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## RESEARCH ARTICLE

# INFLUENCE OF INCOME GENERATING ACTIVITIES ON QUALITY OF SECONDARY SCHOOL EDUCATION IN KENYA: A CASE STUDY OF MIGORI COUNTY

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### ABSTRACT

The government of Kenya encourages Income Generating Activities in educational institutions to generate income for enhancement of the quality of education. Whereas, principals of secondary schools have embraced this approach, little was known on the actual influence of Income generating Activities on quality of secondary school education. To establish the influence of Income generating Activities on the quality of secondary school education in Kenya, Migori County was chosen as the site for the study. Migori County was chosen among 5 counties surveyed because it had the lowest average mean score of 4.530 (D+) and between 2011 and 2017 it varied from C- in 2011 to D in 2017 exhibiting poor quality education. The average national Kenya Certificate of Secondary Education mean score from 2011 to 2017 varied from 5.207 (C-) in 2011 to 5.173 (C-) in 2012 and declined to mean score of D+ between 2013 and 2015. The national Kenya Certificate of Secondary Education mean score dropped to a mean score of 3.980 (D) in 2016 and declined to 3.734 in 2017 resulting in an average national mean score of 4.617 (D+) over a seven year period which indicated declining quality education. The objective of this study was therefore to establish the influence of income generating activities on quality of secondary school education in Migori County, Kenya. The study established that Income Generating Activities accounted for 50.7% of the variation in the quality of secondary school education. This implies that income generating activities can be relied upon in improving the quality of secondary school education. Thus the income generated is used to promote institutional inputs, for instance provision of teaching /learning resources, physical facilities and human resource.

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## INTRODUCTION

Provision of quality education is a key ingredient in achieving Kenya's Vision 2030 and making her a middle income country by the year 2050. Republic of Kenya (2014) describes quality education as adequately and equitably resourcing education institutions and programmes with core requirements of safe, environmentally, friendly and easily accessible facilities, motivated and professionally competent teachers and books, other learning materials and technologies that are content specific, cost effective and available to all learners. The challenge is that quality must be continuously sustained at a specified standard through adequate resourcing. Orodho (2002) complements discussion on quality of education as comprising the development of a student's potential measured by

indicators of quality, comprising availability, adequacy and state of inputs namely teaching force in terms of student/teacher ratio, physical facilities, instructional materials as well as the curriculum and hours taught and also addresses indicators like performance in the Kenya Certificate of Primary Education and Kenya Certificate of Secondary Education; transition rates from primary and secondary schools and the overall survival rate from primary standard one level up to the university. Quality of secondary school education refers to the desired knowledge and skills acquired at secondary school education as measured by students academic achievement or performance. Quality secondary school education is measured by attaining high standards as a mean score of C+ and above in Kenya Certificate of Secondary Education. Quality also refers to the availability, adequacy and state of inputs and requires continuous improvement. Investments in secondary school education can be justified on grounds of provision of knowledge and skills that build the human resource to contribute social, cultural and economic development.

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Investment in the secondary education subsector improves human capital which results in greater returns to the individual and the society (Psacharopoulos & Patrinos, 2002). Investments in the secondary sub-sector fans access which if not matched by additional resourcing results in deterioration in quality of secondary school education. The World Bank (2005) supports the human capital development perspective as it observes that it brings about benefits on democracy, better citizenship, crime reduction and improvement of living conditions. Human capital development improves productivity, enhances competences, stimulates economic development, raises standards of living, reduces poverty and uplifts quality of secondary education. There are many factors that influence quality of secondary school education. These factors include entry behaviour, physical facilities, teaching/learning resources, teacher characteristics, income generating activities, home background, free secondary school education policy, teacher attitude, student attitude, learning environment, location of schools, security, school community, principals leadership styles, school culture, legal framework and retention rates. Literature has shown that Income Generating Activities greatly influence quality secondary school education. The African Union (2006) has identified institutional inputs of physical and infrastructural resourcing for learning environment, learner characteristics teacher qualification, competence, motivation, relevance of subject matter and of teaching and learning material and professional support for teachers.

The choice of institutional inputs for the study finds justification on many grounds. Entry behaviour which refers to the academic ability of the students who is admitted to secondary school on attaining a particular Kenya Certificate of Primary Education score was chosen as an institutional input because it is a resource the institution uses just like physical facilities, teaching and learning resources, teacher characteristics and Income Generating Activities. Most studies have often focused on effect of home background or socio-economic factors on performance in Kenya Certificate of Secondary Education. Oghuvbu (2007) in a study on family history in Nigeria as a tool for adequate management of pupils and students in schools found out that home background influenced students academic achievement. Donkor (2010) in Ghana found out that family's structures influenced achievement, Ogalo, Simatwa and Okwach (2013) in a study in Nyando and Muhoroni districts on socio-economic challenges faced by principals on providing quality education found out that parental sickness like HIV and AIDs affected the students performance. Other studies like Jagero (2013) and Ondima et al (2013) focused on influence of Kenya Certificate of Primary Education scores on Kenya Certificate of Secondary Education performance but did not link this to other institutional inputs influence on quality of secondary school education. The methodology and analysis of Jagero and Ondima studies were limited to linear regression and did not use multivariate analysis to show the contribution of entry behaviour to quality of education when compared to contribution of other institutional inputs like physical facilities, teaching/learning resources, teacher characteristics and Income Generating Activities which the Migori study showed. Neither have other studies integrated qualitative and quantitative analysis to breathe greater insight into the relationship between institutional inputs and quality of secondary school education in Migori.

Income Generating Activities refers to the money received from investment activities carried out by the school to argument other sources of income. They include planting of maize, keeping bees, poultry keeping, dairy farming, horticulture, brick making and hiring of school bus. Income Generating Activities was chosen because most studies have focused on ways of financing secondary school education. Getange (2013) on financing public day secondary schools in Kisii central district and its implications on the quality of learning focused on various sources of financing. The study on institutional inputs in Migori not only focused on Income Generating Activities but also stated the contribution of various Income Generating Activities on the quality of secondary school education. A multivariate analysis also showed the contribution of Income Generating Activities compared to other institutional inputs on quality of secondary school education which other studies have not shown. Ojwang, Simatwa and Ayodo (2011) in their study on contribution of income generating activities contributed significantly to financing secondary school education in Kenya and established that Income Generating Activities contributed significantly to financing of education by purchasing of inputs and payment of salaries which in turn enhance quality of secondary education. The study used a descriptive survey design. The study population consisted of 14 principals, 3 County Quality Assurance and Standards Officers, 12 District Education Officers. The study used a semi-structured questionnaire and an interview schedule. The study on influence of institutional inputs in Migori County used multivariate analysis and established the contribution of planting of maize, keeping bees, poultry, brick making and hiring of school van to the quality of secondary school education.

The World Bank (2008) in a Trends in International and Science Study on performance in mathematics and sciences in secondary school in 46 countries worldwide, found out that 90% of the students in Ghana and South Africa did not reach the low international benchmark while Botswana was better but below the international average and Morocco, Tunisia and Egypt fared better but got below the average of 400 marks out of 700 marks in mathematics and science out of the average marks of 467 in mathematics and 474 in science. This shows that most secondary students in Africa do not have a good mastery of knowledge of mathematics and depict a poor understanding of science. The World Bank study (2008) did not investigate influence of entry behaviour, physical facilities, teaching /learning resources, teacher characteristics and Income Generating Activities on quality of secondary school education and only concentrated on performances in mathematics and sciences which the study on inputs tackled. Chacha and Zani (2015) on the impact of Free Primary Education on pupil teacher ratio in Kuria East sub-county established that the pupil teacher ratio increased from 53.1 in 2003 to 60:1 in 2006 which brought a shortfall in staffing of teachers and the teachers resorted to teacher centred methods of teaching rather than student centred. This research did not focus on effect of institutional inputs on secondary school education. The research on influence of institutional inputs on quality of secondary school education in Migori County explored this by investigating institutional inputs like teacher characteristics and teacher adequacy on the quality of secondary school education. A study by Akinyi, Nyanzia and Orodho (2015) on challenges facing implementation of inclusive education in public secondary schools in Rongo sub county, Migori County, found out that physical and critical

teaching and learning resources such as teacher textbooks, library and laboratories were either inadequate or quite dilapidated and there were several economic and cultural variables that constrained teaching and learning. The study used a descriptive survey design and a sample of 34 secondary schools, 34 principals, 170 students with special needs, 102 teachers, 1 Sub County Quality Assurance and Standards Officer and questionnaires and interview schedule for principals. The studies strength lay in the use of more than one instrument which enhanced reliability of data capture. The study on influence of institutional inputs explored the contribution of inputs of entry behaviour, physical facilities, teaching /learning resources, teacher characteristics and Income Generating Activities on quality of secondary school education which the Aking et al (2015) did not do. The Ministry of Education (2014) Migori County documents that there were 603 public primary and 203 public secondary schools with an enrolment of 262,941 in primary and 55,577 in secondary schools with 5,201 teachers in primary and 1224 teachers in secondary school resulting in a teacher shortage of 1,068 and 1,688 in both primary and secondary. The student teacher ratio for secondary schools was 23:1 as the number of students stood at 57,000 and the number of teachers stood at 2,439 (Ministry of Education, 2016). Table 1 shows that the number of candidates in Kenya Certificate of Secondary Education has increased from 357,488 in 2010 to 574,125 in 2016.

Scores of C+ and above which is the minimum university admission marks declined from 97,134 in 2010 to 88,929 in 2016 reflecting a declined from 27.2% decline in 2010 to 15.41% in 2016. However the scores of C and below remained at an average of 70% for the last 5 years except in 2016 when it rose to 84.9% which depicts and shows that most of secondary school students perform poorly in Kenya Certificate of Secondary Education examinations. Those who scored grade A had declined from 0.47% in 2011 to 0.02% in 2016.

Table 2 shows the trend of performance in Kenya Certificate of Secondary Education in Kenya and Migori County from 2011 to 2017. This trend of performance is compared to four other counties of Homa Bay, Kisii, Kisumu, and Siaya from 2011 to 2017. It shows three counties of Migori, Homabay and Kisii, Siaya and Kisumu had a mean score of C- (5) which is below C+ (7). C plus is minimum or benchmark for admission to the university. This depicts that Migori County the four other counties and Kenya depict poor quality of education as 5 counties had a mean score lower than C+. Migori County had the lowest mean score of 4.530 followed by Kisii County with a mean score of 4.678 which was the second lowest. Siaya County had the highest mean score of 5.426 followed by Kisumu County with a mean score of 5.250. Homabay had a mean score of 4.865. The average national mean score dropped to 3.980 in 2016 and further dropped to 3.734 in 2017. From 2011 to 2015 the national mean score remained low at 5.267, 5.173, 4.581, 4.776 and 4.805 respectively and had an average of 4.617 over the 7 years. This depicts poor quality of education.

**Research Objective:** The research objective was to determine the influence of Income Generating Activities on quality of secondary school education.

**Synthesis of literature on influence of income generating activities on quality of secondary school education:** There are many ways of financing secondary school education which

comprise personal grants, government, non-governmental organizations, foreign aid and commercial banks. Community financing and Income Generating Activities play a complementary role. Income Generating Activities include maize planting, bee-keeping, brick making, horticulture and bus hiring. Oluyele and Kunene (2001) in a case study of Swaziland education financing and budgetary reforms in Africa, found out that despite all the government provision of almost all expenditure other source like local communities, foreign aid, families and individuals, Non Governmental Organizations, mission institution can be used to finance education. This is necessary because government financial constraints cannot allow them to meet the entire entry cost of education. The World Bank (2005) on financing education articulates that education systems even in developed countries do not fund schools as schools are usually provided by inputs through teacher replacement, provision of books and materials as most school districts in the United States schools have real discretionary funding for only 10% to 20% of their total reserve use, the balance come in the form of direct inputs. The report further states that in Korea the government introduced subsidies, paid tax exemption for private sector finances. The study in Migori county on institutional inputs explored the influence of Income Generating Activities on quality secondary education. Improving the quality of education will require nations to invest more financial resources in education. The Republic of Kenya (1997) states that by the take-off point into industrialization the newly industrialized countries of Korea, Malaysia and Mauritius had achieved secondary enrolment rate of 42%, 34% and 30% respectively but by 1991 these percentages had risen to 88%, 58% and 54% compared to Kenya's 29%. The massive expansion in enrolment created the necessary human capital that was able to engineer economic growth and development. Psacharopolous and Patrinos (2004) in a study on return to additional year of schooling averaged 10% in 100 countries with the highest returns resulting in low income countries and the developed had the lowest. The highest return was in Latin America followed by Sub Saharan Africa and the lowest was in Economic Corporation and Development Europe, Middle East and North Africa.

Mingat et al (2010) and UNESCO (2013) articulate that civil society organizations and others have argued that there is need to increase levels of education aid but the latest findings show that aid to education decreased for the first time since 2002 by 7% from 2010 to 2011. Whereas Mingat (2010) explored how financing sustainability improves quality education in secondary school in Africa, UNESCO (2013) reports on how financing can enhance the attainment of universal primary education for all by 2015. The synthesis between the two studies is the focus on quality education although Mingat concentrates on secondary and UNESCO on primary subsection. The study in Migori explored how Income Generating Activities in form of planting maize, bee keeping, brick laying, horticulture, dairy farming, poultry keeping and hiring of school bus contribute to quality education. Gillies (2010) completes the above studies and reports that in times ahead external aid financing, while still important will play a diminishing role compared to domestic spending for most countries with the exception of fragile states where aid is likely to continue in the more traditional sense but for other countries aid should be considered as addition to rather than a substitute for domestic funding and should initiate and stimulate change. The high returns to low income countries is because of the underdeveloped human capital which is relatively developed in

middle and high income countries. With diminished foreign aid alternative sources of financing quality secondary school education will be explored. The study on institutional inputs in Migori County investigated contribution of Income Generating Activities to quality secondary school education. In South Asia, Bangladesh donates only 2.6% of its national income in education and Pakistan 2.7% and India donates 3.3% of its Gross Domestic Product which is lower than the median for sub Saharan Africa which is 4% and even the National income donated to education is stagnating or decreasing in countries like Bangladesh, India and Pakistan resulting in 15 million out of school children (UNICEF, 2008). The decline in national income contribution to education undermines provision of quality education at all levels. It also reduces access, retention and performance of education. Kenya's expenditure on education as a percentage of Government expenditure stands at 33% compared to Indonesia that spends 10%, South Africa 24% and Malaysia 20% and Kenya's expenditure per pupil as a percentage of Gross Domestic Product per capita is 25% compared to Indonesia's 3%, South Africa's 14% and Malaysia's 17% (Republic of Kenya, 2007). This shows that Kenya spends an inordinately higher amounts of money than many middle income countries like Indonesia, South Africa and Malaysia yet the quality of education is lower. The study on institutional inputs showed declining quality of education for the last five years as Kenya Certificate of Secondary Education scores have been below C+ for the last five years which is the bench mark for quality performance. The study also indicated poor physical facilities and lack of teaching and learning resources.

Republic of Kenya (2012) observes that in spite of continuous huge budgetary allocations over the last decade especially since the launch of Free Primary Education in 2003 and Free Day Secondary Education in 2008 quality remains an issue across the entire spectrum of the education and training sector because of declining Kenya Certificate of Secondary Education performance, inadequate physical facilities and insufficient teaching and learning resources. The quantitative expansion in secondary education has not been matched by qualitative improvements of secondary education. Consequently, there is need to match the increase in number of students with increased provision of inputs of physical facilities, teaching /learning resources and additional financing. Financing of secondary education faces many challenges which includes inadequacy of public resources to effectively meet infrastructural needs of secondary schools, inequality of funding between primary and secondary schools, weaknesses in the bursary funds scheme, inefficiency in resource utilization and lack of enforcement of fees guidelines and high additional and unregulated school levies and high costs of school uniforms and delays in remittance of funds and failure to comply with financial regulations like poor procurement procedures (Republic of Kenya, 2012). This impoverishes schools making them vulnerable and undermining the quality of secondary school education. Gogo (2002) on the impact of Cost sharing strategies on access, equity and quality of secondary school education in Rachuonyo district established that the financiers of secondary school projects (1996-1999) comprised 58% by Parents Teachers Association, 29% by community, 6% local donors, 2.47% foreign aid and government 2.47% and individuals 1.23% whereas between 1996-1999; 65.63% of the schools had no income generations activities while 12.5% had vegetable and maize production, hiring of school chair comprised 3.13%, beans 3.13% and

brick making was 3.13%. The low engagement in Income Generating Activities by secondary schools denied the schools of the much needed complementary financing and reduced the quality of education through scarcity of institutional inputs. Secondary schools have ignored income generating projects but with government budgetary constraints these activities will take an increasing role. The study design was a correlation research design used to establish the magnitude of the relationship among the variables. The target population was 46 schools but a sample of 32 schools was taken which was adequate. This study however used only the questionnaire as an instrument of collecting information on students and teachers. The study on influence of institutional inputs on the quality of secondary school education in Migori County used a variety of instruments and investigated the contribution of Income Generating Activities to quality secondary education. Kenya Institute of Public Policy Research and Analysis (2006) asserts that the government alone cannot meet the education cost due to inflation rate and poor performance of the economy which has led to only a small increment of the per student allocation per year. Improving quality of secondary school education will entail mobilizing supplementary sources of income to finance learning and teaching in secondary schools. The study on influence of institutional inputs explored how Income Generating Activities can implement the available resources to promote quality secondary school education. Getange (2013) on financing of public day secondary schools and its impact on quality of learning in Kisii Central District established that there was a coefficient of correlation of 0.447 at the 0.05 level of significance. It was also established that the revenue to Free secondary education were inadequate and parents also owed the schools fees arrears to parents low income which affected the ability of parents to pay fees required by the schools. The report further stated that with the introduction of Free secondary education parents sources of financing day secondary education were inadequate to meet the financial demands of learning to enhance quality and recommended the harnessing and strengthening of various sources of school income generating activities like crop and animal production, intensive gardening and hiring school facilities.

The study used survey design which was suitable as it enabled investigation of the state of affairs as it exists. From a target population of 102 public day secondary schools a sample of 36 schools were chosen through stratified random sampling. Purposive sampling was used to select 36 principals, 36 bursars, 36 Board of Management, 36 Parents Teachers Association and 4 District Quality Assurance officers resulting in 148 respondents. The use of stratified sampling took care of the strata but purposive sampling may have reduced reliability due to possibility of bias. Moreover the sample of 36 schools out of 102 was inadequate. Questionnaires were used for principals but interview schedule were used for Parents Teachers Association and Board of Management. The use of two instruments enhanced reliability because of wide data capture. The use of descriptive and inferential statistics to analyse data gave an in-depth insight into the relationship between variables in the study. The study on influence of institutional inputs on the quality of secondary school education in Migori County used adequate sample to enhance reliability through use of random sampling. The study in Migori County focused on institutional inputs that influence quality of secondary education unlike the Getange (2005) study which focused on the influence of finance on the quality

of learning in public secondary schools. Ojwang, Simatwa and Ayodo (2011) in their study on contribution of Income Generating Activities to financing secondary school education in Kenya established that Income Generating Activities contributed significantly to financing education by purchasing of inputs and payment of salaries which in turn enhance quality of secondary education. The study used a descriptive survey design. The study population consisted of 14 principals, 3 County Quality and Standards Assurance Officers, 2 District school auditors and deputy District Education officers who were purposively sampled. A semi-structured questionnaire and an interview schedule were used as data collection tools. The study showed that public secondary schools have the potential to generate additional income. The study on influence of institutional inputs on quality of secondary school education used a wide spectrum of inputs and explored the contribution of each input entry behaviour, physical facilities, teaching /learning resources, teacher characteristics and Income Generating Activities on quality secondary school education. The Migori study further investigated how each activity of Income Generating Activities contributed to quality secondary education.

Quality manifests itself through the achievement level at Kenya Certificate of Secondary Education and school level. The quality of education is determined by the level of performance. Todaro (2011) has observed that quality of education is higher in high income countries as it is higher in Europe than it is in Africa. However quality education can differ even within the same region as there can exist elite private schools that offer quality education compared to public schools or it can differ between urban areas and rural areas. Darling and Wentworth (2010) and Ravela (2005) report that in countries like Australia, Finland, Singapore, Sweden, Uruguay and the United Kingdom education systems are high performing systems but their assessment systems comprise, examinations, classroom assessment and large –scale system level assessments, whereas the United States emphasizes on standardised testing but does not perform well in international assessment exercises. The above reviewed studies did not investigate the influence of institutional inputs on the quality of secondary school education. It is this knowledge gap that the study filled. A study by Ouma (2013) on factors affecting participation of the girl-child in secondary school education in Migori sub-county found out that 80% of the respondents identified socio-economic background and 50% identified teaching /learning resources and 75% identified school fees while 47% identified levies as inhibiting effective participation. School fees and levies which are financing aspects combined greatly inhibit participation of the girl in secondary school education. The study used a survey research design and a target population of 33 schools and a census sample was undertaken. The questionnaire was used to collect the information. The study used only descriptive statistics using means and percentages. This did not effectively bring out the relationship among the variables. The study also used only the information and this limited the scope and variety of the information collected. The reviewed study only tackled the factors affecting girl-child participation in secondary school but did not focus on institutional inputs that influence the quality of secondary school education which gap this study in Migori filled. Republic of Kenya (2003) in an Education sector review identified challenges that affect enrolment in education as being due to high dropout rates, low retention rates, non-enrolment, high cost of education, declining economic growth

rate, increased household poverty levels, HIV/AIDS pandemic, internal management inefficiencies, inhibitive socio-cultural practices and practices and beliefs, rigidity in the education system, poor child health and nutrition and uncongenial learning environment. These challenges vary on their impact on enrolment but when taken together they greatly undermine the quality of education and performance. Daily nation (2012) has stated that transition from primary to secondary has increased from 40% in 2003 to 73% in 2012 and secondary school completion rate has increased from 46% to 74%. Table 3 shows national trends in Kenya Certificate of Secondary Education candidates top performance mean grade by sex 2014 to 2017.

From Table 3, the number of candidates grew from 482,133 in 2014 to 610,501. The number of candidates increased from 223,231 in 2014 to 295,623 in 2017 but the males increased from 258,896 in 2014 to 314,875 in 2017. The number of students who scored a minimum university entry score of C (plus) and above decreased by 21.2% to 70,073 in 2017 from 85,929 in 2016. During the review period the number of candidates who scored A (minus) and above declined by 40.3% from 4,786 in 2016 to 2,856 in 2017. This depicts decline in quality of education between 2014 to 2017. Although quality of education of the students was deteriorating the performance of the boys is better than that of girls. However the girls in 2016 got higher grade A than boys. Kenya Economic Survey 2018 has shown that although the annual intake of boys is standard one is will higher than that of girls, more boys dropout in the 8 years of primary school. The declining quality of education shows that many of the students cannot pursue courses in Science and technology and this can hamper the rate of development. The report on performance also exhibits a very high wastage rate in the education system. Cheeseman (2015) in a research found out that there were more than 13 year old girls in secondary school than boys but the age of 14 onwards boys increasingly outnumbered the girls but what was worse was that only 25% young people of secondary school age attended schools. Standards and quality assurance officers need to evolve a new strategy on ensuring quality education, quality learning outcomes and quality institutional leadership through frequent and constant assessment of learning programmes.

### Theoretical framework

The study on the influence of Income Generating Activities on quality of secondary school education was informed by the Production Function Model. The model postulates that educational outcomes are a function of Income Generating Activities (Psacharopoulos & Woodhall, 1985). The formula of production function model is;  $A = f(T, B, E, \dots)(I)$

Where;

A -is Achievement

T- is Teacher pupil ratio

B -is books and other materials

E- is Equipment

In this study the education production function model was expressed as

$$A = f(B, P, D, H, \dots)(I)$$

Where;

- P = Poultry keeping
- B = Brick making
- BK – Bee keeping
- PM = Planting maize
- D - Dairy farming
- H= Hiring school van

When quality of secondary school education was taken as dependent variable (A) and poultry keeping brick making , bee keeping , planting maize , dairy farming hiring school van as independent variables

$$A = F(X_1, X_2, X_3, \dots, X_n) \dots \dots \dots (2)$$

The Education Production Function Model was re-constructed as a regression model thus

$$Y = B_0 + B_1X_1 + \varepsilon \dots \dots \dots (3)$$

Where Y was the dependent variable represented by Kenya Certificate of Secondary school Education scores of secondary education.

- B<sub>0</sub> is the constant or intercept.
- B<sub>1</sub> is the slope or change in y given one unit change in X<sub>1</sub>.
- X<sub>1</sub> = Poultry keeping
- X<sub>2</sub>= Brick making
- X<sub>3</sub>= Bee keeping
- X<sub>4</sub>= Planting maize
- X<sub>5</sub>=Dairy farming
- X<sub>6</sub>= Hiring school van
- ε is the Error term.

This model helped the study to focus on the variables of the study and computation of the data that was obtained in order to determine the influence of Income Generating activities on quality of secondary school education.

**RESEARCH METHODOLOGY**

This study is anchored on Psacharopolous production function model in education which relates inputs in education like learning resources to outputs in form of achievement measured by student performances. The study adopted descriptive and correlational research designs. The study population was 59,691 comprising of 245 principals, 2,439 teachers, 57,000 students and 7 Quality Assurance and Standards Officers. Fisher’s formula was used to select 384 students, 331 teachers and 148 principals. Saturated sampling was used to select 7 Quality Assurance and Standards Officers resulting in total respondents of 870. The data was collected using questionnaires, interview schedule, observation guide, focus group discussion and document analysis guide. Face and content validity of the instruments were ascertained by experts in Educational administration who evaluated the appropriateness of items in the instruments. Their input was therefore included in the final instruments. Reliability of the instruments was ascertained by piloting in 7 schools whereby a coefficients of 0.8, 0.73, 0.78 for principals, teachers and students questionnaires were obtained and were above 0.7 at a set p-value of 0.05 and was therefore considered reliable. Inferential statistics were used to determine the influence of physical facilities on the quality of secondary school

education. In effect the mean scores were regressed against physical facilities to establish the magnitude of the influence at the 0.05 level of significance

**RESULTS**

**Research Objective:** The research objective was: To determine the influence of Income Generating Activities resources on quality of secondary school education. The research hypothesis responded to was: Income Generating Activities has no influence on quality of secondary school education. Descriptive and inferential statistics was used to establish the relationship and the nature of association between Income Generating Activities and quality of secondary education. Data and information given by school principals was used as the focus and it was supported by information given by teachers, students, and Sub County Quality and Assurance Standards Officers.

Table 4 presents findings related to income generating activities and the amount accrued from the ventures in order to understand the table, consider the following initials;

- P.M=Planting maize
- K.B=Keeping bees
- P.K=Poultry keeping
- D.F=dairy farming
- H=horticulture
- B-M=Brick-making
- H.S.V=Hiring school van

From Table 4, 122 school principals stated that their schools ventured in planting maize and they valued the practice between Ksh. 0.05-0.15million, while 26 principals valued the venture of planting maize between Ksh. 0.151-0.250 million. Bee keeping and poultry farming were done on low scales; 26 and 38 school principals valued bee keeping and poultry keeping between Ksh. 0.05-0.15million. Upon asking teachers about the income generating activities in their respective schools, 232 out of 331 representing 70.1% indicated that various sources of income different from Free Secondary Education were not adequate. Even so, 99 teachers representing 29.9% stated that the various sources of income generating activities apart from Free Secondary Education were adequate. In order to establish the influence of Income generating activities on quality of secondary school education data on students’ mean scores in Kenya Certificate of Secondary Education examinations from 2014 to 2017 examination was regressed against data on income generating activities and the results were as shown in Table 5. From Table 5 it can be observed that income generating activities accounted for 50.7% of the variations in the quality of secondary school education as signified by the Adjusted R Square of 0.507. The other 49.3% was due to other factors that were not subject to this study. These could include location of the schools, teacher’s attitude, students attitude, government policies among others. The null hypothesis was rejected because the influence of Income Generating Activities was significant as signified by the p –value of 0.00 which was less than the set p-value 0.05. To confirm whether Income Generating Activities were significant predictors of quality of secondary school education, analysis of variance was computed and the results were as shown in Table 6. From Table 6 it can be observed that income generating activities were significant predictors of secondary school quality of

**Table 1. Kenya Certificate of Secondary Education Enrolment and performance for 2010 to 2016**

Year	2010	2011	2012	2013	2014	2015	2016
Candidates	357,488	411,785	436,349	446,696	483,630	522,820	574,125
Score of Grade A	0.44	0.47	0.45	0.61	0.64	0.51	0.02
Score C+ & above	97,134	119,658	123,748	123,365	149,717	169,492	88,929
Percentage score C+ & above	27.2	29	28.36	27.36	30.8	32.23	15.41
Percentage score C & below	72.8	71	71.64	72.64	69.2	67.7	84.89

Source: KNEC

**Table 2. Trend in Performance in Kenya Certificate of Secondary Education examinations between 2011-2017 Nationally, Migori County and other counties**

Year	Mean Scores (Grade)							Average
	2011	2012	2013	2014	2015	2016	2017	
County /National								
Migori	5.154	4.356	5.144	5.255	5.413	3.072	3.316	4.530
Homa Bay	5.595	5.247	5.384	5.162	5.1912	3.7533	3.7301	4.865
Kisii	4.934	4.427	4.959	5.3842	5.669	3.95	3.420	4.678
Siaya	5.216	5.176	5.225	6.7262	6.841	4.050	4.750	5.426
Kisumu	5.751	5.637	5.814	5.634	5.546	4.340	4.025	5.250
National	5.267	5.173	4.581	4.776	4.805	3.980	3.734	4.617

Source: Kenya National Bureau of Statistics (2011, 2012, 2013, 2014, 2015, 2016, 2017); County Education Offices Migori, 2017 Homabay (2017) Kisii (2017) and Kisumu (2017)

**Table 3. National trends in Kenya Certificate of Secondary Education candidates top performances 2014 to 2017**

Year	2014			2015			2016			2017			
	Sex	Male	F	Total	Male	F	Total	Male	Female	Total	Male	F	Total
Grade													
A		2133	940	3073	2024	661	2685	58	83	141	81	61	142
A-		7644	4124	4768	7952	4417	2069	2585	1960	4645	1813	901	2714
B+		12606	7208	19814	13517	8410	21927	6581	4394	10975	4596	2748	7344
B		17941	11378	29319	19826	13634	33460	10204	7012	17216	7738	4890	12628
B-		21997	16318	38315	25312	19269	44581	13649	10096	23745	11631	7754	19385
C+		25978	21450	47428	29556	25214	54770	17238	14989	32207	15828	12032	27560

Source: KNEC Key: F = Female

**Table 4. Income Generating Activities based on the amount earned**

Income Generating Activities-Ksh.	P.M		K.B		P.K		D.F		H		B-M		H.S.V	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%
Millions														
0.05-0.150	122	82.4	26	17.6	38	25.7	64	43.2	49	33.1	17	11.5	98	66.2
0.151-0.250	26	17.6	0	0	0	0	19	12.8	2	1.4	6	4.1	20	13.5
0.251-0.350	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.351-0.450	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Above 0.450	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	148	100.0	26	17.6	38	25.7	83	56.0	51	34.5	23	15.5	118	79.7

**Table 5. Regression analysis of Income Generating Activities and Quality of Secondary Education**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.727 <sup>a</sup>	.529	.507	.314	.529	28.455	8	134	.000

a. Predictors: (Constant), poultry keeping, brick-making, hiring school van, bee keeping, dairy farming, planting maize

**Table 6. Analysis of Variance of Income Generating Activities and Quality of Secondary Education**

Model	Sum of Squares	df	Mean Square	F	Sig.
1					
Regression	60.244	8	7.530	28.455	.000 <sup>a</sup>
Residual	35.462	134	.265		
Total	95.706	142			

a. Predictors: (Constant), poultry keeping, brick-making, hiring school van, bee keeping, dairy farming, planting maize

b. Dependent Variable: Kenya Certificate of Secondary Education mean score

**Table 7. Multiple Linear Regression Analysis of Influence of Income Generating activities on Quality of secondary School Education**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.094	.111		9.816	.000
	Poultry keeping	.380	.081	.485	4.673	.000
	Brick making	.231	.100	.246	2.309	.002
	Bee keeping	.363	.081	.470	4.488	.000
	Planting maize	.730	.080	1.033	9.123	.000
	Dairy farming	.430	.083	.668	5.184	.000
	Hiring school van	.558	.080	.803	6.968	.000

a)Dependent Variable: Kenya Certificate Of Secondary Education mean score

Regression Equation  $Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + \dots + \epsilon$

education ( $F(8, 134) = 28.455, P < 0.05$ ). This means that Income Generating Activities which include Planting maize, Keeping bees, Poultry keeping, dairy farming, horticulture Brick-making, and Hiring school van can be relied upon to predict the quality of secondary school education. This is achieved by availing the much needed finances to meet the school requirements for purposes of enhancing instructions. To determine the actual influence of Income Generating Activities on quality of secondary education multiple linear regression analysis was computed and the results were as shown in Table 7. From Table 7 it can be observed that Income Generating Activities had different prediction powers. The highest being maize planting with a coefficient of .730. This means that for every one unit increase in maize planting, quality of education improved by .730 units as signified by the coefficient .730. All the six Income Generating Activities were predictors of quality secondary school education as their p-values were less than 0.05. The regression equation can therefore be represented as follows. Quality of secondary school education =  $1.094 + 0.380X_1 + 0.231X_2 + 0.363X_3 + 0.730X_4 + 0.430X_5 + 0.558X_6$

Where  $X_1 =$  a measure of individual income generating activities

This model can be used to predict the quality of education of a country where income generating activities are undertaken for a similar purpose.

**DISCUSSION**

All the schools ventured into some income generating activity which comprised planting of maize, keeping bees, poultry keeping, dairy farming, horticulture, brick-making and hiring school van. In this respect a principal commented “government financing through free secondary school education and the fees paid by parents at prescribed levels is insufficient to sustain quality education because of 100% transition policy, over enrolment, inflation and the need to provide a variety of institutional inputs. The disbursement of Free secondary education is also delayed making school management challenging.” The remarks show that the state of secondary school education is deteriorating and needs additional financing alternatives and prudent and efficient use of resources if it is to be improved in an environment of increased access. Thus during the interview, a teacher stated “There are a few Income Generating Activities such as horticulture and maize planting that are carried on in the school. However lack of adequate funding they are operated on a low scale and the sales from the produce are used in paying salaries of Board of Management teachers. Most income generating activities are small. They can do better if they are well planned and effectively.”

All the Sub County Quality Assurance and Standards Officers stated that the capitation provided by the Ministry of Education to secondary schools was not enough indicating that the quality of education in most secondary schools that relied on Free Secondary Education only was insufficient. All the Quality Assurance and Standards Officers stated that the capitation disbursed to secondary schools were inadequate and the number of students kept increasing relative to the capitation received from the government. Compared to the quantitative findings regarding Income Generating Activities and quality of secondary, qualitative findings were explicit. Seven Sub County Quality Assurance and Standards Officers observed that almost half the schools did not engage in complimentary income generating activities and a few who engaged in all the income generating activities did it on a low or medium scale. Upon inquiring from principals regarding level of financing and quality of education, they stated that the capitation received from government was usually inadequate and was subject to delays. Most schools had no resources and capacity to operate other income generating activities effectively, and the leadership in some of the schools was not proactive or willing to venture in income generating activities. Some of the intervention measures suggested by principals included collaborating with the community parents and the government in financing Income Generating Activities.

The school principals added that changing the attitude about costs, capacity, and resources needed would enable schools start with small enterprises and expand their scale of operations. There was the need to stop the culture of buying almost everything such that principals should limit the items that they purchased especially if the school could produce them. Secondary schools were not adequately resourced. Indeed this problem was compounded by the fact that disbursement of funds to schools was delayed compromising routine activities. This affected performance in secondary schools as vital items like books, stationery, repairs and wages of Board of Management teachers and support staff could not be paid in time. Governments financial constraints and competing demand by various sectors cannot allow it to finance the entire cost of education. It is necessary that schools start income generating activities to supplement what the government gives. Lack of financial resources can affect provision of quality education. Secondary schools have ignored Income Generating Activities because of inadequate budgetary allocation and planning. Yet substantial gains can accrue for these activities if they are well resourced and planned. Many studies Mingat (2004) and Gillies (2010) show a strong correlation between income generating activities and quality of secondary school education. The two studies differ in scope as Mingat’s study focus on financial sustainability but the Gillies study is more robust and explored how financing can be used to bring education reform.



In addition, Ojwang, Simatwa and Ayodo (2011) on contribution of Income Generating Activities To financing secondary school education in Kenya established that Income Generating Activities contributed significantly to financing of education by purchasing of inputs and payment of salaries which in turn enhanced quality of secondary school education. Getange (2013) in Kenya, in Kisii Central District on Income generating activities and quality of learning, established that there was a coefficient correlation was 0.447. Compared to Getange's (2013) the Migori study established that the coefficient of correlation between Income generating activities and quality of education was 0.507; however, the Migori study further established the extent or the contribution of each income generating activities on quality of education. A study by Gogo (2002) established that income generating activities influence quality of secondary school education. The current study identifies the contribution of each income generating activities on the quality of secondary school education.

### Conclusion

All schools were engaged in Income Generating Activities but levels of engagement differed from one school to another. The ever-increasing school fees arrears hindered most schools from exploring their potential in exploiting available resources in income generating activities. The community and indeed parents played a minimal role in enhancing for supporting income generating activities in schools. The contribution of Income Generating Activities to quality of secondary school education was 50.7%. This contribution was significant.

### Recommendations

Principals should venture into and /or expand Income Generating Activities in their schools to mobilize additional financial resources. For this to be effective, the Ministry of Education to develop a policy framework on financing, legality, planning and proper administration of Income Generating Activities. The Ministry of Education also needs to train principals on entrepreneurial, innovation and accounting culture to enhance and sustain financial returns. This can take the form of ventures like brick-making, hiring school facilities, poultry keeping, dairy farming, horticulture, bee keeping, fish farming and maize farming. This alternative form of financing education can be used to provide teaching/ learning resources, physical facilities, pay salaries of Board of Management teachers and supporting staff. This would improve the quality of secondary school education.

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