INFLUENCE OF SECONDARY SCHOOL CURRICULUM ON STUDENTS' DEVELOPMENT OF LIFE SKILLS FOR CLIMATE CHANGE ADAPTATION IN KALOBEYEI SETTLEMENT, TURKANA WEST, KENYA

By

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DECLARATION

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

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Dedication

For your encouragement and eternal patience, I dedicate this work to my wife Bertha.

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I wish to express my heartfelt gratitude to all the respondents of this research, acknowledging that without them, this project would never have been accomplished. I also wish to add a note of gratitude to my fellow students for peer support. Finally, a special thanks to my designated supervisors; Senior Lectures Dr. Rosemary Imonje and Dr. Loise Wambui Gichuhi from the Department of Educational Management, Policy and Curriculum Studies at the Faculty of Education, University of Nairobi-for your continued support and guidance.

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ABBREVIATIONS AND ACRONYMS

CC   Climate Change

CCE   Climate Change Education

LSD   Life Skills Development

LSE   Life Skills Education

KISEDP Kalobeyei Integrated Social and Economic Development Programme

SDG's   Sustainable Development Goal

School A Brightstar Integrated Secondary School

School B Kalobeyei Settlement Secondary School

ABSTRACT

This study examines the influence of the secondary school curriculum on students' development of life skills for climate change adaptation in Kalobeyei Integrated Settlement, Turkana West, Kenya. The first objective of the study was to assess students' levels of acquired life skills for climate change (CC) adaptation and examine how trends in those levels develop in forms 1-4. The second research objective was to investigate how individual subjects in the curriculum and extracurricular activities influence the development of life skills for CC adaptation in Kalobeyei. The last research objective was to determine to what extent activities by NGOs and UN agencies, influence students 'development of life skills for CC adaptation in secondary schools. The design used in the study is a descriptive survey design. The study used purposive sampling for data collection with a sample size of 889 respondents and received a 98.09% successful return rate. The main findings of the study are; that a limited rising influence of the curriculum on the development of students' life skills for CC adaptation was recorded from Form 1-3 whereafter a decline was revealed in Form 4. Of the 10 subjects that the study examined, the subject of Agriculture has the highest level of influence on students' life skills development for climate change adaptation. In contrast, the subject of Christian Religious Education has the lowest level of influence. The influence of both NGOs programming and extracurricular activities were shown to have limited influence on students' life skills development for climate change adaptation. The study concludes by first recommending formally integrating climate change education into the Kenyan secondary school curriculum. Secondly; to contextualize climate education in the curriculum to respond to the challenges posed by climate change in Kalobeyei and finally to strengthen climate change education in secondary schools, especially in Form 4.

CHAPTER 1

INTRODUCTION

1.1 Background to the Study

Secondary students in Kalobeyei Integrated Settlement (Kalobeyei) constitute an emerging generation of breadwinners within the settlement but face significant barriers in entering the job market. These barriers include; lack of trained skills and education, cultural and language barriers and legal restrictions to obtaining Kenyan work permits. Few will progress towards higher learning than the secondary school level. Secondary students who graduate will have limited job options and especially the refugee community will find it very challenging if not impossible to be employed outside the settlement. During their school years, secondary students are from a societal perspective, expected to contribute to either income-generating activities, typically agriculture, market activities or pastoralism, if the family has any means to undertake such activities. It is therefore essential that secondary education graduates are equipped with life skills to manage livelihoods within the framework of the Kalobeyei Integrated Socio-Economic Development Plan (KISEDP). Agricultural activities, livestock husbandry and employment in the informal economy constitute areas where the majority of refugees are self-employed in Kalobeyei. (UNHCR, 2018). These job opportunities are unfortunately increasingly influenced by a changing climate. Consequently, the ability to acquire life skills to adapt to climatic changes is of vital importance for the future success of secondary students and for the implementation of the KISEDP strategy. In a time with a changing climate, weather conditions have become increasingly unpredictable. Life skills for CC adaptation revolve around managing such unpredictability and utilizing resources in a way that

responds to this scenario. A majority of refugees in Kalobeyei have become refugees due to conflict in their country of residence. But if one looks back through the chain of events that cause conflict in many areas, the issue of limited resource availability is often a contributing factor. By obtaining life skills that provide better resource management strategies, students can develop resilience to conflict, increase prosperity for their families and increase their chances of managing a successful livelihood. Life skills for CC adaptation provide such essential tools. The Kenyan Secondary curriculum constitutes the cornerstone of the secondary education content in Kalobeyei and the learning objectives of the curriculum naturally emphasize the development of skills that are tailored to fulfil the educational objectives of Kenyan society. At the same time, legal barriers and cultural barriers restrict refugees' access to inclusion into the society that the curriculum is meant to serve. Consequently, refugees are caught in a gap, where the curriculum that they are taught does not comprehensively reflect the reality of refugees' limited options for societal inclusion and livelihood choices available in Kalobeyei. To examine the levels of influence that secondary education has on the development of life skills for climate change (CC) adaptation, this study used a cross-curricular approach. This is informed by the fact that CC content is present in more than one subject and stretches across several parts of the curriculum. But to comprehensively examine the influence of the curriculum on the development of students' life skills for CC adaptation, it is essential to observe the fact that the development of life skills can be a product of more than one source of learning. Arguably, the Kenyan Secondary curriculum can be influenced by input, stemming from the context where teaching takes place, in this case, the Kalobeyei settlement. Thus, the curriculum was not examined as the only variable in the study. The study also sought to explore if the acquired life skills for CC adaptation are influenced by education stemming from outside the school as well. United Nations (UN) agencies and NGOs run educational programmes within Kalobeyei that

are either aimed directly at young people or their families. Some of these programmes have content that supports life skills and CC content. Such programmes also formed part of the investigation, to determine if they influence the overall development of students' life skills for CC adaptation. On a global level, climate CC's destructive powers stretch across food security, availability of natural resources, environmental degradation, changing weather patterns, security, economy and ultimately peace (Blondel, 2012). African countries are among the most vulnerable to the impacts of CC (Case, 2006). A study by United Nations Educational, Scientific and Cultural Organisation (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2018) reveals that there is a growing global understanding that education concerned with sustainability, environmental awareness and sustainable development needs to be prioritized. Education for Sustainable Development is a UNESCO initiative that aims to improve access to quality education, across all levels and social contexts, transform societies by reorienting education and help students develop knowledge, skills, values and behaviours important for sustainable development. Climate Change Education (CCE) is an important part of this framework, as it is concerned with the causes and consequences of CC and addresses measures of mitigation and adaptation (UNESCO, 2015). For Education for Sustainable Development to transform societies there is urgency to translate these education objectives into applicable life skills, relevant to a variety of societal contexts. Life skills help young people to develop the capacity for independent thinking, adopting critical analysis and reflection, and personal development, specifically related to the context in which they live (United Nations High Commissioner for Human Rights [UNHCR] 2012). Life skills education (LSE) is recognized as a methodology to address a variety of issues of child and youth development and thematic responses. LSE is now widely adopted into the curricula of secondary school education across the world (World Bank, 2007). The refugee crisis taking place across South Sudan,

Somalia, Burundi, The Democratic Republic of Congo and Ethiopia is having a lasting impact on the refugee and migration patterns in East Africa (UNHCR, 2017). The reasons for these crises are diverse and major factors include political instability, civil war, competition for resources, ethnic divides and economic challenges. These developments are predicted to be major drivers of conflict in the East African region and are equally predicted to become major socio-economic destabilizers (Van Baalen & Mobjork, 2018). The aspects of CC in the role of the conflict in East Africa have been studied before, (Tiitmamer, Mayai & Hoth, 2018) but little attention has been directed at how secondary education impacts the development of life skills, to practically help refugees manage their situation. Kenya hosts a large number of refugees in Kakuma Refugee Camp (Kakuma) and Kalobeyei among others. Arid and semi-arid areas like Turkana County have low adaptation abilities and reduced resilience to the effects of CC (Anderson, 2013). Kalobeyei has since its inception in 2015 already faced several extreme weather events. The consecutive failure of the long rains in 2017 and 2018 resulted in acute malnutrition rates above 30 percent in Turkana County – double the emergency threshold and caused escalations in food prices. (The New Humanitarian, 2018) In contrast, above-than-normal precipitation created favourable agricultural and pasture conditions in 2020. This underscores the need for skills to manage agricultural practices, the utilisation of market forecast skills and the need for adaptation to changing weather patterns. Many families have been allocated kitchen gardens within the camp and agricultural plots nearby in an effort to develop nutritional variety and to create a market economy built on agricultural and livestock products. United Nations High Commissioner for Refugees (UNHCR) reports that a total of 6,170,000 m2 have been allocated for agriculture and an additional 675m2 allotment is distributed per household. (Betts, 2018) But as refugees and host communities have seized the opportunities for increased self-reliance and build economic, agricultural and societal structures, their efforts become

vulnerable to the erratic climatic changes happening in the region. This has led to the loss of crops, livestock diseases, health issues and influence market price fluctuations. (The New Humanitarian, 2018) The vision for Kalobeyei is different from traditional refugee camps. The (KISEDP) plan aims to support the local economy and increase self-reliance among refugees. The KISEDP interventions are structured around four components: (1) Sustainable integrated service delivery and skills development; (2) Spatial planning and infrastructure development; (3) Agriculture and livestock; (4) Private sector and entrepreneurship. This vision breaks away from more traditional camp management, where refugees' dependency on aid constitutes the status quo and the framework for increased self-reliance is less developed. Considering the objectives of the KISEDP strategy which aims at developing refugees' self-reliance, Kalobeyei has emerged as the ideal location to undertake the study. The success of the KISEDP strategy hinges on factors linked to refugees' ability to increase self-reliance which in return is linked to environmental circumstances impacted by climate change. Arguably the study would have less relevance in settings where refugees rely heavily on aid and are not expected to contribute to wider societal development. No formal evaluation of how the secondary school curriculum influences students' life skills development has taken place in the context of Kalobeyei. Given the importance of the development of students' life skills, in the CC adaptation context, this represents a knowledge gap that calls for examination.

1.2 Statement of the Problem

An ideal situation for students in Kalobeyei would entail that CC content should have a presence in the curriculum that adequately responds to the challenges posed by CC and offers students applicable solutions for CC adaptation. Since CC has varying degrees of impact, depending on geographical locations and societal context, a contextualized addition to the curriculum, relevant to the setting in Kalobeyei would form an ideal educational response to the challenges that students face. The current situation in Kalobeyei contrasts the ideal situation due to the fact, that few of these components are in place within the curriculum. Life skills education was introduced into the Kenyan secondary school's curriculum in 2003 but does not mention skills related to CC in its objectives (Kenya Institute of Education [KIE], 2006). In addition, the Kenyan secondary school curriculum has limited content related to CC and the infusion of CC into the curriculum is facing both delays and challenges (Kariuki, 2017). The objectives of secondary school education are to prepare students to make a positive contribution to the development of society and to acquire attitudes of national patriotism, self-respect, self-reliance, cooperation, adaptability, a sense of purpose and self-discipline (Sifuna, 1990). These objectives are difficult to fulfil if the students of Kalobeyei are not equipped with life skills to match the objectives of secondary education. If the curriculum does not provide provisions to undertake education that reflects the challenges that Kalobeyei secondary students face in society, then the curriculum is inadequate. To fulfil the objectives of secondary education, the curriculum should entail an educational response that fosters the development of life skills for CC adaptation. This study examines if this link is missing and if the situation constitutes an educational gap and a destabilising factor for achieving the objectives of secondary education. And here lies the root of the problem, warranting the research undertaken in this study. This gap is significant because it constitutes a knowledge and survival skills deficit. Mapping out

the extent of this problem is an important step, to guide education planners towards bridging the gap in the curriculum and moving towards the development of applicable life skills to adapt to CC.

1.3 Purpose of the Study

The purpose of the study is to examine the influence of the curriculum on the development of life skills for CC adaptation, in secondary schools in Kalobeyei Settlement, Turkana West, Kenya.

1.4 Objectives of the Study

i. To assess students' levels of acquired life skills for CC adaptation and examine how trends in those levels develop in forms 1-4.

ii. To ascertain the influence that individual subjects in the curriculum and extra-curricular activities have on secondary students' development of life skills for CC adaptation.

iii. To determine to what extent that additional activity by NGOs and UN agencies, influence students' development of life skills for CC adaptation in secondary schools.

1.5 Research Questions

i. What levels of life skills for CC adaptation do students possess in Kalobeyei and what trends can be observed in those levels in Form 1-4?

ii. How do individual subjects in the curriculum and extracurricular activities influence the development of life skills for CC adaptation in Kalobeyei?

iii. What influence does educational programming by NGOs and UN agencies have on students' development of life skills for CC adaptation in secondary schools in Kalobeyei?

1.6 Significance of the Study

The likely beneficiaries of the findings of this study include:

Students in secondary schools and their families as direct beneficiaries of the proposed research. The second category of beneficiaries of this study is organisations and other stakeholders working with refugees, not only in Kalobeyei but also in other areas comparable to the context. A wide variety of NGOs, agencies, ministries and donors can potentially benefit from the data and recommendations accumulated, as the basis for future educational programming. Organisations concerned with other areas than education will also find the research utilizable in developing livelihoods training, food security, reintegration efforts, disaster risk reduction, capacity building, empowerment and market-based economy solutions. In addition, government agencies and ministries can utilize the findings for the review of education policies and curriculum design. Finally, the study contributes to the field of Education in Emergencies, by examining how education can respond to the growing problem of CC impacts, not only in Kalobeyei but in comparable global contexts as well.

1.7 Limitations to the Study

Kalobeyei in 2018 and -19 experienced natural hazards such as flooding, even outside of the predictable rainy seasons. To minimize the possibility of unexpected flood occurrences during data collection, the researcher travelled during the dry season. Unexpected natural hazards could have an impact on school activities or the ability to collect data in the area and the researcher, therefore, planned ample time for unforeseen challenges during the data collection period. In addition, the influx of refugees to Kalobeyei depends on a range of security, political and seasonal factors and had the potential to affect enrolment

and student attendance. The researcher stayed updated on the situation in the settlement by using informants within the camp to assess if the situation could influence the study on an ongoing basis. Language barriers existed within the target population and the employment of interpreters was needed to ensure that this barrier did not influence the data collection exercise. The presence of Covid-19 in the country and Kalobeyei, complicated access to the research site and had an effect on the timeframe for the reopening of schools in the area. The researcher overcame this challenge by delaying the first intended data collection timeframe until authorities allowed access to the camp. The researcher then stayed informed about the impact of Covid-19 conditions across the country and at the site, before making travel arrangements and embarking on data collection.

1.8 Delimitations of the Study

The location is Kalobeyei Integrated Settlement.? The sample population totals 856 respondents. The sample size is 29.4 % of the target population. The respondents were all present within the study location and the study's scope did not stretch beyond the borders of Kalobeyei. This was a consequence of the unique design of the KISEDP strategy, which provided the respondents with opportunities and goals that differ from other refugee settlement contexts and would as a consequence exceed the scope of this study. The study did not attempt to examine all subjects in the secondary curriculum for CC content as it would be irrelevant to the scope of the study. Some subjects in the curriculum would have little or no influence on the development of skills e.g.; Physical Education, while others were expected to have a larger level of influence e.g.; Geography and Agriculture. As a consequence, eight subjects from the secondary school curriculum were identified for examination. These subjects are Agriculture, Biology, Chemistry, Physics, History, Christian Religious Education, Geography and Business Studies. These subjects have

been identified from previous research. Kariuki (2017) and Ndiritu et.al (2016) identified these subjects within the curriculum, based on CC content within each subject. In addition, the subject of Life Skills Education was included for examination, due to its obvious connection to the study objectives. The study is taking place within a controlled area, with relative security.

1.9 Assumptions of the Study

The assumptions of the study were:

i. That the influence that the curriculum in secondary schools has on students' acquired life skills for CC adaptation in Kalobeyei, is low.

ii. That the curricular subjects under investigation have limited influence on students' life skills development for CC adaptation in Kalobeyei.

iii. That the influence of educational programming by NGOs and UN agencies, on the development of students' life skills for CC adaptation in Kalobeyei, is limited.

1.10 Definition of Key Terms

The following terms defined in this paragraph are used frequently throughout the study;

Adaptation to Climate Change refers to the Intergovernmental Panel on Climate Change (IPCC, 2007) as "an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities."

Climate Change Content is educational content, which constitutes components of the curriculum that supports learning about climate change. Climate change content is found across the curriculum in

subjects that have varying elements embedded in the subject syllabus that in some form constitute the term "Climate Change Education."

Climate Change Education is education that aims to address and develop effective responses to climate change. It helps learners understand the causes and consequences of climate change, prepares them to live with the impacts of climate change and empowers learners to take appropriate actions to adopt more sustainable lifestyles. (UNESCO, 2015)

Life Skills are transferable skills that enable individuals to deal with everyday life, and to progress and succeed in school, work and societal life (UNICEF, 2019).

Life Skills Development is the development of personal skills and approaches, based on the student's accumulated knowledge and specific competencies. (Aarhus University, School of Business and Social Sciences, 2020)

Life Skills Education is the study of abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everyday life. (UNICEF, 2019)

1.11 Organisation of the Study

The study is organised into five chapters. Chapter one comprises the introduction to the study. It consists of a background to the study, statement of the problem, the purpose of the study, objectives of the study, research questions, limitations and delimitations to the study, the significance of the study, assumptions

of the study and definition of terms. Chapter two contains a literature review of the themes derived from the study objectives. In addition, this section contains the theoretical and conceptual frameworks. Chapter three covers the research methodology. This comprises research design, target population, sample size, sampling procedures, description of research instruments, validity and reliability of the research instruments, data collection procedures, data analytical techniques and ethical considerations. Chapter four includes the presentation and interpretation of the results of the data analysis. Key summary tables, graphs and charts are presented and discussed, while chapter five provides a summary of the research findings; makes conclusions and recommendations as well as suggests areas for further research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter discusses definitions of life skills, from a global perspective and in the context of CC adaptation, before moving on to identify the specific life skills that constitute the indicators of the dependent variable. The chapter also examines the literature reviewed on the global aspects and definitions of CC content in education, before informing about the presence of CC content in the Kenyan secondary education curriculum. The chapter contains different scholars views, on the identification of carrier subjects and additional subjects that incorporate CC content in the Kenyan secondary curriculum. The educational links between CC content and life skills development are then examined, exposing existing linkages and gaps. The chapter concludes, by describing the indicators linked to the intervening variable namely; UN agencies and NGOs Education Programs that include CC content in the Kalobeyei settlement.

2.2 Life Skills and why they matter

UNHCR (2016) defines life skills as; Support for young people to develop the capacity for independent thinking, critical analysis and reflection, and for personal development, specifically related to the context in which they live. Scholars argue that both academic education and life skills are needed for personal development. This argument is supported by Winthrop & McGivney (2016) who argue that; "in taking a wider view on adolescent development, it should be noted that life skills may be necessary but are not on their own sufficient. Rather, in today's globalized and ever-changing world, children and youth require a wide range of interrelated academic, livelihood, and psychosocial competencies – a breadth of skills – to survive and thrive." Life Skills Education is the term used to describe formalized education, specifically incorporating objectives of life skills development. (Wikieducator.org, 2020) Although LSE is an adopted part of the curriculum in large parts of the world, it is not necessarily timetabled and is

often a part of the hidden curriculum. A report by UNICEF (2019) concludes; that much of the formal curriculum concerning life skills development is not assessed through formal assessment methods. In the Kenyan context, the Kenya Institute of Education (K.I.E.) 2008 defined LSE as abilities which enable an individual to develop adaptive and positive behaviour so as to effectively deal with challenges and demands of everyday life. In the same report, KIE notes that; "it has now become clear that the prioritization of academic knowledge without acquisition of psychosocial skills is an inadequate way of preparing young people for the complex challenges that exist in our world today." (KIE 2008)KIE here supports the argument that an educational gap exists in the curriculum and that specific life skills need to be taught in secondary schools to fulfil the objectives of secondary education in Kenya. In a report, UNICEF (2019) notes that; Ideally, teachers should access professional development through in-service training and teacher resource centres on the links between CC, the environment and life skills-based education. (UNICEF, 2019). Assessments of levels of life skills have been completed in many studies before. Self-reports and self-ratings are the most commonly used types of soft skills measures (Duckworth & Yeager, 2015). Common in such studies are questionnaires where students rate their own skills on a Likert scale. Scholars like Pagel et al. (2016) argue that the method of self-rating can present possible sources of error. Pagel et.al (2016) note that; "These include reference bias, whereby frames of reference differ by individual according to their social group norms, and social desirability bias or faking, whereby individuals provide answers that they perceive to be "desirable" but are not accurate." Innovative approaches to address such errors include using anchoring vignettes, force choice methods and situational judgement tests to compensate for possible data inaccuracy, for the researcher (Kyllonen & Bertling, 2013). Anchoring vignettes are questions that present hypothetical situations, followed by a

series of response options, one of which is correct. The respondent is asked to rate the vignettes on the same scale used for a self-report, which is administered at the same time (Galloway et. al, 2017).

2.3 Specific Life Skills for CC adaptation.

To identify the life skills needed for CC adaptation in the context of Kalobeyei, this study took the approach of mapping out three categories, where students and their families within Kalobeyei are most impacted by CC. Specific life skills to adapt to those impacts were then subsequently identified as sub-categories to these main categories, relying on the information that the literature reviewed provided.

A special study published by UNHCR (Afifi, Govil, Sakdapolrak & Warner, 2012) summarizes refugees' from East- and Horn of Africa's perspectives on how, and to what extent, climatic change has contributed to their vulnerability. The report concludes that the three largest categories impacting refugees are; **Agriculture, Livestock Husbandry and Economy**. These three categories form the indicators of the independent variable in this study, from which specific adaptation strategies and skills are sub-categorised in this chapter. The individual life skills for CC adaptation, which constitute the indicators in the dependent variable were informed by these strategies;

Within the category of Agriculture, a report by the International Livestock Research Institute (Mude et al., 2011) identified water management and access to Climate Information Systems as pivotal to adapt to climatic stressors in ASAL regions in Kenya. FAO (2015) recommends that improved cropping practices, like the migration to drought-resistant crops and utilizing crops with shorter harvest cycles be introduced in agricultural education to mitigate changing climate conditions.

Within the category of Livestock Husbandry, Mude et al. (2011) point to; that communities surveyed regard the diversification of livelihoods connected to livestock and pastoralism, as a key mitigation strategy whose effectiveness in reducing vulnerability would increase relative to the past. The report notes that improving education that enables livelihood diversification is a crucial intervention for improving the welfare of concerned populations. Finally, the report (like in the Agriculture category) identifies water management as essential to adaptation to CC in this category.

Within the category of Economy, Megersa et al. (2014) found that limited responses to market dynamics and the collapse of livestock markets during droughts resulted in disadvantageous sales and overall economic disadvantages. Devereux and Scoones (2008) argue that economic diversification is the key to enhancing the resilience of the pastoralist economy and addressing recurrent humanitarian disasters in East Africa's drylands. Lastly in this category, we turn our attention to the access to Climate Information Systems as a strategy for CC adaptation. A study of vulnerability and adaptation to CC in the semi-arid regions of East Africa (Few & Morchain, 2017) underlines the importance for communities to have access to CC Information systems, to enable proactive action to CC-induced events, that cushion ongoing or planned economic activities.

2.4 Climate Change Content in education by global definitions.

To define content in the secondary curriculum, which is relevant to qualify as CC content, this study draws on the global definition and framework of the term "Climate Change Education". Climate Change Education is not a subject on its own within the Kenyan secondary curriculum, but rather constitutes education that draws from components present in a variety of subjects and thus bridges knowledge from

across the curriculum. This is a consequence of the complex impacts that CC has on human existence, which cannot be captured in a single subject. UNESCO concludes in a report from 2015 that; "Climate Change Education is education that aims to address and develop effective responses to CC. It helps learners understand the causes and consequences of CC, prepares them to live with the impacts of CC and empowers learners to take appropriate actions to adopt more sustainable lifestyles.

UNESCO (2013) identified 3 major categories that summon up the overall learning objectives of CC education: 1) The Science of Climate Change: Education that explains the components of the climate system, outlines the underlying factors of observed CC characteristics and concludes by presenting the CC impacts that can be observed today. 2) Society and Climate Change: Education that explores the social impacts of CC, especially on the most vulnerable populations. 3) Responding to Climate Change: Education that focuses on mitigation and adaptation strategies and presents various options for each. It also looks at the economics of CC and explains the international policy framework for dealing with CC as well as current negotiated global agreements. Using these international definitions, this study aimed to isolate subjects and content in the secondary curriculum that fit these definitions.

2.5 Climate Change Content in the Secondary Curriculum in Kenya

The East African Community Climate Change Master Plan (2011) asserts that; the "Curricula of most developing countries, especially in Africa, show a critical shortage of CC content at all educational levels from primary to tertiary levels and as a result, Africa has the least intellectual capacity to deal with the CC challenge." The report does not discuss any particular reason for these gaps in the curricula. In a

Kenyan study by Ndiritu et al. (2016), it was established that the national goals of education in Kenya have been reviewed, infusing CC-related content into Kenya's secondary school curriculum in the year 2003. The eighth goal introduced, paved the way for the introduction of environmental issues into the curriculum, and the aspect of CC as a subtopic in Geography. It is therefore apparent that important objectives of the curriculum have their main focus elsewhere. The National Climate Change Response Strategy (NCCRS) attributes this to a lack of adequate CC information, knowledge and long-period data for researchers, planners, policymakers and the general public on CC adaptation, impacts and mitigation measures (RoK, 2012).

The National Climate Change Action Plan 2018 -2022 (Government of Kenya [GoK], 2018) does mention the objective to integrate CC into the education system and thus acknowledges a curriculum deficit. Notably, the action plan sets defined targets and deadlines for interventions in relation to the integration of CC in the education system, emphasizing integration into the existing curriculum for lower secondary grades 7, 8 and 9. The action plan targets a pilot phase for lower secondary grades by end of 2020. Further, the action plan notes that by June 2023 such a CC curriculum needs to be incorporated into the secondary curriculum. All though a growing understanding of the need to infuse CC education into the secondary curriculum is evident, the actual actions to get it done, remain elusive. None of the literature examined in this review considers what life skills, such as education should develop and that exposes a gap between the ideal situation and the current situation.

Other aspects threaten to complicate such an addition to the curriculum; Bangay & Blum (2010), claims that the overloaded nature of the secondary school curriculum is a major problem that could potentially reduce the role that schools contribute in equipping learners with the necessary knowledge.

Kariuki (2017) concluded that CC content in the Kenyan secondary school curriculum in sampled subjects was inadequate. Geography was identified by KICD experts as the 'carrier subject' for environmental content and therefore contained most of the CC content. The study further showed that 44% of identified themes linked to CC education, were absent in the sampled subjects. Main concepts such as CC, global warming, greenhouse gases and the greenhouse effect were found to be addressed in several of the sampled subjects but were again most explicitly addressed in Geography. Interestingly the study points out, that a majority of students were informed about CC, while a majority of teachers were not.

This echoes a study by Litus (2012), who noted that a lack of teacher knowledge of CC will remain a barrier to effective CCE. Interviewees from the study also felt that; despite the fact that CC needed to be addressed in a special discipline, infusing more content into the curriculum would be unwelcome by most stakeholders, citing an overloaded curriculum.

2.6 **Subjects that incorporate Climate Change content in the Kenyan Secondary Curriculum**

In a study (Ndiritu et al., 2016) aimed at undertaking a survey on Kenya's efforts to infuse CC content into the taught secondary curriculum. The study established that following the review of the national goals and the introduction of the eighth goal, Geography became the carrier subject. Geography under the topic Climate has a sub-topic; Climate Change. The sub-topic defines explicitly the major concepts of CC, global warming, greenhouse gases and the greenhouse effect. It also highlights the causes and impacts of CC but lacks attention to adaptation and mitigation measures. Respondents of the study also reported that little is known concerning CC and that teachers as well as curriculum developers have limited knowledge on the whole issue and are therefore not in a position to educate learners on the same.

This exposes a wider knowledge gap, which potentially has broader implications across the education sector.

A study by Kariuki (2017) identified the same subjects as Ndiritu et.al (2016) as having relevant content on CC. These subjects are; Physics, History, Geography, Christian Religious Education, Business Studies, Biology, Chemistry, History and Government. In this study, Geography was likewise identified as the carrier subject. These 8 subjects, plus the subject of Life Skills Education, formed the body of subjects under examination in the independent variable in this project, due to their established CC contents through previous research. Extracurricular activities can in addition contain CC content. Agriculture clubs, environmental clubs and community projects within the school can help to develop life skills.

2.7 UN agencies and NGOs Education Programs that include CC content in Kalobeyei settlement.

World Food Program (WFP) and partners such as the Food and Agricultural Organization of the United Nations, (FAO) facilitate skills and knowledge transfer in vegetable production and promote market access and linkages in Kalobeyei. WFP and FAO established 2,850 kitchen gardens in Kalobeyei for refugees to produce vegetables for both sale and consumption (UNHCR, 2018). Although such activities are not directly aimed at secondary education, it is likely that secondary students have benefitted and gained skills, by participation in these training as part of the general community.

FAO is actively promoting and training young people in Kalobeyei in greenhouse gardening and innovative ways of managing agriculture. The aim is to provide Junior Farmer Field and Life Schools facilitators with information to discuss the topic of climate change, its impact on agriculture and actions

that farmers can undertake to reduce their vulnerability to climate change. Through exercises and discussions, climate change issues in relation to agriculture are highlighted. The module also helps the participants to learn about, the impacts of climate change on agriculture, and ways to reduce these impacts by applying relevant actions, methods and practices such as climate-smart agriculture practices. (FAO, 2015)

Action Africa Help International carries out training to support farmers with growing vegetables in kitchen gardens and also works with the training of commercial agriculture farming skills using modern drip irrigation and shade net technology. In addition, the programs focus on induction, life skills and basic financial literacy for both refugees and host communities. (AAHI, 2020)

Windle International implements secondary education Programming on behalf of UNHCR in Kakuma Refugee Camp. They also provide technical assistance and input to UNHCR for secondary schools in Kalobeyei. (Windle International, 2020)

Swisscontact, a Swiss Foundation for Technical Cooperation manages an educational program "4 Life Project". The project aims to strengthen the income-generating capabilities of youth aged between 16 and 25 years by supporting access to technical skills, and financial, life and literacy skills for improved livelihoods. The program includes both members of the host community and refugees living in Kalobeyei. (swisscontact.org, 2020)

2.8 Summary of Literature Review

The literature reviewed highlights definitions of life skills in the context of wider adolescent development and examines LSE's formal inclusion into the Kenyan secondary school curriculum. The literature also describes how to define life skills and how a set of specific life skills for CC adaptation, relevant to the context of Kalobeyei, is drawn from three categories; Agriculture, Livestock Husbandry, and Economy. The three categories constitute the areas where students and their families are impacted most, by the effects of CC. Studies reveal scholars' views on the challenges in the integration of CC content into mainstream secondary curricula in Africa. Many factors play a role in this situation, including; limited resources, a loaded curriculum and the lack of collaboration between institutions responsible for curriculum change. Eight subjects were identified by scholars as relevant to the scope of the study, for examination of CC content. The literature examined paints a picture showing that; although both CC content and LS were observed as important and have earned their place in the curriculum, the curriculum is still inadequate and the framework for practical infusion of this content is missing. As a consequence, the curriculum does not provide provisions to undertake education that reflects the challenges that Kalobeyei secondary students face in society. The curriculum should ideally entail an educational response that fosters the development of life skills for CC adaptation, but this link is missing, exposing a knowledge and skills deficit, and calling for research. The review also shows that mapping out the extent of this problem has not been attempted before and as a result, no studies from Kenya have examined, if any aspects of secondary education support the development of life skills for CC adaptation or to what extent. The section concludes by examining literature linked to UN agencies and NGOs that undertake educational programs accessible to students in Kalobeyei, with CC content and constitute the indicators of the intervening variable, expected to influence the dependent variable in this study.

2.9 Theoretical Framework

The Protective Action Decision Model (PADM) is a model that is based on findings from research on people's responses to environmental hazards and disasters. The PADM model integrates the processing of information derived from social and environmental cues with messages that social sources, in this case, education, transmit through communication channels, to those at risk. The transmission of social information is based upon the classic six-component communication model of source-channel-message-receiver-effect-feedback. The PADM identifies three critical pre-decision processes (reception, attention, and comprehension) exposure, attention, and interpretation of environmental/social cues)—that precede further processing. The model identifies three core perceptions—threat perceptions, protective action perceptions, and stakeholder perceptions—that form the basis for decisions. Such decisions then determine how to respond to an imminent or long-term threat. The outcome of the protective action decision-making process then produces a behavioural response. This response can be fed back into new social and environmental cues and the process is repeated. The stages in the PADM characterize the way people most often make decisions about adopting actions to protect against environmental hazards. These stages are sequential, as are those within the information-seeking process.
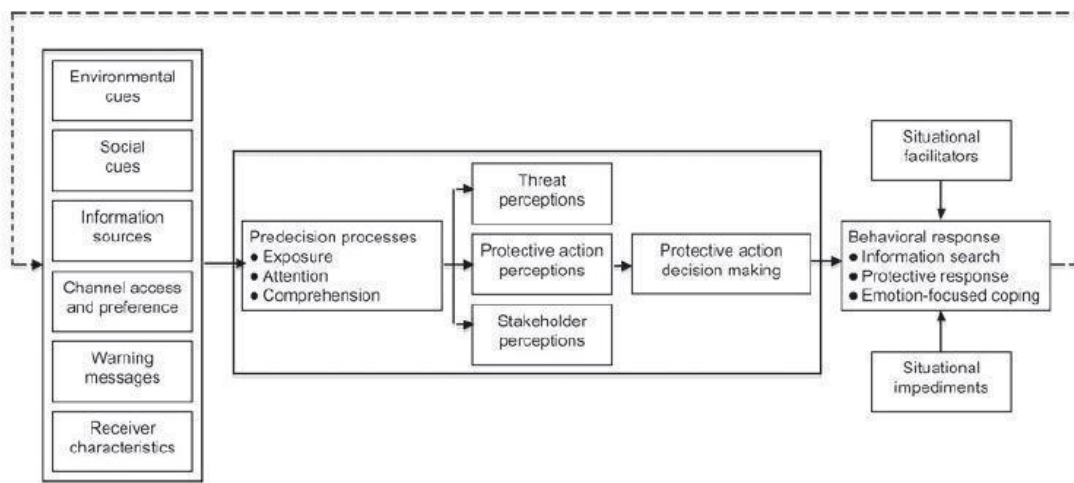
Fig. 2.1 The Protective Action Decision Model (Lindell & Perry, 2011)

Related theories:

The Theory of Planned Behaviour and Disaster Preparedness was proposed by Ajzen in 1989 as a refinement to the earlier theory of reasoned action proposed in the 1970s by Ajzen and Fishbein. (Tutor2You, 2020). The Theory of Planned Behaviour and Disaster Preparedness is a framework for investigating antecedents of behaviour. The Protection Motivation Theory was founded by R.W. Rogers in 1975 in an attempt to better understand fear appeals and how people cope with them. The Protection Motivation Theory was originally based on the work of Richard Lazarus. (Wescott et al. 2017)

The theory has been used to analyse people's behaviour during the Bakken Train derailing disaster (Savitt, 2015) that took place in Casselton in North Dakota in 2013. The PADM identifies three critical pre-decision processes (reception, attention, and comprehension) exposure, attention, and interpretation of environmental/social cues)—that precede further processing. This applies to the study variables as the transmittal of education, as a catalyst for the development of life skills to act upon

environmental/social cues. The outcome of the protective action decision-making process is the production of a behavioural response, which for students can lead to important decisions about how to apply life skills to manage stressors linked to CC.

2.10 Conceptual Framework

This section outlines the perceived relationship between the independent and the dependent variable and the influence on this relationship by the intervening variable. The section also describes the indicators for the mentioned variables.

Subjects in the Secondary Curriculum that include CC Content

- Agriculture
- Physics
- History
- Geography
- Christian Religious Education
- Business Studies
- Biology
- Chemistry
- Life Skills Education

Extra-Curricular Activities that include CC Content

- Clubs
- Community initiatives

Students' Development of Life Skills for Climate Change Adaptation

Agriculture:

- Improved cropping practices
- Water Management
- Climate Information Systems

Livestock Husbandry:

- Diversification of livelihoods
- Education
- Water Management

Economy:

- Economic diversification
- Response to market dynamics
- Climate Information Systems

UN agencies and NGO's Education Programs that include CC content in Kalobeyei

- Support for farmers
- Dryland farming training
- Junior Farmer Field Schools
- Training of farmers in kitchen gardens
- Technical assistance to Secondary Education
- Youth educational programing and support of life skills

Fig.2.2 describes the relationship between the independent, dependent and intervening variables in the proposed research. The independent variable provides input from subjects in the taught curriculum that have CC content drawn from the global definition and framework of the term "Climate Change Education". Input also extracurricular activities with CC content, like environmental and agriculture clubs and community-led initiatives connected to the school. The dependent variable; Students Development of Life Skills for Climate Change Adaptation embodies actual life skills acquired by secondary students in the curriculum and through extracurricular activities. The indicators of the dependent variable were based on three categories, agriculture, livestock husbandry and economy, where students and their families within Kalobeyei are most impacted by CC. Specific life skills to adapt to those impacts were then subsequently identified as sub-categories to these main categories, relying on the information that the literature reviewed provides. The intervening variable; UN agencies and NGO Education Programs that include CC content in Kalobeyei**,** reflects that secondary schools are not the only source of education in the context of Kalobeyei. Some students had access to education programs run by UN agencies and NGOs that could influence their development of life skills for CC adaptation. The intervening variable moderates the relationship between the independent and the dependent variable, considering that some secondary students have benefitted and gained skills, by participating in training as part of the general community.

It is the influence of the independent and intervening variables on the development of these essential life skills that the researcher sought to measure.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter covers the used research design, an overview of the target and study population included in the data analysis and describes the sampling techniques and sample size identified by the researcher. Also included in this chapter is a list of used instruments and an analysis of their validity and reliability. This is followed by details of the data collection procedures and data analysis techniques used. The section concludes by outlining the researcher's ethical considerations for the study.

3.2 Research Design

In this study, the research design used was a descriptive survey design. Aspers & Corte (2019) argue that; "A descriptive survey attempts to establish the range and distribution of some social characteristics, such as education or training, occupation, and location, and to discover how these characteristics may be related to certain behaviour patterns or attitudes." Both variables were examined using quantitative data, allowing the researcher to use measures of association to examine the relationship between the variables. In this design, data was gathered during observation of the phenomenon under investigation, describing the state of affairs. The researcher had no ability to influence any of the variables under investigation. Observation of the dependent variable was done first, followed by the independent variable, establishing the relationship to and impact on the dependent variable.

3.3 Target Population

The target population was identified from five categories of respondents all from Kalobeyei; Secondary students, Secondary School Teachers, Extracurricular committee members, School Principals or management committee members and programme management personnel, from UN agencies and NGOs that are concerned with CC content in educational and training activities. Only two secondary schools exist within Kalobeyei. Both were chosen for sampling, from the criteria of their geographic location within Kalobeyei (UNHCR, 2018). Each secondary school had a mean of 1479 students in forms 1-4, (UNHCR, 2018) totalling a target population of 2958 students. Each school had an average of 12 teachers, (UNHCR, 2018) totalling a target population of 24 teachers. Each school had 2 extracurricular committee members, (Kenya News Agency, 2018) totalling a target population of 4 committee members. Each school had a mean of 14 management committee members and 1 principal totalling 30 of the target population. The target population of Programme Management Personnel, from UN agencies and NGOs stands, is 2 per organisation totalling 10. The total target population within the five categories is 3026. The study population; Each secondary school has a mean of 1479 students in forms1-4. Each form has 370 students with a mean of 123 students in each class. The research was conducted in both schools comprising one class from each form (4) making the study population, before considering the influence of emerging issues (Covid-19) stand at 984 students. The student study population diminished slightly, due to the influence of Covid-19 on returnee rates of students after the pandemic. Sang, Koros & Bosire, (2013) argue that an average of 13 % of students are affected by school disruptions. Taking this into consideration the study population of students was decreased to 856. Purposive sampling was used to identify 9 teachers in each school, each teaching one of the subjects identified by the researcher as relevant to the variables under investigation, totalling 18 teachers. The target population also included 2 extracurricular committee members, 1 principal and 2 school management committee members from

each school totalling 10 participants from both schools. Finally, one programme management personnel, from five UN agencies and NGOs was identified from their job descriptions, totalling a study population of 5. The study thus concerns 889 respondents, equal to the sample size.

3.4 Sampling Techniques and Sample Size

The sample size is 889 respondents. The study used purposive sampling for data collection. The researcher extracted data from identified individuals considered to be representative of the population based on the research objectives. The sample size was 29.4% of the target population. The rationale for the sample size was practical; the researcher could not positively count on the entire population to have returned to school after the Covid-19 disruption and therefore had adjusted the total study population downwards. In descriptive research, a sample size of 10-50% is acceptable (Mugenda & Mugenda, 2008).

3.5 Research Instruments

The research instrument used were questionnaires. The questionnaire was chosen as the preferred instrument, due to the researcher's desire to achieve uniformity of items enclosed, the ability to use language and content appropriate to age range and the design intended to be completed by respondents within 45 minutes of class time. The questionnaires contained only closed-ended questions for purposes of uniformity in the extraction of quantitative data. Five different questionnaires were distributed; one for the students, one for the teachers, one for principals and management committee members, one for the extracurricular committee members and finally one for UN and NGO personnel that constitute the study population. Accompanying the questionnaire for students was a set of anchoring vignettes, to

compensate for possible self-rating errors by the students. Anchoring vignettes compensate for possible data inaccuracy, for the researcher (Kyllonen & Bertling, 2013). Anchoring vignettes are questions that present hypothetical situations, followed by a series of response options, one of which is correct. Data was collected using a 5-point Likert Scale, chosen as the scale for the measurement of the variables, due to the fact, that this scale produces ordinal data. These instruments all produced data applicable to the calculation of a range of statistical measures, including measures of association and regression, to examine the relationship between the variables.

3.6 Validity

The instruments chosen for this study were assessed for content validity by review from supervisors and colleagues experienced in this area of study. The researcher thus initiated a peer-review process of validating the questionnaires to ensure that accurate data was obtained.

3.7 Instrument Reliability

A test of the reliability of the instruments was achieved by test-retesting the instruments. Mugenda & Mugenda (2008) notes that test re-testing is essential since it helps to identify errors found in the study instrument which can later be corrected, in addition to assisting in estimating the time needed for administering the instrument. The instruments were administered twice to selected respondents, involving respondents from each category of respondents. The Pearson product-moment correlation

formula $r = \dfrac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[\,n\Sigma x^2 - (\Sigma x)^2\,]\,[\,n\Sigma y^2 - (\Sigma y)^2\,]}}$ was employed to compute the correlation coefficient reliability achieving a 0.81 correlation coefficient. Gay (2003) suggests that a coefficient of 0.70 is considered adequate. The method of self-rating could present possible sources of error, whereby

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individuals provide answers that they perceive to be "desirable" but are not accurate." (Pagel et al, 2016). Innovative approaches to address such errors include using anchoring vignettes, force choice methods and situational judgement tests to compensate for possible data inaccuracy, for the researcher. (Kyllonen & Bertling, 2013) As a consequence a set of anchoring vignettes were administered at the same in the respondent category of students, to eliminate inaccurate data collection.

3.8 Data Collection Procedures

The researcher sought clearance from the University of Nairobi to conduct the proposed research. The researcher obtained a research permit through National Commission for Science, Technology and Innovation (NACOSTI) and upon commencement of the research reported to the relevant government offices in the area. The researcher used email to administer questionnaires to the respondents of categories 2, 3, 4 and 5 (ref. Population section) 2 weeks before arrival at the research site allowing for the option of being completed electronically. However, all respondents opted to fill the questionnaires manually. The researcher utilised a 2-week time frame for the on-site data collection exercise. The questionnaires are stored for safekeeping by the researcher and electronic backup files were created using cloud storage technology.

3.9 Data Analysis Techniques

The first research question produced preliminary data sets comprising nominal data drawn from questions related to levels of life skills, drawn from a 5 step Likert scale. Each form (Secondary forms

1-4) produced 4 data sets organised in 3 categories of life skills discussed in chapter 2, resulting in a total of 12 data sets per school. This data was further analysed as scores and percentages. This procedure was replicated in the second school, resulting in 2 main data sets, (1 per school) which were analysed using percentages, ranking and means. The merging of these 2 data sets produced measures of acquired levels of each core category of life skills (3) and equally produced summarised data showing the trends in how life skills develop over the 4 years that students spend in secondary schooling. The final products of research question 1 were depicted using bar charts and combined charts. Research question number 2 followed the analysis steps described for research question 1 in this section. Question 2 produced 18 data sets. Questions1 and 2 were then analysed by applying measures of association, ranking and extracting percentages and means to establish the relationship between the independent variable and the dependent variable. Question 3 produced 5 data sets, and the influence of the independent variable on the dependent variable, to which this question is related, was determined using a comparison of scores and regression analysis.

3.10 Ethical Considerations

The researcher obtained informed consent from all individuals in the study group and distributed adequate information about the research, its purpose and the use of data to each individual, in a language that the respondent understood well. This was done in both English and Arabic. Participants were not offered incentives to participate. No aspects of perception were applied as tools in data collection efforts. The researcher is responsible for all confidentiality and privacy aspects of the research. There were no planned questions or activities that touched on major sensitive issues. Neither did the research expose any personal or professional reliability of any respondents.

CHAPTER 4

DATA ANALYSIS PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents the results of the data analysis on the study on the influence of secondary school curriculum on students' development of life skills for CC adaptation in Kalobeyei Settlement, Turkana West, Kenya. The chapter starts with the response rate, and demographic information and presents responses to the study objectives.

Data collection was undertaken in two secondary schools in Kalobeyei and in the offices of the concerned organisations, relevant to this study. The respondents filled out individual questionnaires for their category of respondents. The students filled one additional anchoring vignette accompanying the questionnaire to obtain data for analysis of possible over – or underrating of their own skills.

4.2 Response rate

The study sought to determine the response rate from the research instruments issued to five categories of respondents concerned. This information was acquired to investigate the attitude and perception of the respondents towards the study. Table4.1 shows the numbers of sampled and returned instruments in the five respondent categories. The table also illustrates the return percent rate for each category and the total return rate in percent.

Table 4.1; Respondents 'response rate

Respondents	Sampled	Returned	Return Rate (%)
Students	856	839	98.01%
Teachers	18	18	100%
Principals	6	6	100%
Ex-cur Org	4	4	100%
UN/NGO personnel	5	5	100%
Total	889	872	98.09%

Of the 18 teachers sampled, 18 teachers returned the instrument and for the 6 principals and management committee members sampled, 6 returned the instrument. Of the 856 students sampled, 839 returned complete questionnaires. Of the 4 Extracurricular organisers sampled all 4 returned the instruments and of the 5 sampled education personnel from UN and NGO organisations, 5 returned the questionnaire.

4.3 Demographic Information of the Respondents

The study sought to acquire general information and characteristics of the respondents in the categories of respondents' age, gender, nationality and status in Kenya. Further, the study acquired information on how many years of professional experience the respondents have, which excluded the category of students. This information was sought to provide oversight on the attributes of the population under study and their potential influence on the variables under investigation in this study.

4.3.1 Respondents Age;

Table 4.2 shows the age distribution of the respondent's categories displayed in 6 age brackets from respondents under 15 years of age to respondents over 40 years of age. The table also displays how many respondents fall within each division in frequency and percent.

Table 4.2; Respondents' age

Respondent's age N=872	Frequency (F) ≥15	F =16-20	F =21-25	F =26-30	F= 31-35	F= 36-40	F= 40≤	Total F
Students	0	452	317	64	6	0	0	839
Teachers	0	0	9	6	2	0	1	18
Principals	0	0	0	0	2	2	2	6
Ex-cur Org	0	0	1	2	0	1	0	4
Un/Ngo personnel	0	0	0	3	1	0	1	5
Total F	0	452	327	75	11	3	4	N=872
Total Percentage	0%	51.83%	37.50%	8.60%	1.27%	0.34%	0.46%	=100%

As illustrated in table 4.2 the majority of the respondents lie within the age bracket 16-20 years old (51.83%) followed by respondents within the age bracket of 21-25 years old (37.50%) This is mainly a consequence of the category of students being relatively large compared to other respondent categories represented. Noticeable is also that some students (F=70) are between 26 and 35 years of age. This points

to the absence of adequate educational opportunities that the student population has faced as a consequence of being refugees and/or from a background with disadvantaged educational opportunities.

4.3.2 Respondents' gender:

Table4.3 illustrates the gender distribution of the respondents. Notably, the male sample population is larger in all categories of respondents.

Table 4.3; Respondents gender

Respondents Gender (N=872)	Male	Female	Total
Students	671	168	839
Teachers	12	6	18
Principals	4	2	6
Ex-cur Org	4	0	4
Un/Ngo personnel	4	1	5
Total	695	177	872
Percentage	79.70%	20.30%	100%

4.3.3 Respondents nationality and status

Table 4.4 shows the origin of the respondents. The majority of the respondents (83.95%) have origins in South Sudan. Both teachers, students and UN/NGO agencies have respondents in other countries, while

Extracurricular organisers and principals all are Kenyan. Of the respondents, 95.99% have status as refugees, while 4.01% are Kenyan. Exclusively within the category of students, the refugee population is at 98.57%. Within the category of teachers, the refugee population is at 33.33%.

Table 4.4 Respondents Origins

Respondents Origins (N=872)	Kenya	South Sudan	Ethiopia	Burundi	Somali	Other	Total	
Students	12	726	46	13	16	26	839	
Teachers	10	6	2	0	0	0	18	
Principals	6	0	0	0	0	0	6	
Ex-cur Org	4	0	0	0	0	0	4	
Un/Ngo personnel	3	0	0	0	0	2	5	
Total	35	732	48	13	16	28	872	
Percent	4.01%	83.95%	5.50%	1.50%	1.83%	3.21%	100	

4.3.4 Respondents' professional work experience

The table 4.5 captures how many years of professional experience the respondents have. The students are not represented in this table. The data paints a picture of relatively young teachers, with the majority having professional experience between 0-5 years, while principals and the UN/NGO respondents have the longest professional experience.

Table 4.5; Respondents' professional experience

Respondents professional experience (N=33)	0-5 Years	6-10 Years	≥ 10 Years	F
Teachers	13	3	2	18
Principals	2	3	1	6
Ex-cur Org	2	2	0	4
Un/Ngo personnel	2	2	1	5
Total	19	12	2	33
Percent	57.58%	36.36%	6.06%	100%

4.4 Presentation of data results per Research Objective

The study sought to establish 3 research objectives: The first research objective: to assess student's levels of acquired life skills for CC adaptation and examine how trends in those levels develop in form 1-4. The second research objective sought to ascertain the influence, that individual subjects in the curriculum and extracurricular activities have on secondary students' development of life skills for CC adaptation. The last research objective was; to determine to what extent activities by NGOs and UN agencies, influence students' development of life skills for CC adaptation in secondary schools.

4.5 Research Objective 1

The first objective of the study is to assess students' levels of acquired life skills for CC adaptation and examine how trends in those levels develop in forms 1-4. To determine the characteristics of the dependent variable, the study sought to ascertain if students' levels of acquired life skills for CC adaptation develop in tandem with knowledge accumulation through the progression from form 1 -to 4 or if a different trend is apparent.

The study issued to the respondents a questionnaire with a 5-step Likert-type scale answer option, which the respondents used to rate their levels of own skills for CC adaptation. Respondents had the option of answering questions in 3 categories of life skills, with the self-rating options of; Very Low, Low, Average, High and Very High. This enabled the extraction, tabulation and interpretation of the responses from the questionnaire, by assigning a score to each self-rating option ranging from 1-5, where Very Low was scored 1 point and Very High scored 5 points respectively. From these scores, quantitative data has been extracted. Scholars like Pagel et al. (2016) argue that the method of self-rating can present possible sources of error. Pagel et.al (2016) note that; "These include reference bias, whereby frames of reference differ by individual according to their social group norms, and social desirability bias or faking, whereby individuals provide answers that they perceive to be "desirable" but are not accurate." To moderate any possible misrepresentation of the self-rating data, either by some respondents over- or understating their own levels of skills for CC adaptation, a subsequent data collection instrument; the anchoring vignette, was distributed after completion of the self-rating questionnaire. The anchoring vignette presented only forced-choice answer options, where respondents had to score the best solutions to a range of fictitious dilemmas, allowing for the extraction of data reflecting their actual skills. The

anchoring vignette followed the same categories of questions as the questionnaire for easy comparison. Like the questionnaire, the anchoring vignette presented the respondent with a 5 step Likert scale choice with the option of rating the level of skills in 3 categories paired to different dilemmas and solutions; Very Low, Low, Average, High and Very High and assigning a score to each self-rating option ranging from 1-5, where Very Low was scored 1 point and Very High scored 5 points respectively This enabled the extraction, tabulation and interpretation of the responses from the anchoring vignette, using quantitative data and enabled direct comparison to the scores of the questionnaire, exposing potential differences between the self-rating exercise and the actually achieved skills for each respondent.

Both the questionnaire and the anchoring vignette follow the same 3 life skills categories as identified as "Specific Life Skills for CC adaptation" as identified in the literature review section 2.3 comprising of three main categories, namely; Agriculture, Livestock Husbandry and Economy. This enabled extraction, tabulation and interpretation of data from each category.

4.5.1 Student's self-rating of own levels of life skills for climate change adaptation in Form 1

Table 4.6 shows the result of scores from Form 1 student's self-rating of own levels of life skills for CC adaptation in School A and School B. Both the results from a questionnaire and an anchoring vignette are displayed. The scores are presented in 3 categories of questions. 1; Agriculture, 2; Livestock Husbandry, and 3; Economy

Table 4.6 Students' self-rating of life skills, Form 1

Form 1	Category 1 Agriculture	Category 2 Livestock Husbandry	Category 3 Economy	Category 1- 3 Total Score
School A; Brightstar Integrated Secondary School, Form 1 (F=110)				
Questionnaire Score	845	983	861	2689
A. Vignette Score	1129	1140	1054	3323
Difference	284	157	193	634
Mean of difference				5.76
School B; Kalobeyei Settlement Secondary School, Form 1 (F=144)				
Questionnaire Score	1154	1120	1060	3334
A. Vignette Score	1590	1468	1405	4463
Difference	436	348	345	1129
Mean of Difference				7.84
School A and B; Form 1 (F=254)				
Total Questionnaire Score	1999/m7.87	2103/m 8.28	1921/m 7.56	6023/m 23.71
Total A. Vignette Score	2719/m 10.70	2608/m 10.27	2459/m 6.68	7786/m 30.65
Total Difference	**720**	**505**	**538**	**1763**
Mean of Total difference	**2.83**	**1.99**	**2.12**	**6.94**

Students in form 1 generally scored highest on the anchoring vignette with a mean score of 30.65 and lower on the questionnaire with a mean score of 23.71, indicating that their achieved skills for CC adaptation are more developed than rated by themselves on the questionnaire. The highest mean score of 8.28 from the questionnaire (2103 points) is found in category 2 "Livestock Husbandry". This shows that Form 1 students rate themselves highest in category 2 followed by Category 1 with a mean score of 7.87 and lastly category 3, with the lowest mean score of 7.56. The largest difference between scores from the questionnaire and the anchoring vignette is found in category 1; Agriculture, where the total difference for schools A and B was 720 points, with students scoring 2719 points on the anchoring vignette and 1999 points on the questionnaire, with a mean of difference at 2.83 points. This indicates that students in Form 1 have higher levels of skills for CC adaptation in category 1, than those initially rated by themselves. The reason for this is not certain but might be that many families were allocated small patches of land for agriculture and that traditional knowledge and the management of these small farms generate knowledge. Category 2 shows the smallest difference between the anchoring vignette and the questionnaire scores at 505, and a mean difference of only 1.99 points. This indicates that the students have the most accurate rating of their own LS in category 2. Overall category 2; "Livestock Husbandry" emerged as the category where Form 1 students have the most developed range of LS for CC adaptation, due to the highest mean score of 8.28 and the mean difference at 1.99 points. This points to that; students have some experience, gained outside the curriculum pertaining to livestock management. The lowest mean scores on both the questionnaire (7.56) and the anchoring vignette (6.68) are found in category 3; Economy. This reveals that Form 1 students' least developed LS for CC adaptation is found in this category.

4.5.2 Student's self-rating of own levels of life skills for climate change adaptation in Form 2.

Table4.7 shows the result of scores from Form 2 students' self-rating of own levels of life skills for CC adaptation in School A and School B. Both the results from a questionnaire and an anchoring vignette are displayed. The scores are presented in 3 categories of questions. 1; Agriculture, 2; Livestock Husbandry, and 3; Economy

Table 4.7 Students self-rating of life skills, Form 2

Form 2	Category 1 Agriculture	Category 2 Livestock Husbandry	Category 3 Economy	Category 1- 3 Total Score
School A: Brightstar Integrated Secondary School, Form 1 (F=106)				
Questionnaire Score	896	937	899	2732
A. Vignette Score	1131	1148	1057	3336
Difference	235	211	158	604
Mean of difference				5.67
School B; Kalobeyei Settlement Secondary School, Form 2 (F=109)				
Questionnaire Score	921	909	947	2777
A. Vignette Score	1202	1114	1078	3394
Difference	281	205	131	617
Mean of Difference				5.67
School A and B: Form 2 (F=215)				
Total Questionnaire Score	1817/m 8.45	1846/m 8.59	1846/m 8.59	5509/m 25.62
Total A. Vignette Score	2333/m 10.85	2262/m 10.52	2135/m 9.93	6730/m 31.30
Total Difference	**516**	**416**	**289**	**1221**

Mean of Total difference	2.4	1.93	1.34	**5.68**

Students in form 2 generally scored highest on the anchoring vignette with a mean score of 31.30 and lower on the questionnaire with a mean score of 25.62 indicating that their achieved skills for CC adaptation are more developed than rated by themselves on the questionnaire. This resembles the pattern we saw in form 1. The highest mean score of 8.59 from the questionnaire (1846 points) is shared between categories 2; "Livestock Husbandry" and 3; Economy. This shows that Form 2 students rate themselves highest in categories 2 and 3 followed lastly by category 1 with a mean score of 8.45. The largest difference between scores from the questionnaire and the anchoring vignette is found in category 1; Agriculture, with students scoring 2333 points on the anchoring vignette and 1817 points on the questionnaire, with a mean difference of 2.40 points. This indicates that students in Form 1 have higher levels of skills for CC adaptation in category 1 than those initially rated by themselves. As discussed in the results from Form 1, the reason for this is not certain, but might be that many families were allocated small patches of land for agriculture and that traditional knowledge and the management of these small farms generate additional knowledge within the family structures. This aligns well with reports that a total of 6,170,000 m2 have been allocated for agriculture and an additional 675m2 allotment is distributed per household. (Betts,2018). Category 3 shows the smallest difference between the anchoring vignette and the questionnaire scores at 289, and a mean difference of only 1.34. This indicates that the students have the most accurate rating of their own LS in category 3. Overall category 2; " Livestock Husbandry" emerged as the category where Form 1 students have the most developed range of LS for CC adaptation, due to achieving the highest mean score of 8.28 on the questionnaire and simultaneously

scoring the second highest mean score of 10.52 on the anchoring vignette. Just like the picture seen from results from Form 1, this points to that; students in Form 2 also have some experience, gained outside the curriculum pertaining to livestock management. The lowest mean score on the questionnaire (8.45) is found in category 1; Agriculture.

4.5.3 Student's self-rating of own levels of life skills for climate change adaptation in Form 3

The table 4.8 shows the result of scores from Form 3 student's self-rating of own levels of life skills for CC adaptation in School A and School B. Both the results from a questionnaire and an anchoring vignette are displayed. The scores are presented in 3 categories of questions. 1; Agriculture, 2; Livestock Husbandry, and 3; Economy.

Table 4.8 Students' self-rating of life skills, Form 3

Form 3	Category 1 Agriculture	Category 2 Livestock Husbandry	Category 3 Economy	Category 1- 3 Total Score
School A; Brightstar Integrated Secondary School, Form 3 (F=109)				
Questionnaire Score	932	956	981	2869
A. Vignette Score	1275	1158	1079	3512
Difference	343	202	98	643
Mean of difference				5.89
School B; Kalobeyei Settlement Secondary School, Form 3 (F=115)				
Questionnaire Score	926	923	974	2823
A. Vignette Score	1275	1239	1093	3607
Difference	349	316	119	784
Mean of Difference				6.82
School A and B; Form 3 (F=224)				
Total Questionnaire Score	1858/m 8.29	1879/m 8.39	1955/m 8.73	5692/m 25.41
Total A. Vignette Score	2550/m 11.38	2397/m 10.70	2172/m 9.70	7119/m 31.78
Total Difference	692	518	217	1427
Mean of Total difference	3.09	2.31	0.97	6.37

Students in form 3 generally scored higher on the anchoring vignette with a mean score of 31.78 and lower on the questionnaire with a mean score of 25.41 indicating that their achieved skills for CC

adaptation are more developed than rated by themselves on the questionnaire. This is the same trend that we saw in results from Forms 1 and 2. The highest mean score of 8.73 from the questionnaire (1955 points) is found in category 3 "Economy". Thus, Form 3 students rate themselves highest in category 3 followed by Category 2 with a mean score of 8.39 and lastly category 1 with the lowest mean score of 8.29. The largest difference between scores from the questionnaire and the anchoring vignette is found in category 1; Agriculture, where the total difference is 692 points, with students scoring 2550 points on the anchoring vignette and 1858 points on the questionnaire, with a mean of difference at 3.09 points. This indicates that students in Form 1 have higher levels of skills for CC adaptation particularly in category 1, than those initially rated by themselves. That trend is the same as in both Form 1 and 2, possibly attributed to the generational passing on of agricultural management practices. Category 3; "Economy" shows the smallest difference between the anchoring vignette and the questionnaire scores at 217 points and a mean difference of only 0.97 points. This indicates that the students have the most accurate rating of their own LS in category 3. Category 1 "Agriculture" emerged as the category where Form 3 students have the most developed range of LS for CC adaptation, due to the mean score of 8.29 on the questionnaire and 11.38 on the anchoring vignette. The lowest mean score of the anchoring vignette 9.70 is found in category 3; Economy. This reveals that Form 1 students' least developed LS for CC adaptation is found in this category.

4.5.4 Student's self-rating of own levels of life skills for climate change adaptation in Form 4

Table 4.9 shows the result of scores from Form 4 student's self-rating of own levels of life skills for CC adaptation in School A and School B. Both the results from a questionnaire and an anchoring vignette are displayed. The scores are presented in 3 categories of questions. 1; Agriculture, 2; Livestock Husbandry, and 3; Economy

Table 4.9 Students self-rating of life skills, Form 4

Form 4	Category 1 Agriculture	Category 2 Livestock Husbandry	Category 3 Economy	Category 1- 3 Total Score
School A; Brightstar Integrated Secondary School, Form 4 (F= 68)				
Questionnaire Score	552	649	568	1769
A. Vignette Score	702	751	728	2181
Difference	150	102	160	412
Mean of difference				6.05882352941176
School B; Kalobeyei Settlement Secondary School, Form 4 (F=78)				
Questionnaire Score	660	723	703	2086
A. Vignette Score	855	814	782	2451
Difference	195	91	79	365
Mean of Difference				4.68
School A and B; Form 4 (F=146)				
Total Questionnaire Score	1212/m 8.30	1372/m 9.40	1271/m 8.71	3855/m 26.40
Total A. Vignette Score	1557/m 10.66	1565/m 10.72	1510/m 10.34	4632/m 31.73
Total Difference	**345**	**193**	**239**	**777**
Mean of Total difference	**2.36**	**1.32**	**1.64**	**5.32**

Students in form 4 generally scored highest on the anchoring vignette with a mean score of 31.73 and lower on the questionnaire with a mean score of 26.40 indicating that their achieved skills for CC adaptation are more developed than rated by themselves on the questionnaire. As we have seen in all the Forms, this is a constant picture, which strengthens the argument that the instruments used in the data collection exercise performed well in both validity and reliability. The highest mean score of 9.40 from the questionnaire (1372 points) and from the anchoring vignette with a mean score of 10.37 (1510 points) are found in category 2 "Livestock Husbandry". This shows that Form 4 students rate themselves highest in category 2 and simultaneously score the highest on actually achieved skills. The largest difference between scores from the questionnaire and the anchoring vignette is found in category 1; Agriculture, where the total difference is 345 points, with students scoring 1557 points on the anchoring vignette and 1212 points on the questionnaire, with a mean of difference at 2.36 points. This indicates that students in Form 4 have higher levels of skills for CC adaptation, particularly in category 1, than initially rated by themselves. This result mirrors the trends seen from Form 1-3 where the largest difference in scores was found in category 1; Agriculture. Category 2; "Livestock Husbandry" shows the smallest difference between the anchoring vignette and the questionnaire scores at 193, and a mean difference of only 1.32 points. This indicates that the students have the most accurate rating of their own LS in category 2. Overall category 2; "Livestock Husbandry" emerged as the category where Form 4 students have the most developed range of LS for CC adaptation, due to the highest questionnaire mean score of 9.40 and the highest anchoring vignette score of 1556 with a mean of difference at 1.32 points. The lowest mean scores of the anchoring vignette (1510 points) are found in category 3; Economy. This reveals that Form 1 students' least developed LS for CC adaptation is found in this category.
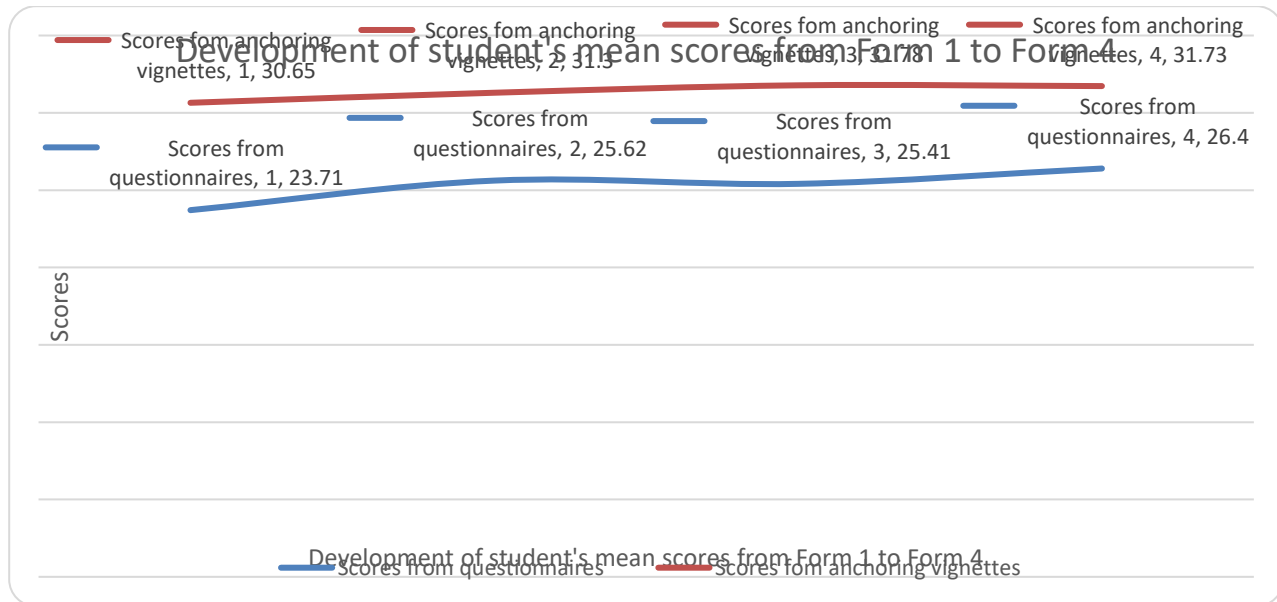
4.5.5 Trends in the development of life skills for climate change adaptation from Form 1-4.

Across forms 1-4, the students generally scored higher on the anchoring vignette and lower on the questionnaire, indicating that their achieved skills for CC adaptation are more developed than rated by themselves on the questionnaires. A trend visible throughout Form 1-4 was that the category "Agriculture" consistently achieved the largest difference between the anchoring vignette and the questionnaire. The reason for this is not certain but might be that many families were allocated small patches of land for agriculture and that traditional knowledge and the management of these small farms generate knowledge. The curriculum is likely not influencing this trend. If the curriculum provided adequate learning opportunities for developing life skills for CC adaptation in the subject of Agriculture, then the difference in points would likely reveal a narrower gap in points. This argument aligns well with the researcher's findings in the literature section of the study, revealing that none of the literature examined took into account what life skills, such education should develop and that exposes a gap between the ideal situation and the current situation.

Figure 4.1 illustrates how the mean score from the questionnaire reveals a limited development curve only rising from 23.71 to 26.4 mean scores from Form 1-4. The mean score from the anchoring vignette develops upwards slightly from 30.65 to 31.78 from Form 1 to Form 3 respectively before dropping slightly to 31.73 in Form 4 indicating a trend of a limited rise in the development of LS for CC adaptation between Form 1-3 is observed before tapering off in Form 4. This indicates that the curriculum has limited content across subjects which offer students the opportunity to grow their life skills for CC adaptation. As discussed in the literature review, CCE constitutes education that draws from components present in a variety of subjects and thus bridges knowledge from across the curriculum. Thus,

curriculums ability to develop life skills for climate change adaptation from Form 1-4 appear inadequate and out of sync with the situation in Kalobeyei.

Figure 4.1

Development of student's mean scores from Form 1 to Form 4

- Scores fom anchoring vignettes, 1, 30.65
- Scores fom anchoring vignettes, 2, 31.5
- Scores fom anchoring vignettes, 3, 31.78
- Scores fom anchoring vignettes, 4, 31.73
- Scores from questionnaires, 1, 23.71
- Scores from questionnaires, 2, 25.62
- Scores from questionnaires, 3, 25.41
- Scores from questionnaires, 4, 26.4

Scores

Development of student's mean scores from Form 1 to Form 4
— Scores from questionnaires   — Scores fom anchoring vignettes

Teachers and principals were asked their opinion on how students' levels of life skills for CC adaptation developed in secondary school from Forms1-4. The respondents were issued a 5 step Likert type scale which for each Form (1-4) had a choice of; Very Low, Low, Average, High and Very High. This enabled the extraction, tabulation and interpretation of the responses from the questionnaire, by assigning a score to each option ranging from 1-5, where Very Low was scored 1 point and Very High scored 5 points respectively. From these scores, quantitative data has been extracted.

Figure 4.2 shows teachers' and principals' opinions on how students' levels of life skills for CC adaptation developed in secondary school from Form 1-4.

Teachers and Principals score of the development of life skills for climate change adaptation from Form 1-4
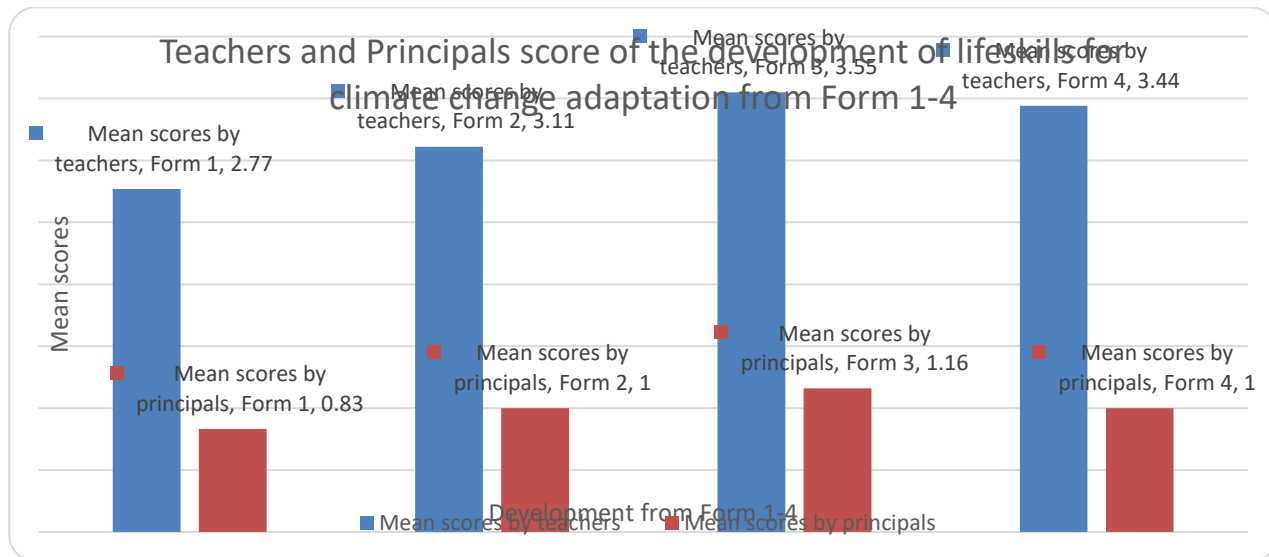
A trend of rising scores from teachers and principals, of the development of life skills for CC adaptation from Form 1-3 is apparent, followed by a more significant downwards trend in Form 4 is also emerging when analysing the data from teachers' and principals' perception of how skills develop on aggregate from Form 1-4. The mean score from teachers (N=18) rises from 2.77 in Form 1 to 3.55 in Form 3, whereafter it drops to 3.44 in form 4. A similar development is apparent when analysing data from principals on the same. Principals' (N=6) mean scores rise from 0.83 in Form 1 to 1.16 in Form 3, before dropping to 1 in Form 4. A point to note here is that the teachers looked more optimistically on how trends developed than the principals. This is possibly an effect echoing Litus (2012) and Kariuki (2017) who both concluded that teachers limited knowledge of CC remains a barrier to effective CC education.

As shown in Fig. 4.3, the development of the difference between the questionnaire mean scores and the anchoring vignette mean scores develop downwards from 6.94 to 5.32 from Form 1 to 4, revealing a

nonlinear development over the four years, albeit indicating a downwards trend. This indicates that as students progress through Form 1-4, the ability to accurately score their own levels of LS for CC adaptation improves.

Figure 4.3 Students' questionnaire and anchoring vignette mean scores.

Mean of difference between scores of anchoring vignettes and questionnaires Form 1-4

Series1, 1, 6.94
Series1, 2, 5.68
Series1, 3, 6.37
Series1, 4, 5.32

$y = -0.417x + 7.12$
$R^2 = 0.5569$

Mean of difference

Development of scores from Form 1 - 4
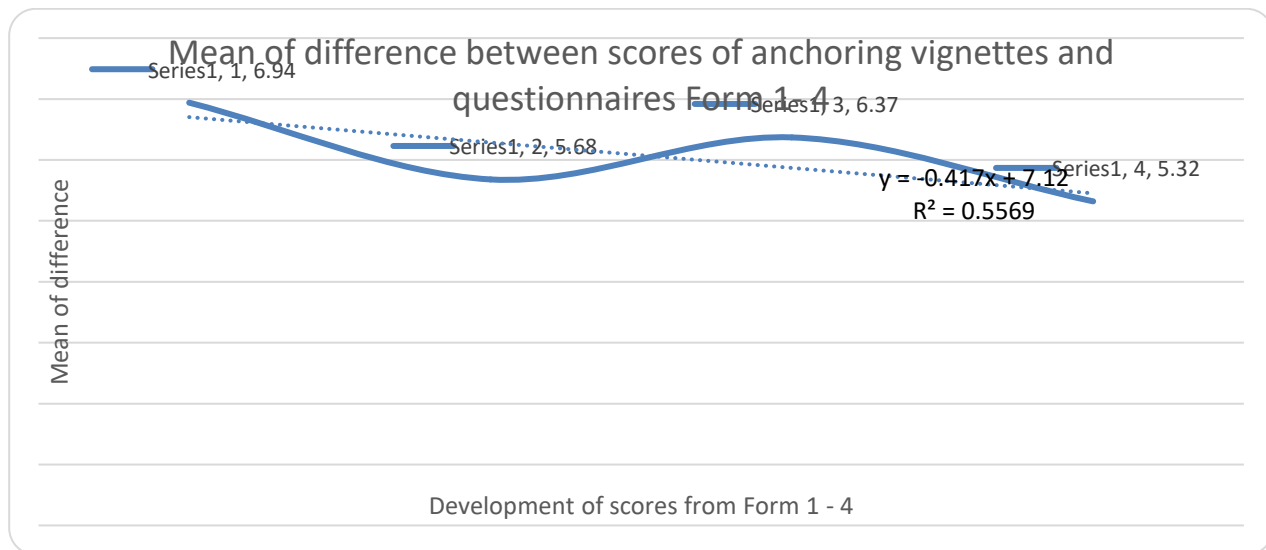
4.5.6 Development of life skills for climate change adaptation from Form 1-4 in life skills categories.

The life skills concerned with the study are categorized in 3 categories. Category 2; "Livestock Husbandry" emerged as the category where students in Form 1-4 have the best developed LS for CC adaptation in 3 out of 4 Forms (Form 1, Form 2, and Form 4). The researcher attributes this to the skills that many students may have developed by actual practical participation in livestock husbandry outside of the school boundaries. This was followed by category 1; "Agriculture" and the weakest development

of LS for CC adaptation was observed in category 3; "Economy" which attracted the least scores in 3 out of 4 Forms (Form 1, Form 3 and Form 4).

4.6 Research Objective 2

The second research objective is to investigate how individual subjects in the curriculum and extracurricular activities influence the development of life skills for CC adaptation in Kalobeyei. This is to investigate if the independent variables; (subjects that include CC content) and (extracurricular activities that include CC content) influence the dependent variable under investigation in the study.

4.6.1 Individual subjects influence the development of life skills for CC adaptation in Kalobeyei

Teachers who teach the 9 concerned subjects and extracurricular activities were asked to score their own subject's levels of influence on student's life skills development for CC adaptation in secondary school. The teachers were issued with a 5-step Likert type scale with the options of; Very Low, Low, Average, High and Very High. This enabled the extraction, tabulation and interpretation of the responses from the questionnaire, by assigning a score to each self-rating option ranging from 1-5, where Very Low was scored 1 point and Very High scored 5 points respectively. From these points, quantitative data has been extracted.

Table 4.10 shows how teachers that teach the 9 concerned subjects and extracurricular activities score their own subjects influence students' life skills development for CC adaptation in secondary school. The teachers were not asked to consider their subject in comparison to any other subjects other than their own. The table further displays how the teachers perceive their own subject's performance in the sub-categories; Agriculture, Livestock Husbandry and Economy. The rankings are based on the mean score,

as some subjects have entries from more teachers than others. Agriculture achieved the highest mean ranking, Chemistry and Extracurricular Activities jointly share the 5th place while Life Skills Education achieved the lowest mean ranking. The question category "Agriculture" achieved the highest mean of 10.2 followed by "Economy" with a mean score of 8.88 and lastly "Livestock Husbandry" with a mean score of 8.55.

Table 4.10 Teachers' scores on their own subject

Subjects	Category 1 Agriculture	Category 2 Livestock Husbandry	Category 3 Economy	Points	F=	Mean	Rank
Agriculture	15	15	15	45	1	45	1
Biology	47	41	36	124	4	31	2
Physics	13	10	5	28	1	28	3
Geography	10	9	8	27	1	27	4
Chemistry	36	20	22	78	3	26	5
Extracurricular	19	16	17	52	2	26	5
History	16	15	20	51	2	25.5	6
Business Studies	7	5	13	25	1	25	7
Christian Religious Studies	15	17	17	49	2	24.5	8
Life Skills Education	7	6	7	20	1	20	9
Total	185	154	160	499	18	27.7	
Mean	10.2	8.55	8.88				

Many of the subjects show a low mean score. This is consistent with the literature review in this study, showing that curricula, especially in Africa show a critical shortage of CC content at all educational levels (The East African Climate Change Masterplan, 2011) The government of Kenya has before

acknowledged a curriculum deficit related to CCE and The National Climate Change Action Plan (GoK, 2018) notes that curriculum changes should be incorporated in the secondary curriculum by June 2023.

Table 4.11 shows the respondents; principals' perception of the level of the subject's influence on each category of questions considering the subjects on aggregate, using a 5 step Likert scale based on the following scale; No influence, minor influence, Moderate influence, Major influence, Very high influence, attracting scores from 1-5 respectively.

Table 4.11: Principals score of subjects on aggregate

Principals scoring of subjects on aggregate, in life skills categories N=6	Category 1; Agriculture	Category 2; Livestock Husbandry	Category 3; Economy
Principal's score	64	54	59
Mean	10.66	9.0	9.83

The respondents; principals, teachers and students were each asked to rank the 9 timetabled subjects and extracurricular activities in order from 1-10. The number 1 indicated which subject the respondents perceived as contributing the most to the development of students life skills for CC adaptation in secondary school and number 10 indicated the subject with the least influence. The rankings were then assigned a numerical value identical to the rank and arranged in figure 4.4. In fig 4.4 the lowest mean

score displays the subject contributing the most to the development of students' life skills for CC adaptation in secondary school, and the highest mean score as the least contributing subject respectively.

Figure 4.4 (School A; Brightstar Integrated Secondary School) and (School B; Kalobeyei Settlement Secondary School)

Compared ranking of all included subjects in School A and B
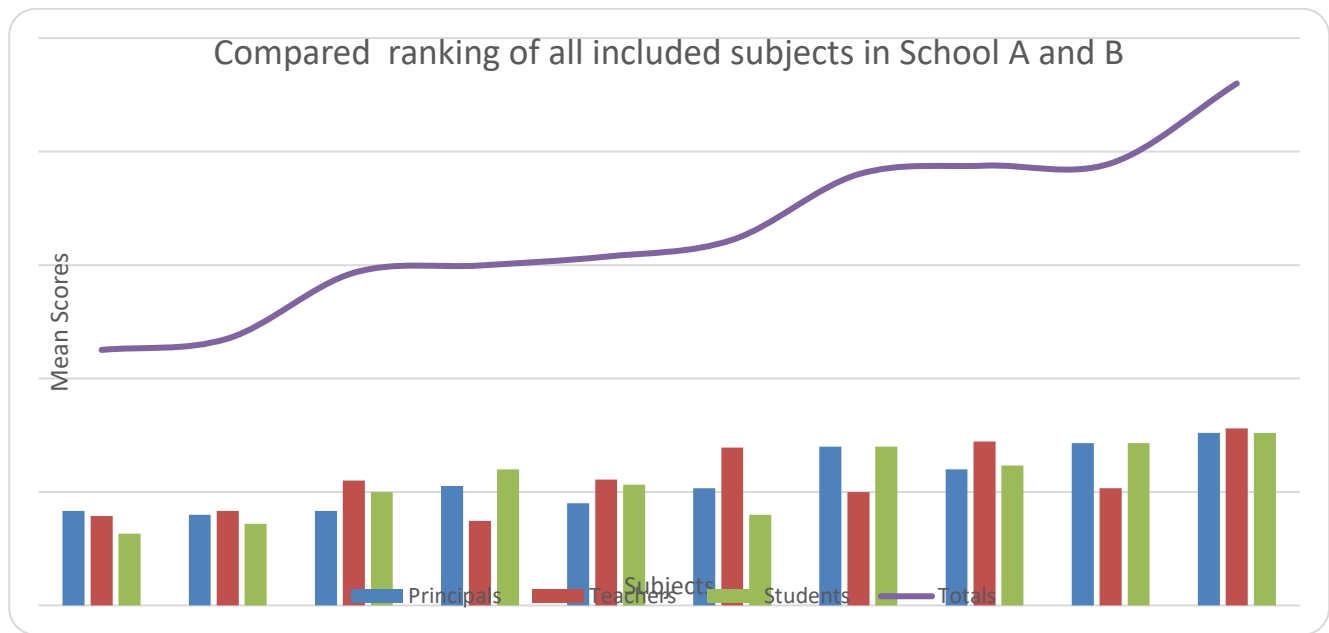
4.6.2 Categories of life skills

The mean score of the teacher's and principal's perception of the influence of the 3 different categories of life skills (ref; Fig.4.5) have on the development of students life skills for CC adaptation in secondary school reveal a trend, where Category 1; "Agriculture" achieved the highest mean score, followed by Category 3; "Economy" and lastly Category 2; "Livestock Husbandry" achieving the lowest mean scores.

Fig. 4.5 shows a comparison between teachers' and principals perceptions of the influence of the 3 different categories of questions on students' life skills for CC adaptation in secondary school.

Figure 4.5
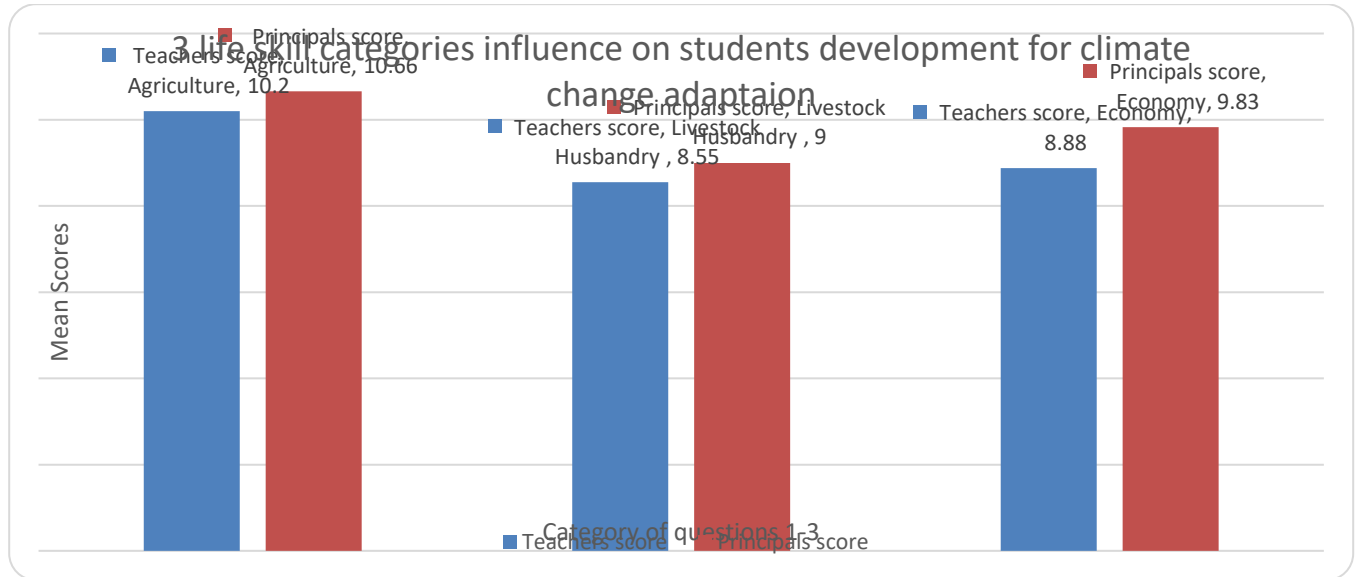
Teachers and principals score the life skill category "Agriculture" highest at a mean of 10.2 and 10.66 respectively. This is followed by the life skills category "Economy" and lastly by the category "livestock Husbandry" which achieved a mean score of 8.55 and 9 respectively.

Agriculture is the most prominent subject across data analysed from teachers' perception of their own subjects influence on student's life skills development (without direct comparison to other subjects), (Ref; Fig. 4.10) in the subject ranking done by teachers, principals and students and in addition, emerges as the best scoring category of questions. This study, therefore, concludes that the subject of Agriculture has the highest level of influence on students' life skills development for CC adaptation of the subjects of consideration. This finding contradicts previous research from Kariuki (2017) who concluded that

Geography was identified as the carrier subject for CC in the Kenyan secondary curriculum. However, the study did not investigate the development of life skills, but rather content, so a direct comparison would be misleading. The subject of Christian Religious Education emerges as the subject with the lowest level of influence on student's life skills development for CC adaptation of the subjects of consideration, due to its lowest ranking of subjects (ref) and subsequently individual score from teachers who teach the subject (without direct comparison to other subjects). (Ref; Fig.4.10) The remaining subjects' ranked influence on students' life skills development is distributed as illustrated in Figure 4.4.

4.6.3 Extracurricular Activities

Analysing Extracurricular activity's influence on student's life skills development for CC adaptation requires a separate paragraph, due to the fact that only some students actively participated in the activities (=F)Table 4.12 shows the percentage of students that have participated in Extracurricular activities; (School A; Brightstar Integrated Secondary School) and (School B; Kalobeyei Settlement Secondary School.)

Table 4.12; Percentage of students that have participated in Extracurricular activities

Student's Participation rates in Extracurricular activities	Form 1	Form 2	Form 3	Form 4
School A	12	11	30	9
School B	5	18	11	17
F= Total students participating in Extracurricular Activities	17	29	41	26
N= Students enrolled	254	215	224	146
Percentage of participating students	6.69%	13.49%	18.3%	17.8%

The students who participated in extracurricular activities were asked to self-assess their achieved levels of life skills development for CC adaptation from Extracurricular Activities. The study issued a questionnaire with a 5 step Likert-type scale answer options, which the respondents used to self-assess their own skills for CC adaptation. Respondents had the option of answering each category of questions with the self-rating options of; Very Low, Low, Average, High and Very High. This enabled the extraction, tabulation and interpretation of the responses from the questionnaire, by assigning a score to each self-rating option ranging from 1-5, where Very Low was scored 1 point and Very High scored 5 points respectively. From these scores, quantitative data has been extracted.

Table 4.13 shows how students self-assess their achieved levels of life skills development for CC adaptation from Extracurricular Activities.

Table 4.13; Students' self -assessment scores Form 1-4

Students' self-assessment scores, Ex-curricular activities	Very Low	Low	Average	High	Very High	F=
Form 1	6	7	2	1	1	17
Form 2	3	9	12	3	2	29
Form 3	12	8	17	2	2	41
Form 4	7	9	10	0	0	26
Total	28	33	41	6	5	113

Notably the categories Very Low, Low and Average attracted the majority of scores, indicating that students experience an overall low generation of life skills developed. This can be attributed to the prevalence of limited choices for Extracurricular activities, with school A reporting one activity (tree planting) and school B also reporting only one relevant choice of activities (agriculture club) as the only choices available. This reveals an opportunity for teachers of extra- curricular activities to provide more focus and content related to CC in extracurricular activities. Teachers of extracurricular activities and

principals were asked to determine to which level extracurricular activities influence students' life skills development for CC adaptation in secondary school. The respondents were issued with a 5-step Likert type scale with the options of; Very Low, Low, Average, High and Very High. This enabled the extraction, tabulation and interpretation of the responses from the questionnaire, by assigning a score to each self-rating option ranging from 1-5, where Very Low was scored 1 point and Very High scored 5 points respectively. From these scores, quantitative data has been extracted.

Fig; 4.6 shows extracurricular teachers' and principals' scores of how they perceive the subject of extracurriculars' influence on the development of secondary students' life skills from Form 1-4.

Figure 4.6
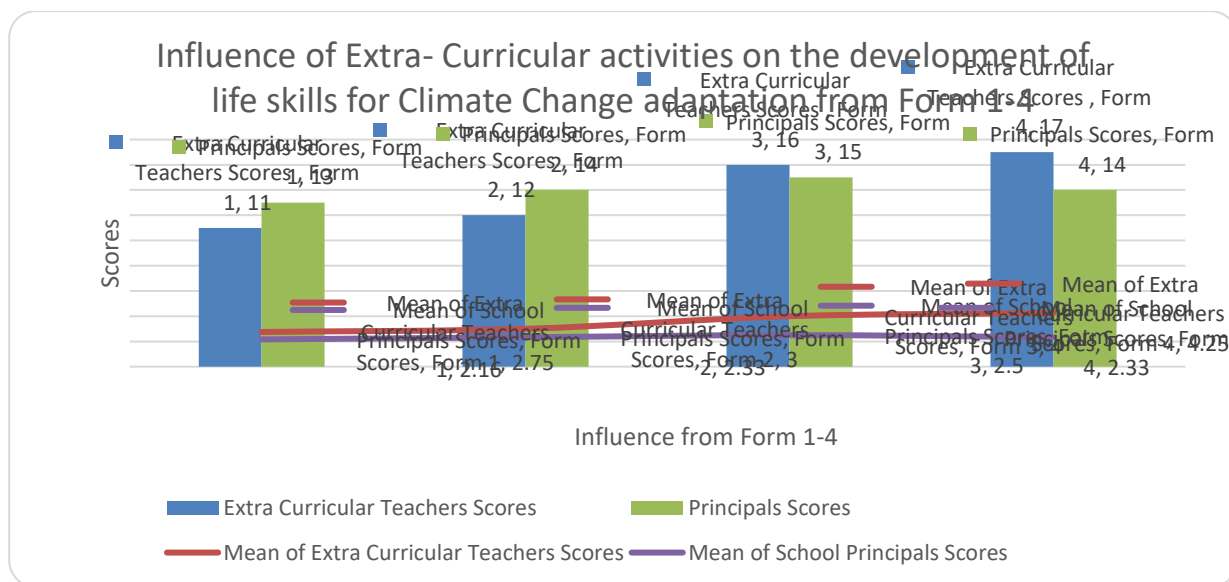
Extra-curricular teachers score their subject as having a larger influence in Forms 1,3 and 4, where principals score the subject higher than the teachers only in Form 2. The mean scores indicate that principals generally rate the influence of extracurricular subjects lower than the teachers. As we have

seen in other teachers rating of additional subjects (not extracurricular activities) the higher rating by teachers than by their principals is a trend permeating the study. Principals mean scores decline in influence in Form 4 down from a mean score of 2.5 in Form 3 to a mean score of 2.33 in Form 4. In contrast, extracurricular teachers indicate a steady rise in influence from 2.75 in Form 1 to 4.25 in Form 4. Given how students score their achieved levels of life skills development for CC adaptation from Extracurricular Activities in Form 1-4, combined with observing principals' scores in Fig 4.6, the influence of Extracurricular activities on the development of secondary students' life skills for CC adaptation is low, albeit teachers of the subject score the influence slightly higher than students and principals. This reveals a picture that mirrors findings in the literature reviewed that teachers tend to lack both awareness and do not sufficiently incorporate CCE in the curriculum, or indeed in extracurricular activities. In addition, only a limited number (Ref. Table 4.12) of the students have participated in the activities offered. Observing this, combined with the limited choice of extracurricular activities available for students, this study concludes that; the influence of extracurricular activities, on secondary students' development of life skills for CC adaptation is insignificant.

4.7 Research Objective 3.

The third research objective was to determine to what extent activities by NGOs and UN agencies, influence students' development of life skills for CC adaptation in secondary schools. The data under analysis relate to the intervening variable; (UN agencies and NGO education programs that include CC content) and determine the intervening variables' possible influence on the dependent variable.

4.7.1 Respondents' awareness of NGO/UN activities in Kalobeyei and environs

Students were asked to indicate if they are aware (YES) or not (NO) of ongoing programming by NGOs and UN agencies, which are accessible to secondary students in Kalobeyei and its environs, who can develop students' life skills for CC adaptation.

Table: 4.14 show how many students which have answered "YES" to be aware of ongoing programming by NGOs and UN agencies, which are accessible to secondary students in Kalobeyei and its environs, who can develop students' life skills for CC adaptation.

Table 4.14; Students' awareness of NGO/UN programs. (School A; Brightstar Integrated Secondary School) and (School B; Kalobeyei Settlement Secondary School)

Students' awareness of NGO/UN programs	School A; N=	Yes (%)	School B; N=	Yes (%)
Form 1	110	19.09%	144	54.86%
Form 2	106	10.37%	109	44.04%
Form 3	109	25.68%	115	43.48%
Form 4	68	23.53%	78	52.56%
Total	393		446	

The table shows that students' awareness of NGO/UN programs is notably higher in School B than in School A in all four forms. This points to differing school policies in the exposure of students to UN/NGO programming.

Table 4.15 shows how many teachers and principals who have answered "YES" to being aware of ongoing awareness of ongoing programs by NGOs and UN agencies, which are accessible to secondary students in Kalobeyei and its environs, which can develop students' life skills for CC adaptation.

Table 4.15; Awareness of principals/ teachers of programs by NGOs and UN agencies (School A; Brightstar Integrated Secondary School) and (School B; Kalobeyei Settlement Secondary School.)

Awareness principals, teachers of programs by NGOs and UN agencies	Schoo l A; (F=)	N	F %	Schoo l B; (F=)	N	F %
Teachers	5	9	55.55 %	7	9	77.77%
Principals	2	3	66.66%	3	3	100%
Total	7	12	58.33%	10	12	83.33%

The majority of both teachers and principals have indicated positive awareness of UN/NGO programming which can develop students' life skills for CC adaptation, which is accessible to students. This is a positive sign to note. Teachers at School B constitute the largest group of which have indicated awareness of 77.77% of ongoing programming by NGOs and UN agencies in Kalobeyei or environs. In comparison, only 55.55% of the teachers in school A indicated awareness. In school, A only 66.66 of the principals demonstrated awareness in comparison with 100% in school B. This indicates that teachers' and principals' awareness of NGO/UN programming has an influence on the awareness of their students and on the participation rates of their students in programming which can develop students' life skills for CC adaptation. The researcher observes this as an important indicator of the awareness that cascades from teachers/ administrators to students. This represents an opportunity for further investigation and the possibility for a positive policy shift in schools with lower awareness scores.

4.7.2 The influence of UN/NGO activities on the development of students' life skills for CC adaptation

Personnel from UN agencies and NGOs were asked to score their program levels of influence on students' life skills development for CC adaptation in secondary school. The respondents were issued with a 5-step Likert type scale with the options of; Very Low, Low, Average, High and Very High. This enabled the extraction, tabulation and interpretation of the responses from the questionnaire, by assigning a score to each self-rating option ranging from 1-5, where Very Low was scored 1 point and Very High scored 5 points respectively. From these scores, quantitative data has been extracted.

Table 4.16; NGO/UN self-assessment of life skills categories

NGO/UN self-assessment of life skills categories	Category 1; Agriculture	Category 2; Livestock Husbandry	Category 3; Economy	Total Categories
FAO	12	13	8	33
Windle Trust	6	7	5	18
AAHI	10	12	9	31
SwicssContact	4	5	8	17
WFP	4	4	3	11
Total score	36	41	33	110

The table 4.16; lists the scores in 3 questionnaire categories from UN/NGO personnel, who were asked to indicate the levels of influence that their programs have on students levels of life skills for CC adaptation in Kalobeyei. FAO emerged as the organisation that has the highest influence, with a total

score of 33 while WFP recorded the lowest scores at 11, considering all categories. This is likely not a coincidence as FAO has directly cited that the objective of their programming includes discussions on the topics of climate change, its impact on agriculture and strategies for CC resilience in agricultural management. The category of questions; "Livestock Husbandry" was scored as having the highest influence at 41, followed by "Agriculture" with 36 scores and the category with the least influence is "Economy with 33 scores.

Table 4.17 lists the scores of UN/NGO personnel, who were asked to indicate the levels of influence that their programs have on students' development of life skills for CC adaptation in Kalobeyei in Forms1,2,3 and 4.

Table 4.17; NGO/ UN self-assessment of influence in Form 1-4

NGO/ UN self-assessment of influence in Form 1-4	Form 1	Form 2	Form 3	Form 4	Total Form 1-4
FAO	4	4	5	4	17
Windle Trust	2	3	4	3	12
AAHI	3	3	3	3	12
SwicssContact	1	1	2	2	6
WFP	3	3	4	3	13
Total score	13	14	18	15	60

The influence of UN/NGO's programming rises from a score of 13 in Form 1, to 18 in Form 3, whereafter the score drops to 15 in Form 4. FAO scored the highest influence, with a total score of 17 while SwissContact recorded the lowest score at 11, considering all forms. Students who have participated in UN/NGPO programs were asked to self-assess their achieved levels of life skills for CC adaptation which they have gained from the participation. The study issued students a questionnaire with 5- step Likert-type scale answer options, which the respondents used to rate their levels own skills for CC adaptation. Respondents had the option of answering questions with the self-rating options of; Very Low, Low, Average, High and Very High. This enabled the extraction, tabulation and interpretation of the responses from the questionnaire, by assigning a score to each self-rating option ranging from 1-5, where Very Low was scored 1 point and Very High scored 5 points respectively. From these scores, quantitative data has been extracted.

Figure 4.7
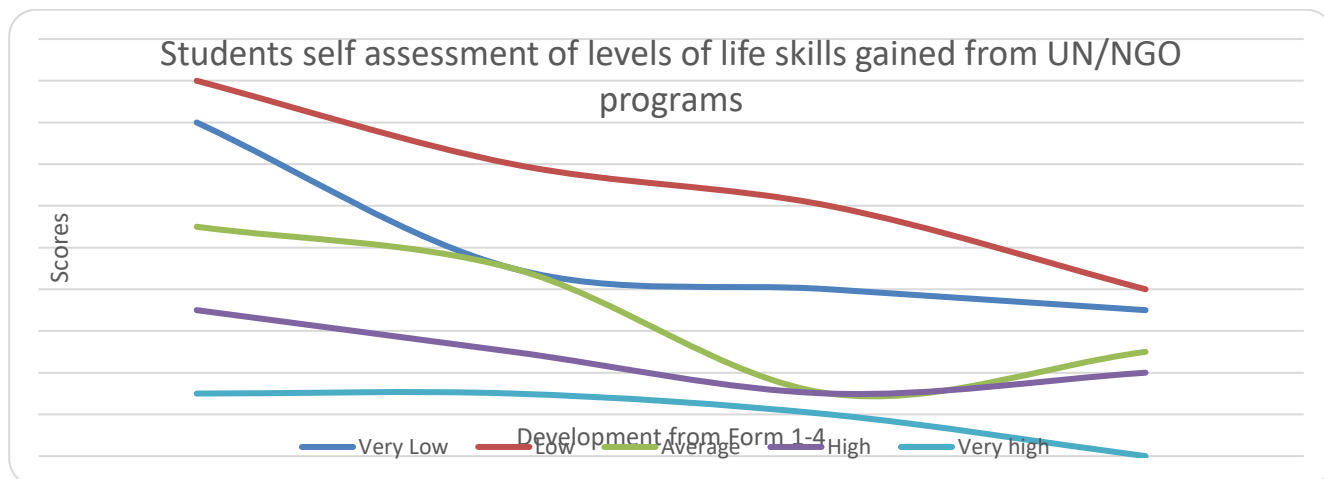
Students self assessment of levels of life skills gained from UN/NGO programs

Out of the total population of 839 students, only 145 (17.28%) students have participated in programs that support the development of life skills for CC in Kalobeyei. Fig. 4.7 shows these students (N=145) self-assessment of the levels of life skills for CC adaptation, which they have gained from participation in UN/NGO programs outside of their school. Fig 4.7 reveals a general downwards trend in scores from Forms1-4. The majority of scores were placed on "Low" with a total score of 52, while "High" and "Very High" only count for scores of 19 and 8 respectively. This shows that students' own assessment of the levels of life skills gained from NGO/UN programs is low. NGOs and UN agencies clearly have the opportunity to improve not only awareness of their programs but also to develop education strategies that can positively impact these results. In comparison teachers and principals were asked about their opinion of the levels of influence that UN/NGO programs have on students' development of life skills for CC adaptation on aggregate in secondary school. The respondents were issued a 5-step Likert type scale which had a choice of; Very Low, Low, Average, High and Very High. This enabled the extraction, tabulation and interpretation of the responses from the questionnaire, by assigning a score to each self-

rating option ranging from 1-5, where Very Low was scored 1 point and Very High scored 5 points respectively. From these scores, quantitative data has been extracted.

Fig 4.8 shows how the principals and teachers score the levels of influence that NGO/UN programs have on students' levels of life skills for CC adaptation in Kalobeyei higher than the students. The dominating entry was "High" which achieved the highest score of 2 and 5 from both principals and teachers alike. Notably, this opinion differs sharply from the students. However, these scores are indicative of an opinion, more than actual knowledge, as no principals or teachers have taken part in the organisation's programming.

Fig. 4.8

Teachers and principals opinion on the influence of UN/NGO programs on the development of life skills for CC adaptation in from 1-4
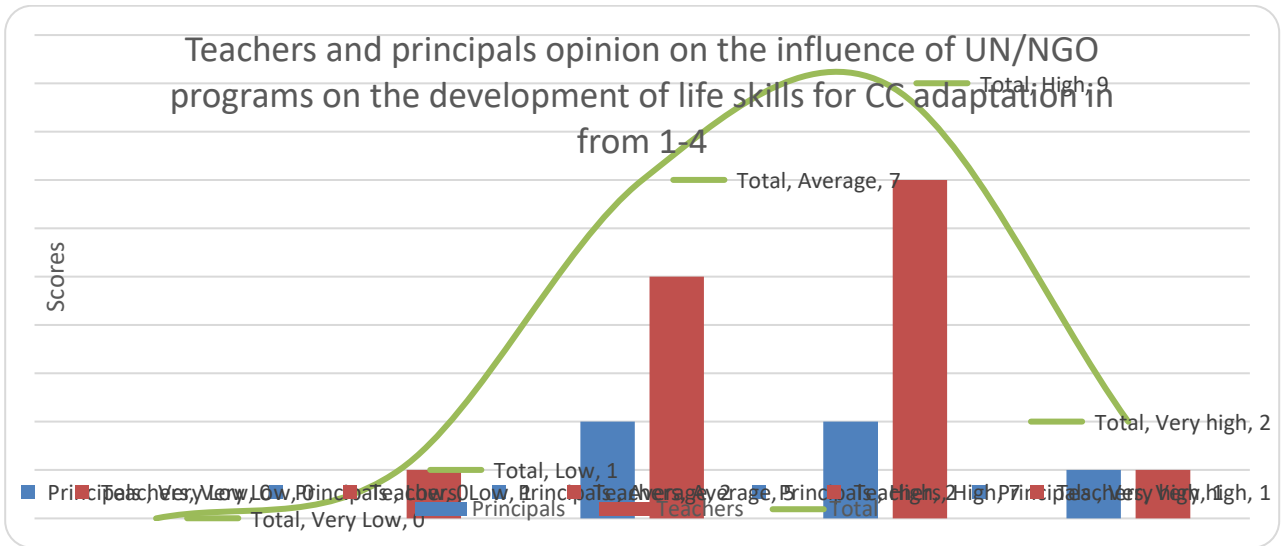
Overall, this study concludes that UN/NGO programming has a limited influence on the development of life skills for CC adaptation, based on students' own self-rating results (Ref; Fig 4.7) and the fact that only 17.28% actually have participated in these programs. To add to the conclusion, the study shows that only some and not all of the programs sampled have a high influence, further diminishing the overall impact.

A trend visible throughout Form 1-4 was that the category "Agriculture" consistently achieved the largest difference between the anchoring vignette and the questionnaire. The curriculum is likely not influencing this trend. This finding concurs with a study by UNHCR (2018) which details that WFP and FAO established 2,850 kitchen gardens in Kalobeyei for refugees to produce vegetables for both sale and consumption. The study concludes that; although such activities are not directly aimed at secondary education, it is likely that secondary students have benefitted and gained skills, by participation and as part of the general community. If the curriculum provided adequate learning opportunities for developing life skills for CC adaptation in the subject of Agriculture, then the

difference in points would likely reveal a narrower gap in points. Another key finding from Chapter 4 is; that the mean score from the questionnaires reveals a limited rise in the curve of life skills for CC adaptation, from Forms 1-4. This reveals a trend of a limited rise in the development of LS for CC adaptation between Form 1-3 is observed before tapering off in Form 4. This indicates that the curriculum has limited content across subjects which offers students the opportunity to grow their life skills for CC adaptation. This trend concurs with findings from The East African Community Climate Change Master Plan (2011), which asserts that; the "Curricula of most developing countries, especially in Africa, show a critical shortage of CC content at all educational levels from primary to tertiary levels." A study by Kariuki (2017) concurs with this argument by concluding that CC content in the Kenyan secondary school curriculum is inadequate. The study further concludes that the subject of Agriculture has the highest level of influence on students' life skills development for CC adaptation of the subjects of consideration. This finding contradicts previous research from Kariuki (2017) who concluded that Geography was identified as the carrier subject for CC in the Kenyan secondary curriculum. However, Kariuki (2017) does not exclusively investigate the development of life skills for CC adaptation, but rather CC content in subjects, so a direct comparison would be misleading. The subject of Christian Religious Education emerges as the subject with the lowest level of influence on students' life skills development for CC adaptation. The influence of extra-curricular activities on the development of students' life skills for CC adaptation was found to be low, albeit teachers of the subject score the influence slightly higher than students and principals. This finding concurs with Litus (2012) who argues that the lack of teacher knowledge of CC remains a barrier to delivering effective CCE. In addition, this study found that UN/NGO programming has a limited influence on the development of life skills for CC adaptation. Since no previous studies have undertaken a combined

assessment of multiple UN/NGOs influence on the development of life skills for CC adaptation in this

context, these findings constitute a new addition to the current body of knowledge on this subject.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the study, a summary of findings and a discussion of key findings. The chapter also presents conclusions drawn from the study and recommendations for policy development.

5.2 Summary of Study

This study sought to establish the influence of secondary school curriculum on students' development of life skills for climate change adaptation, in Kalobeyei Integrated Settlement, Turkana West, Kenya. The study was guided by three main objectives. The first objective of the study was to assess students' levels of acquired life skills for CC adaptation and examine how trends in those levels develop in forms 1-4. The second research objective was to investigate how individual subjects in the curriculum and extra-curricular activities influence the development of life skills for CC adaptation in Kalobeyei. The third research objective was to determine to what extent activities by NGOs and UN agencies, influence students 'development of life skills for CC adaptation in secondary schools. The research design used is a descriptive survey design. The study used purposive sampling for data collection with a sample size of 889 respondents and received a 98.09% successful return rate. For the student population, data collection was undertaken in relevant classrooms in Form 1-4 in Kalobeyei Integrated settlement. Present throughout the data collection exercises was the researcher and a team of research assistants and interpreters were available for support. This real-time style of data collection and support for the respondents affected the high rate of return rate. Additional data collection was undertaken in the

relevant school offices and NGO/UN compounds and offices. The main instruments of data collection were questionnaires and for the student population an additional anchoring vignette. The majority of respondents were male (79.70%) while 20.30% were female. A large majority of the respondents (83.95%) have origins in South Sudan, while Burundians were the least represented at 1.50%.

5.3 Summary of Findings - Research Objective 1

The first objective of the study was to assess students' levels of acquired life skills for CC adaptation and examine how trends in those levels develop in forms 1-4. The study found that students' levels of life skills for CC adaptation, developed only limited. The level curve is only rising from 23.71 to 26.4 or the equivalent of 10.19% in mean scores from Form 1-4. That reveals a yearly rise in student levels of only 2.56 %.In addition, the study established that mean scores from the anchoring vignette and questionnaires, both develop upward from Form 1 to Form 3 respectively before dropping in Form 4. This indicates a trend of a limited rise in the development of LS for CC adaptation, between Form 1-3 before tapering off in Form 4. This trend is also apparent in teachers and principals' assessment of the development of life skills from Form 1-4, also indicating a rising development in form 1-3 followed by a drop in Form 4. The study also found that across forms1-4, the students generally scored higher on the anchoring vignette and lower on the questionnaire, revealing that their achieved skills for CC adaptation are more developed than rated themselves on the questionnaires. The difference between the questionnaire mean scores and the anchoring vignette mean scores develop downwards from 6.94 to 5.32 from Form 1 to 4, revealing a nonlinear development over the four years, albeit indicating a downwards trend. This indicates that as students progress through Form 1-4, the ability to accurately score their own levels of LS for CC adaptation improves. The life skills concerned with the study were

categorized into 3 categories and identified as the most impacted by CC in Kalobeyei. Category 2; "Livestock Husbandry" emerged as the category where students in Form 1-4 have the best developed LS for CC adaptation. This was followed by category 1; "Agriculture" and the weakest development of LS for CC adaptation was observed in category 3; "Economy".

5.3.1 Research Objective 2

The study sought to investigate how individual subjects in the curriculum and extracurricular activities influence the development of life skills for CC adaptation in Kalobeyei. The study concluded that the subject of Agriculture has the highest level of influence on students' life skills development for CC adaptation of the subjects of consideration. In addition, the life skill category; "Agriculture" emerged as the best scoring of the category of life skills examined. The subject of Christian Religious Education emerges as the subject with the lowest level of influence on student's life skills development for CC adaptation of the subjects of consideration. The remaining subjects' ranked influence on students' life skills development is distributed as illustrated in Figure 4.4. Given how students score their achieved levels of life skills development for CC adaptation from extracurricular activities in Form 1-4, combined with observing principals ' scores (Ref. Fig; 4.6) the influence of Extracurricular activities on the development of secondary students' life skills for CC adaptation are low, albeit teachers of the subject score the influence slightly higher than students and principals. The study also established that only a limited number (Ref. Table 4.12) of the students have participated in Extracurricular activities. Observing this, combined with the limited choice of extracurricular activities available for students, this study concludes that; the influence of extracurricular activities on secondary students' development of life skills for CC adaptation is insignificant.

5.3.2 Research Objective 3

The third research objective was to determine to what extent activities by NGOs and UN agencies, influence students' development of life skills for CC adaptation in secondary schools. The study established that students, principals and teachers' awareness of NGO/UN programs is notably higher in School B than in School A. This points to differing school policies in the exposure of students to UN/NGO programming. The study found that teachers' and principals' awareness of NGO/UN programming has an influence on both awareness of their students and participation rates of their students in UN/NGO activities which can develop students' life skills for CC adaptation. Out of the total population of 839 students, only 145 (17.28%) students have participated in programs that support the development of life skills for CC in Kalobeyei. These students' self-assessment of their achieved levels of life skills for CC adaptation, gained from UN/NGO activities remain low. FAO emerged as the organisation, which had the highest influence on students' life skills for CC adaptation and SwissContact emerged as the lowest influencer. The organisation's assessment of the influence that they have on students' development of life skills for CC adaptation rises from Form 1-3 and drops in Form 4. The study revealed that UN/NGO programming has a limited influence on the development of life skills for CC adaptation, based on students' own self-rating results and the fact that only 17.28% actually participated in these programs. Adding to the findings, the study shows that only some of the programs sampled have a significant individual relevant impact, further diminishing the overall influence.

5.4 Conclusion

The study concluded that secondary students' levels of life skills for CC adaptation in Kalobeyei undergo a total limited rise of 10.19% from Form 1 through Form 4. That equals a mere 2.56 % yearly rise in

levels of life skills for CC adaptation gained per year that students spend in high school. A gradually rising influence of the curriculum on the development of students' life skills for CC adaptation was recorded from Form 1-3 whereafter a noticeable decline of the curriculum's influence was revealed in Form 4. Of the 10 subjects that the study examined, the subject of Agriculture has the highest level of influence on students' life skills development for CC adaptation. The subject of Christian Religious Education emerged as the subject with the lowest level of influence on students' life skills development for CC adaptation of the subjects of consideration. Of the three categories of life skills examined (Agriculture, Livestock Husbandry and Economy) the life skill category; "Agriculture" emerged as the most influential category. The influence of Extracurricular activities on students' levels of life skills for CC adaptation was examined and shown to be insignificant. The presence and influence of relevant NGO organisations and NGO programs which included CC education and are accessible to secondary students were assessed for influence on students' development of life skills. The influence of these programs was shown to have limited influence, based on students self – assessment of skills gained and a limited amount of students participating in the programs. The study concluded that the independent variable (subjects in the curriculum that include CC content) and (extracurricular activities that include CC content) has limited influence on the dependent variable (Students development of life skills for climate change adaptation). The study also established that the intervening variable (UN agencies and NGO education programs that include CC content) has a limited influence on the dependent variable.

5.5 Recommendations

The study has arrived at the following recommendations, with the aim of increasing the levels of students' life skills for climate change adaptation in secondary schools in Kalobeyei;

i. To formally integrate climate change education into the Kenyan secondary school curriculum.

ii. To contextualise climate education in the curriculum to respond to the challenges posed by climate change in Kalobeyei.

iii. To strengthen climate change education in secondary schools, especially in Form 4

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APPENDICES

Appendix A.

Letter of Introduction

Study Title: INFLUENCE OF SECONDARY SCHOOL CURRICULUM ON STUDENTS' DEVELOPMENT OF LIFE SKILLS FOR CLIMATE CHANGE ADAPTATION IN KALOBEYEI SETTLEMENT, TURKANA WEST, KENYA

Researchers: Peter Martinsen, Master of Education, Education in Emergencies student, University of Nairobi

Dear Sir/ Madam

As part of the University of Nairobi, Master of Education program, students are approved to do research and you have been identified as a potential respondent for such research. I would be a great honour for me if you would consider this request for participation in the research, by answering a questionnaire.

Before agreeing to participate in this research, we encourage you to read the following explanation of this study and to subsequently review the Informed Consent Form for your perusal. This study has been approved by the University of Nairobi and the National Commission of Science and Technology. This study is designed to examine the ways how Climate Change Education, impacts Life Skills Development in Secondary Schools in Kalobeyei Settlement, Turkana West, Kenya. Your input would, due to your profession or status add great value to the data collected in this study and we hope for your kind participation. Kind regards, Peter Martinsen – Researcher

Appendix B.

Informed Consent Form

Study Title: INFLUENCE OF SECONDARY SCHOOL CURRICULUM ON STUDENTS' DEVELOPMENT OF LIFE SKILLS FOR CLIMATE CHANGE ADAPTATION IN KALOBEYEI SETTLEMENT, TURKANA WEST, KENYA

Researchers: Peter Martinsen, Master of Education, Education in Emergencies student, University of Nairobi

Dear Sir/ Madam

Participation in the study involves completion of a questionnaire. This questionnaire is specific to your job description. The questions are professional in nature and will not touch on any personal matters.

There are no risks or discomforts that are anticipated from your participation in the study. The respondents should however expect 30- 45 minutes to complete the questionnaire.

Confidentiality

The information gathered during this study will remain confidential in secure premises during this project. Only the researcher will have access to the study data and information. There will not be any identifying names on the questionnaires, they will be coded and the key to the code will be kept locked away. Your names and any other identifying details will never be revealed in any publication of the results of this study. The results of the research will be published in the form of a research paper and may be published in a professional journal or presented at professional meetings. The knowledge obtained from this study will be of great value in guiding professionals to be more effective in the understanding, planning and revision of education concerned with climate change.

Withdrawal without Prejudice; Participation in this study is voluntary; refusal to participate will involve no penalty. You are free to withdraw consent and discontinue participation in this project at any time without prejudice or penalty. You are also free to refuse to answer any question in the questionnaire.

Further Questions and Follow-Up; You are welcome to ask the researchers any questions that occur, either via email or in person. If you have further questions once the questionnaire is completed, you are encouraged to contact the researchers.

Consent:

I_____ (name; please print clearly), have read the above information. I freely agree to participate in this study. I understand that I am free to refuse to answer any question and to withdraw from the study at any time. I understand that my responses will be kept anonymous.

Participant Signature Date

If: (a) you would like a copy of your questionnaire once it is available (b) you are interested in information about the study results as a whole and/or (c) if you would be willing to be contacted again in the future for a follow-up data collection, please provide contact information below:

Check those that apply:

_____ I would like a copy of my questionnaire_____ I would like information about the study results

_____ I would be willing to be contacted in the future for a follow-up data collection exercise.

Write your address clearly below. Please also provide an email address if you have one.

Name: Profession: Email address: Phone Number:

Signature of Respondent:……………………………………………………………….

Appendix C.

Questionnaire for Teachers of Secondary Schools in Kalobeyei Settlement

Study Title: INFLUENCE OF SECONDARY SCHOOL CURRICULUM ON STUDENTS'
DEVELOPMENT OF LIFE SKILLS FOR CLIMATE CHANGE ADAPTATION IN KALOBEYEI
SETTLEMENT, TURKANA WEST, KENYA

Researchers: Peter Martinsen, Master of Education, Education in Emergencies student. University of
Nairobi

Research approval ID/ Number:

Section 1 –The respondent

Subjects taught; (tick box/boxes)

Agriculture	Biology	Chemistry	Physics	History	Christian Religious Education	Geography	Business Studies	Life Skills education	Extracurricular Activities

Indicate the level of influence, that you perceive that your subject has on: Students' development of Life Skills for Climate Change adaptation based on the following scale: 1, No influence 2, Minor influence, 3, Moderate influence 4, Major influence 5, Very High influence.

Section 2- Research Questions

Question 1; (Life Skills for Agriculture).How does teaching Biology influence your students' Life Skills development for Climate Change adaptation through the process of:

A; Teaching about improved cropping practices in Agriculture?	No influence	Minor influence	Moderate influence	Major influence	Very High influence
B; Teaching about water management?	No influence	Minor influence	Moderate influence	Major influence	Very High influence
C; Teaching about Climate Information Systems?	No influence	Minor influence	Moderate influence	Major influence	Very High influence

Question 2;(Life Skills for Livestock Husbandry). How does teaching Biology to influence your student's Life Skills development for Climate Change adaptation through the process of;

A; Teaching about diversification of livelihoods, as an alternative to Livestock Husbandry?	No influence	Minor influence	Moderate influence	Major influence	Very High influence
B; Providing education relevant to Livestock Husbandry?	No influence	Minor influence	Moderate influence	Major influence	Very High influence
C; Teaching about Water Management?	No influence	Minor influence	Moderate influence	Major influence	Very High influence

Question 3; (Life Skills for Economy) How does teaching Biology influence your student's Life Skills development for Climate Change adaptation through the process of;

A; Teaching about Economic diversification?	No influence	Minor Influence	Moderate influence	Major Influence	Very High influence
B; Teaching about Response to market dynamics?	No influence	Minor Influence	Moderate influence	Major Influence	Very High influence
C; Teaching about Climate Information Systems?	No influence	Minor Influence	Moderate influence	Major Influence	Very High influence

Appendix D

Questionnaire for Students of Secondary Schools in Kalobeyei Settlement (Reduced Items)

Study Title: INFLUENCE OF SECONDARY SCHOOL CURRICULUM ON STUDENTS'
DEVELOPMENT OF LIFE SKILLS FOR CLIMATE CHANGE ADAPTATION IN KALOBEYEI
SETTLEMENT, TURKANA WEST, KENYA

Researchers: Peter Martinsen, Master of Education, Education in Emergencies student. University of
Nairobi

Research approval ID/ Number:

Instructions; Rate your personal level of skills by ticking the box that shows the level of skills you can
use to engage in a list of activities. You will rate your level skills based on the following definitions;

Very Low	Low	Average	High	Very High
My skills are not useful, and I would need help.	My skills can be used but I would need support.	Some skills are useful, and I can manage.	I have developed skills and can manage without support.	My skills are very developed, and I can add additional knowledge to the task.

Rate your personal level of skills. Tick the box that shows the **level of skills** you can use to engage in these activities:					
Use improved cropping practices that work well, when planting and harvest seasons are disrupted by extreme weather events.	Very Low	Low	Average	High	Very High
Manage to harvest water, store water for droughts and apply technical solutions to irrigation.	Very Low	Low	Average	High	Very High
Use Climate Information Systems as a tool to plan and manage agricultural activities.	Very Low	Low	Average	High	Very High
Generate other means of income than from livestock raring.	Very Low	Low	Average	High	Very High
Create access to renewable sources of water for livestock, which lasts throughout the dry seasons.	Very Low	Low	Average	High	Very High
Engage in educational activities that can help to get a job outside pastoralism.	Very Low	Low	Average	High	Very High

Appendix E; Anchoring Vignettes to accompany appendix D (reduced items)

Imagine that you have 2 friends in Kalobeyei called George and Rose. George and Rose have asked you to help them to decide if their decisions for the future are wise. Rate George and Rose's level of skills. Tick the box that shows the **level of skills** that you think that George and Rose have used to do the following:					
Rose and George are worried, that the rains are delayed and it can threaten their harvest. George and Rose decide to build a place to harvest and store water and lead the water through pipes that drip onto every plant. What level of skills have Rose and George used to solve the problem?	Very Low	Low	Average	High	Very High
George and Rose have many problems with their cows. The cows get sick, they do not have enough pasture and the price of cows are low. George and Rose decide to wait for the prices of cows to go up, before selling any more cows to buyers. What level of skills have Rose and George used to solve the problem?	Very Low	Low	Average	High	Very High
George and Rose want to increase their income, but the little money they can get on the market, from their cows produce on is not enough for the family. George and Rose decide to try to get more cows to grow their income in the future.	Very Low	Low	Average	High	Very High

Appendix F; Letter of Introduction

UNIVERSITY OF NAIROBI
COLLEGE OF EDUCATION ANDEXTERNAL STUDIES
SCHOOL OF EDUCATION
DEPARTMENT OF EDUCATIONAL ADMINISTRATION AND PLANNING

Telegram: "CEES"

P.O. BOX 30197
OR P.O. BOX 92 -00902
dept-edadmin@uonbi.ac.ke
KIKUYU

OUR REF: UON/CEES/SOE/A&P/1/6
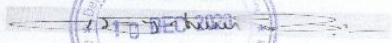
December 10th, 2020

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: <u>PETER MARTINSEN – REG NO. E55/15934/2018</u>

This is to confirm that **Peter Martinsen is** a Master of Education student in the department of Educational Administration and Planning of the University of Nairobi. He is currently working on his research proposal entitled **"Influence of Secondary School Curriculum on Students' Development of Life Skills For Climate Change Adaption in Kalobeyei Settlement Turkana West, Kenya".** His area of specialization is Educational Emergencies

Any assistance accorded to him will be highly appreciated

Jeremiah M. Kalai, PhD
Associate Professor
Chairman
DEPARTMENT OF EDUCATIONAL ADMINISTRATION AND PLANNING

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Appendix H; Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: 509977

Date of Issue: 11/June/2021

RESEARCH LICENSE

This is to Certify that Mr. Peter Anders Martinsen of University of Nairobi, has been licensed to conduct research in Turkana on the topic: INFLUENCE OF SECONDARY SCHOOL CURRICULUM ON STUDENTS' DEVELOPMENT OF LIFE SKILLS FOR CLIMATE CHANGE ADAPTATION IN KALOBEYEI SETTLEMENT, TURKANA WEST, KENYA for the period ending: 11/June/2022.

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Applicant Identification Number

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