

**DETERMINANTS OF EARLY CHILDHOOD SCHOOLING
AMONG SEMI-SEDENTARY POPULATIONS IN SAMBURU
COUNTY, KENYA**

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Education in Economics of Education of Kenyatta University**

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DECLARATION

CANDIDATE'S DECLARATION

I confirm that this thesis is my original work and has not been presented for a degree in any other University/Institution for certification. The thesis has been complemented by referenced works duly acknowledged. Where text, data, graphics, pictures or tables have been borrowed from other works including the internet, the sources are specifically accredited through APA referencing in accordance with anti-plagiarism regulations.

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DEDICATION

To my Son Jeremy Curtis Otieno

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ABBREVIATIONS AND ACRONYMS

ASAL	Arid and Semi Arid Lands
CCF	Christian Child Fund
CI	Confidence Interval
CiC	Children in Crisis
CSU	Colorado State University
DF	Degree of Freedom
DICECE	District Centres for Early Childhood Education
ECCDE	Early Childhood Care, Development and Education
ECD	Early Childhood Development
ECDE	Early Childhood Care, Development and Education
EFA	Education for All
GDP	Gross National Product
GER	Gross Enrolment Ratio
HH	Household
HHH	Household Head
IBM	International Business Machines
ISCED	International Standard Classification of Education
KESSP	Kenya Education Sector Support Programme
KIE	Kenya Institute of Education
KM	Kilometre
LGA	Local Government Authority
LR	Likelihood Ratio
MDG	Millennium Development Goals
MoE	Ministry of Education
MOEST	Ministry of Education Science and Technology
MOHSW	Ministry of Health and Social Welfare
NACECE	National Centre for Early Childhood Education
NCST	National Council of Science and Technology
NEP	North Eastern Province
NER	Net Enrolment Ratio
NGO	Non-Governmental Organization
OLS	Ordinary Least Squares
SCF	Save the Children Fund
SIEA	Secondary Education in Africa
SJE	Social Justice Education
SPSS	Statistical Packages for Social Scientists
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Education Fund

ABSTRACT

The purpose of the study was to empirically identify the determinants of early childhood schooling among semi-sedentary populations. The study used a causal comparative design. This study was conducted in five locations within Samburu County. Mixed sampling techniques were used to select study sites and respondents. Locations were purposively selected to reflect the diversity of the County and enhance sampling efficiency. Within 3.5% DF and 95% CI, a sample of 600 households was selected using the systematic random sampling technique. The criterion variable was early childhood schooling status. Child characteristics, household economic characteristics, household socio-demographic characteristics and ECDE centre and community characteristics were the four categories of explanatory variables included in the study. Study data were collected using a household questionnaire. Multivariate logit models were estimated using the maximum likelihood estimation function in IBM SPSS Statistics Version 21. Empirical results on child characteristics show no significant impacts of sex and age on schooling. Under household economic characteristics, there was a significant positive relationship between the levels of education expenditure and schooling. Livestock ownership, however, diminishes the odds for early childhood schooling. In terms of socio-demographic characteristics, both an increase in the age of the household head and the total number of children aged 0-8 years had a diminishing effect on schooling. Under ECDE centre and community characteristics, an increase in the distance between learning centres and households greatly suppressed the odds for girls' schooling. The study however brings forth a confounding result showing that household location in an area with an apparent high ECDE centre density actually diminishes schooling prospects. This is attributable to an underlying problem of a spatial and temporal mobility of the ECDE centre density frontier. Often, the number of traditional childcare centres, known as *Loipis*, fluctuates with the supply of school feeding and ECDE teachers. The empirical results suggest that the strength of supply side factors, especially the school feeding programme, by far outweighs the expected impact of factors that underlie sex and age as they relate to access. The positive effect of increased household expenditure on education confirms the expected peristaltic and positive externality effects of parental education and income on schooling. Richer households are more likely to make pro-schooling choices and spend more on it. The adverse effect of livestock ownership suggests that the main economic activity in an area can have a diminishing effect on schooling. Restocking interventions for reconstructing the livelihoods of the economically vulnerable households are therefore in competition with the full ECDE enrolment goal. From the results, the study fails to reject H_01 with the conclusion that child characteristics are not significant determinants of early childhood schooling. However, the study rejects H_02 , H_03 and H_04 and concludes that household economic characteristics, household socio-demographic characteristics and, ECDE centre and community characteristics, respectively, are significant determinants of early childhood schooling. The study recommends right-age enrolment to diminish age related wastage at later levels of schooling. Livestock herd-rightsizing would be effective in suppressing the negative effect of livestock ownership on schooling. The adverse impact of an increase in the number of children on schooling necessitates the integration of family planning in other livelihood enhancement interventions in the County. Considering the profound impact of supply side factors on access, both public and private stakeholders should ensure consistent ECDE teacher pay and the sustenance of school feeding programmes to improve access to full enrolment.

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction

This chapter introduces and contextualizes the study problem. The chapter has eight main sections. Section 1.2 presents the background to the study outlining the state of early childhood in Kenya and within the study locale; Samburu County. Further, the background briefly introduces the evidence from past works on how some of explanatory variables generally affect schooling among populations similar to the study population. Respectively, the subsequent sections 1.2 to 1.13 present a background to the study, the statement of the study problem, the purpose of the study, the study objectives, research hypotheses, significance of the study, delimitations, limitations, assumptions, theoretical framework, conceptual framework, and operational definition of terms.

1.2 Background to the Study

Although the historically low access to education by communities in Arid and Semi Arid Lands (ASAL) regions of Kenya has been attributed to the community attributes in these regions such as adverse spatial distribution occasioned or intensified by nomadism, cultural conservancy and ignorance of benefits of education among these communities, researchers on nomadic pastoralist education (Ezeomah, 1990; Kratli, 2000) counter these arguments as being merely convenient. In their analyses, the authors have often argued that contrary to common claims, low school attendance rates in these areas are at

times attributable to low quality of education provision, lack of curriculum relevance and supply limits of the education systems.

The Kenya Education Sector Support Programme (KESSP) identifies early childhood development interventions as being significant in the social and economic development of a country as they provide children with a fairer and better start in life (Republic of Kenya, 2005). In what Cohn (1969) terms as the allocative and distributive functions of education, children from low-income households who access Early Childhood Development and Education (ECDE) services will be more likely to enrol in primary school at the right age and they will be less likely to drop out of school or repeat grades. Eventually, this increases their chances of entering and completing subsequent cycles of education and entry into the job market. There is also a high probability that these children will have improved school performance and cognitive abilities than those who do not attend ECDE.

In recent years, a great deal has been achieved in this sector through investments by the Government, development partners such as the World Bank, United Nations Children Education Fund (UNICEF), Christian Child Fund (CCF) and religious organizations. The contribution from communities and parental investments in the supply of ECDE has also been significant. However, despite these achievements, access to ECDE services remains low in Kenya with an estimated 65 percent, approximately 3 million, of the children aged 3-6 years not accessing ECDE services. In ASAL areas this situation is much worse with only 9 percent of children aged 3-6 accessing ECDE services (Republic of Kenya, 2005). In 2003, for example, the number of children enrolled in

ECDE was 1.60 million representing a net enrolment of 33.6 percent. This suggests that some 3.20 million children in the official ECDE age were out of schools then. The 2007 figures showed that some 1.69 million children in the official ECDE age group were enrolled, representing a net enrolment ratio of 39.7 percent (Republic of Kenya, 2008).

In their review on the reform agenda for education sector in Kenya, Elimu Yetu Coalition and the Commonwealth Fund (2003) explicitly state that early childhood education in Kenya has been a neglected area in Kenya for a long time. The review further points out that government attention on preschool education started only in 1980. Even then, this only came after a presidential Circular No.1 of 1980 (MOEST and UNICEF, 1999). In terms of funds, however, it remains one of the areas that are least funded by the government. The consequence is that preschool education has remained a responsibility of parents, community organizations, Non-Governmental Organizations (NGOs) and local government authorities (Elimu Yetu Coalition & The Commonwealth Fund, 2003).

1.2.1 The Goal of State ECDE Investment Programme and Implications for Equity

As highlighted in Republic of Kenya (2005), the overall goal of the ECED investment programme is to expand access to and enhance the quality of ECDE services for children aged 4-5 years, especially those living in ASAL areas, urban slums and pockets of poverty in Kenya. To achieve this goal, the following strategies were proposed for the ECDE investment programme: ECDE national policy guidelines and service standards; Community mobilization and capacity building; Community support grants; ECDE

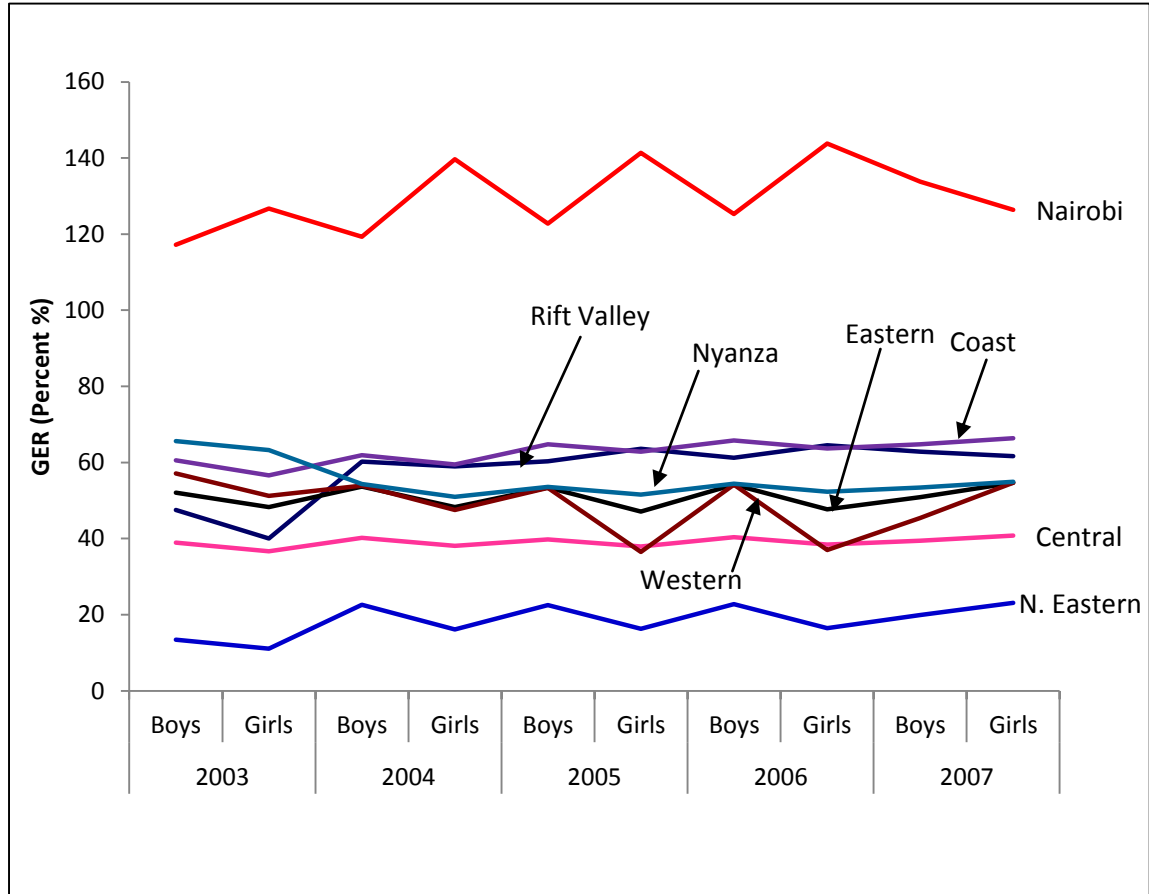
curriculum review; ECDE health and nutrition promotion and Primary school readiness. The cornerstone of the previous ECCDE policy was partnership between Government of Kenya and the groups and organizations who spearheaded the development of the programme. Since assuming responsibility for co-ordinating ECCDE, MoE had set up an organizational infrastructure aimed at facilitating curriculum development, teacher training, research, and general guidance and administration of the programme. This infrastructure consisted of: (a) the preschool section at MoE headquarters; (b) the preschool section of the school inspectorate; (c) the National Centre for Early Childhood Education (NACECE) at the Kenya Institute of Education (KIE); and (d) District Centres for Early Childhood Education (DICECE) at district and municipal level (MOEST & UNICEF, 1999).

The foregoing policy intentions indicate the quest to deliberately target ASAL and regions inhabited by the disadvantaged segments of Kenya's population, at least latently. This targeting suggests that ASAL regions are exposed to an array of unique and distinct factors which place households at a disproportionate disadvantage in their efforts at sending children for ECDE. Combined, the equity impetus created by the Head Start Program goals, the evidently skewed distribution of preschool opportunities between regions to the disadvantage of the semi-sedentary populations in ASAL areas like Samburu County and the strong counterarguments against the traditional explanations on the plight of nomadic communities in terms of access to formal education; make nomadic education a major issue in education policy discourse. From the foregoing, a compelling case emerges for an empirical study that seeks to isolate the determinants of early childhood schooling that uniquely characterize semi-sedentary populations.

1.2.2 The Status of Early Childhood Development and Education in Kenya

Similar to the case of other levels of education, national ECDE access data masks the underlying reality of differences between regions. Analysis of Gross Enrolment Rate (GER) by province for 1998 revealed serious gender disparities (MOEST, 2005). North Eastern Province (NEP) with a GER of 19.1 percent had the lowest GER, with boys being at 25.2 percent compared to 12.6 percent for girls. The province also exhibited a glaring gender gap of 12.6 percentage points. Although found in northern part of Rift Valley province, the greater Samburu region has climatic, socio-economic and demographic characteristics that are similar to those of NEP. The NEP preschool GERs therefore serve as very good proxies for those of the greater Samburu region.

In his analysis on inequality in Kenya's education sector, Wainaina (2005) pointed out that while no significant differences existed with respect to equity at the ECDE level, regional differences existed in relation to access. As Figure 1.1 shows, there were marked differences in enrolment between North Eastern Province and the other provinces. Except for Nairobi and North Eastern Provinces, the Gross Enrolment Ratio (GER) in the other provinces was approximately the same. Over the five year period spanning 2003 to 2007, North Eastern Province had the lowest GER among all the provinces, while Nairobi Province had the highest GER over the same period. Whereas the GER in Nairobi Province had varied between 121.5 percent in 2003 to 130.1 percent in 2007, the GER in North Eastern Province had fluctuated between 12.2 percent in 2003 and 21.5 percent in 2007 over the five year period under review.



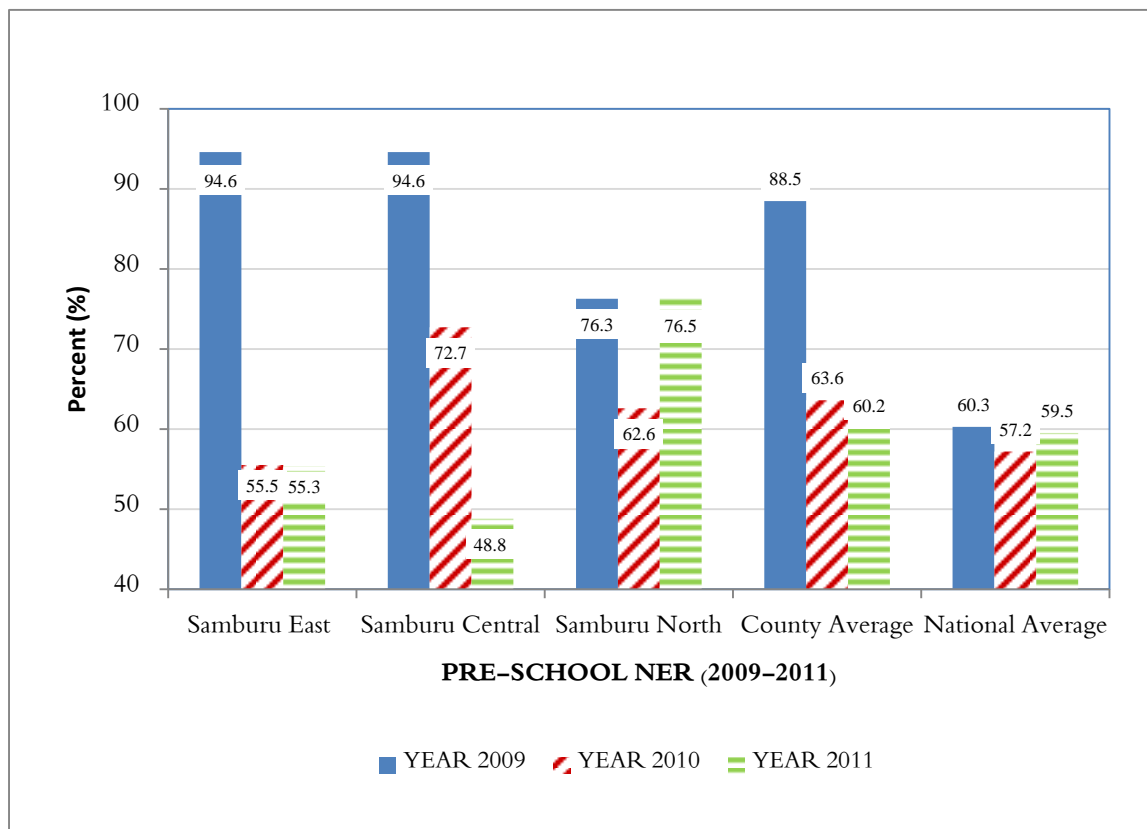
Source: Author Generated based on Data from EMIS Section, Ministry of Education, 2008

Figure 1.1. Provincial GER Enrolment Trends in Kenya 2003-2007

1.2.3 The Status of ECDE in Samburu County

As illustrated on Figure 1.2, the Pre-primary school participation of 3-5 year olds in the county in terms of NER had undergone a steep decline between 2009 and 2010. The most decline of -39.1 percent was registered in Samburu East district. The second highest decline of - 21.9 percent was registered in Samburu Central district. Although Samburu North District had registered a relatively lower decline of -13.7 percent, its NER for the base year was the lowest at 76.3 percent. As shown on Figure 1.2, data from

learning assessment reports in Uwezo (2010) and Uwezo (2012) show that the Northern district of the County had registered the more stable NER over the period under review.



Source: Author Generated Based on Data from Uwezo Learning Assessment Reports (2010, 2012)

Figure 1.2. Pre-Primary NER Trends in Samburu County and National Average

1.2.4 Child, Household, Community and School Characteristics and Schooling

In an analysis on the determinants of education attainment, Sanchez (2009) contends that it is generally accepted that education constitutes the main means by which a country invests in human capital and that the main gain of this investment is a higher living standard for a more literate population and more development for the country. Unsurprisingly, therefore, the author offers, many developing countries still experience low levels of education attainment. Further, Sanchez points out that for developing

countries; in particular, it then becomes relevant to investigate what the main determinants of enrolment behaviour are, with a view to assist policy makers in designing policies that may lead to increased educational attainment.

Under child characteristics, a study by Tansel (2000) points to gender as one dimension that should be allocated greater attention when analyzing the determinants of education. The author noted that the effect of income on the schooling of girls was more marked than that of boys. In addition, the parental education effect on schooling was seen to be larger for girls. The gender issue is also raised by Ahlburg Assaad and MCCall (2004) in the context of education in Egypt. The authors noted that the enrolment rate of rural girls aged 6-14 was only 72 percent of that of rural boys in 1988. Recent empirical evidence for Egypt emphasizes the gender issue, too. For example, Roushdy and Namora (2007) and Rammohan and Dancer (2008) show that boys are more likely to get more education than girls, and Hanushek, Lavy and Kohtaro (2008) note that girls' dropout rate is 0.06 higher than boys' in elementary schools. Another issue of concern on enrolment behaviour in developing countries is the delay in school enrolment which may be due to different reasons. As pointed out in a study in Peru by Jacoby (1994) Children's entry into school may be delayed due to liquidity constraints faced by the household. In the end, however, as found by Onsomu, Muthaka, Ngware and Manda (2006), as a child delays to join school their entry age increases thus increasing the odds for non-schooling.

In terms of Household socio-economic characteristics, Schultz (1999) identifies three key socioeconomic determinants of household demand for schooling: public expenditure on education, education of the parents, and wealth of the family. Schultz's observations are consistent with studies by Tan, Lee & Mingat (1998) and Bedi, Kimalu, Manda and Nafula (2004) showing that the parents' level of education and cost of education as being some of the factors with most profound impact on a household's schooling choices. An empirical analysis by Psacharopoulos (1997) suggests that labour force participation of individuals below the legal working age or who are supposed to be in school reduces educational attainment in Bolivia and Venezuela. On the contrary, Ravallion and Wodon (2000) question whether child labour displaces schooling for the case of Bangladesh. They found that a reduction in child labour only leads to a very small increase in school enrolment. Another contribution that tests and rejects the "luxury axiom" is provided by Ray (2000), in the context of Pakistan. Also, Bhalotra (2007) does not find a consistent relationship between child labour and household income. Despite these conflicting views and evidence, poverty by and large remains one of the possible explanations for low attendance in developing countries' schooling system.

Focusing on the demographic attributes of households, Sanchez (2009) points out that parental education is unquestionably a fundamental factor in explaining education investments, especially in developing countries. According to the author, an educated parent most likely understands more the importance of achieving basic education and would be more willing to send the offspring to school than a parent with none or little education. Further, Sanchez explains that educated parents are more prepared to evaluate

the investment in human capital that would increase the wage expectations for their children. On the contrary, however, a parent who started to work at an early age and did not study as a consequence may not see school as a crucial investment. Al-Samarrai and Peasgood (1998), on the other hand, found that household characteristics such as parental education may have a totally different impact on the education of females and males in Tanzania. In Egypt, for example, Wahba (2006) found that, on average, 10 percent of a sample of Egyptian parents who were child labourers would most likely send their children to work rather than to school. Additional evidence in this direction can be drawn from Tansel (2000) for Turkey and Al-Qudsi (2003) for the cases of Kuwait, Jordan, Gaza, and Yemen who, for instance, coincide that parental education and income are the most important determinants of education. Namora and Roushdy (2008) also provide evidence on the importance of parents' educational level for enrolment and drop out in Egypt's primary education. In the current study, it would be interesting to see results on how educational attainment, economic activity, incomes and expenditure on education by pre-dominantly semi-sedentary households impact schooling decisions.

On the supply side of education and community characteristics, Duflo (2001) noted that, as a result of the massive school construction programme, implemented by the national government in Indonesia during the 1970s, enrolment rate rose to 83 percent in 1978 up from 69 percent in 1973. Assuming similar dynamics as in the case of Indonesia, it can be expected that parts of Samburu County with higher ECDE centre density are likely to show higher enrolment rates among children of the ECDE age. Similarly, Glewwe and Ilias (1996) noted that the economic decline of the late 1970s and early 1980s in Ghana

led to a reduction in public spending in education and, as a consequence, enrolment rates were shown to be on the decline. What the Ghanaian education investment pattern suggests is that parts of the Samburu County with low public and private investments in the supply of ECDE places are more likely to register lower attendance rates. Presenting the case of Mozambique, Handa (2002) was able to demonstrate the importance of public expenditure in education by showing that building more schools in Mozambique had a larger impact on primary school enrolment rates compared with public interventions that raise household income. Similar results are also found in Handa and Simler (2005) for the same country. School building campaigns were also proved effective in fostering school enrolment in Egypt in the 1990s, as observed by Ahlburg Assaad and MCCall (2004). From the foregoing, it can be deduced that improved education supply investments that increase the number of learning centres would generally increase school density at a level that significantly reduces the home-to-school distances. This result would be particularly important for semi-sedentary households with children of ECDE age where schooling choices may be based on the distance that children may have to cover to access learning and development.

Notwithstanding the evidence presented here on the determinants of education and schooling, the available literature tends to focus on largely sedentary populations. With little information on the manifestations of these factors among populations similar to the Samburu and Turkana communities in Samburu County, this study sought to present the case for semi-sedentary populations using a framework similar to those used in past studies reviewed.

1.3 Statement of the Problem

Available evidence from basic education data for Kenya indicates glaring disparities in access to educational opportunities at all levels between and within regions. Much as the levels of access to education in ASAL areas is known to be generally poor, the situation is even worse at ECDE level that up to 2006 had historically lacked a guiding policy coupled with continued low state funding. Within Samburu County, the latest Uwezo learning assessment reports present a disturbing declining trend in the ECDE NER for 3-5 year olds. For example, whereas the average ECDE NER for the County's districts was 88.5 percent in 2010, the county average declined to 65.1 percent in 2011 and then to 58.9 percent in 2012. Notwithstanding the evidence from data in Uwezo (2010) and Uwezo (2012) that the Samburu County ECDE NER for 3-5 year olds is marginally higher than the national average, it is clear that nearly 4 in every 10 children in the 3-5 age bracket still remain out of early childhood schooling.

Although the factors of access to education are generally known, not much evidence is available from empirical studies that attempt to isolate explanatory factors which are unique to access to ECDE among pastoralist and semi-sedentary populations in ASAL areas. In addition, available literature on schooling factors (Onsomu, Muthaka, Ngware, & Manda 2006; Okumu, Nakajjo & Isoke, 2007; Ngware, Oketch & Ezech, 2008; Nyokabi, 2010) tends to concentrate on non-early childhood levels. Reviews on the provision of ECDE services in the greater Samburu region indicate that various donor agencies including the World Bank, Christian Children Fund (CCF) and the Catholic Church have since concentrated their interventions in this area; however, exclusion of children of ECDE age still persisted at 30-40 percent of children in the ECDE age group

(Ministry of Education, 2008; Uwezo, 2012). Further, in the absence of predictive studies based on sound econometric models, studies based entirely on qualitative data and anecdotal evidence always carry disproportionately high chances of exaggerating the impact of certain factors on access to educational opportunities in marginalized regions like Samburu. In the face of the declining ECDE enrolments, this study sought to establish the specific characteristics of children, the households where they live, the communities and the ECDE centres that can explain the odds for schooling at this level.

1.4 Purpose of the Study

The purpose of the study was to empirically identify the significant determinants of chances that a household will send a child of either gender for early childhood schooling using logit models.

1.5 Objectives of the Study

The study was premised on the following specific objectives:

- i. Establishing the significance of child characteristics as determinants of early childhood schooling;
- ii. Assessing the significance of household economic characteristics as determinants of early childhood schooling;
- iii. Establishing the significance of socio-demographic characteristics of a household as determinants of early childhood schooling; and
- iv. Assessing the significance of school and community characteristics as determinants of early childhood schooling.

1.6 Research Hypotheses

The study design and analytical model were based on the following hypotheses:

H_01 Child characteristics are not significant determinants of early childhood schooling;

H_02 Household economic characteristics are not significant determinants of early childhood schooling;

H_03 Household socio-demographic characteristics are not significant determinants of early childhood schooling; and

H_04 ECDE centre and community characteristics are not significantly determinants of early childhood schooling.

1.7 Significance of the Study

This study was premised on an ex post facto design that integrates an investigation of hypothesised explanatory factors and their impacts on access to early childhood schooling, as the dependent variable. The study is therefore deemed to hold academic, research evidence and policy significance in a number of contexts. Firstly, study results and data help to statistically establish the extent to which child characteristics, household economic characteristics, household socio-demographic characteristics and school and community characteristics impact children's access to early childhood schooling. Secondly, findings are useful in the identification of which factors are critical determinants of children's access to preschool education in ASAL areas. Thirdly, study findings also help provide compelling research evidence that inform policy formulation to enhance the provision of early childhood schooling opportunities in a way that strikes

a blow for general equity in access to educational opportunities among semi-sedentary populations in ASAL areas.

1.8 Delimitations of the Study

The study was delimited to collecting data within the Samburu County which is a predominantly ASAL region comprising two major pastoralist communities, the Samburu and Turkana. The study only focused on socio-demographic, economic and ECDE centre distribution data.

1.9 Limitations of the Study

Given the nature of the study, the geographical location and demographic characteristics of the population in the selected study locale, the work faced three limitations:

- i. The researcher faced difficulties in collecting sufficient and accurate data on some economic characteristics such as incomes and expenditure owing to low literacy levels among the targeted population. Two strategies were employed to tackle this challenge. Firstly, where possible, the study disintegrated the household income and expenditure data to weekly estimates for specific items which respondents would easily remember. Secondly, the researcher worked with trained research assistants with good knowledge of the local dialects for purposes of translation during household interviews.

- ii. Paucity of literature on similar empirical studies on early childhood schooling using logit estimations. For this reason, precursory conceptual and empirical reviews in this work benefit largely from literature on schooling factors for non-ECDE levels.

- iii. The spatial and temporal distribution of the targeted population posed a challenge to reaching all the sampled study sites and respondents. This challenge was tackled through the use of an off road type of vehicle to get research assistants to field each day and collect them at the end of work.

1.10 Assumptions

The study design was based on the following three fundamental assumptions:

- i. The unaccounted for early childhood education supply factors have insignificant effect on access differentials at the household level;
- ii. The impact of other unaccounted for demand side factors on access to early childhood schooling is infinitesimally small.
- iii. Provision and access to early childhood education in Sumburu County responds to the ideal market forces;

1.11 Theoretical Framework

The study was premised upon the theoretical concepts of market failure and demand and supply as they relate to access and equity in public and private provision of early childhood education. The Market failure theory holds that when markets operate without government intervention, they get so inefficient as to fail to deliver or allocate

available resources optimally (Ajit, 2009). As a result, the economic and social welfare may not be maximized resulting in a loss of allocative and productive efficiency. This constitutes the welfare losses for the society. In a situation of market failure, the outcome of market is not efficient from the standpoint of the economy, because the benefits conferred by the markets on individuals or institutions digress from benefits to the society as a whole. There are externalities not taken into account. The concept of education as a merit good is relevant here. Education is considered to be the merit good, which the government should subsidize (Ibid). Positive externality is applicable in the case of early childhood education because its benefits, as will be shown in the reviewed literature, spill over to the society as a whole (Weir & Knight, 2000). Moreover, there is compelling evidence that human capital increases economic productivity and the growth rate (Hall, 2000, 2006; Manda, Mwabu, & Kimenyi, 2002).

Within the context of early childhood education provision in the greater Samburu County, it can be argued that the low level of government intervention has been a major reason for failure in this important education sub-sector. The inequitable provision and access to early childhood education is a case of market failure in ASAL areas because while this sector has been treated as public good in other countries, in Kenya, it is placed in the realm of market good. The disparities in access to preschool education opportunities can only be greater in ASAL areas that already face systemic and natural marginalization (Kratli, 2000). Therefore, despite preschool having known positive externalities, it ends up yielding negative externalities such as setting the stage for further socio-economic stratification of society in the future because of the present market approach in most marginalised regions (Psacharopoulos & Woodhall, 1985).

Public sector approach to early childhood education and development can therefore be transformed after recognizing the long term economic benefits of access to preschool education by creating a system that is specifically targeted at correcting an existing market failure in ASALs (Shweinhart, Barnes, Waikart, & Epstein, 1993).

The relationship between demand and supply underlies the forces behind the allocation of resources. Under market economy theories, the demand and supply theory will allocate resources in the most efficient way possible (Investopedia, 2010). Applied to education, the law of demand states that, if all other factors remain equal (*ceteris Paribus*), the higher the present cost of early childhood schooling, the less people will demand it. In other terms, the higher the price, the lower the quantity demanded. Market demand for education is the sum of the individual demand for it from each consumer in the market. If a greater segment of the presently partly nomadic Samburu County population were to enter the education market, and that they have the ability to pay for preschool education (effective demand), then demand for preschool opportunities at the present price level will rise (Riley, 2006). Like the law of demand, the law of supply demonstrates the quantities of education that will be provided at a certain price. However, unlike the law of demand, the supply relationship shows an upward slope. This means that the higher the price the consumers of early childhood education are willing to pay, the higher the quantity that will be supplied. The for-profit education providers will thus supply more early childhood education opportunities to the population at a higher price because, to them, providing a higher quantity at a higher price increases their revenue. Ordinarily, in the absence of affirmation and state intervention in the provision of early childhood education in ASAL areas, the theory of

demand and supply is relevant to provision and access to education at this level. However, the combined effect of poverty, marginalization, information asymmetry and non-market interventions tends to distort the dynamics of a perfect demand-supply equilibrium.

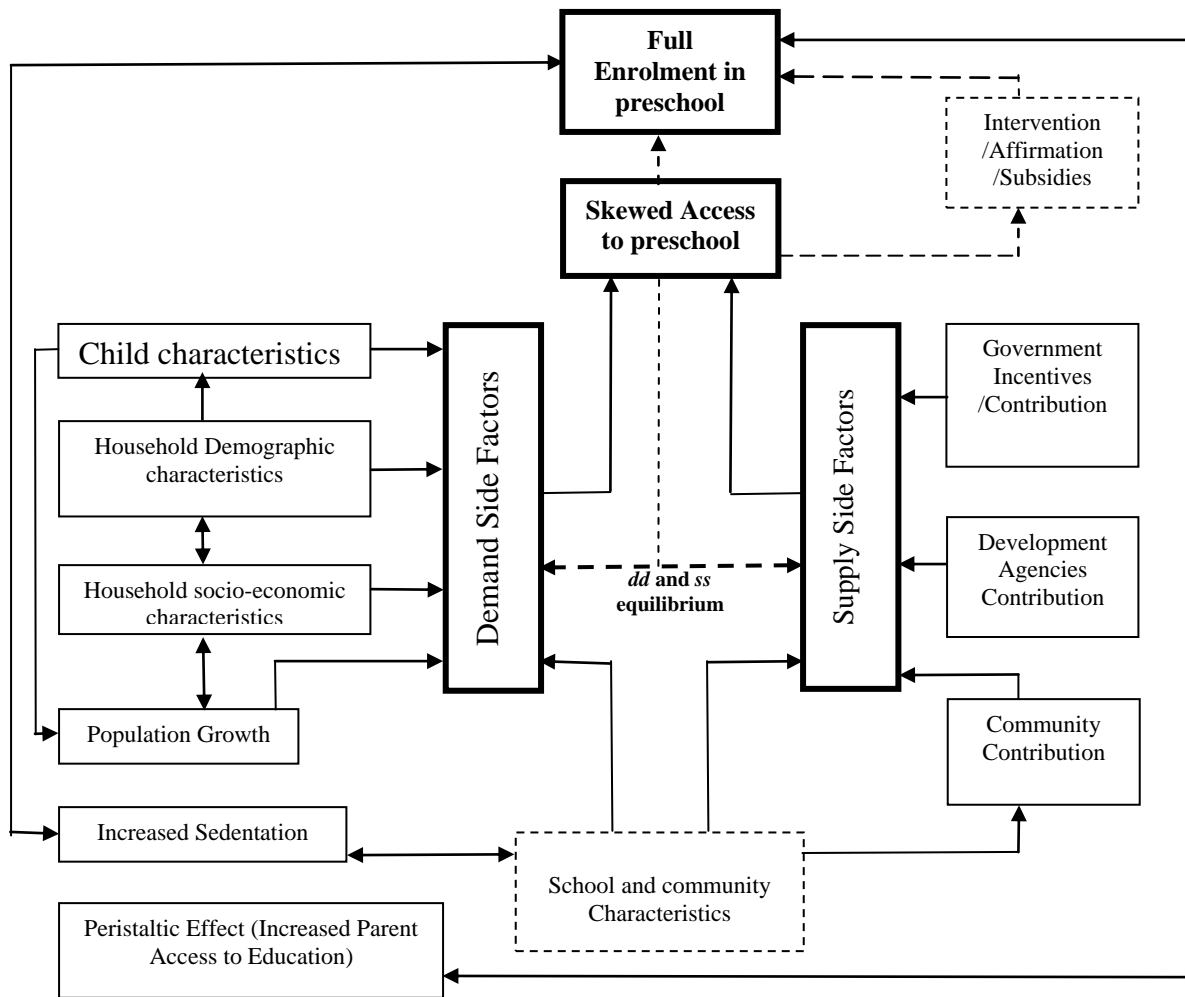
The early childhood education access situation in the greater Sumburu County therefore illustrates the simultaneous convergence in the theories of market failures, and demand and supply on the four premises. First, because of low or non-existent state intervention in the provision of preschool opportunities, there has been a failure by the other non-state providers to allocate the early childhood schooling opportunities optimally. Second, the market failure problem has distorted the normal demand supply equilibrium to a point where there is no supply of early childhood schooling opportunities even in areas where potential consumers have the will and ability to access it (effective demand). Third, because of the high poverty incidence and pricing problem, there could only be a will but no means to access education (latent demand) in areas where some form of paid for early childhood schooling is provided. Fourth, the absence of state intervention in the provision of early childhood education leads to the exclusion of children from poor households hence inequities and marginalization of this segment of the society.

1.12 Conceptual Framework

In the conceptualization detailed in Figure 1.3, access to education is viewed as the result of the interplay between demand and supply side factors. The conceptual framework assumes a free market scenario that is devoid of extraneous subsidies and affirmation.

On the demand factor side, it is expected that the combined impacts of child characteristics, household demographic and economic characteristics, peristaltic effect of parental education, sedentation and population growth are collocated in the overall aggregate demand for education. It is however noteworthy, that each of these demand side factors can impact demand for education exclusively, under *ceteris Paribas* conditions.

On the other hand, contributions from the government, communities, and development agencies towards the provision of preschool opportunities are collocated on the supply side. As opposed to the demand side, where a single factor can be shown to have a disproportionate impact on access, all the three factors have a joint contribution on the supply side.



Source: Author, (*dd* = demand, *ss* = supply)

Figure 1.3. Determinants of Early Childhood Schooling

As shown on Figure 1.3, school and community characteristics have bi-directional impacts on both the demand and supply sides. School characteristics like type of ownership and level of staffing would determine the level of community support to provide more facilities or employ more teachers. On the other hand, community characteristics like the aggregate wealth status, average years of schooling and type of economic activities will determine if the communities are willing and have the ability to

contribute towards supply. The quantity of early childhood education that a community affords to supply, in turn, determines the levels of access. In terms of demand, the level of price elasticity in demand for paid-for early childhood schooling opportunities among the populations depends, in part, on the aggregate economic structure of a community and the known opportunity costs related to their main economic activities.

From the conceptual framework, the order of education access differentials is hierarchical from the skewed levels of access to a state of full enrolment; the ideal equity in access. The typical skewed levels of in early childhood schooling is usually in a state of disequilibrium with children from households with certain characteristics dominating access compared to those households that lack these socio-demographic and economic traits. It is therefore argued that, on the demand side, increased sedentation and the peristaltic effect of parents' level of education help enhance equity in access to education.

As noted by Dyer and Choski (1998) and Ezeomah, (1987), education can be seen to go hand in hand with sedentarization, both as contributing factors and as a result of the process. This is illustrated by a bi-directional arrow in the conceptualization framework which implies that the more education non-sedentary populations receive, the higher the chances they will transition into sedentary lifestyles. On the other hand, increased sedentarization can also be seen to enhance equity in access to education by including erstwhile excluded nomadic groups. In this context, sedentarization can be seen as a factor of access on two fronts. First, it allows children whose families were initially nomadic to take up existing schooling opportunities. Second, it creates a demand

potential that attracts external providers or community members to mobilize themselves to provide, at least, some basic form of early childhood schooling opportunities.

1.13 Operational Definition of Key Terms

In this study, a variety of terminologies that characterize schooling and the study design have been used. This section outlines the contextual and conventional definitions of the key terms used:

Causal Comparative or ex post facto design: A quantitative study design in which a study is conducted after the variations in the independent variable has occurred naturally. The basic purpose of this form of study is to determine the relationship between variables.

Child Characteristics: This refers to the innate attributes of children in the preschool age. Examples include sex and age of the child.

Community Characteristics: Factors inherent in the immediate school environment that potentially impact the demand and supply of educational opportunities hence access.

Cost recovery: The process of levying different direct and indirect costs on families towards meeting the costs of education accessed by the child.

Demand and supply equilibrium: This is an ideal situation where the supply of educational opportunities perfectly matches the popular aggregate demand. It represents a situation of perfect equity in access to and the provision of education.

Demand side factors: The set of factors that act in combination to make households to actively seek schooling opportunities for children in the preschool age.

Household demographic characteristics: Non-pecuniary attributes of a household that are related to its population distribution and structure e.g. total number of people, type of household head, household head's marital status, total number of children of preschool age, age of parents etc.

Household socio-economic characteristics: Represents attributes of a household that can be measured in monetary terms e.g. income and property ownership.

Loipi: Community supported Early Childhood Care and Development centres that integrate traditional child care practices and formal education.

Nomads: Nomads are variously defined. Carr-Hiil and Peart (2005) define nomads as ethnic socio-economic groups who constantly travel and migrate in large or small groups in search of means of livelihood within a community, country or across international boundaries.

Non-Schooling: The state of being unable to attend a learning institution e.g. an ECDE centre in the case of this study.

Odds ratio: the quotient obtained from dividing the probability that a certain event will occur by the probability that the event will not occur.

Opportunity cost: This is the sum of benefits foregone by a household and pupil when the pupil attends school.

Pastoralism: Pastoralism, sometimes used interchangeably with the term nomadism reflects a lifestyle based upon maintenance of animals that depend mainly on natural vegetation for their food. This dependence, along with migration to water, a way from disease and in response to other pressures, determines the seasonal and daily movements of pastoralists (Awogbade, 1991). Nomadic pastoralists are therefore persons whose main source of livelihood is livestock keeping and have to move from one place to another depending on season and availability of water and pasture.

Preschool: This refers to the whole range school systems that offer Early Childhood Development Education. The various terms used to various refer to this collection of institutions include kindergarten, nursery school, ECDE centres, Montessori centres, etc.

School Characteristics: As used in the study, these refer to pre-existing attributes of a school which potentially have an impact on demand for schooling opportunities by households.

Schooling: The state of being able to attend a learning institution e.g. an ECDE centre in the case of this study.

Sedentarism: Refers to a settled lifestyle characterised by more permanent settlements and sources of livelihood where households do not have to migrate with changing seasons.

Sedentary populations: Refers to people living in villages, towns and cities, and tied to fixed locations by agriculture, employment, housing and social and cultural factors.

Semi-Sedentary Populations: Populations that have some form of partially settled permanent settlementshabitats but often characterised by changes in household composition due to a spatially and temporally nomadic movement of some or all members to sustain their livelihoods.

Supply side Factors: The set of factors that act in combination to make preschool opportunities available for those who actively seek them.

The Logit: Is the natural logarithm of the odds ratio i.e. the natural logarithm of the ratio of the of the probability that a certain event will occur to the probability that the event will not occur.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature on issues of access to education among both sedentary and nomadic pastoralist populations. The chapter has nine main sections. Section 2.2 delves into a brief conceptual review while 2.3 reviews preschool access trends at the global and country levels. Section 2.4 contains empirical reviews on the evidence on benefits of preschool. The subsequent sections, 2.5 to 2.8 present empirical reviews on the four critical study variables; child characteristics, household socio-demographic characteristics, household economic characteristics, and school and community characteristics, respectively. Section 2.9 presents empirical reviews on policy and other related factors impacting access to education among the nomadic pastoralist populations while 2.10 summarises the literature review and identifies knowledge gaps.

2.2 The Concept of Early Childhood Care and Education

The International Standard Classification of Education (ISCED) defines pre-primary education (ISCED level 0) as all programmes that, in addition to providing care, offer a structured and purposeful set of learning activities, either in a formal institution or in a non-formal setting (UNESCO, 1997). Pre-primary programmes are usually for children aged 3 and above, and are held for the equivalent of at least two hours a day for at least one hundred days a year (UNESCO, 2006a).

Early Childhood Care and Development Education also known as preschool education refers to the institutionalised nurture of children in the age group 0 to 6 years. Associated with modernization, ECCDE is the logical replacement of traditional family- and community-based processes of socializing the young (Elimu Yetu Coalition & Commonwealth fund, 2003; Riechi, Mbiti, & Kisilu, 2006; Republic of Kenya 1998, MOEST & UNICEF, 1999). With the onslaught of western culture, associated with increased social mobility and an expanding money economy, traditional socializing institutions have had to give way to new non-family child care institutions. Because many young parents are no longer able to live close to or count on the support of the extended family and the traditional neighbourhood, alternative forms of early childhood care have developed. Some parents have resorted to hiring child-minders, while others have turned to institutionalized collective care in the form of kindergartens, nurseries and day care centres also known as preschools (MOEST & UNICEF, 1999).

2.3 Access to Preschool Education

This section focuses on access trends to pre-primary education both at the global and country levels. The main indicators of access reviewed here are enrolments in absolute numbers and the gross enrolment rates (GERs).

2.3.1 Global Trends in Access to preschool Education

Towards the attainment of EFA Goals worldwide, approximately 170 million children were enrolled in pre-primary education in 2011, an increase of 52 percent over 1999 (Table 2.1). Over the same period, increases were particularly pronounced in sub-

Saharan Africa (138 percent), South and West Asia (123 percent), and the Arab states (76 percent). Increases remained modest across other regions at under 35 percent. On the other hand, the Gender Parity Index (GPI) had improved across all regions with the highest increase registered across Arab states (UNESCO, 2006; UNESCO 2014).

Table 2.1. Global Trends in Pre-primary enrolment in 1999 and 2011

	Total Enrolment			Gross Enrolment Ratio (GER)		Gender Parity Index of GER	
	1999 (000)	2011 (000)	Δ Since 1999 (%)	1999 (%)	2011 (%)	1999 (F/M)	2011 (F/M)
World	111 772	170 008	52	33	50	0.97	1.00
Lower income countries	...	10743	...	11	17	0.90	0.99
Lower middle income countries	...	65 195	...	22	46	0.93	1.01
Upper middle income countries	...	64 164	...	43	67	1.00	1.02
High income countries	...	29 906	...	72	82	0.99	1.01
Sub-Saharan Africa	5 129	12 222	138	10	18	0.95	1.00
Arab States	2 356	4 142	76	15	23	0.77	0.94
Central Asia	1 450	1 713	18	19	32	0.96	1.00
East Asia and the Pacific	36 568	47 603	30	39	62	1.00	1.01
South and West Asia	22 186	49 539	123	22	50	0.93	1.02
Latin America and the Caribbean	16 393	20 999	28	54	73	1.02	1.01
N. America and Western Europe	19 151	22 341	17	76	85	0.98	1.01
Central and Eastern Europe	8 538	11 448	34	51	72	0.96	0.98

Source: UNESCO, 2006; UNESCO 2014 ...Comparative data unavailable owing to change of classification

2.3.2 Country Level Preschool Education Access Trends: Kenya

2.3.2.1 Public versus Private Access

Data on Table 2.2 show that between 2003 and 2007, enrolment in public ECDE centres increased from 1,006,512 to 1,094,471, representing a 8.7 percent increase, while that of privately owned ECDE centres increased by 12.2 percent from 531,556 in 2003 to 596,622 in 2007. Despite the fact that each public primary school is expected to have an ECDE centre, between 2003 and 2007, the rate of growth of public ECDE centres (8.7 percent) was up to 3.5 percentage points lower than that of private (12.2 percent). This

could partly be explained by the observation that the rate of expansion of public ECDE centres that has largely benefited from community contributions is slower than that of individual and organizational private sector expansion where the motivation is mostly profits.

Table 2.2. National ECDE Enrolments for 3-5 year olds by Sponsorship Category, 2003-2007*

ECDE Category	2003	2004	2005	2006	2007
Public	1,006,512 (65.4)	1,033,627 (63.3)	1,066,941 (64.9)	1,082,332 (64.7)	1,094,471 (64.7)
Private	531,556 (34.6)	598,094 (37.6)	576,705 (35.1)	590,004 (35.3)	596,622 (35.3)
Total	1,538,068	1,631,721	1,323,455	1,455,626	1,538,068

Percent (%) in parentheses

Source: EMIS, MoE (2008)

*Data for 2008 or later were unavailable owing to operational challenges at the EMIS

2.3.2.2 Access Trends by Gender

Early childhood enrolment increased from 1.67 million in 2006 to 1.69 million in 2009 as shown in Table 2.3. Participation levels in pre-primary schools increased from a gross enrolment rate (GER) of 58.8 percent in 2006 to 59.3 percent in 2007. Similarly, Net Enrolment Ratio (NER) increased from 33.6 percent to 39.7 percent during the period under review (Table 2.3).

Table 2.3. Pupil Number in Early Childhood Development and Education Centres 2003-2007*

	2003	2004	2005	2006	2007
Enrolment					
Boys	816,577	823,417	830,828	866,445	876,163
Girls	785,655	804,304	812,347	805,891	814,930
Total	1,602,232	1,627,721	1,643,175	1,672,336	1,691,093

Source: Ministry of Education as presented in Republic of Kenya, 2008

*Data for 2008 or later were unavailable owing to operational challenges at the EMIS Section.

2.4 Benefits of Preschool Education: The Case for Preschool Education

Education research in Africa hardly presents any evidence on the benefits of preschool education on the continent. However, a great deal of experimental evidence can be drawn from studies conducted in the developed countries. Analytical works on the outcomes of three preschool programmes (i) The High/Scope Perry Preschool study, (ii) The Abecedarian project and (iii) the Chicago Child-Parent Centres (CPC) Programme have presented a great deal of evidence on their academic, economic and social benefits.

In terms of specific outcomes, high quality preschool programmes have immediate and long term benefits that include; higher test scores, better social skills, less grade repetition and special education incidence, higher graduation rates, increased earnings, less crime and less teen pregnancy, abortion and smoking (Shweinhart, Barnes, Waikart & Epstein, 1993; Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002; Reynolds, Temple, Robertson & Mann, 2002; Schweinhart, Montie, Xiang, Barnett, Belfield, & Nores, 2005). Barnnet (2006) assembles research evidence to provide a compelling case for the provision of preschool education to all by pointing out three

major concerns. (i) investing in early childhood education can yield returns and is pro-growth; (ii) the problem of school failure is not just exclusive to children in poverty; (iii) universal programs are more cost-effective than targeted programmes.

Research evidence provided by the High/Scope Perry Preschool study, the Abecedarian project and the Chicago Child-Parent Centres (CPC) Programmes does not readily show how universal preschool programmes can enhance inter-class equity in future social and economic outcomes by ‘taming’ the class advantage that children from high income groups already possess. However, it is nonetheless evident that preschool education programmes have a most profound positive impact on children from the low income groups. It can therefore be argued that a universal preschool programme enhances equity primarily because they bring significant benefits to the low income groups but may have little or insignificant benefits to children from high income groups who are already fortified by an economic advantage, anyway.

Based on the empirical results from these studies, a case is made for the provision of universal preschool education or at least a targeted form of it focusing on children in poverty and other vulnerable groups. This is because, in part, evidence from preschool studies has shown these groups benefit the most from such programmes.

2.5 Child Characteristics and Access to Education

In their study on policy gaps and strategies of enhancing access to ECDE, Riechi, Mbiti and Kisilu (2006) note that much as the provision of basic services to children aged zero to three years is a segment of ECDE, none existed in most parts of Kenya. This absence

of coordinated national programme for children aged zero to three years is in fact an indication that, in most parts of the country and particularly the more disadvantaged areas, a child's age becomes a factor that determines their chances of accessing ECDE.

Onsomu, Muthaka, Ngware and Manda (2006) advance the argument that in countries where patrilineal marriages are prevalent, a child's gender is a factor in access to education; often parents prefer to invest in boy's education. Brock and Cammish (1997) note that because of patriarchal predominance, investment in girl's schooling is viewed as wasteful since it benefits the family into which the girl is married. However, for the more privileged households, investment in the education of girls is viewed as an advantage in 'marrying well' (Brock & Cammish, 1997). All these factors therefore tend to intensify an already bad gender gap.

Onsomu et al. (2006) hold the view that individual characteristics such as gender and age group have profound effects on household schooling choices. In theory, the authors contend, ability and educational attainment of a child affect school participation in various ways. Arunatilake (2004) shows that being male in poorer households has a statistically significant negative effect on schooling in Sri Lanka due to the opportunity costs of schooling, particularly among low-income families who need them for their labour.

Roth (1991) observes that there are several reasons why girls drop out of school more than boys. In part, this may be due to the fact that, as girls move to a different household with marriage, paying for their education is not considered a good investment. Indeed, to

the extent to which education is associated with status, a woman is supposed to be less educated than her husband and therefore a girl's education will actually reduce the choice of potential husbands especially in the pastoral context (Fratkin, Roth & Nathan, 1999).

2.6 Household Socio-Demographic Characteristics and Access to Education

Earlier Studies conducted in Mali, Malawi and Kenya (Bedi, Kimalu, Manda & Nafula, 2004; Birdsall, 1987; Tan, Lee & Mingat, 1998), respectively, show that parents' education level, direct and indirect cost of schooling, the proportion of girls among the children in a household are some of the most important determinants of household demand for schooling. In another study by Singh (1992) in Brazil, household size was found to be an additional factor affecting household decisions on schooling. Manda, Mwabu and Kimenyi (2002) show that the level of education of household head, especially male household head, increases the odds for a household's decision on enrolling a child in paid for education. Ngware, Oketch and Ezeh (2008) showed that among urban slum households, while the gender of a child does not influence schooling decisions, a household head's level of education did.

A more recent empirical study by Nyokabi (2010) on primary schooling has shown that non-schooling schooling option at this level is determined by household characteristics which include number of siblings, schooling of the household head and area of residence. Based on the study findings, however, Nyokabi contends that school-side characteristics have no effect on the odds of enrolling in private schools. Of note, is the finding from Nyokabi's study which suggests that urban households are less likely to

enrol their children in primary education but when these households opt for schooling they are more likely to send their children to private schools.

2.7 Household Economic Characteristics and Access to Education

In an empirical analysis, Maglad (1994) used a multiple regression model to establish the determinants of school demand in Sudan. The dependent variable was net enrolment rate and the explanatory variables were age, sex of child, parents' educational level, land holding per adult (land ownership), and residence of school and household (rural and urban). The study established that land holding had negative effect on schooling, implying that a child had to stay out of school during harvest or planting or tilling period.

Manda et al. (2002), advance the argument that individuals choose education and training, as an investment of the future, to build capital in the form of enhanced skills and competencies that they believe will bring them future rewards in the form of higher earnings after completion of education and training. The authors further contend that, indeed, this is one of the main underlying factors parents consider when deciding whether or not to commit their money to education.

In an apparent reference to market failures, Phillips and Bhavnagri (2002) explain that, generally, it is only children from middle and upper class families who benefit from preschool experiences that meet at least the minimum quality standards. Children from the disadvantaged, marginalised and most likely poor communities such as semi arid and urban slums have little access to early childhood care and education, enrolment levels

are markedly low in rural areas compared to urban ones. The writers give an example of the migratory Maasai community in Kenya which they single out as probably having the least access to early childhood education and care. It is noteworthy that the selected study population; the Samburu and Turkana have socio-economic traits that are nearly identical to those of the Maasai.

2.7.1 Cost Recovery in Education and Household Opportunity Costs as Impediments to Access

In order to send children to school, a household must renounce their labour, with all the economic consequences that this involves. Moreover, school tax and boarding contribution in the case of shared cost-systems (for example, in Kenya or, until 1999, in Mongolia) together with the cost of books and uniforms, often place unbearable burden on poor families in cash-scarce areas.

In a Participatory Living Standards Assessment (PLSA) in Mongolia, the cost of education emerged as one of the key shocks/stresses for a sample of 180 households across a range of different “well being” categories. It also emerged as a main trigger of impoverishment, either directly or as a factor preventing households from improving their asset position, at least in the short run (World Bank & NSOM, 2000).

2.8 School and Community Characteristics and Access to Education

2.8.1 The Impact of Spatial Distribution of Schools

Findings by Gertler and Glewwe (1998) in Peru indicate that children from households located away from schools have higher probability of not being enrolled in school. Consequently, level of parental education, presence of other children in a given level of education, sex, school quality and cost of schooling were major determinants of schooling. In contrast to Gertler and Glewwe's findings, Nyokabi's (2010) empirical analysis on determinants of primary schooling showed that school-side characteristics such as distance have no impact on the odds of private primary schooling.

In an empirical analysis using a multiple regression model, Maglad (1994) established the determinants of school demand in Sudan. The study established that the longer the distance between residence and school, the higher the cost of schooling, in terms of time spent in travelling to and from school, thus negatively impacting on schooling. Land was also found to have negative effects on schooling, implying that a child had to stay out of school during harvest or planting or tilling period. Gebreselasie's (1998) study that estimated a logit model to assess the role of households, community and regional factors in determining household demand for schooling in Ethiopia corroborates some of Maglad's findings. The author established that distance to school had negative effect on both primary and secondary school demand.

2.8.2 Wide Spread Pastoralist Conservatism: Fallacy or Exaggeration

In a study on challenges and opportunities to nomadic education among the eastern Sudanese and Western Eritreans, Ismail (2002) points out that most of the statistics available suggest that the nomadic pastoralists form the majority of the poorest and most vulnerable of the African population. The author further observes that past studies significantly conclude that millions of the nomadic pastoral children have been denied access to education. In Ismail's view, the reasons given by stakeholders are controversial between the mostly non-pastoralist mainstream designer policy makers and pastoralists who like their life style to remain unchanged. It is especially the latter premise of pastoralists wanting to 'remain unchanged' that Kratli (2000) counters with the argument that the belief that pastoralists are a resilient people is a long unsubstantiated belief which has been widely analysed and disapproved over the last three decades. For the evidence, the writer cites a number of authors (Baxter & Hogg, 1990; Ginat & Khazanov, 1998; Hogg, 1982; Rigby, 1985). On their own, Kratli's views reduce the pastoralist conservatism arguments to mere fallacy or farfetched exaggerations that cannot explain their low levels of access to education.

2.8.3 Mobility and School Attendance in ASAL areas

Kratli (2000) points out that mobility, sparse population, harsh environmental conditions and remoteness are clearly technical obstacles to the provision of formal education through systems which are designed for sedentary people in well connected and densely populated areas. However, with rare exceptions, the problem is represented as created by nomads with their obsolete way of life rather than by the incapacity of a national system to respond to the living conditions of significant numbers of citizens. Representations of

nomadism as a stage towards sedentarism are used to dismiss the problems of nomads as only temporary ones due to a way of life which is not going to last. Governments, therefore, respond to mobility, sparse population and remoteness by introducing various alternatives to standard education structure. The most common to date have been boarding schools, but few examples of successful mobile schools and distance education using radio broadcast programmes exist.

2.8.4 Pupil Sedentation as a Strategy to Improve Access to Education among Pastoralists

In a study on education provision to nomadic pastoralists, Kratli (2000) observes that much as pupil sedentation by way of offering boarding facilities can be an effective mechanism of getting more pastoralist children to schools, living standards in boarding schools in pastoral areas are often very low. The author notes that, often, school teachers are rarely from a pastoral background. In some countries, schools in pastoral districts may have a majority of non-pastoral children since they may be subsidised or easier to get into than other areas. As a result, the prevailing school culture may be anti-pastoralist despite the surroundings (Bensalah, 1987; Habeck, 1997; Narman, 1990; Rybinski, 1980; UNDP-Emergency Unit for Ethiopia, 1996). In the end, if the role of subsidies is not backed by greater targeting, schools intended for children from nomadic pastoralist backgrounds may very well remain the preserve of children from other non-pastoralist segments of the population. In emphasising the role of boarding schools as a cost effective option in inclusive education, Bass (1998) noted that boarding schools have been considered as a solution to the high rate of exclusion from educational opportunities among the very sparse populations in regions like Tibet.

2.8.5 The Contradiction of Self-Sufficient School Models as Remedy to Remoteness

School self-sufficiency has a long history in remote pastoral areas. Usually self-sufficiency was pursued by farming fields around the school using children's labour. As learning to become settled farmers was considered an important part of pastoralists' development, the use of child labour was not seen as contradictory to the educational mission of the school (Sifuna, 1987). Kratli (2000) gives the example of new tent boarding school at YakCho, in the Qinghai province, China, where attempts at making the school self-sufficient was based on keeping of domesticated *Yaks*; for each pupil. Similarly, the school camel programme in Samburu, Kenya, established herds of ten camels, three of which were provided by the families, in selected schools. For each school, the programme trained the school committee, a few girls and boys and one teacher in camel husbandry. The camels were used as practical learning aids (MOEST, 1999). It can be pointed out that rather than help attain the goal of sufficiency in schools, in a way that ensures pastoralist children attend and remain in schools, some of the labour intensive school sufficiency programmes can only intensify an anti-school behaviour in the children.

2.8.6 Nomadism and Mobile Schools

Tent-schools, schools-on-wheels and various kinds of collapsible schools have been experimented with at least over the past fifty years, for example in Mauritania (Oul Mahand, 1956), Algeria (Blanguernon, 1954; Rybinski, 1981), Iran (Hendershot, 1956; Varlet & Massumian, 1975) and Nigeria (Udoh, 1982). Tents are also used as semi-stable structures that are moved seasonally or that simply can be moved at low cost if necessary (CiC, 2000). With the exception of Iran, Mobile schools have performed far

below expectations. In Nigeria, for example, Tahir (1997) observed that after almost twenty years since the first attempts were made, the mobile school system remained sparingly used due to the enormity of the problems associated with the model.

2.8.7 ASAL Poverty, School Feeding and Access to Education

In their study on bio-behavioural response of nomads to uncertain environment among the Turkana in Northern Kenya, Campbell, Leslie, Little, Brainard and De Luca (1999) conclude that in areas of low food-security or in periods of exceptional food scarcity, day schools may guarantee the children a daily meal and also prevent performance from falling due to malnutrition. Schools that provide meals are usually successful in increasing school attendance, but management and corruption are very frequent hindrance to the good performance of these programmes (MOEST, 1999). Extensive research in Turkana district in Kenya shows that food supplements at school do not compensate for the deficit in nutritional status of children from settled households compared to those who remain nomadic (Campbell et al., 1999). The foregoing evidence suggests that household poverty may, in some instances, contribute to a purely circumstantial access to education by children from food insecure households.

2.8.8 Security

Swift, Toulmin and Chatting (1990), contended that pastoralists live in remote areas that are often close to insecure international borders and conflict prone regions and children have to walk long distances to get to school. For girls, especially, this may present serious risks of sexual attack. In Rural Juba, for example, schools in remote centres make good targets for mass-abduction of children, particularly girls by raiding parties,

and bandits. Findings from a baseline study on rural development in Juba County in South Sudan by Oliech (2009) indicate that rampant conflicts between the nomadic pastoralist and farming tribes in rural Juba had led the close down of entire schools. Situations of rampant insecurity thus greatly hamper access to education among pastoralist and even neighbouring populations.

2.8.9 School Staff Motivation

Schools in pastoral areas have a very high rate of staff turnover and the highest rate of requests for moving to other locations. Teachers are not impressed by the combination of erratically paid low salaries, isolation, lack of teaching resources and harsh life conditions. Their motivation is very low and absenteeism is high and to a certain extent structural. For example, teachers may have to travel long distances with no public transport in order to buy food or collect their wages. It is commonly recognised that, ideally, teachers should be from the same pastoral background of the pupils. However, usually the demand for teachers in such regions exceeds the supply. Moreover, a pastoral background is not always a guarantee that teachers will settle in the job rather than trying to move to town (MOEST, 1999).

In addition to the foregoing problems, corruption in government employment, and therefore in teaching appointments, is common. In such cases, nobody expects teachers to take their job seriously and the level of absenteeism may be extremely high. Communities, on the other hand, do not have the power to raise and sustain the issues (SCF, 2000). Kratli (2000) also observes that among nomadic groups, more often, the school is seen as a government enterprise that has nothing to do with local communities

and therefore what the government does with it may simply not appear to be an issue for the locals.

2.9 Policy Environment and Other Factors

2.9.1 Law Enforcement, Legislation and Schooling

Swift, Toulmin and Chatting (1990) suggest that strict law enforcement by itself does not guarantee success in getting children from nomadic pastoralist backgrounds to school. He presents the example of Niger in the 1980s, where the government used a hard hand on Wodaabe pastoralists to force them to obey the law on compulsory education. Army patrols were used to bring children of school age to school by force. The writer however notes that, often, children tried to escape, to the point that incidents involving fugitive children were not uncommon.

On the contrary, in his case study on access to education among nomadic populations in Mongolia, Kratli (2000) indicates that observations by respondents interviewed in the rural areas, both teachers and nomads, mentioned that a strict and effective policy of enforcement of law on compulsory education was the primary reason for the high rate of school attendance during socialism. In this study, respondents observed that cars were sent to the country side to collect drop-out or non-enrolled children, whilst steep fines and even expulsion from the collective, with the consent withdrawal of livestock on lease, were threatened against families who failed to obey the law. Kratli's study however reveals that in the post liberalization period there was a sharp decline in school enrolment and attendance where even parents who themselves had gone to school

preferred to keep children at home both for emotional and economic reasons. The evidence from the Mongolian case suggests that, when strictly applied, law enforcement may in fact improve school enrolment and attendance.

2.9.2 The Impact of Free Primary Education on Access

In their assessment, Riechi et al. (2006), indicate that the introduction of FPE has had a negative effect on pre-primary education. Arguing that the government should provide free pre-primary education, poor parents refuse to pay preschool fees and instead choose to withdraw children from ECDE centres and keep them at home until they can attain the primary school entry age. Preschool education still has a cost tag because, in most cases, ECDE teachers' salaries in Kenya are drawn from user fees charged on parents per pupil. Often, decreased enrolments in the affected ECDE centres mean reduced salaries for teachers (UNESCO, 2006). As a consequence of the reduced teacher incomes, a new problem of low and intermittent pay arises which, if not corrected by some external intervention, could easily lead to the collapse of an ECDE centre. This threat is especially real in the remote rural areas where the existence of ECDE centres is often almost exclusively dependent on the presence of the teacher.

2.10 Summary of Literature Review and Knowledge Gaps

In this chapter, attempts have been made to present relevant conceptual and empirical reviews on access to educational opportunities. Conceptual reviews presented under section 2.2 briefly outline the main concepts that sustain the scholarly construct of this study. On the other hand, the empirical reviews presented in sections 2.3 to 2.9 delve into critical reviews, discussions and analysis of what existing literature says on factors

of access to education in general and access to early childhood education in particular, among sedentary, semi-sedentary and nomadic pastoralist populations.

This work does not lay even the most subtle of claims on having exhausted just about all literature on issues of access to education. The review of available, or at least the reachable, literature of concern to the study shows that most studies on access to education are skewed in favour of other levels of basic education; primary and secondary levels, much to the exclusion of early childhood education. Even in the few instances of studies focusing on access to early childhood education, at least in part; they remain heavily descriptive. Being the most visible study on access to ECDE in Kenya, yet, Riechi et al. (2006) however focused only on policy gaps in access to education at this level. In addition, as opposed to this study, Riech et al.'s study was largely descriptive and not specific to the situation of non-sedentary populations. Besides being non-empirical, other related studies on pastoralist education such as Kratli (2000) and Ismail (2002) focus on non-sedentary populations outside Kenya whose life circumstances may not replicate those of pastoralist communities in Kenya.

In Kenya, only three known studies by Onsomu et al (2006), Ngware, Oketch and Ezech (2008) and Nyokabi (2010) have attempted to empirically establish the determinants of schooling. However, in addition to being generic to whole country populations, two of these studies are also based on dated data. For example, whereas the study by Onsomu et al. (2006) used data from the national welfare Monitoring Survey (III) conducted in 1997, Nyokabi's study relies on data from the Kenya Integrated Household Budget Survey (KIHBS) conducted in 2005/2006. The two studies focused on schooling factors

for non-early childhood levels at secondary and primary levels, respectively. In contrast to the present study, which focuses on early childhood schooling among semi-sedentary populations, the two studies by Onsomu et al and Nyokabi tended to focus on general populations whose schooling decision factors may differ significantly from those of semi-sedentary populations. As opposed to this study, which considered schooling decisions among non-sedentary populations; the work by Ngware et al. (2008) used data from sedentary households in Nairobi's urban slums. A related study by Njeru and Orodho (2003) only concentrates on access to secondary education and is based largely on descriptive analysis in addition to failing to show how various factors impact secondary schooling. In contrast to this work, which used logit models based on the maximum likelihood estimation technique, past studies by Maglad (1994) used the multiple regression option while Ngware et al. (2008) used a probit model.

From the reviews, there is still hardly any compelling empirical analysis on how the various sets of demand and supply factors impact early childhood schooling, especially in high difficulty regions that ASAL areas are. In contrast to the generic studies that have focused on whole national populations and other non ECDE levels, this study provides empirical evidence on determinants of early childhood schooling that are specific to semi-sedentary populations.

CHAPTER THREE

DESIGN AND METHODOLOGY

3.1 Introduction

This chapter presents the research design and methodology used in the work. Specifically, the chapter details the study design, the locale, the targeted population, sample and sampling procedures, instruments, data collection techniques, method of data analysis, the analytical model used, description and measurement of the variables and the logistical and ethical considerations made in the study.

3.2 Study Design

The study used a causal comparative design also known as *an ex post facto* design which literally means ‘from after the fact’ (Burns, 2005; Sinks, 2007; McGraw-Hill, 2008). It means something done or occurring after an event with a retroactive effect on the event (Kerlinger, 1964). In other terms, *ex post facto* research is based on an assumption known as “*post hoc, ergo propter hoc,*” which means after this, therefore caused by this or that one thing causes another simply because it occurs before the other.

The term ‘*ex post facto study*’ is used to identify that the research in question has been conducted after the variations in the independent variable have occurred naturally. Farzin (1998) observes that *ex post facto* studies are applied in situations where cause-and-effect relationships are sought, but experiments are not possible and where one or more independent variables are used to study their effects on one dependent variable.

However, the significant difference from experimental and quasi-experimental design is that causality cannot be established with absolute certainty due to lack of manipulation of independent variables (Levin & McEwan, 2001).

In terms of variables, *ex post facto* research means that an investigation starts by observing a dependent variable because the independent variable has already occurred in the past followed by studying the independent variables retrospectively for their possible effects on the dependent variable. As noted by Burns (2005), Sinks (2007) and McGraw-Hill (2008), the *ex post facto* design was deemed most appropriate for this work because the researcher had no control at all over which household received and did not receive a given treatment. Furthermore, neither randomization of the treatments nor quasi-experimental matching was possible. In addition, the design was relevant to the study because the naturally occurring or self-selecting independent variables of interest to the study such as child characteristics, household demographic and socio-economic characteristics do not lend themselves to experimentation. In the design used, the researcher began the collection and analysis of data after the ‘treatment’ had been applied or occurred naturally.

3.3 Study Locale

The study was conducted in five locations of Samburu County namely Nyuat, Leroki, Barasaloi, Baragoi, and Archer’s Posts. The County is located in the Northern part of of the former Rift Valley province. The County was been selected for the study because unlike the majority of sedentary populations on which most past studies had been conducted, its population is characterised by semi-sedentary spatial and temporal

movements that are expected to impact early childhood schooling decisions, at the household level, differently. In terms of land use, the region is classified as Arid and Semi Arid Lands (ASAL). The residents of the selected divisions have mixed settlement pattern comprising sedentary and semi-sedentary pastoralist households with the latter being the majority. Whereas the more sedentary populations are concentrated around the urban centres, purely nomadic populations are concentrated in the periphery of urban centres and rural parts.

3.4 Target Population

The target population in the study were an estimated 2960 households in five divisions namely Nyuat, Leroki, Archer's post, Barsaloi, and Baragoi spread across three districts, Samburu Central, Samburu East and Baragoi, of Samburu County. Household heads were interviewed to give information on the early childhood schooling status of children aged 3-8 years in the households and the characteristics of their households that were of interest to the study.

3.5 Sampling Technique and Sample Size

3.5.1 Sampling Techniques

This study employed a combination of purposive and systematic random sampling methods. Whereas the selection of the study divisions was done purposively to include areas with sedentary and semi-sedentary populations, the selection of households employed a systematic random sampling procedure. The systematic selection of households was done after every k^{th} household where k was the coefficient obtained by

dividing the total household population in a given area (N) by the sample expected from that area (n); ($k=N/n$). Where k was not a discrete number, the quotient was rounded down to the nearest whole number. While the sampling unit for the study was households, the unit of analysis included individual children within the household in the 3-8 year age group

3.5.2 Sample Size

The study targeted 600 households, which constituted 20 percent of the estimated household population of 2960 in the selected locations. The 20 percent sample size of 600 households was deemed optimal based on the sample size estimation formula by Krejcie and Morgan (1970). From the sample size Table based on the authors' formula, at 95% confidence interval, a sample of 579 should be drawn from a population of 2,500 for the margin of error to fall within 3.5%. For a population of 3,500, a sample of 641 is required to get results within 95% confidence interval (CI) and 3.5% degree of freedom (df) / margin of error. A sample of 600 was therefore deemed sufficient for a population of 2960 that falls between these two values on the Krejcie and Morgan sample size Tables. Table 3.1 presents the estimated household population and the expected sample from each selected location.

Table 3.1. Sampling Frame

Location	No. of ECD Centres	Zones	Estimated No. of HH	Sub-sample (20 percent)	Rounded to the nearest 5
Nyuat	14	7	560	112	115
Leroki	8	8	640	128	130
Acher's Post	10	8	640	128	130
Barseloi	9	8	640	128	130
Baragoi	6	6	480	96	95
Total	47	37	2960	592	600

Source: Christian Children's Fund Samburu field office records (2009)

Study Data on Table 3.2 show overall good return rates of 518 households constituting 86.3 percent of the target sample of 600 households. Whereas the total number of children aged 0-8 in all participating households was 1442, children in the age bracket of interest, 3-8 year, totalled 1037 with 52.7 percent being male while 47.3 percent were female.

Table 3.2. Distribution of Sampling and Units of Analysis

Location	Sampling Unit (Households)			Unit of Analysis		
	HH Targeted	Complete Questionnaires	% Return	# Children (0-8)	# Children (3-8)	
					Male	Female
Nyuat	115 (19.2)	107 (20.7)	93.0	319 (22.1)	120 (52.4)	109 (47.6)
Leroki	130 (21.7)	113 (21.8)	86.9	317 (22.0)	114 (52.1)	105 (47.9)
El-Barta	130 (21.7)	89 (17.2)	68.5	287 (19.9)	107 (49.5)	109 (50.5)
Barasaloi	130 (21.7)	108 (20.8)	83.1	296 (20.5)	124 (58.2)	89 (41.8)
Archer's Post	95 (15.8)	101 (19.5)	106.3	223 (15.5)	81 (50.6)	79 (49.4)
Total	600 (100)	518 (100.0)	86.3	1442 (100.0)	546 (52.7)	491 (47.3)

3.6 Research Instruments

This study used a household survey questionnaire. The format of the questionnaire was adapted from the instrument used in Welfare Monitoring Surveys (Republic of Kenya, 2000) and modified by the researcher. The modification reduced the number of variables on household economic characteristics while concentrating only on economic and schooling characteristics relevant to the study. This instrument had five major sections; household socio-demographic characteristics, child characteristics, household economic characteristic and school and community characteristics. The last section sought recommendations from respondents on how to improve ECDE provision in the region.

3.6.1 Validity

As suggested by Joppe (2000) and Throckmorton (2009), in this study, the content validity of research instrument, which refers to the domain of content that is measured, was determined through a meta-analytic comparison with studies using similar designs (Glewwe & Ilias, 1996; Nyokabi, 2010; Onsomu et al., 2006) and observations from reviews by experts and peers. The study instrument was deemed valid based on favourable expert and peer review in terms of its content validity and the results of a meta analytic comparison with instruments used in similar studies which showed significant content convergence.

3.6.2 Reliability

Reliability which is concerned with the consistency of measurement using a given instrument can be determined using two approaches (i) the test re-test method and (ii) the split half method. However, Joppe (2000) points at a problem with the test-retest

method which can make the instrument, to a certain degree, unreliable. The author explains that the test-retest method may sensitize the respondent to the subject matter and hence influence the responses given. The author explains that it therefore becomes difficult to be certain that there was no change in extraneous influences such as an attitude change that had occurred. This could lead to a difference in the responses provided. Similarly, she notes that when a respondent answers a set of test items, the score obtained represents only a limited sample of behaviour. As a result, the scores may change due to some characteristic of the respondent, which may lead to errors of measurement. These kinds of errors tend to reduce the accuracy and consistency of the instrument and the test scores. The reliability of the study instrument was thus established by piloting it.

3.7 Piloting

One village within Nyuat was selected as the piloting centre for the study instrument. Results of the pilot were then used in the determination of the reliability of the questionnaire and a basis for carrying out revisions on its content.

Given the challenges associated with the test re-test procedure, reliability of the household survey instrument was determined using the split-half technique. Split-half coefficient of internal consistency was used and the Spearman Brown Prophecy Formula applied to calculate the correlation coefficient to determine the reliability of the instrument. A correlation coefficient of 0.8571 was obtained which is higher than the minimum conventional threshold of 0.7 for instrument validity in Gay (1987). The instrument was thus deemed reliable.

3.8 Data Collection Procedure

Study data were collected through a household survey targeting heads of selected households or, in their absence, the principal adult caregiver. Research assistants who were holders of a minimum of O-Level qualifications were interviewed out of whom ten were trained and engaged in conducting the household interviews and making entries in the questionnaires.

3.9 Method of Data Analysis and Presentation

Quantitative study data were entered into an IBM SPSS Statistics Version 21 dataset template to organize the mass of quantitative data collected on the instrument for efficiency in analysis. On the other hand, qualitative data were analysed using the content analysis technique.

Several statistical analyses were performed. First, study data were analysed descriptively to generate relevant descriptive statistics showing trends and relations between selected sets of explanatory variables and the dependent variable. Secondly, cross tabulation analysis was performed to establish possible associations between the explanatory and dependent variables. Thirdly, regression analysis was conducted to estimate multivariate logit models to assess how explanatory variables used in the study impact early childhood schooling.

The multivariate Logit Model of analysis was selected for the testing of research hypotheses because the dependent variable, access to preschool education, was dichotomous i.e. it takes numerical values of 0 or 1. In addition, as confirmed by

(Mukras, 1993) the logit model is often used instead of the probit model, which is to a large extent functionally similar to it, partly because the interpretation of coefficients in logit can be much easier in terms of odds ratios.

3.9.1 The Analytical Model

Past studies on access to education in Eastern African countries, for example Onsomu et al. (2006) in Kenya, Maglad, (1994) in Sudan, Gebreselassie (1998) in Ethiopia, have estimated logit models using the maximum likelihood procedure in multivariate regression analysis. Whereas Maglad's (1994) study used a multiple regression model to establish the determinants of school demand in Sudan, Gereselassie (1998) estimated a logit multivariate analysis regression model to assess the role of household, community and regional factors in determining household demand for schooling in Ethiopia. Onsomu et al. (2006) on the other hand estimated a logit model in a multivariate regression model to establish the determinants of access to secondary education in Kenya. Because of the closeness in the types of explanatory and dependent variables used by Onsomu et al. (2006), Gebreselassie (1998) and Gertler and Glewwe (1990), this study used an analytical model similar to the ones used in these three studies.

The Logit Model can be defined by the following two equations (Mukras, 1993):

$$P_i = F(Z_i) = \frac{1}{1 + e^{-z}} \quad (1)$$

OR

$$P_i = F(\alpha_0 + \alpha_1 X_i) = 1 / \text{Exp.} - [\alpha_0 + \alpha_1 X_i] \quad (2)$$

In this model, P_i represents the probability that an individual household 'i' makes a certain schooling choice for the child when X_i is known. In the case of this study, for example, P_i would represent the probability that a household will send a child for early childhood schooling, given an income of X_i . In the model where Z_i ranges from $-\infty$ to $+\infty$, P_i ranges from 0 to 1. In addition, P_i is non-linearly related to Z_i . The non-linearity of P_i w.r.t Z_i and α_1 creates an estimation problem since the Ordinary Least Squares (OLS) cannot be used on the model. However, as Mukras (1993) points out, the model can be shown to be intrinsically linear.

Using the simplified form of equation 1,

$$P_i = \frac{1}{1 - e^{-z}} \quad (3)$$

Where P_i is the probability that a household will send a child for early childhood schooling and $Z_i = \alpha_0 + \alpha_1 X_i$;

The probability of a household not sending a child for early childhood schooling is given by:

$$(1 - P_i) = \frac{1}{1 - e^z} \quad (4)$$

Dividing Equation 3 by Equation 4 gives:

$$\frac{P_i}{1-P_i} = \frac{1+e^z}{1-e^{-z}} = \frac{1+e^z}{(e^z+1)e^{-z}} = e^z \quad (5)$$

The term $P_i/(1-P_i)$ is the odds ratio in favour of a child accessing ECDE. In other words, it is the ratio of the probability that a household will send a child to school to the probability that it will not send a child to school.

Taking natural logarithms of Equation 5, gives:

$$L_i = \ln \left(\frac{P_i}{1-P_i} \right) = \ln e^z, \text{ (} z = \alpha_0 + \alpha_1 X_i \text{), the RHS becomes } \alpha_0 + \alpha_1 X_i \ln e \text{ (} \ln e = 1 \text{)}$$

Therefore;

$$L_i = \ln \left(\frac{P_i}{1-P_i} \right) = Z_1 = \alpha_0 + \alpha_1 X_i \quad (6)$$

Equation (6) is the logit Model. L_i , the logit, is the natural logarithm of the odds ratio, and is linear in X_i . The logit is the dependent variable and is the logarithm of the odds that a household will make a pro-early childhood schooling choice over non-schooling.

3.9.2 Model Specification

Early childhood schooling may be defined in terms of a dichotomous variable ECS_{ij} , where $ECS_{ij} = 1$, if a child i from household j is enrolled for ECDE and $ECS_{ij} = 0$ if a child of ECDE age is not enrolled. Households are expected to favour a child's schooling if it yields maximum utility (U_1) over non-schooling (U_0). In other terms:

$$ECS_{ij} = 1, \text{ if } U_1 > U_0 \quad (7)$$

From the conditional function in Equation 7, a household would make a pro-schooling choice ($ECS_{ij} = 1$) if in the quantified judgment of the decision maker, $U_1 - U_0 + \varepsilon_{ij} > 0$; holding that the stochastic / error term ε_{ij} is normally distributed. As defined in Onsomu et al. (2006) and Okumu, Nakajjo and Isoke (2007), the general linear form of the related probability equation is given as;

$$\Pr[(ECS_{ij} = 1)] = \Pr[U_1 - U_0 + \varepsilon_{ij} > 0] \quad (8)$$

As proposed by Okumu et al. (2007) and Gebresellasie (1998), in modelling for the present study, a generalised nonlinear probability or logistic regression model can be specified as:

$$\text{Logit}[(Y = ESC_{ij})] = \beta_0 + \beta_1 CC_{ij} + \beta_2 EH_j + \beta_3 SH_j + \beta_4 EC_{ij} + \varepsilon_{ij} \quad (9)$$

Where the terms in Equation 9 are defined as follows:

ECS_{ij} = early childhood schooling status of child i in household j

CC_{ij} = the set of characteristics of child i in household j

EH_j = the set of economic characteristics of household j

SH_j = the set of socio-demographic characteristics of household j

EC_{ij} = the set of characteristics of community i where household j is located

ε_{ij} = the stochastic / error term; assumed to be normally distributed.

3.9.3 Definition and Measurement of Variables

(a) Criterion Variables

The criterion or dependent variable is based on the fact that a household sending at least one child for early childhood schooling has demand for schooling at this level. Thus, three dependent variables ECDEACCS, MALEACCS and FEMLACCS which are dummies take the values of 1 or 0 as defined below:

i. Aggregated Access

Modelling for aggregated access was concerned with whether there was a pro-schooling decision in a household for at least one child of ECDE age, irrespective of their sex.

$$\text{ECDEACCS} = \begin{cases} 1, & \text{if a child of ECDE age in a household attends ECDE} \\ 0, & \text{Otherwise} \end{cases}$$

Modelling for sex disaggregated access considered the status of pro-schooling decisions among households for the male child of ECDE age and girl child of ECDE age separately. The dependent variables MALEACCS and FEMLACCS for male and female schooling, respectively, were defined as follows:

$$\text{MALEACCS} = \begin{cases} 1, & \text{if a male child of ECDE age attends ECDE} \\ 0, & \text{Otherwise} \end{cases}$$

$$\text{FEMLACCS} = \begin{cases} 1, & \text{if a female child of ECDE age attends ECDE} \\ 0, & \text{Otherwise} \end{cases}$$

(b) Explanatory Variables

Tables 3.3 to 3.6 presents explanatory variable clusters and the descriptions of each variable included in the models.

i. Child Characteristics

In this study, child characteristics were captured through the two explanatory variables defined on Table 3.3.

Table 3.3 Definition and Measurement of Explanatory Variables on Child Characteristics

Variable Cluster	Description
Child Characteristics	Sex: This variable takes a binary definition. When testing for impact of being male and early childhood schooling the explanatory variable was MALECHLD = 1, when the child is male and 0, otherwise; and FEMLCHLD =1, if child is female and 0, otherwise. Age: This was the age in complete years of a child of ECDE age found in the Household.

ii. Household Economic Characteristics

Data on household economic characteristics were captured through the three explanatory variables as defined on Table 3.4

Table 3.4. Definition and Measurement of Explanatory Variables on Household Economic Characteristics

Variable Cluster	Description
Household Economic Characteristics	<p data-bbox="613 457 1414 632">Total expenditure on education: Total expenditure on education was constructed from termly household expenditures on school fees, books for the three school terms then added to the cost of uniform.</p> <p data-bbox="613 684 1414 810">Household ownership of Livestock: This is a dummy variable defined as LIVSKOWN = 1 if the household owns livestock and 0, otherwise.</p> <p data-bbox="613 884 1414 961">Number of livestock owned: This is a categorical variable showing levels of cattle ownership.</p>

iii. Household Socio-Demographic Characteristics

Household socio-demographic characteristics were measured using eight explanatory variables as defined in Table 3.5

Table 3.5. Definition and Measurement of Explanatory Variables on Household Socio-Demographic Characteristics

Variable Cluster	Description
Household Socio-Demographic Characteristics	<p>Household size: Total number of all members of the household.</p> <p>Number of children: The total number of children in the ECDE age bracket: especially number of household members aged between 0 and 8 years. The children in a household of preschool age cohort are expected to compete for the same resources either in schooling or equivalent educational programmes.</p> <p>Number of children by gender: Household composition by total number of girls and total number of boys aged 0-8 Years.</p> <p>Household Head Level of education: A categorical variable defined as HEDLHHH showing the highest level of education attained by the head of the household.</p> <p>Age of Household Head: A continuous variable defined as AGEHHHD showing the age of household heads in six categories.</p> <p>Monogamy status of mother: A dummy variable defined as MONGSTAT = 1 if mother is presently married in a monogamy and 0, otherwise.</p> <p>Household Sedentation Status: A dummy variable Defined as SEDNSTAT = 1 if household is sedentary and 0, if household is nomadic.</p> <p>Household Location: A dummy variable defined as LOCTNHHH = 1 if household is located in urban area and 0, otherwise.</p>

iv. ECDE Centre and Community Factors

School and community factors were captured through distance covered to the nearest school and the apparent school density as defined in Table 3.6.

Table 3.6. Definition and Measurement of Explanatory Variables on School and Community Factors

School and Community Factors	<p>Distance: Is a continuous variable DSHMECDE taking values of the estimated distance between households and the nearest ECDE centres.</p> <p>School Density: observed school density and is a dummy variable ECDEDENS taking the values of 1, if school density is high and 0 for households areas with low ECDE centre density.</p>
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3.9.4 Potential Threats to the Assumptions of the Regression Model

Mukras (1993) and Maddala (2005) identify three major problems that violate assumptions of a regression model. The problem violating assumption on common variance is known as heteroskedascity and defined by $\text{Var}(U_i) \neq \sigma^2 \forall i$. On the other hand, the condition that violates assumption on independence of U_i and U_j for all $i \neq j$ is known as autocorrelation and defined as $E(U_i, U_j) \neq 0, i \neq j$. The third condition that violates the assumption on independence of x_j is known as multicollinearity.

(a) Description of the Model Violations

Autocorrelation: This is a condition which occurs when the stochastic/error term does not meet the condition of sequential independence in its successive values. Mukras (1993) and Maddala (2005), however note that this is condition where the error term occurring at a time t_0 carries over into successive periods t_1, t_{1+1} and so is restricted to time series studies. Autocorrelation was therefore not be a threat to model estimations in the present study.

Multicollinearity: Maddala (2005) defines this as the condition where the explanatory variables are highly intercorrelated. According to Mukras (1993), unlike the situation in experimental sciences, in applied economics, observations on variables are not generated under controlled conditions. For this reason, he concludes, a researcher will always find some general intercorrelation among explanatory variables. It is this phenomenon that he refers to as multicollinearity. He however points out that so long as the correlations among exploratory variables is not so high, there would be no significant difficulty associated with multicollinearity.

Heteroskedasticity: Mukras (1993) affirms that the assumption of homoskedasticity of the stochastic or disturbance / error term requires that the variance of this error term U_i or ε_i to be constant and a violation of this assumption gives rise to the problem of heteroskedasticity. Maddala (2005) describes heteroskedasticity as the absence of a constant variance in the error terms U_i in a regression equation.

(b) Tests for Violations of Model Assumptions

In this study, heteroskedasticity was tested using the method suggested by Glejser (1969) where the regressions were estimated and then testing the hypothesis $\beta = 0$. To detect levels of multicollinearity among the explanatory variables, each explanatory variable was regressed on all the remaining variables using the correlation function IBM SPSS Statistics Version 21, the resulting R^2 was used to determine the corresponding “goodness of fit” in each case. By comparing the various R^2 obtained, the highest value of R^2 represented very low degrees of multicollinearity existing in the sample.

3.9.5 Hypothesis Testing and Decision Rule

Decision on the level of significance of the relationship between the explanatory and the dependent variables in the models was arrived at based on the magnitude and sign on the B co-efficient and their related p -values. The relationship between the explanatory and criterion variables was deemed significant at $0.01 \leq p \leq 0.1$, i.e. relationships were deemed significant at $\alpha = 0.1$, $\alpha = 0.05$, or $\alpha = 0.01$.

3.10 Logistical and Ethical Considerations

3.10.1 Logistical Procedures

Official permission to conduct the study was sought from the Graduate School at Kenyatta University before applying for the research authorization permit from the National Council of Science and Technology (NCST). Upon authorization by NCST,

thirty (30) draft study instruments were used in a pilot. Ten (10) research assistants from the local area were recruited and trained on piloting procedures and actual field data collection. Implementation of the main household survey followed the revision of the research instrument. Data sheets were reviewed at the end of each day for entry cleaning. At the end of the data collection exercise, all valid questionnaires were serialised followed by the development of an IBM SPSS Statistics dataset template and entry of the data. The data were cleaned at the completion of entries.

3.10.2 Ethical Considerations

To build confidence in the respondents, an introductory and informed consent section was included on the face of the household questionnaire and read out to respondents in the local dialects before the commencement of any interview. This section assured the respondents that the study was purely for academic purposes and confidentiality on the information received would be guaranteed at all times. In addition, research assistants with a good understanding of the communities' cultural setting and languages were engaged to improve the efficiency of the study at collecting accurate data. Household interviews in this study targeted adult mothers. In absence of the mother, adult principal caregivers aged 18 years or older were chosen as respondents.

CHAPTER FOUR

FINDINGS AND DISCUSSIONS

4.1 Introduction

In this chapter, the study presents the main results and discussions from the bivariate and multivariate analysis on the determinants of early childhood schooling. The presentation of the chapter is guided by the four study objectives: (1) establishing the significance of child characteristics as determinants of early childhood schooling; (2) assessing the significance of household economic characteristics as determinants of early childhood schooling; (3) establishing the significance of household socio-demographic characteristics as determinants of early childhood schooling and; (4) assessing the significance of ECDE centre and community characteristics as determinants of early childhood schooling.

Specifically, the presentation under multivariate analysis gives logit model results for testing the following four study hypotheses: (H_01) child characteristics are not significant determinants of early childhood schooling; (H_02) household economic characteristics are not significant determinants of early childhood schooling; (H_03) household socio-demographic characteristics are not significant determinants of early childhood schooling and; (H_04) ECDE centre and community characteristics are not significant determinants of early childhood schooling.

4.2 Findings

This section presents logit regression results for the three models used to test study hypotheses. Decisions on the level of significance of the relationship between the explanatory and the dependent variables in the models is based on the magnitude and sign on the B co-efficient and their related p -values. The relationship between the explanatory and criterion variables is deemed significant at $p \leq 0.1$. In terms of alpha values, the relationships are deemed significant at $\alpha = 0.1$, $\alpha = 0.05$, or $\alpha = 0.01$.

For each objective and related hypothesis, Tables 4.1 – 4-4 summarize results from which the decisions on the rejection of the study hypotheses or otherwise are drawn. The first model (M1) presents results of logit estimations of the determinants of aggregated access to early childhood schooling among semi-sedentary populations, irrespective of the sex of the child. The second model (M2) presents estimates for determinants of early childhood schooling for the males aged 3-8 years. The third model (M3) presents estimates for determinants of early childhood schooling for females aged 3-8 years. Having employed a logit model to estimate the main significant determinants of early childhood schooling among the target population, irrespective of sex, in the second and third models, the study sought to establish if any differences existed in the impact of these determents when the sample is disaggregated by sex. As explained under the target population for the study, models were built for early childhood schooling status among Samburu County children in the 3-8 year age group against the expectation that this segment would be the most representative of the ECDE age group across the County's population. Specifically, the decision to include children above age 6 in the ECDE

segment was premised on the fact that this County experiences unique schooling demand and supply constraints in a way that could promote late entry. Thus, excluding 7-8 year olds potentially excludes a large segment of the ECDE age group in the County's context.

4.2.1 Significance of Child Characteristics as Determinants of Early Childhood Schooling

This subsection presents results on the first study objective on establishing whether child characteristics are significant determinants of early childhood schooling. It also presents results for testing the first null hypothesis, H_01 , on the significance of child characteristics as determinants of early childhood schooling.

H_01 : Child Characteristics are Not Significant Determinants of Early Childhood Schooling

Logit model results on Table 4.1 on aggregated access indicate that no significant relationship existed between the sex of a child aged 3-8 years and the odds for attending ECDE ($B = -0.061$, $p = .833$). Similarly, although the B coefficient shows a negative relationship between age and the odds of access to ECDE in Samburu County, this relationship was not significant ($B = -0.050$, $p = .550$).

Although negative, the impact of a child's age remained insignificant for male and female children, ($B = -.101$, $p = .407$) and ($B = -.034$, $p = .782$), respectively. This is backed by descriptive data on proportions of girls who accessed ECDE by age which show only marginal differences. From the results, the study fails to reject H_01 .

Table 4.1. Partial Logit Regression Results on Child Characteristics as Determinants of Early Childhood Schooling

Child Characteristics	Aggregated Access (M1)		Male Access (M2)		Female Access (M3)	
	B	Sig.	B	Sig.	B	Sig.
Sex of Child (Male=1)	-.061	.833				
Age of Child	-.050	.550	-.101	.407	-.034	.782
Constant in full model	5.540	.000***	3.303	.031**	10.409	.000***

* $p < .1$ ** $p < .05$ *** $p < .01$

As illustrated on Figure 4.1, the proportion of males aged 3-8 who had attended ECDE, 87 percent, was only marginally lower than that of females in the same age bracket, 89 percent, who had attended ECDE. These marginal variations help explain logit results showing a negative but insignificant relationship between the sex of a child and the odds that they will attend ECDE.

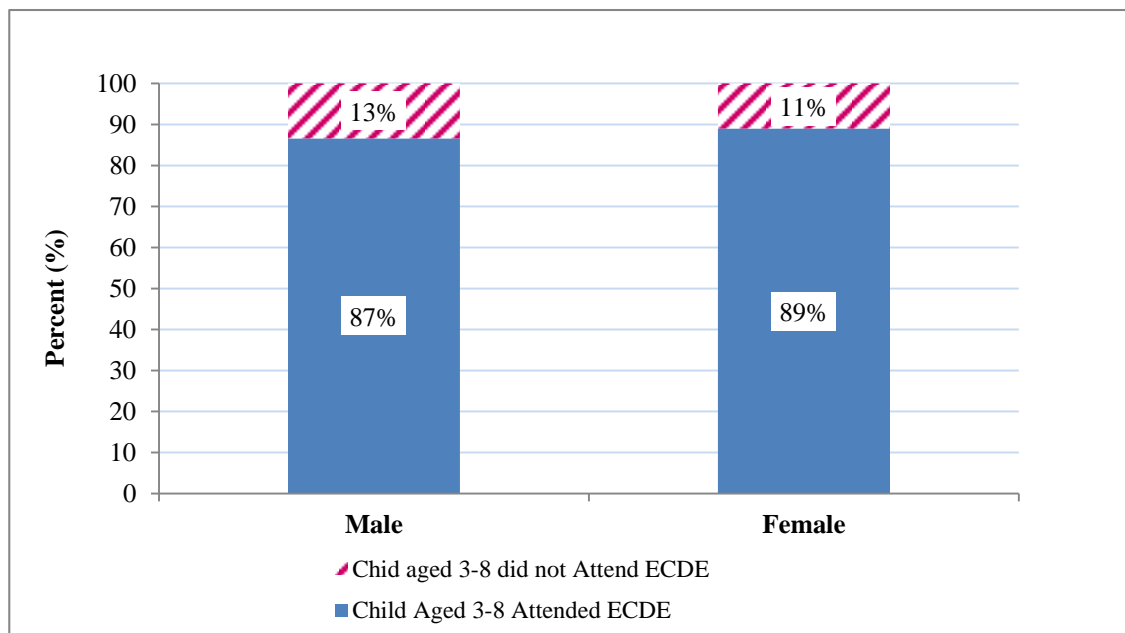


Figure 4.1. ECDE Attendance by Sex

Trends on Figure 4.2 show attendance rates for both girls and boys generally are lower in the earlier ages between 3 and 4 years. While the attendance rate peaks at 92.2 percent at age 5 for girls, the peak attendance rate for boys is 94.0 percent at age 6. For both sexes, the attendance rates then generally decline as the age of the child approaches 8 years. This peaking effect followed by a decline partly explains the logit results showing a negative but non-significant relationship between age and early childhood schooling.

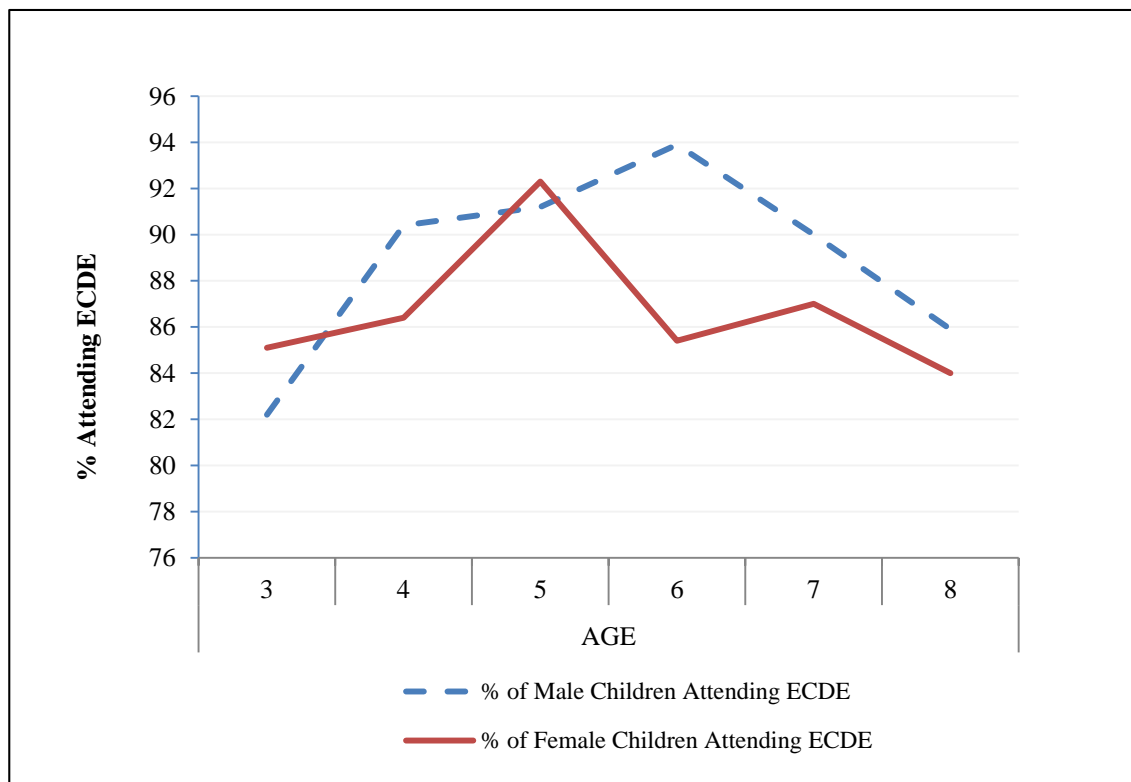


Figure 4.2. ECDE Attendance Trends by Age

4.2.2 Significance of Household Economic Characteristics as Determinants of Early Childhood Schooling

This subsection presents results on the second study objective on assessing the significance of household economic characteristics as determinants of early childhood schooling. It also presents results for testing the second null hypothesis, H_{02} , on the significance of household economic characteristics as determinants of early childhood schooling.

Ho2: Household Economic Characteristics are Not Significant Determinants of Early Childhood Schooling

Results on Table 4.2 indicate that the two household economic characteristics included in model 1 were significantly related to the chances that a child would attend ECDE. The total amount spent by a household on education was also found to be positively and significantly related to chances of early childhood schooling, ($B = .424$, $p = .001$). Conversely, ownership of livestock at the household level significantly diminished the odds that a child in the 3-8 year bracket, irrespective of their sex, would attend early childhood schooling ($B = -1.058$, $p = .059$).

The positive impact of levels of household education expenditure was significant for girl and boy access but at different confidence levels. With $B = .868$ and $p = .001$, for the boy child and $B = .236$ and $p = .064$, for the girl child, the increased levels of household expenditure on education increases the chances that a boy in the 3-8 year age group would access early childhood education more intensely compared to the girl child.

Although livestock ownership diminished the chances of early childhood schooling across the sexes, boys ($B = -.976$, $p = .169$) and girls ($B = -.236$, $p = .064$), the impact was only significant on the girl child. Based on the results, the study rejects H_02 .

Table 4.2. Partial Logit Regression Results on Household Economic Characteristics as Determinants of Early Childhood Schooling

	Aggregated Access (M1)		Male Access (M2)		Female Access (M3)	
	B	Sig.	B	Sig.	B	Sig.
HH Economic Characteristics						
Annual Education Expenditure	.424	.001***	.868	.001***	.236	.064*
Livestock Ownership	-1.058	.059*	-.976	.169	-2.261	.054*
Constant in full model	5.540	.000***	3.303	.031**	10.409	.000***

* $p < .1$ ** $p < .05$ *** $p < .01$

Trends on Figure 4.3 demonstrate generally high levels of ECDE attendance across the sexes and expenditure groups. Although gradual, the access levels for girls and boys generally increases with increase in the total amount of household expenditure on education. Access by boys was marginally higher for the first three semi-quintiles. This suggests that household poverty potentially disadvantages girl access more, especially in instances of paid for schooling or where indirect costs associated with schooling at this level take a significant proportion of household incomes.

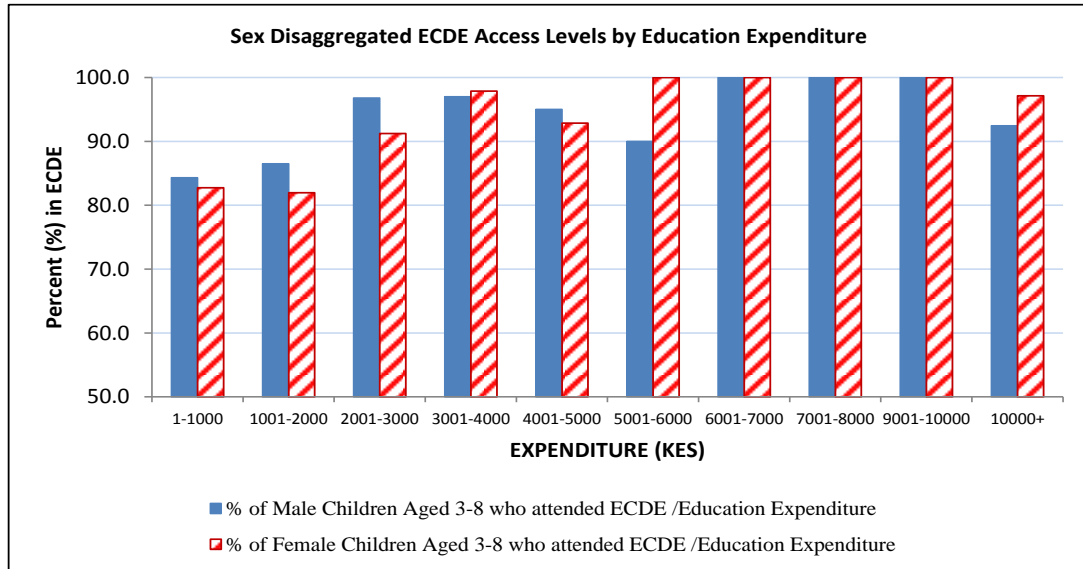


Figure 4.3. Education Expenditure and Levels of Access

ECDE non-attendance rates on Figure 4.4 show that children from livestock holding households, 13 percent, have nearly twice as high chances of non-schooling as those from non-livestock holding households at 7 percent. These variations point to the significant negative relationship between livestock holding and schooling seen in the logit results.

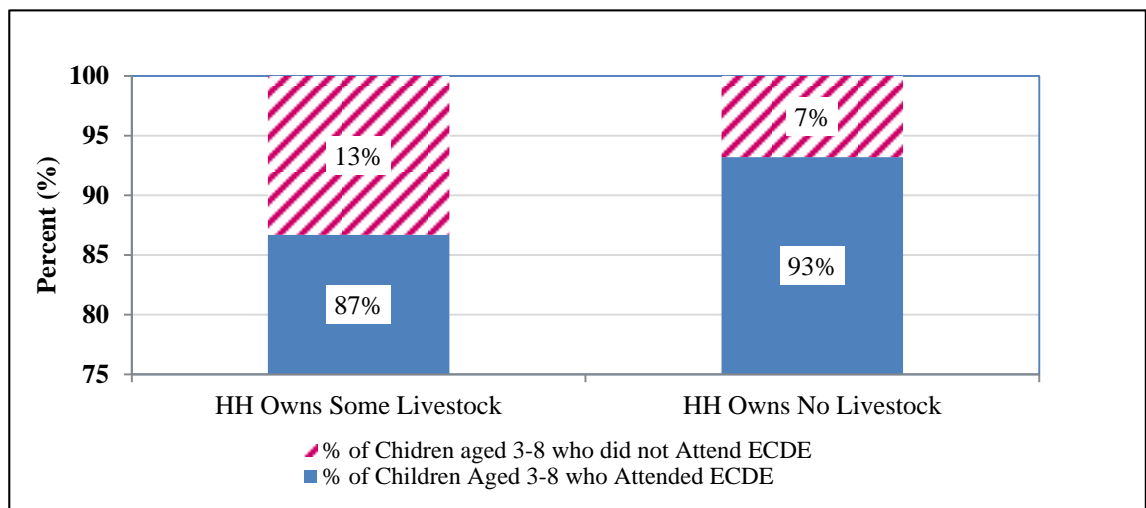


Figure 4.4. ECDE Attendance by Household Status of Livestock Ownership

4.2.3 Significance of Household Socio-Demographic Characteristics as Determinants of Early Childhood Schooling

This subsection presents results on the third study objective on establishing whether the socio-demographic characteristics of a household have any effects on early childhood schooling. It also presents results for testing the third null hypothesis, H_03 , on the significance of household socio-demographic characteristics as determinants of early childhood schooling.

H_03 : Household Socio-Demographic Characteristics are Not Significant Determinants of Early Childhood Schooling

Out of the six socio-demographic characteristics included in the model, two were significantly related to the odds of early childhood schooling. A child's chances of early childhood schooling were found to be negatively related to the age of the head of the household ($B = -.277, p = .049$). The total number of children in the 0-8 age bracket was also negatively and significantly related to a child's odds of attending ECDE ($B = -.386, p = .004$). However, in this category, sex of the head of a household, highest level of education of the household head, mother's monogamy status and urban or rural location of a household were found to have no significant relationship to the odds of access.

Comparative results on the socio-demographic determinants of access show that female household headship had a significant diminishing effect on the odds for girl early childhood schooling ($B = -1.593, p = .033$). The negative impact of an increase in the

age of a household head on early childhood schooling was found to be only significant for the girl child ($B = -.602$, $p = .010$). An increase in the number of children aged 0-8 years in a household had a diminishing effect on the odds of access for the boy and the girl child, ($B = -.447$, $p = .018$) and ($B = -.429$, $p = .051$), respectively. However, based on the differences in the B coefficients and p - values, the impact was marginally stronger on the boy child. The effect of level of education, and urban / rural location of a household were however insignificant across the sexes (Table 4.3). From the results, showing that four out of six explanatory variables are significant in at least one model, the study rejects Ho3.

Table 4.3. Partial Logit Regression Results on Household Social and Demographic Characteristics as Determinants of Early Childhood Schooling

	Aggregated Access (M1)		Male Access (M2)		Female Access (M3)	
	B	Sig.	B	Sig.	B	Sig.
HH Socio-Demographic Characteristics						
Female Household Head	-.289	.588	.835	.370	-1.593	.033*
Highest Level of Education of HHH	.054	.629	.208	.220	-.082	.620
Age of Household Head	-.277	.049**	-.144	.551	-.602	.010**
Mother in Monogamy	.388	.217	1.024	.016**	-.492	.345
Location of Household	.690	.379	.564	.614	.534	.634
Total Number of 0-8 year olds	-.386	.004**	-.447	.018**	-.429	.051**
Constant in full model	5.540	.000***	3.303	.031**	10.409	.000***

* $p < .1$ ** $p < .05$ *** $p < .01$

Evidence from descriptive trends on Figure 4.3 illustrates declines in proportion of boys and girls accessing early childhood schooling against the age of the household head. Younger household heads can therefore be considered better pro-early-childhood schooling decision makers compared to their older counterparts. There is however a point of inflection on the curves at age 50-59 with access rates increasing marginally for girls and boys by age 60+ years. The change in access rate trends by age 50 and above suggests that at this stage, older siblings instead of the parents are most likely making schooling decisions for the children. Being the more likely better educated and aware of education benefits, compared to their parents, older siblings are more likely to make pro-schooling decisions for their younger siblings.

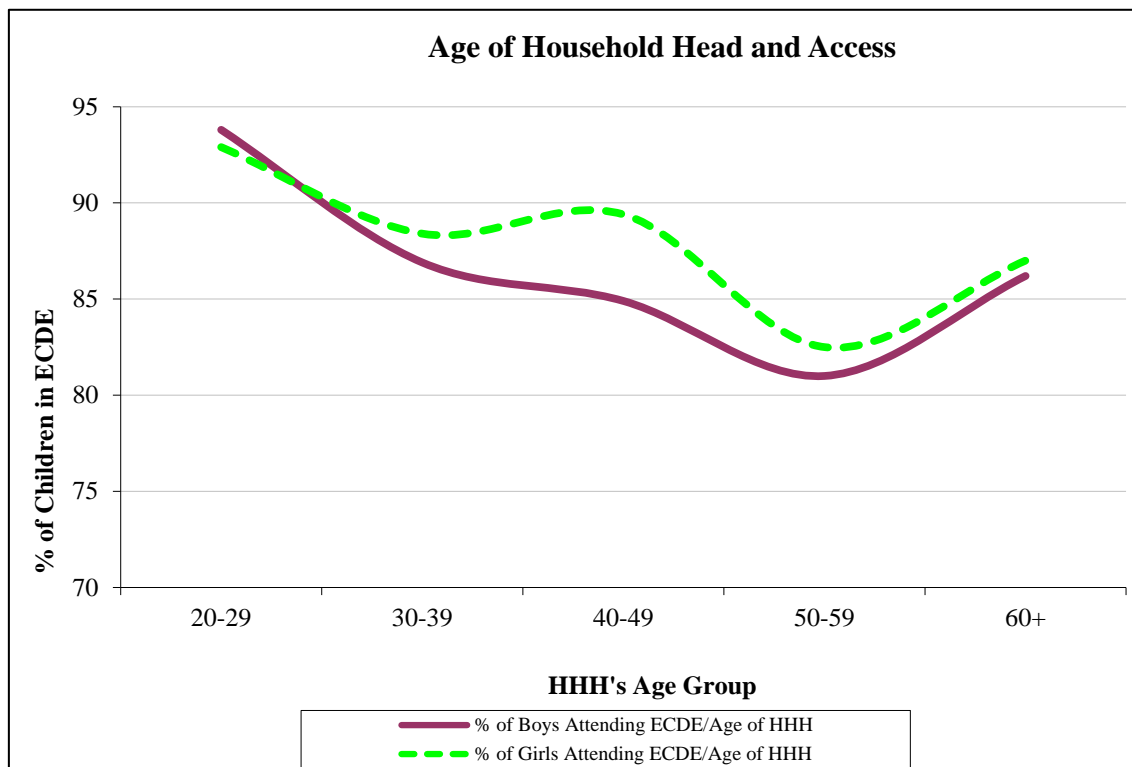


Figure 4.5. ECDE Attendance Trends by Age of Household Head

General trends on Figure 4.6 suggest that the proportion of children in the target age group who have access to ECDE declines against an increase in the number of children in the 0-8 age group in a household. This further illustrates the model findings showing significant negative relationship between the schooling chances of a child and the number of children in the household.

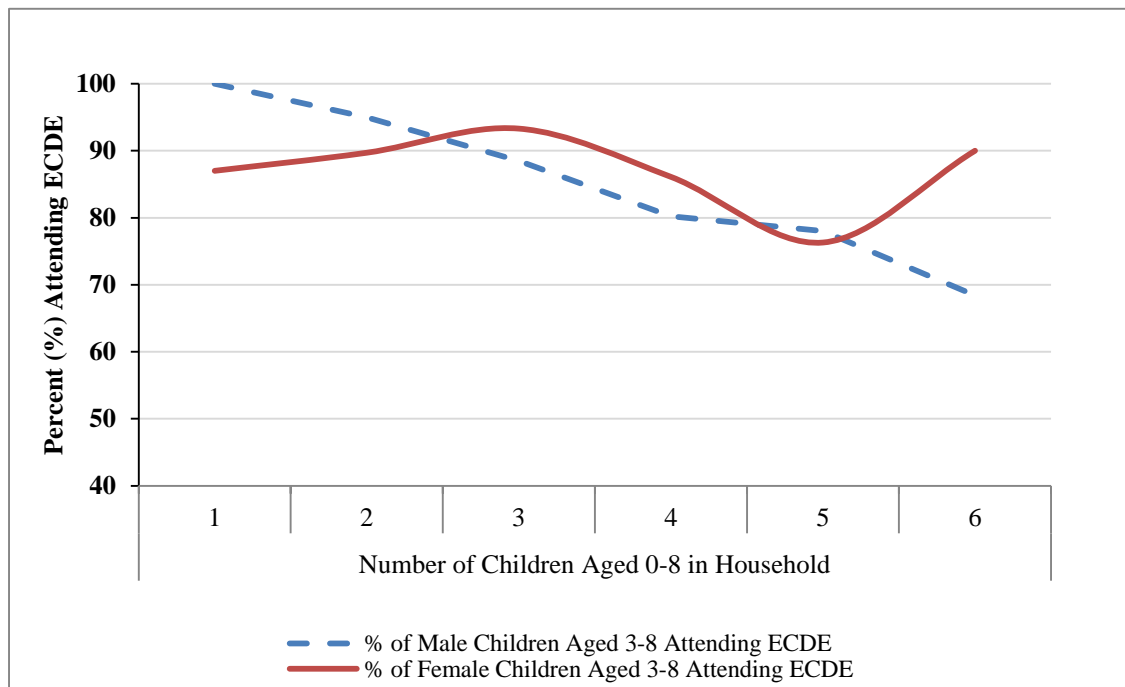


Figure 4.6. ECDE Attendance by Number of Children Aged 0-8 in the Household

4.2.4 Significance of School and Community Characteristics as Determinants of Early Childhood Schooling

This subsection presents results on the fourth study objective on assessing whether ECDE centre and community characteristics have any effects on the odds for early childhood schooling. It also presents results for testing the fourth null hypothesis, H_{04} ,

on the significance of ECDE and community characteristics as determinants of early childhood schooling.

Ho4: ECDE centre and Community Characteristics are Not Significant Determinants of Early Childhood Schooling

The distance between households and ECDE centres was found to be negatively related to the chances that a child would access ECDE at 95% CI, ($B = -.371$, $p = .012$). On the other hand, and contrary to expectation, ECDE density, computed as the number of households per centre was found to be negatively related to the odds for access at 95% CI, ($B = -1.100$, $p = .012$).

Model results on Table 4.4 confirm that the two school and community characteristics included in the model effect girl and boy access differently. An increase in the distance between homes and ECDE centres had a significant adverse effect on female access, ($B = -0.795$, $p = .002$) the relationship between distance and boy access was however insignificant. On the other hand, against theoretical expectations, households in areas with apparent higher ECDE centre density had lower chance of sending a boy child for early childhood education compared to areas with lower ECDE centre density ($B = -2.034$, $p = .002$). Based on the results, the study rejects H_04 .

Table 4.4. Partial Logit Regression Results on School and Community Characteristics as Determinants of Early Childhood Schooling

School and Community Characteristics	Aggregated Access (M1)		Male Access (M2)		Female Access (M3)	
	B	Sig.	B	Sig.	B	Sig.
Home-ECDE Centre Distance	-.371	.012**	-.142	.481	-.795	.002***
ECDE Centre Density	-1.100	.012**	-2.034	.002***	.297	.709
Constant in full model	5.540	.000***	3.303	.031**	10.409	.000***

* $p < .1$ ** $p < .05$ *** $p < .01$

Descriptive trends on Figure 4.7 show that between 0 to 2 kilometres, attendance rates are marginally but consistently higher for the girl child. However, as the home-to-ECDE centre distance crosses the 2 kilometre (km) barrier, both girl and boy access rates decline steeply (Figure 4.7). The girl child access rate declines faster as shown by the boy child curve rising over that of the girl access rates. These trends show that shorter home-to-ECDE centre distances tend to favour girl access rates while beyond the 2km barrier, girl access rates decline faster than those for the boy child. The results therefore suggest that increasing distances tends to hurt girl access more.

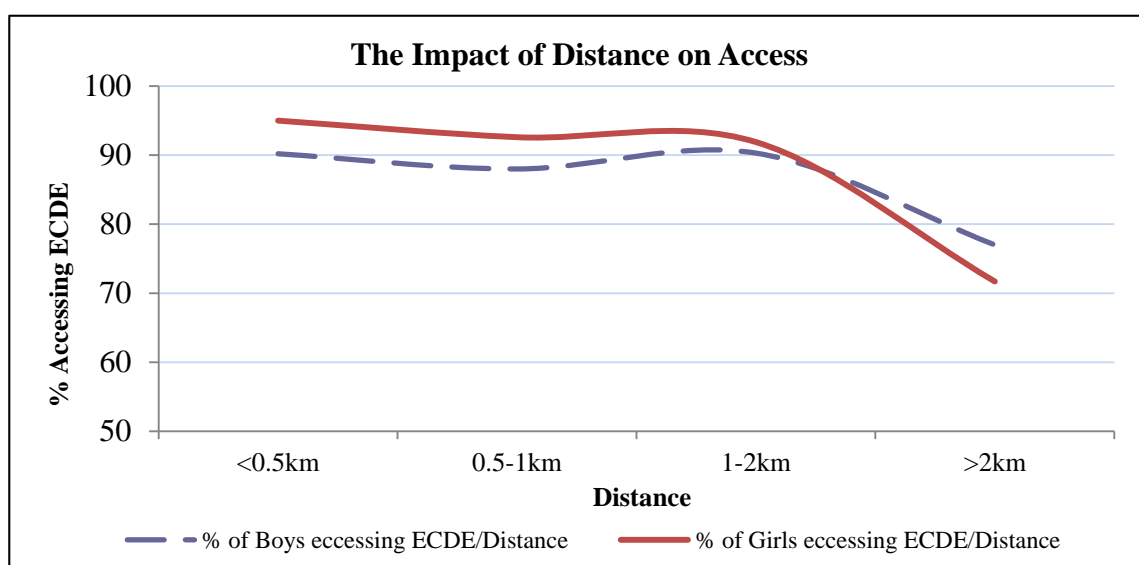


Figure 4.7. The Impact of Distance on Access

Illustrations on Figure 4.8 suggest that from the descriptive trends, the variations in ECDE attendance status between children in low and high ECDE centre density areas was only marginal.

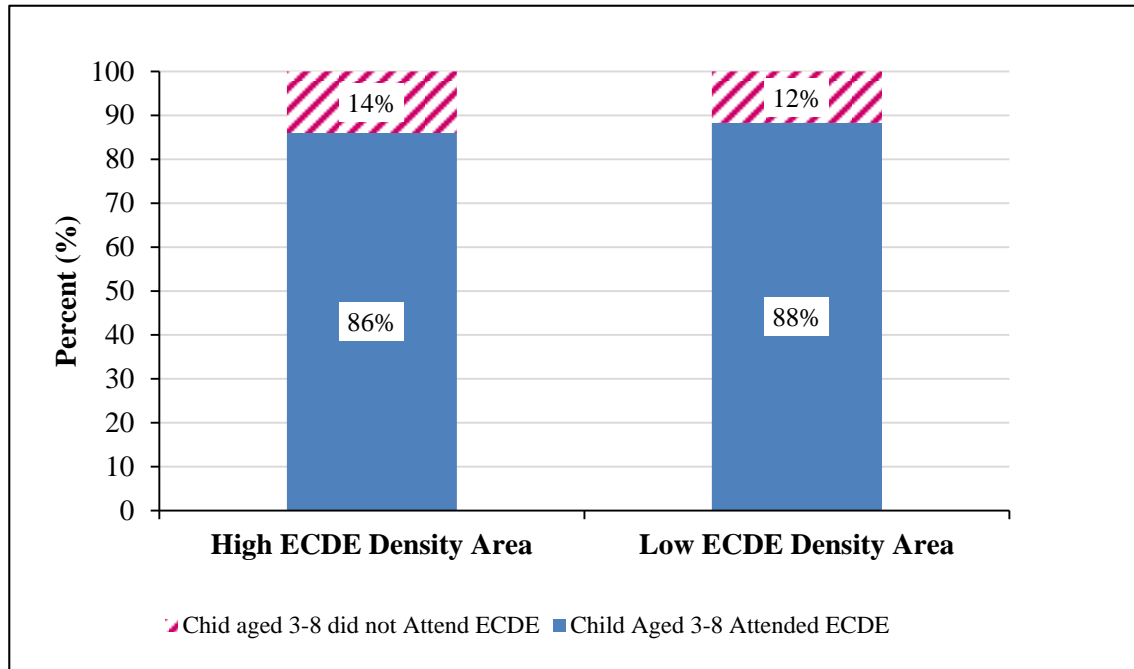


Figure 4.8. ECDE Attendance by ECDE Density in the Community

4.3 Discussion of Results

4.3.1 Determinants of Aggregated Access

Absence of significant differences in access to early childhood schooling by sex confirms the widely held notion of near enrolment parity across the sexes at the lower levels of education. Often, gender based disparities in access to education in favour of the male child are more pronounced at the post lower primary school levels and above. On the other hand, the absence of a significant relationship between age and access is at odds with expectation and findings from past studies. On the contrary, past studies on basic education have shown that the odds of primary and secondary schooling diminish against age. For example, using a multinomial logit model to establish the determinants of primary schooling in Kenya, Nyokabi (2010) found that an increase in a child's age by 100 percent reduced the probability of non-enrolment in primary school by 2 percent. In their study on the determinants of secondary education in Kenya Onsomu et al. (2006) found a student's age to have highly significant negative effect on secondary schooling. Primarily, the authors attribute this connection to the increasing odds of dropping out when a learner's age advances relative to their classmates. In part, the near gender and age parity in access to ECDE in the County can be explained by field observations which indicated high levels of donor agency provision of ECDE in the settled parts of Samburu County. As a result of this non-market driven intervention, the relatively high levels of access to ECDE registered were more supply than demand driven. In instances of mass provision of schooling opportunities, some of the natural underlying factors that selectively impede access to the disadvantage one of the sexes or

some of the age groups fail to apply in most households. From the findings on the insignificance of age and sex, the study fails to reject H_0 but sustains its alternative, H_A , that, given the existing ECDE supply and demand disequilibrium in the Samburu County context, child characteristics are not significant determinants of early childhood schooling.

The positive relationship between the level of expenditure on education and access suggests a bidirectional influence between schooling and educational expenditure. Whereas households that have sent more children for schooling are likely to spend more, those households with more disposable income are more likely to spend more on education. The link between levels of education expenditure and access confirms past findings by Baluch and Shahid (2008) on primary education in Lahore and Onsomu et al. (2006) on secondary education in Kenya. As a proxy for income, the higher income groups are more likely to spend more on the education of their children including having a propensity for premium priced private education. On the other hand, study findings on the negative relationship between livestock ownership and findings by Maglad (1994) on the negative effects of land ownership on schooling in Sudan partly confirm that the main economic activity of a given population can adversely impact schooling. Being a predominantly pastoralist County, ownership of livestock means that part or the whole of a household may have to migrate in search of pasture and water during the dry seasons. Such temporal movements profoundly impact most activities that thrive under sedentary settlement including schooling. Even where only part of the family moves, the absence of male parent who, often, is the household head and main decision maker can adversely affect schooling decisions. In instances of entire household migration,

schooling patterns are often completely distorted since the search for pasture usually takes such households to the more remote places where ECDE provision and schooling opportunities, generally, are in short supply. The odds ratio for livestock ownership in model 1 means that households with livestock are nearly three times more likely as their comparison to keep children out of early childhood schooling. Given the level of significance of the contribution of education expenditure and livestock ownership, the study rejects H_{o2} on the impact of household economic factors on early childhood schooling. Its alternative, H_{A2} , that household economic factors are significant determinants of early childhood schooling is therefore sustained.

The negative relationship between the household head's age and the likelihood of access means that as the age increases, chances of the head making a favourable decision to send a child to school diminishes. The diminishing impact of the household head's age on access is, in part, attributable to the fact that older parents in predominantly pastoralist communities are unlikely to have much formal education that could positively influence their schooling choices. Such parents are more likely to value cultural practices such as girl *betrothal /beading*¹ and *moranism*² over education. The finding on an inverse relationship between household head's age and the odds for early childhood schooling runs counter to findings by Okumu et al. (2007) on primary dropout in Uganda. The authors found a positive connection which they attributed to aged parents being able to appreciate the importance of education to influence their children's stay at

¹ *Beading* is a cultural practice in which a young man or the family of a young boy presents colourful beads to a young girl as an expression of interest to marry the girl ahead of the competition.

² *Moranism* is a cultural practice among the Samburu ethnic group that promotes male circumcision and the socialization of young men as warriors and protectors of the community.

school, especially young ones. The contextual difference between Okumu et al.'s findings and those of this study on the impact of age is attributable to the fact that the overall educational attainment of the larger national adult population in Uganda could be much higher than those of parents in Samburu County. Where schooling decisions arise from the peristaltic and positive externality effects of parent's education, it is the parents in a population sample with a higher average schooling years, like Uganda, that have elevated chances of making pro-schooling decisions relative to their comparison in Samburu County. An overall low formal education attainment among Samburu household heads also explains the absence of significance of positive externalities of a parent's education on early childhood schooling. The overwhelming effect of supply driven access can also be seen as having a screening effect on the contribution of the positive externalities of parent's education on access.

An increase in the number of 0-8 year olds in a household adversely impacts early childhood schooling chances because it intensifies dependency at the household level. The study by Nyokabi (2010) concurs with this finding on the link between number of siblings and schooling chances by pointing out that any extra sibling in a household, who is in same age group, increases the chances of another sibling in the same age group not to attend. Where livelihoods in parts of the County are ravaged by seasonal weather and vegetative cover changes, sporadic ethnic clashes or cattle rustling, households find it convenient to keep children at home and concentrate on the provision of basics such as food.

For the case of Samburu County, however, the true impact of lost livelihoods on access to ECDE is partially distorted by the availability of feeding programmes in some of the ECDE centres. Similarly, the combined distorting effect of supply driven access to ECDE and the provision of school feeding partly explains why differences in levels of education of the household head, type of family headship, marital status of mother, and urban or rural location do not show strong and significant relationships with the odds of access to ECDE. Specifically, the finding that the level of education of the household head was an insignificant determinant of early childhood schooling is at odds with findings by Aakival, Salvanes and Vaage (2005) that found a child's probability of enrolment to increase with parental education, with mother's education being relatively important in encouraging girl's enrolment. Although excluded from the final logit model owing to its insignificant contribution at improving the model, descriptive data showed that a higher proportion, 14.5 percent, of children from non-sedentary households never accessed ECDE compared to 7.9 percent for sedentary households. In general, results showing that out of the six socio-demographic factors included in the model, only two were found to be significant determinants of early childhood schooling leads to the partial rejection of null hypothesis Ho3 that socio-demographic characteristics were not significant determinants of aggregate access in the context of Samburu County.

The inverse relationship between distance and access is attributable to the fact that at tender ages, most children in the 3-8 year bracket would face challenges walking longer distances to ECDE centres. The ECDE centre proximity problem is further intensified by lack of organized school transport that characterises urban areas. The relationship between distance and schooling confirms findings of some past related works on basic

schooling. In their study on primary dropout in Uganda, Okumu et al. (2007) showed that the odds that a pupil will dropout of primary school increases with increase in the distance a pupil covers to school.

The finding that children in parts of the County with apparent higher ECDE centre density per household had lower chances of schooling at this level runs against evidence from similar past studies. Using school density, as an explanatory variable, Onsomu et al. (2006) showed that there exists a significantly positive effect of school density as a result of high concentration of schools in a neighbourhood. In the case of Samburu County, the inverse relationship arises out of three factors. First, there was a disproportionate concentration of ECDE centres close to settled and relatively urban locations. Secondly, ECDE provision in the County combines a mix of formal centres and traditional *Loipi* system of early child hood care. Some of the *Loipis* are unstable, temporary and only function seasonally. As a result, some segment of the population served by the *Loipis* remain out of ECDE schooling during parts of the year. Third, the study also found that outside, the main ‘urban’ centres like Maralal and Baragoi towns, a huge proportion of the economically and socially displaced live in temporary residences. This segment often remains invisible when accounting for ECDE schooling demand and are thus under served. As seen from the descriptive results, households located 3 kilometres from ECDE centres would face challenges getting such children into ECDE centres even in areas where high but skewed densities are reported. From the results on the impact of distance and ECDE density, the study rejects Ho4 and sustains its alternative, H_{A4}, holding that for aggregate access, ECDE centre and community characteristics are significant determinants of early childhood schooling.

4.3.2 Determinants of Sex Disaggregated Access

Results showing insignificant relationship between age and boy or girl access are backed by descriptive data on the proportions of girls and boys who accessed ECDE by age, which show only marginal differences. The near sex-parity in access to early childhood schooling draws from the fact that, in Samburu County, schooling at this level responds to the disproportionate positive impact of demand and supply side factors such as high household poverty and the provision of school feeding, respectively. In these circumstances, most households would naturally send most of their children for schooling even if they would not draw maximum utility from such choices. Thus, irrespective of age, children must be taken for early childhood schooling even if the only reason they attend school is to get food.

Results showing a stronger connection between boy access to early childhood schooling and the level of expenditure on education confirm findings in past works (Onsomu et al., 2006; Brock & Cammish, 1997) indicating that households place higher premium on boy education. A study by Chaudhury, Christiaensen and Asadullah (2006) on the determinants of child schooling in Ethiopia also suggests that where vulnerable households are forced to make tradeoffs in educational investments of their children, they choose to protect their schooling investments in their sons rather than in their daughters. Model results on the impact of livestock suggest that livestock ownership at the household level intensifies the odds of the exclusion of the girl child from ECDE. This finding runs against the widely known negative link between boy child schooling and their participation in livestock rearing. For the case of Samburu County, however, especially among the Samburu ethnic group, there is a cultural association of girl child

participation in goat and sheep rearing / herding and high productivity. Data on livestock ownership also show that most households owned goats and sheep compared to the other livestock types. It is this cultural dimension that partly explains the intensification of the adverse impact of livestock ownership on girl access to early childhood schooling.

Female household headship has a significant inverse relationship with the odds of ECDE access primarily because women among the Samburu and Turkana tribes are traditionally charged with the upbringing of the girl child. Since the ultimate cultural goal of a good upbringing of the girl child is an honourable marriage, the mothers are more likely to concentrate on preparing the girl child for future honour in marriage than schooling. In reinforcing the culturally allocated role of the mother in socialising the girl child away from schooling, Chaudhury et al. (2006) also contend that the individual demand for education is partially shaped by community preferences and social norms. In essence, schooling decisions by mothers tend to take girls out of the school system primarily because schooling outcomes would compete with or erode the dowry benefits upon a girl's marriage. In concurrence, Brock and Cammish (1997) contended that societies with strong attachment to patriarchal cultures tend to associate the future benefits of a girl's education with the families where they get married. This becomes a major disincentive to present investments in girl education. The absence of a significant relationship between the age of the household head and the chances that a boy would access ECDE further lends credence to the deduction that parents place greater premium on boy education, generally. In addition, advanced parental age increases the likelihood that a parent's schooling decisions for the children will be informed by cultural considerations that largely prepare the girl child for marriage as opposed to schooling.

The relatively stronger reverse relationship between the total number of children and the odds of boy access to ECDE can be partly explained by the finding that increased education expenditure favours boy schooling more. The dependency intensification that comes with increased number of children thus disadvantages the boy child who seems to benefit more when resources are freed from domestic dependency.

Results showing that the negative relationship between distance and the odds of access was significant for girls but insignificant for boys reveals that increase in distances tends to diminish access chances for girls more intensely compared to boys. As confirmed by bivariate comparisons, while only 5.0 percent of girls within 0.5km from an ECDE centre had not accessed schooling at this level, 28.3 percent of girls whose homes were located at over 2km from centres never accessed schooling. Similarly, in a study on the determinants of school demand in Sudan, Maglad (1994) established that the longer the distance between residence and school, the higher the cost of schooling, in terms of time spent in travelling to and from school, thus negatively impacting on schooling. The sex-based differentials in the impact of distance on access are partly attributable to societal constructs that deem the boy child as the better prepared for physically demanding tasks. A more gender specific study on schooling in Ethiopia by Chaudhury et al. (2006) similarly found that girls were less likely to complete primary schooling if they lived far from a school, while boys were more likely to complete primary schooling in communities with a greater availability of schools.

The inverse distribution of the effects of distance and ECDE centre density on male and female access are actually mutually reinforcing. The negative relationship between high

ECDE centre density and boy access is attributable to the observation that even in areas recording higher densities, ECDE centres are concentrated in settled areas thus leaving out mostly vulnerable households on the periphery of these urban locations. Among the excluded households, parents may find the opportunity cost associated with the schooling of the boy child, especially the older ones, high. Thus, boy access actually becomes disadvantaged in areas that otherwise report high ECDE centre density due to skewed spatial distribution of the learning centres. Another contributing factor to disadvantaged boy access in areas that are otherwise dense in ECDE centres was the observation that some of the *Loipi* centres considered in the count of all centres available in an area tend to collapse when the food programmes end. In such circumstances, a temporal decline in ECDE centre density occurs. As a result, households that send children for ECDE on the basis of availability of feeding are likely to retain the older boys at home because of their expected positive contribution to labour driven livelihoods.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter summarises the study and presents the main conclusions under each study objective. Also presented are the key recommendations on possible policy interventions and new areas of research for pursuing some incidental and cognate knowledge frontiers on early childhood schooling, participation and access that were outside the scope of this work.

5.2 Summary

The purpose of the study was to identify the significant determinants of chances that a household will send a child for early childhood schooling. The study used household based data from sampled locations to determine which explanatory variables from among four variable categories; child characteristics, household economic characteristics, household socio-demographic characteristics, and ECDE centre and community characteristics, are responsible for the odds that children would access early childhood learning and development.

The study used an ex post facto design which is applicable in educational research where pure experimentation is neither feasible, ethical nor cost-effective. The study was located in five locations of Samburu County namely Nyuat, Leroki, Barasaloi, Archers

post and Baragoi. The target population were households of the semi-sedentary populations in the selected divisions. A population of 2960 households was targeted out of which 600 households, constituting 20 percent, were selected using the systematic / ratio random sampling technique. Household based data from semi-sedentary populations in selected divisions were used to determine which independent / explanatory variables significantly determine the odds of access to early childhood schooling; the dependent variable. Independent variables were clustered into four categories; child characteristics, household economic characteristics, household socio-demographic characteristics and ECDE centre and community characteristics. Multivariate logit models were estimated using the maximum likelihood estimation technique in IBM SPSS Statistics Version 21. Respondents' participation was sought through a standard informed consent and introduction statement which was read out in a version translated into the local dialects.

Under the child characteristics, findings reveal no significant relationship between the sex and age of the child and the odds of access. In terms of household economic characteristics, an increase in household ability to spend more on education increased the odds that both the boy child and the girl child would access early education and development. Comparatively, however, the impact of education expenditure is more profound on the boy access.

From the results, the study concludes that as a result of the non-market interventions in supply of early childhood schooling opportunities in parts of Samburu County, child characteristics fail as strong determinants of access. The observed absence of

significance in the relationship between access and the family socio-demographic characteristics is also partly attributable to the screening effect of supply driven early childhood schooling decisions at the household level. The significant negative effect of age of household heads and total number of children within the 0-8 year age bracket therefore indicate that the true impact of these factors could be more intense in the absence of supply disturbances on the effective demand for early childhood schooling. The significant inverse relationship between distance and access partly helps explain why a negative relationship existed between that the apparent ECDE density and the chances of access. When combined, these two associations suggest the apparent high ECDE centre density is an irrelevant factor in access enhancement especially where the distribution of the centres is neither spatially optimal nor temporally consistent in operation throughout the year. The existence of a significant number of collapsed *Loipi* centres on the outskirts of Samburu town and Leroki urban centre coupled with a huge population of internally displaced households who have migrated to the periphery of the urban centres yield the confounding results on high ECDE density and diminished odds of access.

5.3 Conclusions

Logit regression results showing negative but insignificant relationship between age, sex and access to ECDE lead to the deduction that the dominant provision of non-market, mostly donor driven, ECDE in parts of Samburu County potentially distorts the expected influences of factors underlying age and sex on access. Specifically, the provision of school feeding programmes that are either supported by primary schools to which ECDE centres are attached or ECDE centre sponsors create an artificial near-mass early childhood education access levels which would not ordinarily exist in semi-arid regions like Samburu County. The provision of donor agency driven low cost early childhood schooling opportunities therefore profoundly impacts gender and age group parity in early childhood schooling. Given the insignificance of age and sex for both aggregated and sex disaggregated models, the study fails to reject H_01 and concludes that, given the existing ECDE supply and demand disequilibrium in the Samburu County context, child characteristics are not significant determinants of early childhood schooling.

As seen in the positive relationship between levels of expenditure in education and odds of early childhood schooling, it can be inferred, that parents who are willing to spend more on education are the better earners and most likely better educated. The increased spending on education is therefore a product of more children in school and parental schooling choices driven by the peristaltic effect of their own education. Study evidence on the adverse effect of livestock ownership on early childhood schooling points at a high opportunity cost associated with the schooling of older children who, instead, could be engaged in looking after the livestock. In other terms, households that own livestock

find a child's labour in looking after livestock more economically rewarding compared to the unquantifiable future benefits of present schooling. Considering the opposing effects of education expenditure and livestock ownership, it can be inferred that livestock ownership could be associated with lower levels of education while higher expenditure on education is most likely to be driven by formal employment earnings which, again, is related to higher levels of education. The study therefore concludes that livelihood improvement and reconstruction programmes such as restocking for families that have lost their livestock only help defeat early childhood schooling. From the results on the significance of expenditure in education and livestock ownership, this study rejects H_02 and concludes that economic characteristics of a household are significant determinants of the odds for early childhood schooling in Samburu County.

In terms of household socio-demographic characteristics, an increase in age of a household head increases the chances that they are less educated and would be more inclined to advance cultural and social outcomes over schooling. Such cultural choices place greater premium on the value of livestock, *moranism* and early girl child marriage over the benefits associated with formal schooling. The supply of ECDE in an imperfect Samburu County schooling market however partially distorts the expected effects of the other four socio-demographic factors of access that were included in the models. Notwithstanding these contextual distortions, four out of the six explanatory variables under socio-demographic characteristics of households were found to be significantly related to the odds for schooling in at least one of the three models. Based on these results, this study rejects H_03 and concludes that household socio-demographic characteristics are significant determinants of early childhood schooling.

The diminishing effect of increasing distance on odds of access to ECDE centres arises from the fact that majority of children walk to their ECDE centres. Therefore, children from households located far away from the centres simply cannot cover such long distances to access schooling at this level. Model results showing a negative relationship between the apparent high density of ECDE centres and the odds for access was a confounding outcome. However, in the context of Samburu County, the skewed distribution of ECDE centres coupled with the seasonality of the informal learning centres, the *Loipis*, leads to the exclusion of large segments of households located outside the urban centres. As a result, the apparent high ECDE centre density does not translate to commensurate access. Instead, access becomes better in the more remote locations, with lower ECDE density but have more stable externally funded provision of ECDE opportunities. When combined with reliable school feeding programmes, access in areas with lower ECDE density becomes better. The study therefore rejects Ho4 but accepts the alternative hypothesis that ECDE centre and community characteristics included in the study were significant determinants of access to early childhood schooling. Overall, notwithstanding the connection between livestock ownership and household sedentation status, the availability of school feeding programmes greatly alters the potential adverse impact of temporal movements of some segments of the households on access.

5.4 Recommendations

Drawing from its objectives, the main findings and conclusions, this study makes the following policy and further research recommendations.

5.4.1 Policy Recommendations

a Child Characteristics

- i. Although access was nearly equally high across all ages, there should be advocacy on right-age school entry to ensure that households send children for ECDE at the appropriate age. This would eliminate the challenge of over-age enrolments in ECDE.
- ii. Evidence on the sex based differentials in the impact of education expenditure and female household headship against girl access, calls for the intensification of the promotion of girl child education.

b Household Economic Characteristics

- i. Greater cost-subsidies should be implemented for early childhood schooling to minimise the impact of high direct, indirect and opportunity cost disincentive on access, especially for the girl child.
- ii. Livestock herd rightsizing would go a long way in suppressing the existing negative effect of livestock ownership on early childhood schooling.
- iii. Results on the significant negative effects of livestock ownership on early childhood schooling suggests that livestock restocking as a household livelihood reconstruction

intervention in Samburu County that was observed during the study should be substituted with other more schooling friendly alternatives.

c Household Socio-Demographic Characteristics

- i. Findings showing adverse impact of increasing number of children in a household on schooling call for the integration of family planning advocacy in other livelihood enhancement interventions in Samburu County. This would reduce the intensity of dependency in the face of widespread poverty that impedes early childhood schooling.
- ii. Mounting widespread education awareness campaigns targeting older household heads in the County would be instrumental in limiting the negative impact of an increase in the age of the household head on early childhood schooling.
- iii. The school feeding programmes should be sustained and expanded in coverage to eliminate the opportunity costs that food insecure households could associate with the schooling of the older boys and girls who can, otherwise, make meaningful domestic contribution towards livelihoods.

d ECDE Centre and Community Characteristics

- i. State and stakeholder intervention in the provision of consistent and fair ECDE teacher salaries would be one strategy that can profoundly impact the sustainability of informal *Loipi* centres that integrate traditional child care practices with ECDE.

- ii. Educational planners should engage the communities, private ECDE providers, donor agencies and the government education agencies in optimizing the spatial distribution of ECDE centres to eliminate the constraints of distance on schooling at this level.

5.4.2 Recommendations for Further Research

Further research can be conducted on the following areas:

- i. The learning outcome differentials between community run *Loipis* and formal ECDE centres in the County.
- ii. The determinant of ECDE to primary school transition rates
- iii. The longitudinal impact of ECDE on long term economic and social outcomes among semi-sedentary populations
- iv. The impact of model factors in this study on the primary and secondary schooling within the same population.

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APPENDICES

APPENDIX 1. FULL STUDY MODEL

Table AP1. Full Logit Regression Results on Determinants of Aggregated and Sex Disaggregated Early Childhood Schooling

	Aggregated Access (M1)		Male Access (M2)		Female Access (M3)	
	B	Sig.	B	Sig.	B	Sig.
Child Characteristics						
Sex of Child	-.061	.833				
Age of Child	-.050	.550	-.101	.407	-.034	.782
HH Economic Characteristics						
Annual Education Expenditure	.424	.001***	.868	.001***	.236	.064*
Livestock Ownership	-1.058	.059*	-.976	.169	-2.261	.054*
HH Socio-Demographic Characteristics						
Female Household Head	-.289	.588	.835	.370	-1.593	.033*
Highest Level of Education of HH	.054	.629	.208	.220	-.082	.620
Age of Household Head	-.277	.049**	-.144	.551	-.602	.010**
Mother in Monogamy	.388	.217	1.024	.016**	-.492	.345
Location of Household	.690	.379	.564	.614	.534	.634
Total Number of 0-8 year olds	-.386	.004**	-.447	.018**	-.429	.051**
School and Community Characteristics						
Home-ECDE Centre Distance	-.371	.012**	-.142	.481	-.795	.002***
ECDE Centre Density	-1.100	.012**	-	.002***	.297	.709
			2.034			
Constant	5.540	.000***	3.303	.031**	10.409	.000***

* $p < .1$ ** $p < .05$ *** $p < .01$

APPENDIX 2. HOUSEHOLD SURVEY QUESTIONNAIRE

Determinants of Early Childhood Schooling Among Semi-Sedentary Populations in Samburu County, Kenya

Household Survey Questionnaire

Informed Consent & Cover Page

Hello. My name is **Daniel Oliech**, I am a Masters Candidate Conducting an academic study titled “**Determinants of Early Childhood Schooling Among Semi-Sedentary Populations in Samburu County, Kenya**” As part of the requirements for the conferment of the Degree of Master of Education of Kenyatta University. Your household has been selected by chance from all households in the area. I would like to ask you some questions related to access to Preschool.

Participation in the survey is voluntary, and you can choose not to take part. All the information you give will be confidential. The information will be used in developing my final thesis, but will not include any specific names. There will be no way to identify that you are the one who gave this information.

At this time, do you have any questions about the survey?

Signature of interviewer: _____

Date: _____

Respondent agreed to be interviewed

1. YES
2. NO

SECTION 0. HOUSEHOLD IDENTIFICATION

This section is to be completed for each household visited.

001. Site name. _____

002. Zone name. _____

003. Zone number _____

004. Household number.

005. Interviewer number.

006. Date of interview.

Day:	Month:	Year:
------	--------	-------

007. Time interview commenced.

008. Time interview ended.

009. Respondent's Community 1. Samburu 2. Turkana 3. Other

The questions in this survey are for the **PRINCIPAL CAREGIVER** in the household, normally the mother. If there is more than one mother in a household, choose one mother at random to be interviewed about her household and her children.

SECTION 1. HOUSEHOLD SOCIO - DEMOGRAPHIC CHARACTERISTICS

Can you please tell me the names of all the members of your household who usually live here, sleep here and eat from the same bowl, including yourself. Please include children, relatives or orphans, but do not count temporary visitors. First names are sufficient. This information is confidential and will not be shared with anyone. Names are only used in the interview and will not be related to data in the report. **Make a list of ALL names before asking other questions.**

After getting the full list of family members, continue with the other questions in the table for each person in the list.

101	102	103	104	105
Tell me the first name of all the children in your household aged 8 years and Below?	What is (name's) gender?	What age is (name)?	What is the highest level of school (name) has completed?	If (name) is not in school did she/he go through ECD
Name	1. Male 2. Female Insert Code	Write the number of years. Insert Value	Write the number for the grade level. 00 = never 01 = Baby class 02 = Nursery 03 = Pre-unit 1 = STD 1 2 = STD 2 3 = STD 3	1. Yes 2. No 99. N/A
1.				
2.				
3.				
4.				
5.				
6.				
7.				

106. If there are children of **ECD age** who are **not** attending school, what is the main reason for this?

- | | |
|--------------------------|--|
| <input type="checkbox"/> | 1. The ECD centre is far |
| <input type="checkbox"/> | 2. No ECD centre exists here |
| <input type="checkbox"/> | 3. ECD education is expensive |
| <input type="checkbox"/> | 4. Too old |
| <input type="checkbox"/> | 5. Had to work at home |
| <input type="checkbox"/> | 6. Cultural rituals |
| <input type="checkbox"/> | 7. As a parent I do not think ECD is important |
| <input type="checkbox"/> | 8. Other (Specify) |

106.

List the names of members of the household aged 9 years and above starting with the respondent followed by the spouse then children, relatives and others

107.	108.	109.	110.	111.	112.
Tell me the first name of all other members of your household aged 9 years and ABOVE ?	What relationship is (name) to the head of household?	What is (name's) gender?	What age is (name)?	What is the highest level of school (name) has completed?	Did (name) go through ECD/still at ECD?
CODING FOR ANSWERS ^	1. Head 2. Spouse 3. Child 4. Relative 5. Other	1. Male 2. Female	Write the number of years.	Write the number for the grade level. 00 = never 77 = ECD 88 = Adult literacy 99 = post-secondary.	1. Yes 2. No
1.					
2.					
3.					
4.					
5.					
6.					

113. What is your marital Status?

<input type="checkbox"/>	1. Married in a monogamy		113. <input type="checkbox"/>
<input type="checkbox"/>	2. Married in polygamy		
<input type="checkbox"/>	3. Divorced		
<input type="checkbox"/>	4. Separated		
<input type="checkbox"/>	5. Widow		
<input type="checkbox"/>	6. Widower		
<input type="checkbox"/>	7. Other (Specify) _____		

114. If there are children in the household who are past ECD age but did not undergo this stage what was the main reason?

<input type="checkbox"/>	1. The ECD centre was far		114. <input type="checkbox"/>
<input type="checkbox"/>	2. No ECD centre existed here then		
<input type="checkbox"/>	3. ECD education was expensive		
<input type="checkbox"/>	4. Too old		
<input type="checkbox"/>	5. Had to work at home		
<input type="checkbox"/>	6. Cultural Practices		
<input type="checkbox"/>	7. As a parent I did not think ECD was important		
<input type="checkbox"/>	8. Other (Specify)		

SECTION 2: HOUSEHOLD ECONOMIC CHARACTERISTICS

201. What is your occupation? _____ | 201.

202. What is the occupation of your spouse? _____ | 202.

203. What is your family's main source of livelihood? _____ | 203.

204. Indicate location of household 1. Urban 2. Rural | 204.

205. Please indicate how much you spend on the following household requirements per week

	Item	Amount (KES)
	1. Food	
	2. Soap	
	3. Transport	
	4. Fuel (Lighting/Cooking)	
	5. Airtime	
	6. Entertainment/Leisure	
	7. Livestock Drugs	
	8. Other	

206. Please indicate how much you spend on the following school requirements per term

	Item	Amount (KES)
	1. Uniform	
	2. Books	
	3. Pens	
	4. School Fees	
	5. Other	
	6.	

House Wealth/Possessions

207. Please indicate if the Household owns any of these livestock (*If none Leave Blank*)

	Livestock	1. Yes 2. No	1= 1 -50, 2 = 51- 100, 3 = 101 – 200, 4 = 201 – 500, 5 = Over 500
	1. Camels		
	2. Cattle		
	3. Sheep		
	4. Goats		
	5. Other		

208. Are there instances when some or all members of the household have to move in search of water and pasture for the animals?

1. Yes 2. No 208.

SECTION 3: CENTRE CHARACTERISTICS

301. If there is at least one child attending ECD what type of ECD do they attend? (*If there are no children in ECD skip to question 401*)

1. Private 2. LOIPI/Community 3. FBO 301.

302. In your view, what is the average distance between your household and the nearest ECD centre?

1. Less than ½ Km 2. ½ – 1 Km 3. 1 – 2 Km 4. Over 2 Km 302.

303. On average, how long does it take your child/children to walk to the ECD centre?

<input type="checkbox"/>	1. 0 – 10 minutes walk from the house.	303. <input type="checkbox"/>
<input type="checkbox"/>	2. 10 – 30 minutes walk from the house.	
<input type="checkbox"/>	3. 30 – 60 minutes walk from the house.	
<input type="checkbox"/>	4. More than 60 minutes walk from the house	

304. What is the estimate distance between the ECD your child/children attend and the nearest Primary school?

<input type="checkbox"/>	1. Less than ½ Km	304. <input type="checkbox"/>
<input type="checkbox"/>	2. ½ - 1 Km	
<input type="checkbox"/>	3. 1 - 2 Km	
<input type="checkbox"/>	4. Over 2 Km	

305. Is the ECD your child attends linked to a primary school?

- | | |
|--------------------------|-------------------------|
| <input type="checkbox"/> | 1. Yes |
| <input type="checkbox"/> | 2. No |
| <input type="checkbox"/> | 3. Don't Know/No Answer |

305.

306. Does the ECD centre your child/children attend receive any support from the neighbouring Primary school?

- | | |
|--------------------------|-------------------------|
| <input type="checkbox"/> | 1. Yes |
| <input type="checkbox"/> | 2. No |
| <input type="checkbox"/> | 3. Don't Know/No Answer |

306.

307. If yes, what support does it receive?

- | | |
|--------------------------|--------------------------------|
| <input type="checkbox"/> | 1. Feeding |
| <input type="checkbox"/> | 2. Management/Teachers |
| <input type="checkbox"/> | 3. Teaching/Learning materials |
| <input type="checkbox"/> | 4. Other (Specify) _____ |
| <input type="checkbox"/> | 5. Don't know / no answer. |

307.

SECTION 4: ECD SERVICES

Health Care

Which of the following health care services are provided in your child's ECD centre?

- | | | | | | | | | | |
|--------------------------|---|--------------------------|--------|--------------------------|-------|--------------------------|---------------|------|--------------------------|
| <input type="checkbox"/> | 401. Deworming | <input type="checkbox"/> | 1. YES | <input type="checkbox"/> | 2. NO | <input type="checkbox"/> | 3. Don't Know | 401. | <input type="checkbox"/> |
| <input type="checkbox"/> | 402. Vaccination/Immunization | <input type="checkbox"/> | 1. YES | <input type="checkbox"/> | 2. NO | <input type="checkbox"/> | 3. Don't Know | 402. | <input type="checkbox"/> |
| <input type="checkbox"/> | 403. Growth Monitoring | <input type="checkbox"/> | 1. YES | <input type="checkbox"/> | 2. NO | <input type="checkbox"/> | 3. Don't Know | 403. | <input type="checkbox"/> |
| <input type="checkbox"/> | 404. Malaria prevention | <input type="checkbox"/> | 1. YES | <input type="checkbox"/> | 2. NO | <input type="checkbox"/> | 3. Don't Know | 404. | <input type="checkbox"/> |
| <input type="checkbox"/> | 405. Referrals | <input type="checkbox"/> | 1. YES | <input type="checkbox"/> | 2. NO | <input type="checkbox"/> | 3. Don't Know | 405. | <input type="checkbox"/> |
| <input type="checkbox"/> | 406. Vitamin A Supplementation | <input type="checkbox"/> | 1. YES | <input type="checkbox"/> | 2. NO | <input type="checkbox"/> | 3. Don't Know | 406. | <input type="checkbox"/> |
| <input type="checkbox"/> | 407. Other | <input type="checkbox"/> | 1. YES | <input type="checkbox"/> | 2. NO | <input type="checkbox"/> | 3. Don't Know | 407. | <input type="checkbox"/> |
| <input type="checkbox"/> | 408. Feeding | <input type="checkbox"/> | 1. YES | <input type="checkbox"/> | 2. NO | <input type="checkbox"/> | 3. Don't Know | 408. | <input type="checkbox"/> |
| <input type="checkbox"/> | 409. Age appropriate games | <input type="checkbox"/> | 1. YES | <input type="checkbox"/> | 2. NO | <input type="checkbox"/> | 3. Don't Know | 409. | <input type="checkbox"/> |
| <input type="checkbox"/> | 410. Structured play activities | <input type="checkbox"/> | 1. YES | <input type="checkbox"/> | 2. NO | <input type="checkbox"/> | 3. Don't Know | 410. | <input type="checkbox"/> |
| <input type="checkbox"/> | 411. Relevant outdoor/indoor play materials | <input type="checkbox"/> | 1. YES | <input type="checkbox"/> | 2. NO | <input type="checkbox"/> | 3. Don't Know | 411. | <input type="checkbox"/> |

Protection from Abuse and Neglect

- | | | | | | | | | | |
|--------------------------|-----------------------------|--------------------------|--------|--------------------------|-------|--------------------------|---------------|------|--------------------------|
| <input type="checkbox"/> | 412. Safe play environment | <input type="checkbox"/> | 1. YES | <input type="checkbox"/> | 2. NO | <input type="checkbox"/> | 3. Don't Know | 412. | <input type="checkbox"/> |
| <input type="checkbox"/> | 413. Child rights awareness | <input type="checkbox"/> | 1. YES | <input type="checkbox"/> | 2. NO | <input type="checkbox"/> | 3. Don't Know | 413. | <input type="checkbox"/> |
| <input type="checkbox"/> | 413. Counselling | <input type="checkbox"/> | 1. YES | <input type="checkbox"/> | 2. NO | <input type="checkbox"/> | 3. Don't Know | 413. | <input type="checkbox"/> |

Water and Sanitation

Which of the following are provided in your child's ECD centre?

<input type="checkbox"/>	414. Safe drinking water	<input type="checkbox"/>	1. YES	<input type="checkbox"/>	2. NO	<input type="checkbox"/>	3. Don't Know	414.	<input type="checkbox"/>
<input type="checkbox"/>	415. Adequate Latrines	<input type="checkbox"/>	1. YES	<input type="checkbox"/>	2. NO	<input type="checkbox"/>	3. Don't Know	415.	<input type="checkbox"/>
<input type="checkbox"/>	416. Waste disposal pits	<input type="checkbox"/>	1. YES	<input type="checkbox"/>	2. NO	<input type="checkbox"/>	3. Don't Know	416.	<input type="checkbox"/>

417. If water is available to children at the centre, what is the one main source of the water? **Mark ONE answer only.**

<input type="checkbox"/>	1. Piped into centre.	417. <input style="width: 60px; height: 20px;" type="text"/>
<input type="checkbox"/>	2. Piped into the centre	
<input type="checkbox"/>	3. Public tap.	
<input type="checkbox"/>	4. Open well at the centre	
<input type="checkbox"/>	5. Open public well.	
<input type="checkbox"/>	6. Protected well in the centre	
<input type="checkbox"/>	7. Protected public well.	
<input type="checkbox"/>	8. Spring / river / stream.	
<input type="checkbox"/>	9. Pond / dam.	
<input type="checkbox"/>	10. Rainwater.	
<input type="checkbox"/>	11. Tanker truck.	
<input type="checkbox"/>	12. Bottled water from home.	
<input type="checkbox"/>	13. Other. _____	
<input type="checkbox"/>	14. Don't know / no answer. ^ go to question 501.	

<input type="checkbox"/>	418. How long does it take to go there, get water and come back?	418. <input style="width: 60px; height: 20px;" type="text"/>
<input type="checkbox"/>	1. 0 – 30 minutes walk from the centre	
<input type="checkbox"/>	2. 30 – 60 minutes walk from the centre	
<input type="checkbox"/>	3. More than 60 minutes walk from the centre	
<input type="checkbox"/>	4. Water is piped into the Centre	
<input type="checkbox"/>	5. Don't know / no answer.	

5. PRIORITY NEEDS AND RECOMMENDATIONS

501. In your view, what can be done to improve access to preschool education in this area?

i. _____

ii. _____

iii. _____

iv. _____

v. _____

vi. _____

vii. _____

viii. _____

ix. _____

x. _____

APPENDIX 3. RESEARCH AUTHORIZATION

REPUBLIC OF KENYA



NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telephone: 254-020-2213471, 2241349
254-020-310571, 2213123, 2219420
Fax: 254-020-318245, 318249
when replying please quote
secretary@ncst.go.ke

P.O. Box 30623-00100
NAIROBI-KENYA
Website: www.ncst.go.ke

Our Ref:

NCST/RCD/14/012/1411

Date:

1st October 2012

Daniel Onyango Oliech
Kenyatta University
P.O.Box 43844-00100
Nairobi.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Determinants of access to early childhood development and education among semi-sedentary populations: the case of Samburu County in Kenya*," I am pleased to inform you that you have been authorized to undertake research in Samburu County for a period ending 31st July, 2013.

You are advised to report to the District Commissioners and the District Education Officers, Samburu County before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

A handwritten signature in black ink, appearing to read 'M. K. Rugutt'.

DR M.K. RUGUTT, PhD, HSC.
DEPUTY COUNCIL SECRETARY

Copy to:

The District Commissioners
The District Education Officers
Samburu County.

"The National Council for Science and Technology is Committed to the Promotion of Science and Technology for National Development".

APPENDIX 4. RESEARCH PERMIT

CONDITIONS

1. You must report to the District Commissioner and the District Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit
2. Government Officers will not be interviewed without prior appointment
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2)/four(4) bound copies of your final report for Kenyans and non-Kenyans respectively.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice

REPUBLIC OF KENYA

RESEARCH CLEARANCE PERMIT

GPK6055t3mt10/2011 (CONDITIONS—see back page)

PAGE 2 PAGE 3

THIS IS TO CERTIFY THAT Date of issue

Prof./Dr./Mr./Mrs./Miss/Institution Research Permit No. NCST/RCD/14/012/1411

Daniel Onyango Oliech 1st October, 2012

of (Address) Kenyatta University Fee received

P.O.Box 43844-00100, Nairobi. KSH 1,000


has been permitted to conduct research in

Location

District

Samburu County

on the topic: Determinants of access to early childhood development and education among semi-sedentary populations: the case of Samburu County in Kenya



Daniel Onyango Oliech
Applicant's Signature

[Signature]
Secretary
National Council for Science & Technology

for a period ending: 31st July, 2013