried out and audit reports in many cases took too long to reach schools thereby delaying any corrective measures to be taken by schools
viii) Most schools (68.75 percent) according to BOM and PTA chairpersons had income generating activities mostly farming. However, there were no proper records kept, making it difficult to ascertain the viability of the projects in the majority of schools.
ix) Very few schools (25 percent) made purchase in bulk. Inadequate funds were reported by the head teachers as reason for not purchasing in bulk.
x) Tendering committees in some of the school were not functioning and the responsibility of procurement of goods and services was left to the head teachers.
xi) On time resource, development projects were not completed on time, repairs and maintenance of facilities was delayed. This causes increased costs due to increase of prices of some building materials. Few head teachers (11.5%). reported completing projects on time while 38.5 per cent reported completing development projects on time while 50 per cent reported not completing the projects on time.

7. Recommendations

i) Redeployment of teaching staff should be done to overcome problem of underutilization to schools where their services are required. This will relieve understaffed school extra costs incurred in employing BOG teachers.
ii) Regular inspections by the inspectorate should be carried out to ensure smooth teaching staff work efficiently
iii) Sharing of facilities amongst schools should be encouraged as a cost reduction measure. Sensitization on importance of sharing facilities should be done on both primary and secondary schools.
iv) Stiff penalties on careless use, damage and wastage of facilities should be imposed on students. This minimizes costs incurred in repair and purchases of new facilities for replacement.
v) Income generating activities in schools should be encouraged and managed by qualified personnel. Proper records should also be maintained.
vi) Regular auditing in schools should be done for efficient financial management. Head teachers should ensure that records of accounts are clear and were updated.
vii) Available resources should be efficiently utilized to help make secondary education affordable and accessible to majority of people. For instance, schools with small classes should increase class size to at least 40 for maximum utilization of resources and low unit costs.

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