National Council for Nomadic Education in Kenya

(NACONEK)

AN ASSESSMENT REPORT ON THE IMPACT OF CLIMATE CHANGE ON THE SUSTAINABILITY OF THE LOW COST BOARDING SCHOOLS IN THE ARID AND SEMI-ARID LANDS AND POCKETS OF POVERTY REGIONS IN KENYA

July 2019

MINISTRY OF EDUCATION
STATE DEPARTMENT OF EARLY LEARNING AND BASIC EDUCATION

NATIONAL DROUGHT MANAGEMENT AUTHORITY

GREEN KENYA INITIATIVE TRUST

EUROPEAN UNION

SUSTAINABLE, EQUITA
NAC
NATIONAL COU
EDUCATI

Compiled and produced by:

National Council for Nomadic Education in Kenya (NACONEK)

P.O. Box 300400-00100

Uchumi House, 6th Floor,

Aga-Khan Walk, Nairobi, Kenya.

Telephone: (+254) 20 2241201/2400424

Fax: (254) 20 225786

Email: info@naconek.ke

Website: www.naconek.ke

ACKNOWLEDGEMENT:

This report is the outcome of a close collaborative effort between the National Council for Nomadic Education in Kenya (NACONEK), National Drought Management Authority (NDMA) and Greening Kenya Initiative Trust (GKIT).

Courage, resilience and commitment among officers involved in this work enabled them to overcome many challenges experienced in the process of conducting this assessment. This work benefited immensely from the contributions, guidance and insights from County Directors of Education, heads of LCBS and communities around these low-cost boarding schools.

We acknowledge members of staff from LCBS who never spared their time, thought and effort to provide pertinent data that was required in this study. We thank all the enumerators drawn from **NDMA, NACONEK, GKIT** and **MOE** for sacrificially gathering information from various stakeholders.

Special acknowledgement goes to the three CEOs from **NACONEK, NDMA** and **GKIT** for their support all through in conceptualization of the assessment, field coordination, data analysis and dissemination of the findings.

Whilst it may not be possible to mention all the individuals and institutions that contributed greatly to the success of this assessment, we would like to thank all those who participated in this assessment in one way or the other. Certainly, their valuable contribution made it possible to attain the objectives of this assessment.

Finally, heartily appreciation is to the partners and collaborators; **Ending Drought Emergencies, Support to Drought Risk Management & Coordination** and a **joint GoK/EU Project** for offering financial and technical support to make this assessment a success.

Harun Mohammed Yussuf, HSC
Secretary/Chief Executive Officer
National Council for Nomadic Education in Kenya

ABSTRACT:

Assessment of Low-Cost Boarding schools (LCBSs) in the Arid and Semi-Arid Lands (ASALs) and pockets of poverty regions of Kenya on the impact of climate change to ensure sustainability was undertaken by a team of officers from NACONEK, NDMA and GKIT. The target population was all LCBs in Turkana, Narok, Kajiado, Garissa, Tana River, Taita Taveta, Kwale and Kilifi Counties. The assessment, which was conceptualized as a proposal entitled "Bridging the Gap" was aimed at establishing Climate Resilient Green Model Schools as centers of focus in developing sustainable home-grown communities in Kenya.

The assessment was premised on the need to protect the environment through institutional arrangements that are essential for economic productive systems and the way of life among communities in ASALs in Kenya. Further, the assessment was driven by the need for promoting sustainable development, coordinating education programs and mobilizing additional financial resources to support investment in education in these regions which could be informed by the findings of this assessment. The assessment was guided by the following objectives; to; assess boarding programs, school infrastructure, nutrition and health practices, environment conservation approaches, climate change relevant adaptive capacity designs/models and food security through climate smart Agriculture in LCBS in ASALs and pockets of poverty regions in Kenya..

The survey research design which was used in this assessment enabled officers to collect data from many respondents across the target counties. Data collection instruments used to gather both quantitative and qualitative data included questionnaires, focus group discussions, document analysis and observation guides. The questionnaire which was the main data collection tool consisted of seven sections; **Demographic Information, Boarding Program, School Infrastructure, Nutrition and Health, Environment Conservation** and **Food Security and Smart Agriculture**. Qualitative data was analyzed thematically and presented in narrative form while quantitative data was expressed inform of charts, graphs and tabulation using the Statistical Package for Social Sciences (SPSS).

The summary of findings per thematic areas were as follows;

a) **Demographic Information** indicated that most schools had no valid registration certificates, title deeds, official postal and email address and were understaffed. Facilities in most schools were not friendly to people living with disabilities and majority of the schools had no green school programs.

b) On **Boarding Program**, 65% of the schools had received regular LCBs grants and 88% indicated that grant did not match the enrolment. According to 76% of the schools, boarding facilities were inadequate, inappropriate and unsafe; learners, especially boys were sharing beds while others slept on the floor.

c) Regarding **School Infrastructure**, in most of the Counties (6), toilets were inadequate, were not friendly to people living with disabilities and were not providing required safety and privacy. Hand washing facilities were inadequate in about 53% of the school while 57% of the schools didn't have clean bathrooms and water was inadequate in 62% of the schools.

d) On **Nutrition and Health**, majority of the schools did not provide balanced diet to learners, 80% had secure and safe food storage facilities and 95% of the schools were close to a health facility. It was noted that 80% of the schools used 60% of its budget on food. .

e) On **Issues of Climate Change**, 50% of the schools were aware of various aspects of climate change. There were reported migrations in search of water and pasture in the counties under study. This had negative impact on teaching and learning processes. In all the counties under study, there was notable (50%) human wildlife conflict brought about by scarcity of resources due to climate change.

f) In line with **Food Security and Smart Agriculture**, it emerged that most day scholars were dropping out of school because of hunger and there were high cases of absenteeism, there was increase in food prices necessitating skipping of meals in the community, many households (70%) consisted 1-6 members and most people were relying on small enterprise businesses and farming which was adversely affected by unpredictable weather patterns. This brought about high dependency on relief from both National and County governments as well as on humanitarian agencies.

Based on these findings, there is need to design adaptation programs for LCBS and adjacent communities to enable them cope with the increasing intensity of impacts of climate change. The Government of Kenya, all stakeholders and specifically the three partners; **NACONEK, NDMA, GKIT** should endeavor to design a well-financed evidence-based strategy to support resilience and improved livelihoods in the target LCBS across the Counties.

TABLE OF CONTENT:

TABLE OF CONTENT:

LIST OF TABLES:

LIST OF FIGURES

ABBREVIATIONS & ACRONYMS:

ASAL	Arid and Semi-Arid Land
BOM	Board of Management
CSA	Climate Smart Agriculture
ECD	Early Childhood Development
FAO	Food & Agriculture Organization
FGM	Female Genital Mutilation
FPE	Free Primary Education
FSE	Free Secondary Education
GKIT	Greening Kenya Initiative Trust
GoK	Government of Kenya
KCPE	Kenya Certificate of Primary Education
KNBS	Kenya National Bureau of Statistics
Kshs.	Kenya Shilling (National Currency)
LCBS	Low Cost Boarding Public (Primary) Schools
MOE	Ministry of Education
NACONEK	National Council for Nomadic Education in Kenya
NDMA	National Drought Management Authority
StARCK+	Strengthening Adaptation & Resilience to Climate Change in Kenya Plus
TSC	Teachers Service Commission
SFP	School Feeding Program

CHAPTER 1:
INTRODUCTION

1.1 Background of the Assessment

The Government of Kenya has initiated many programs to ensure all children access basic education. The Basic Education Act, (2013), part IV (Free and Compulsory Education) Sections 28 and 34 clearly stipulates that every child has a right to free basic compulsory education. Kenya's Arid and Semi-Arid Lands (ASALs), which lie largely in the North and East parts of the Country is characterized with perennial droughts that present major challenges on food security and water. This has brought about high poverty level and nomadic lifestyle among ASALs community which has had negative effects on education.

According to Totally Integrated Quality Education and Training (TIQET) Report of 1999, initiation of LCBS in ASALs was the only way equity and access could be achieved in the Kenya education system. This was premised on the fact that nomadic lifestyle could not fully support learning in day schools. The government of Kenya, through Sessional Paper No.1 of 2005 established LCBS in the ASAL areas so as to save the pupils from long distances to school (putting in mind the nature of the terrain, the few schools and the scattered population), lack of food, trauma from cultural practices and family conflicts, initiation of girls and early marriages.

Further, in 2015, the Government established the National Council for Nomadic Education in Kenya (NACONEK) to steer and coordinate efforts towards provision of quality education in all nomadic communities. Other initiatives to ensure access, retention, completion and transition among learners in ASALs community include; vulnerable children support grants, funding mobile schools, enactment on special education, provision of infrastructural funds and school feeding program. The Government of Kenya has been supporting LCBS with an annual grant of Kshs. 400,000,000 annually. The Government disburses a grant of Kshs. 3000 per child twice per year in addition to the Free Primary Education funding. This grant is meant to cater for the Boarding Program (meeting expenses on equipment, meals, and support staff) in schools within the ASALs and pockets of poverty regions of Kenya.

Although the government has greatly improved access and quality of education to children in nomadic communities, about two million of them aged between 6 and 13 years are still out of school. In an effort to ensure these children are in school and learning, NACONEK is currently collaborating with two other state agencies including NDMA which is under the Ministry of Devolution and the ASALs as well as Greening Kenya Initiative Trust (GKIT) which is under National Treasury to conduct a baseline survey in LCBS in ASALs on the gaps to be filled in order to attain climate resilient green model schools for sustainability.

In order to enhance sustainability of quality education in ASALs there is need to encourage schools including LCBS to address the impact of global warming. This is by changing their attitudes and behavior and helping them adapt to climate change-related trends such as environmental conservation activities, use of renewable energy and embrace climate smart agriculture for increased food security among others. This calls for various studies such as the current one to provide feedback to decision and policy makers for improved quality education in ASALs.

1.2 Objectives of the Assessment

Since climate change is the major driver of poverty, hunger, conflict and in some instances death across the ASALs and in pockets of poverty, the three partners purposed to identify challenges of access, retention, transition and completion rates for targeted learners in these LCBS through this exercise. The assessment was based on the following objectives;

1. Assess boarding programs in LCBS in ASALs and pockets of poverty regions in Kenya in terms of grants received, adequacy and safety of facilities as well as meals provided.
2. Examine availability, adequacy and safety of school infrastructure such as classrooms, toilets, water and electricity in LCBS in ASALs and pockets of poverty regions in Kenya.
3. Assess nutrition and health practices such as SFPs, food security and safety in LCBS in ASALs and pockets of poverty regions in Kenya.
4. Identify best approaches for environment conservation in use of renewable energy, appropriate waste management in LCBS in ASALs and pockets of poverty regions in Kenya.
5. Identify climate change relevant adaptive capacity designs/models (green infrastructures) for ending drought emergencies in LCBS in the ASALs and pockets of poverty.
6. Identify ways of ensuring food security through embracing climate smart agriculture and other initiatives in LCBS in ASALs and pockets of poverty regions in Kenya.

1.3 Limitations of the Assessment

During the assessment, the following limitations were encountered;

1. The security situation in some parts of Turkana and Garissa Counties limited free movements. This made it impossible for assessment team to reach Hulugho Sub County necessitating the exercise to be conducted by the local teams.
2. There were difficulties in reaching some of the sampled schools across the study Counties due to dilapidated roads, rough terrains and broken bridges among other challenges.
3. Some heads of institutions were not willing to bring on board all stakeholders to respond to assessment while led to subjective responses on their side.
4. Misconception of the concept behind LCBS, especially in Ganze Sub County in Kilifi County. The area has more requests from schools seeking the LCB status based uniquely on increasing their performance in National examinations rather than fulfill the overall access, retention, and transition and completion rates of learners in marginalized areas of Kenya.

1.4 Delimitation of the Assessment

It is evident that all primary schools in Kenya could have benefitted from climate resilient green model. However, the assessment delimited itself to LCBS that were receiving grants. This was due to the limited resources in terms of time and finances. Other challenges could include logistics such as structure of the assessment, infrastructural inadequacies as well as huge data to be analyzed.

1.5 Significance of the Assessment

The findings from the assessment will provide meaningful information to all key stakeholders regarding status of education in LCBS and how quality education can be enhanced by embracing various initiatives such as provision of adequate, appropriate and safe infrastructure, use of renewable energy, conservation of environment and attaining food security by use of smart agriculture practices as well as empowering communities in ASALs so that they can support learning. It is hoped that, recommendations made in this report will guide government and other partners to;

i. Provide learners in LCBS with a conducive secure learning environment away from a home characterized by family conflicts and trauma, caused by a hostile environment, cattle rustling, and movement from place to place, FGM and early marriages.

ii. Safeguard the child from backward cultural practices that inhibit learning e.g. cattle rustling and early marriages.

iii. Give the child enough study time that he/she could not have gotten while at home since most families are illiterate and therefore don't take education seriously

iv. Mitigate against the nomadic kind of life i.e. the movement of children from place to place which disrupts learning resulting in dropping out hence low retention rates.

v. Help the child develops holistically; the school environment will help the child grow in all domains.

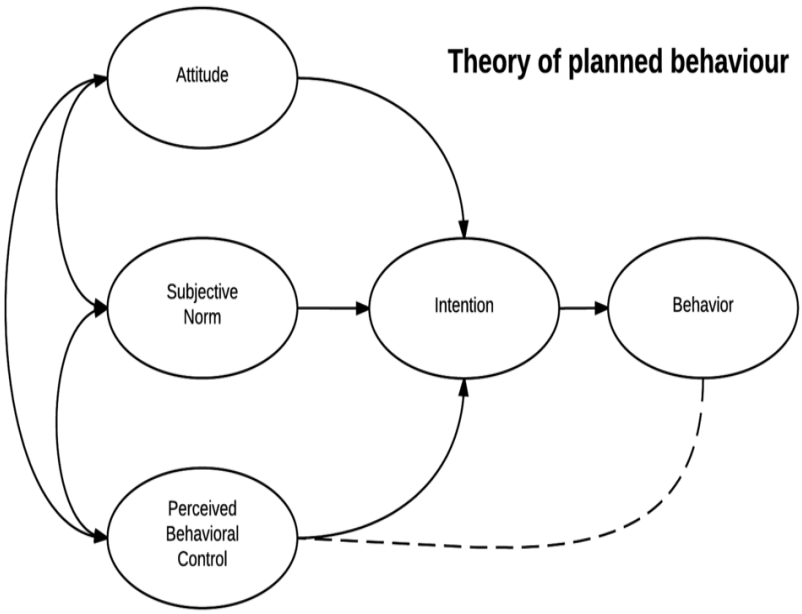
vi. Create equity, by removing the challenges children face which are only unique to this geographical location, hence making education accessible in ASALS just like the way it is in the other parts of the country.

1.6 Theoretical Framework

The assessment was underpinned on the Theory of Planned Behavior (TPB) (Ajzen, 1985) which postulates that Environmental problems like climate changes, pollution and global warming are primarily caused by society and human behavior. In order to solve these environmental problems a series of actions must be taken by society and individuals, because it affects each one of us, directly or indirectly. However, solving environmental problems proves to be very difficult because the changes

induced by a pro-environmental behavior cannot be seen immediately by individuals and very often don't affect them directly (Leary, Toner & Gan, 2011). For example, some people may believe that the negative consequences of global warming are uncertain, and they will not be immediately seen, but rather in a distant future (Clement, Henning & Osbaldiston, 2014; Gifford, 2011). According to TPB attitude and subjective norms are the determinants of intention, and that intention directly affects behavior to some extent. In the TPB, individual intention mainly depends on three determinants: attitude, subjective norms, and perceived behavioral control. These determinants are all based on corresponding underlying belief structures: behavioral beliefs, normative beliefs, and control beliefs. In addition, individual behavior is described as a function of intention and perceived behavioral control. Theory of planed behavior is relevant to this assessment in that if LCBS community as well as the local people could have the right attitude towards issues of climate change, these schools could result to climate resilient green model school which could promote food security and other benefits among the learners and surrounding community. Theory of planned behavior is conceptualized in Figure 1.

Figure 1:



Conceptualization of Theory of Planned Behavior

1.7 Conceptual Framework

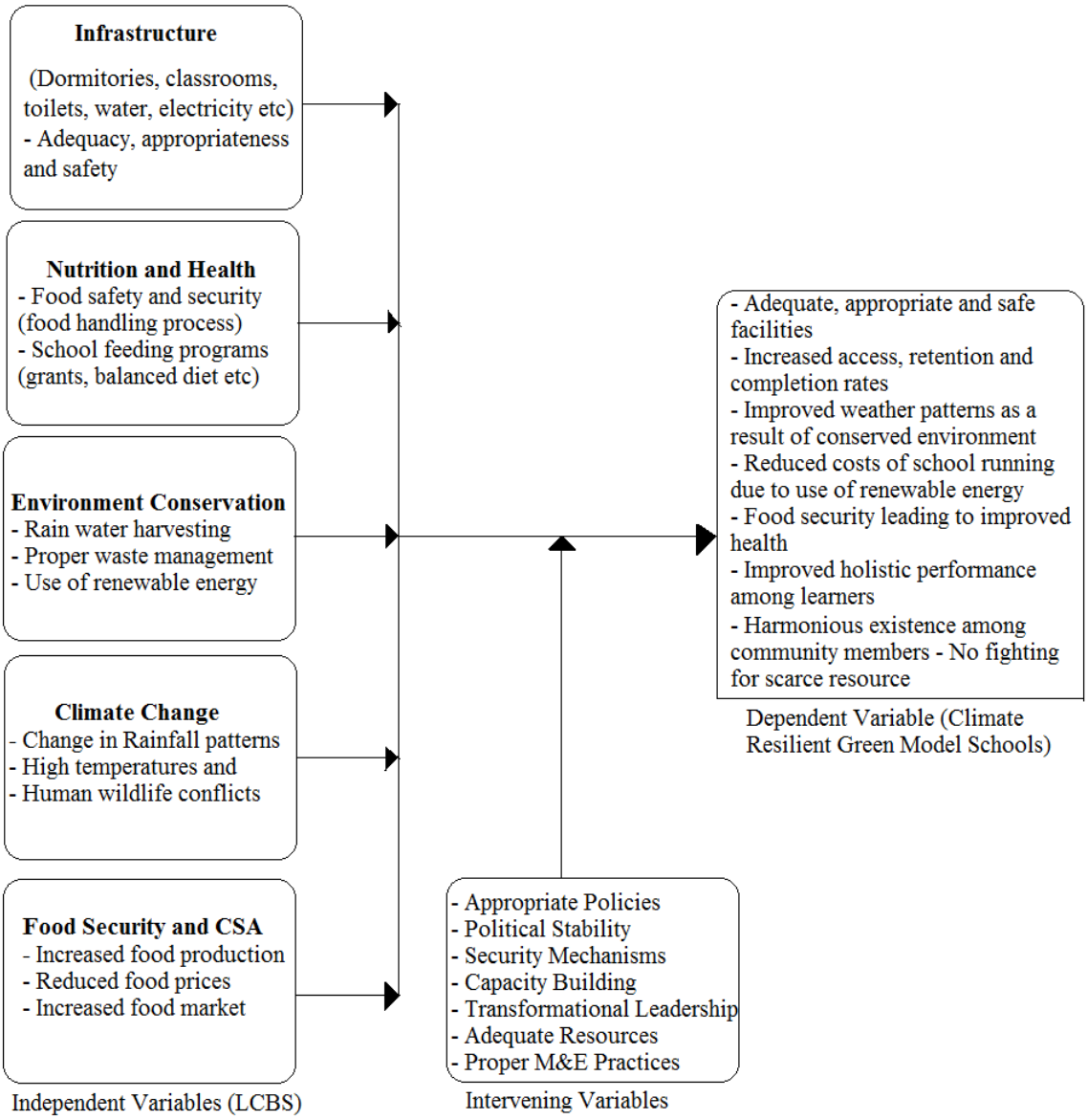


Figure 2:

Conceptualization of Dependent, Intervening and Dependent Variables in the LCBS on the Impact of Climate Change for Sustainability

As indicated in Figure 2, independent variables of the study entailed adequate, appropriate and safe infrastructure for both boarding and tuition areas which are necessary for improved access, retention and completion rates in LCBS. Nutrition and health key to fight malnutrition and other health conditions

conditions which keep learners out of school. Environment conservation is important indicator of success, not only in school but also in the community since it leads to productivity as well as improved lifestyle. Climate change is another independent variable which when well manipulated could lead to reliable rain patterns and improved temperatures leading to reduced human wildlife conflict and reduced migration in search of water and pasture which affects learning negatively. Food security and climate smart agriculture is an important aspect that can increase food production reduce cost of food and increase employment in the community. If these independent variables are improved, it can lead to climate resilient green model school which is the dependent variable of the study whose resultant effects are; increased access, retention and completion rates, improved weather patterns as a result of conserved environment and reduced costs of school running due to use of renewable energy among others. However, there are some intervening variables which if not addressed can also affect the study negatively. They include availability of; appropriate Policies, political stability, security mechanisms and capacity building among stakeholders among others.

1.8 Statement of the Problem

Access, retention, completion and transition rates in education in ASALs are hurdles affecting education system in Kenya, posing a major challenge in the achievement of Sustainable Development Goals (SDGs) as well as other commitments in Kenya Constitution, 2010, Basic Education Act, 2013 and Vision 2030 among others. The Kenyan government has continuously initiated a number of initiatives including provision of grants to support the most vulnerable children, funding mobile schools, enactment of special education policies, provision of infrastructural funds to schools, school feeding programs and FPE.

Reports from the Ministry of Education showed that enrollment rates went up by 90% after the FPE policy was introduced in 2003 (MOEST, 2005). However, dropout rates in public primary schools is still being experienced due to a number of factors such as; high poverty levels, child labor, impact of HIV/AIDS, natural calamities such as floods and droughts, lack of a secure learning environment and socio-cultural activities such as cattle rustling. Female Genital Mutilation (FGM) and early marriages are also factors affecting learning. Based on these challenges, the government decided to construct low-cost boarding schools in ASALS with an aim to increase access and retention in ASAL primary schools; reduce dropout rates and improve academic achievement of pupils.

Most studies, including UNESCO (2010) and various educational reports (The KESSUP report, 2005) and other educational books have mostly dwelt on various ways of improving retention and access but they have not to a great extent examined how improved infrastructure, use of renewable energy, conservation of environment, climate change, food security and smart agriculture can impact education both in schools and communities. It is in this line that this study assessed Low Cost Boarding Schools (LCBSs) in the Arid and Semi-Arid Lands (ASALs) and pockets of poverty regions of Kenya on the impact of climate change to ensure sustainability.

1.9 Operations of Key Terms

Access	Opportunity for a child to gain entry into an educational system ASAL.
Climate Change	A change in global or regional climate patterns.
Climate Change Smart	Agricultural practices that sustainably increase productivity and system resilience while reducing greenhouse gas emissions.
Education	Acquisition of desirable knowledge, skills, values and attitudes necessary for lifelong learning.
Resilience	Refers to the ability to anticipate, withstand and bounce back from external pressures and shocks whether physical, emotional, economic, or related to disaster or conflict.
Mitigation	Refers to the actions that limit the amount and rate of climate change by constraining emissions of greenhouse gases or enhancing their sinks.
Renewable Energy	Comes from natural sources or processes that are constantly replenished.

CHAPTER 2:
REVIEW OF RELATED LITERATURE

CHAPTER 2: REVIEW OF RELATED LITERATURE

2.1 Introduction

This section present literature on the following themes; Boarding Program, School Infrastructure, Nutritional and Health, Environment Conservation, Climate Change and Food Security and Smart Agriculture.

2.2 Boarding Program

Learners like being in school where their basic needs are taken care of. Some children fail to go to school because of hunger and therefore availability of school feeding program sustains children in schools. Muchocho, (2011) noted that ASAL environment at home is not that favorable to the children since there is no room for progressive growth. Children sometimes go without food and sometimes there's exchange of firearms that scare them. In times of drought and other hardships, people are forced to move from one place to another in search of water and green pastures. Some boys as young as 10 years are forced to go and raid while girls on the other hand are forced into early marriages, hence diminishing their future dreams.

Learners from ASALs, through boarding education are afforded an opportunity to excel in academic performance, personal growth and exploration where programs and activities are abundant and where success is celebrated. So, there is need to enhance provision of grants, adequate, appropriate and safe facilities, provision of balanced diet, maintain cleanliness as well as engaging services of trained matrons and security personnel to enhance learning and safety of learners. Therefore, the assessment had one of its objectives on boarding so as to gather information to improve aspects related to boarding in LCBS.

2.3 School Infrastructure

It is evident that school infrastructure has a profound impact on both teacher and student outcomes. With respect to teachers, school facilities affect teacher recruitment, retention, commitment, and effort. With respect to students, school facilities affect health, behavior, engagement, learning, and growth in achievement. Generally, it can be concluded that without adequate facilities and resources, it is extremely difficult to keep children safe and secure in schools and attain high learning outcome.

School infrastructures such as classrooms, laboratories, dormitories, libraries, dining hall, kitchens and special rooms among others are crucial elements of learning environments. There is strong evidence that adequate, appropriate and safe infrastructure facilitates better instruction, improves student outcomes, and reduces dropout rates, among other benefits. Adequate and clean toilets are important component of the overall school health. Children living with disabilities are very likely to be affected at different scales by inadequate and dirty toilets in schools. Adequate, clean and safe water is necessary in schools. Therefore, there is need to have reliable source of water and storage facilities.

2.4 Nutrition and Health

According to a study conducted in Nepal (2019) on school health and nutrition program implementation, impact, and challenges in schools of Nepal: stakeholders' perceptions, nutrition and health initiative in schools is a cost-effective intervention in LCBS. Health and nutrition program in schools provide timely support and preventive measures to improve the health of school children, which can be associated with their cognitive development, learning, and academic performance. Stakeholders at different tiers can play significant roles in the program implementation and its success. Their perceptions are equally important to provide information on the factors influencing the implementation process and help to identify the gaps in the process. However, the evidence is scarce on the school health and nutrition policy and program implementation in developing countries. Not many studies have been conducted to explore effectiveness of school feeding programs, food security and safety as well as observing all health protocol in schools. This study aimed at gathering information to address the identified gaps in LCBS.

2.5 Environmental Conservation

Environmental conservation is the protection, preservation, management, or restoration of natural environments and the ecological communities that inhabit them. Conservation is generally held to include the management of human use of natural resources for current public benefit and sustainable social and economic utilization.

Rainwater harvesting systems for schools are great for educating children about the benefits of conservation of our natural resources. They save money by not wasting water and help to encourage an environmentally responsible attitude in the next generation. However, many schools fail to harvest rainwater as a way of cutting cost as well as conserving the environment. The main objective of the Green School is to create a community in which learners approach Biodiversity in a sustainable and safe way. This is achieved by positively influencing the behavior of children towards environment, focusing on the subjects Biodiversity (school gardens and endangered species), Waste (reduce, reuse and recycle), Water and Energy. The assessment aimed at establishing whether LCBSs are provided with the necessary training, information and materials to implement environment conservation initiatives.

2.6 Climate Change

Climate is an important environmental factor for learning outcomes and well-being of communities in the ASALs and pockets of poverty regions in Kenya. Hence, any major change in climatic conditions is likely to have consequences on learning. However, LCBS can avoid many of these impacts by implementing policies that increase their capacity to cope with this hazard at a school level. The development of policies on climate change touch the areas of interest of several school communities, including those concerned with management of schools, adaptation to climate change, natural hazards, and risk management. Each of these communities has developed their own approach to assess the problem in order to provide the information needed to guide actions within their area of responsibility.

Climate change in Kenya is quite evident indicated by a continuous rise in temperature. Generally, irregular rainfall patterns continue to be experienced with intense downpours causing floods in many parts which appear in cycles with severe droughts. Further, these unprecedented changes in climate have accompanied losses that have already been experienced in the country (Kirimi&Ochieng, 2017). Schools and mostly those in ASALs which are exposed to harsh weather conditions are greatly affected with destruction of lives and properties. It is imperative therefore for school managements to be equipped with knowledge on combating climate change hence the importance of this assessment.

According to Wineman & Mason (2017), the ability to cope with the impacts of weather shocks and natural disasters brought by the effects of climate change depends largely on the household's and institution's resilience, or its capacity to absorb the impact of, and recover from, a shock. It is also true that management structures in LCBS in ASALs lack capacity for such resilience due to inadequate skills and weak financial muscles. It is hoped that this assessment

will bring forth crucial knowledge on how such gaps can be addressed. Strengthening Adaptation and Resilience to Climate Change in Kenya Plus (StARCK+) Programme identifies poverty, weak institutions and under-investment in key sectors as the main factors which stifle Kenya's ability to cope with climate change.

2.7 Food Security and Smart Agriculture

Household food insecurity results from lack of access to enough and nutritious foods for healthy and active life in socially acceptable ways due to economic constraints and other natural and man-made disasters. Findings of various studies also showed that household food insecurity has strong linkage with family socio-economic status like educational background, household income status and having assets like land and livestock (Belachew, 2012).

Household food insecurity not only affects normal physical growth of young children, but also adversely affects their intellectual capacity and social skills. Studies (FAO, 2013) showed that household food insecurity has a significant association with students' poor school attendance. Food insecurity is a common public health problem and major constraints of educational attainments among school children and adolescents in developing countries (UNESCO, 2012). Studies also indicated that students from food insecure households are more likely absent from school compared to their peers from food secure households due to an exposure to infectious disease and socio-emotional difficulties (Matheson, 2002). The findings from this assessment are hoped to assist educators come up with policies and interventions geared to keeping children from ASALs in school as much as possible.

Majority of smallholder farmers in Kenya depend on agriculture for survival (Kabaara, 2015) Building their adaptive capacity and resilience to climate change is key to enable them protecting their livelihoods and ensuring their food security. One way of combating the effects of climate change is through climate-smart agricultural (CSA) practices (FAO, 2013). Promoters of CSA adoption seek to sustainably increase agricultural productivity and incomes by building resilience through adapting to changes in climate and reducing and/or removing Green House Gases (GHGs) emissions relative to conventional practices.

Climate change is a serious threat to local food production and family well-being resulting in malnutrition, hunger and persistent poverty in many regions of Kenya (Lukano, 2017). Despite the multiple benefits of CSAs and the deliberate efforts by the government and development partners to encourage farmers to invest in them, there is still a lack of evidence on farmers' incentives, conditioning factors that hinder or accelerate usage and impact of CSAs on food security status. Thus, an improved understanding of farmers' adoption behavior and the potential welfare effects in terms of food security is important in informing the strategies policy makers and other development partners who could champion in enhancing usage and effectiveness of CSA practices in smallholder production systems. Based on such gaps, this assessment becomes very crucial since the finds could inform on various approaches of combating climate change and embracing of CSA.

CHAPTER 2: REVIEW OF RELATED LITERATURE

Climate change in Sub-Saharan Africa has had a negative impact on agricultural production leading to food insecurity. Climate-smart agricultural (CSA) practices have the potential to reverse this trend because of its triple potential benefits of improved productivity and high income, reduction or removal of greenhouse gases and improved household food security. Hence, we empirically find the determinants of choice and the effect of CSAs on household food security among smallholder farmers in Kenya

CHAPTER 3:
RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

Chapter three presents research design and methodology used in assessing LCBS in the ASALs and pockets of poverty regions of Kenya on the impact of climate change to ensure sustainability. The chapters covers; Research Design, Location of the Study, Target Population, Sampling Procedures, Research Instruments, Validity and Reliability, Data Collection and Analysis Procedures as well as Ethical Considerations..

3.2 Research Design

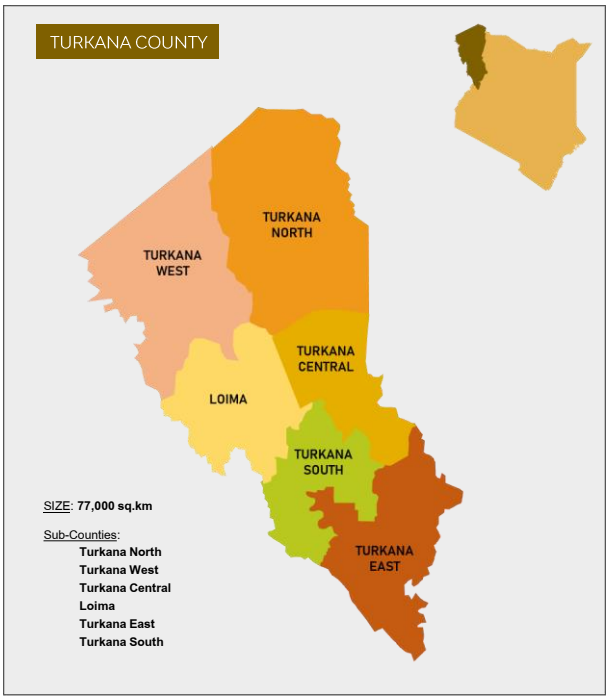
The study used mixed method approach whereby both quantitative and qualitative data were collected. This study employed a descriptive survey research design that allowed researchers to gather data at a particular point in time from a large number of respondents with the intention of describing the nature of existing conditions and standards against which existing conditions can be compared and determined in relations to the existing events. As stated by Kumar (2005) descriptive survey design helped researchers to collect information, summarize, present and interpret the findings for the purpose of clarification and undertaking required interventions.

3.3 Location of the Study

The study was conducted in Turkana, Kajiado, Narok, Garissa, Tana River, Taita-Taveta, Kwale and Kilifi which are some of the Counties where LCBS are located. For a long period of time, these Counties have experienced challenges that have made it difficult for education to infiltrate into the community. Issues of cattle rustling, insecurity, poor infrastructure, inadequate food and lack of water are among the so many reasons as to why this program was initiated.

3.3.1 Turkana County

Turkana County is in the former Rift Valley Province (currently Rift Valley Region) of Kenya. It is the second largest after Marsabit County with an area of 77,000 sq. km. It borders Uganda, South Sudan and Ethiopia Countries. Counties that neighbour Turkana are; West Pokot, Baringo, Samburu Counties and Marsabit. Turkana County has six expansive sub counties namely; Loima, Turkana Central, Turkana East, Turkana North, Turkana South and Turkana West. The County is largely pastoralist with huge



stocks of livestock including cattle, goat, sheep and camel., and for the communities that live near Lake Turkana, they practice fishing. There are pockets farming of maize, sorghum, green grams, cow peas, melons. Charcoal burning is evident across the county. The county is endowed with two rivers: Turkwel and Kerio which support the hydroelectric power generation and irrigation. The county experiences large scale child labour evident through herding, fetching firewood and water, hawking activities. The effects of nomadic life on access to quality education are evidenced by low literacy levels across Turkana County. However, most of the schools are fairly accessible except during flush floods (lagga).

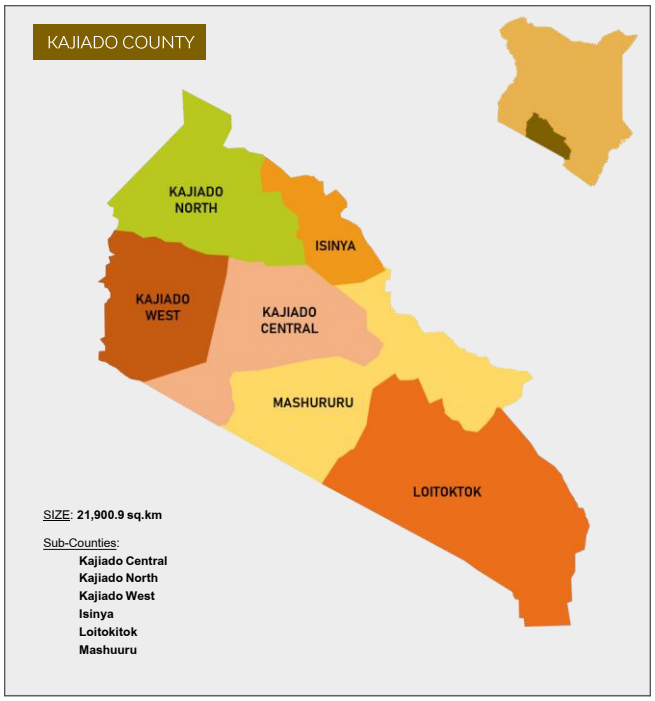
Table 1:

Category	No. of Schools	No. of Boys	No. of Girls	Total Enrolment
Primary				
Public	419	79,274	74,405	153,679
Private	42	5,445	4,982	10,427
Total	461	84,719	79,387	164,106
Secondary				
Public	54	10,077	7,681	17,758
Private	7	683	497	1,180
Total	61	10,760	8,178	18,938

Distribution of Public Primary and Secondary Schools and Pupils' Enrolment per Gender in Turkana County

3.3.2 Kajiado County

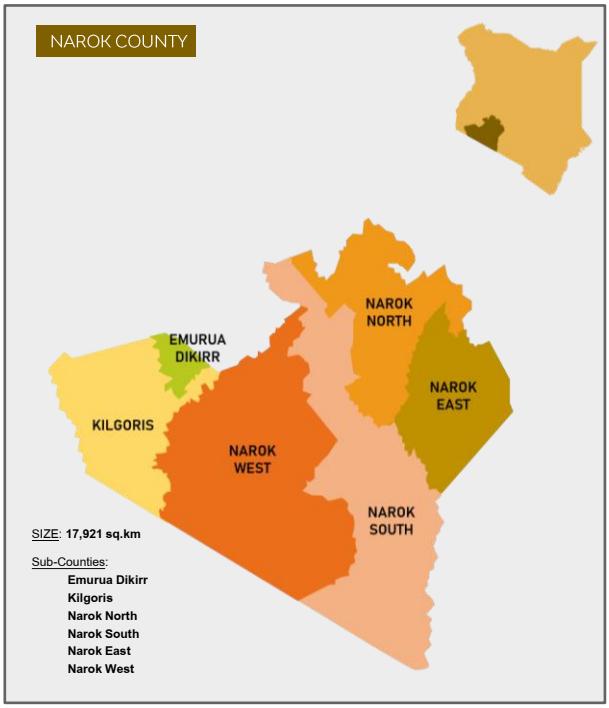
Kajiado County covers an approximate area of 21,900.9 sq. kms. There are 6 sub counties: Kajiado Central, Kajiado North, Kajiado West, Isinya, Loitokitok and Mashuuru. The main physical features of Kajiado are plains, valleys occasional volcanic hills, scarce vegetation in low altitude areas which increases with altitude and rain. Wildlife habitat is a major land occupation. The dominant socio-economic activity is pastoralist with vast land tenure which is both communal and privately owned.



For many years, Kajiado County is prone to perennial drought challenges and flooding effects thus yielding to nomadic life. The county is mainly water stressed where communities cover an average of 10km in search of water. Kajiado County has a population growth rate of 5.5 per cent; total population was estimated at 807,070 with 401,785 being females and 405,245 males as at 2012. The county has Ngong, Kitengela, Ongata-Rongai, Kiserian, Kajiado, Loitokitok, Namanga, Isinya, Sultan Hamud and Ilbisil as the major towns. The current enrolment of the 16 LCBS is 7,888 with a population of 3,312 boys (42%) and 4,574 girls (58%). It is notable that there were more girls enrolled in school (56%) than boys (44%). The stakeholders across the county confirmed that programs on girl child empowerment across the county were highly successful and thus the need to have aggressive campaigns on the status of the boy child. It is twice more likely that the student enrolment of the girls will be higher than the boys in the next coming years if this trend continues to be the same.

3.3.3 Narok County

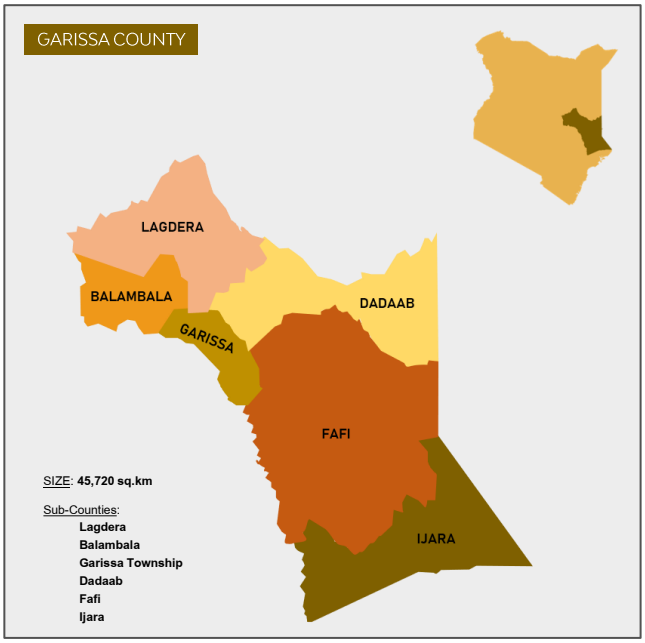
Narok County is situated along the Great Rift Valley. It is named after Enkare Narok, the river flowing through Narok town. It constitutes 6 sub-counties namely: Kilgoris, Narok North, Narok South, Narok East, Narok West and Emurua Dikirr. Narok town is the headquarters of the County and stands as the major centre of commerce in the county. As per the UN study/research for the Kenya Vision 2030, Narok County is marked as one of the fundamental counties for achievement of economic pillar. Key economic contributions are in the tourism sector through the Maasai Mara National Park, located in this county, and the agricultural sector through livestock farming.



Maasai Mara National Park is home to the Great Wildebeest Migration which is one of the "Seven New Wonders of the World". However, Narok County falls among the pockets of poverty regions where educational opportunities have been noted to be under-utilized during phases of transition. In many instances, the Maasai who are mostly nomads, do not have educational opportunities equal to that of their settled counterpart elsewhere like their neighboring Nakuru, Nyamira, Migori and Kisii Counties. For Maasai community, this has resulted in early school leaving, high school drop-out rates, low school attendance and low success rates.

3.3.4 Garissa County

Garissa is an administrative County in the former North eastern province of Kenya. Its capital and largest urban area is Garissa town. Garissa County is also home to Dadaab, the biggest refugee camp in the world hosting about 250,000 refugees from the neighbouring Somalia, Ethiopia and southern Sudan. The county has a current population of about 923,000 and covers a geographical expanse of 45,720 kms. Garissa is a county of vast contrasts; geographically it is among the largest counties in Kenya and borders the porous Somalia and Lamu County which is home to Boni forest where al Shabab terrorist activities have prevalent and at times spilling over into Garissa.



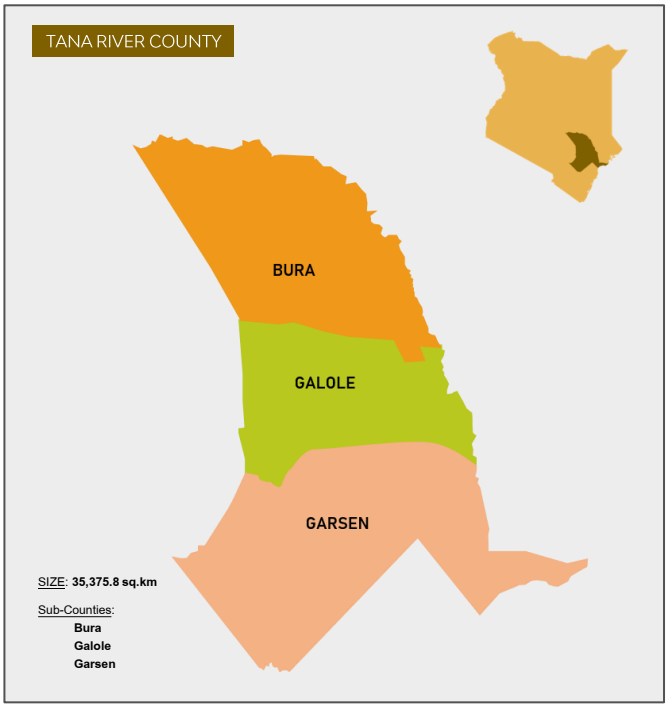
The county has 6 sub-counties namely; Fafi, Dadaab, Lagdera, Balambala, Ijara and Garissa Township/Hulugho. The Tana River, which rises in Mount Kenya east of Nyeri, flows through Garissa. The BourAlgi Giraffe Sanctuary situated 5km south of Garissa, is home to endangered wildlife including the Rothschild giraffe, Gerenuk and other herbivores including Kirk's Dikdik, Lesser Kudu, warthog and water buck.

Garissa is a market centre and the commercial hub of the county.

The town has a number of post-secondary learning institutions including 2 universities; Garissa University College, Umma University and a number of colleges including Medical College. Banks available include Gulf African Bank, Post Bank, First Community Bank, Absa Bank, Equity Bank, KCB, National Bank of Kenya, Chase Bank and Cooperative Bank of Kenya.

Livestock production is a significant part of the town's economy. Between 2005 and 2007, Garissa cattle producers earned over Kshs. 1.8 billion in sales in domestic and overseas markets. Construction on a new abattoir also began in October 2007. Most of Garissa's cattle import come from cross-border trade between Somali livestock merchants. Garissa has a hot semi-arid climate with landscape mostly arid, desert terrain. The city lies along the Tana River and has a very warm/hot climate due to the low elevation and distance from cooler coastal areas. The daytime temperature typically rises above 33°C (91°F) every day but cools down every night. Coupled with religious and cultural inclinations, the county has since independence posted dismal educational performance with one primary school that has never transitioned a single student to secondary school.

3.3.2 Tana River County



Tana River is County number 005 and is located in the coastal region. It borders Garissa County to the North, Isiolo County to the Northwest, Lamu County to the Northeast, Kilifi County to the Southeast, Taita-Taveta County to the South, and Kitui County to the West. It is named after the Tana River and has an area of 35,375.8 sq. km. (13,658.7 sq. mi) and a population of 240,075 according to the 2009 census. The capital and largest town is Hola.

According to the 2009 Kenya Population and Housing Census, the population for Tana River County was 240,075 people with a population density of 6.2 people per sq. km and an annual growth rate of 3.4%. Age distribution was 0-14 years at 50.9%, 15-64 years at 46.2% and 65+ years 2.9%. Major ethnic groups are the Pokomo whom are farmers, the Orma, Wardey and Gadsan. The county is generally dry and prone to drought. Rainfall is erratic, with rainy seasons in March–May and October–December. Conflicts have occurred between farmers and other people over access to water. Flooding is also a regular problem, caused by heavy rainfall in upstream areas of the Tana River.

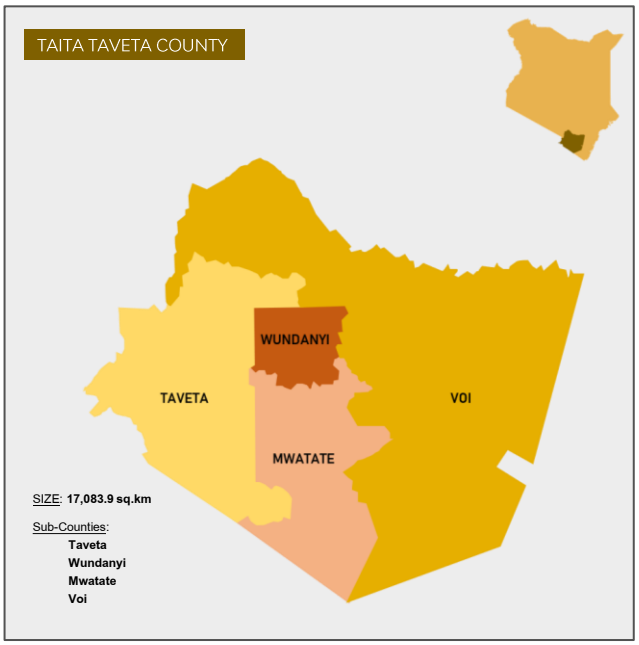
Tana River County presents an interesting case of the nexus between conflict and food security. A recent survey prepared by ALMRP, found that the county is 79% food insecure and with an incidence of poverty at 62% (Interim Poverty Strategy Paper (I-PSP), 2000–2003, Kenya). Tana River County comprises several areas of forest, woodland and grassland which are minor centres of endemism. The forests are designated National Reserve status if they have >4 plant endemics and >7 vertebrate endemics (IUCN, 2003). Despite the apparent adequate natural resources, the region remains marginalized from the rest of the country.

Efforts at development always seem to Centre on the huge River Tana, despite massive failures in all the previous irrigation projects in the district, i.e. Bura, Hola and the Tana delta rice irrigation project which failed after the water works were damaged by the Elnino rains in 1998. Tana River receives annual relief rainfall varying between 400mm and 750mm with a mean annual temperature ranging between 30°C and 33°C. There is a total of 58 health facilities spread across the county. The county has 2 District Hospitals, 47 Dispensaries,

5 Health Centres and 4 Medical Clinics. Notable Hospitals include Hola District Hospital and Ngao District Hospitals. Prevalent Diseases: Malaria, Respiratory Tract Infections, Skin Diseases, Diarrhoea and HIV/AIDs.

Farming and nomadic pastoralist are the main economic activities in Tana River County due to the dry conditions and erratic rainfall patterns experienced in the county. The Tana River is a major water resource in the area. The expansive delta created by the river is characterized by wetlands, which provide grazing area during the dry season and is also a tourist attraction. The water is used for irrigation of rice, banana, maize, mangoes and soya beans. Riverine forest, woodland, grassland, bush lands, lakes, open river channels, sand dunes, mangroves and coastal waters contribute to making Tana River County one of the most ecologically diverse habitats and a tourist attraction in the country.

The county has the potential to use its wildlife and visitor attraction assets as leverage to improve the livelihoods of its people. These assets include the rare primates and aquatic animals at the Tana Delta, beach tourism along the Indian Ocean, water sports and game fishing. Other economic activities include mining with potential for gems such as Barite, ilmenite, Iron ore, Uranium and Gypsum. Tourist attraction sites in the County are; Tana River Primate National Game Reserve and Kora National Park.



3.3.6 Taita-Taveta County

Taita-Taveta County lies approximately 150 km northwest of Mombasa and 300km southeast of Nairobi. The capital, nominally, is in Mwatate town but county government offices are in Wundanyi. The County has four sub counties namely; Mwatate, Taveta, Voi and Wundanyi. The county covers an area of 17,083.9 km^2, of which 62% or 11,100 km^2 is within Tsavo East and Tsavo West National Parks. The remaining 5,876 km^2 is occupied by small scale farms, ranches, sisal estates, water bodies (such as Lakes Chala and Jipe in Taveta and Mzima Springs), and the hilltop forests.

The lowland areas of the county outside the national parks consist of farms, ranches, estates, and wildlife sanctuaries. The county has approximately 25 ranches. The main land use in the ranches is cattle grazing. The three operating sisal estates of the district are the Taita Sisal Estate, Voi Sisal Estate and Taveta Sisal Estate.

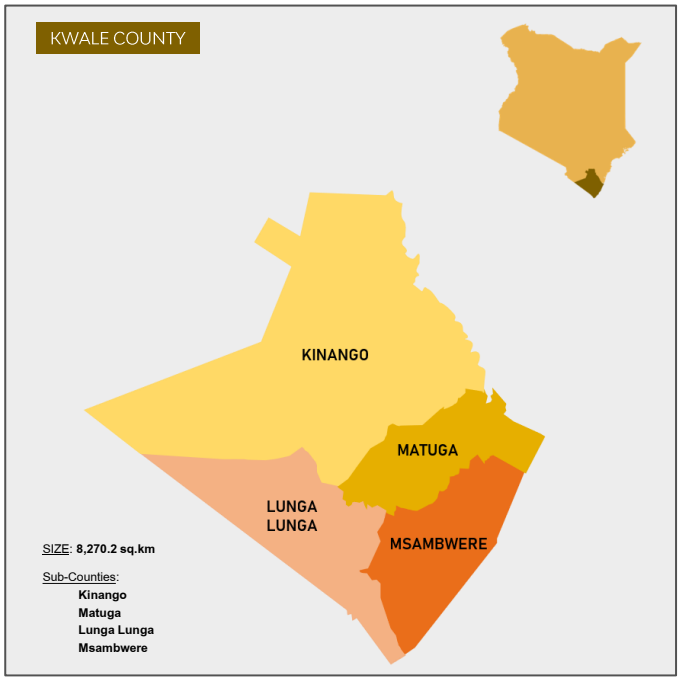
Many ranches have ventured into wildlife tourism and conservation. The Taita Hills and Saltlick Lodges sanctuary is among the well-known tourism attractions in Taita-Taveta. There are 48 forests which have survived on hill tops in the county of which 28 are gazetted and are under government protection and management. They range in size from small 500 square metre patches with a few remnant trees to modestly vast 2 square kilometre indigenous and exotic forest mountains.

As the Tsavo National Park covers approximately two-thirds of the land area of Taita-Taveta County, growth in human population causes conflict with wildlife. The national population census carried out in 1969 put the number of persons in the then Taita-Taveta district at 110,742. Another census carried out in August 2009 found that the number of people was 284,000 representing an increase of 156% in forty years.

The growth of the human population means that land close to the park boundaries is converted from bush land into settlements. Consequently, people have been killed by wildlife, as others lose crops and livestock. The national government has a mechanism for financially compensating families for wildlife-related deaths and destruction of property, but residents of Taita-Taveta say the process of claiming compensation is too tedious. Based on the challenges across Taita-Taveta County, it is considered as among the many other counties within the pockets of poverty.

3.3.7 Kwale County

Kwale County is in the former Coast Province of Kenya. Its capital is Kwale, although Ukunda is the largest town. Kwale County has an estimated population of 649,931. Kwale is mainly an inland county, but it has coastline south of Mombasa. Diani Beach is part of the Msambweni Sub County. Shimba Hills National Reserve and Mwaluganje elephant sanctuary are other attractions in the county. Kwale County has four sub counties namely Matuga, Kinango, Msambweni and Lunga Lunga; and 20 wards.

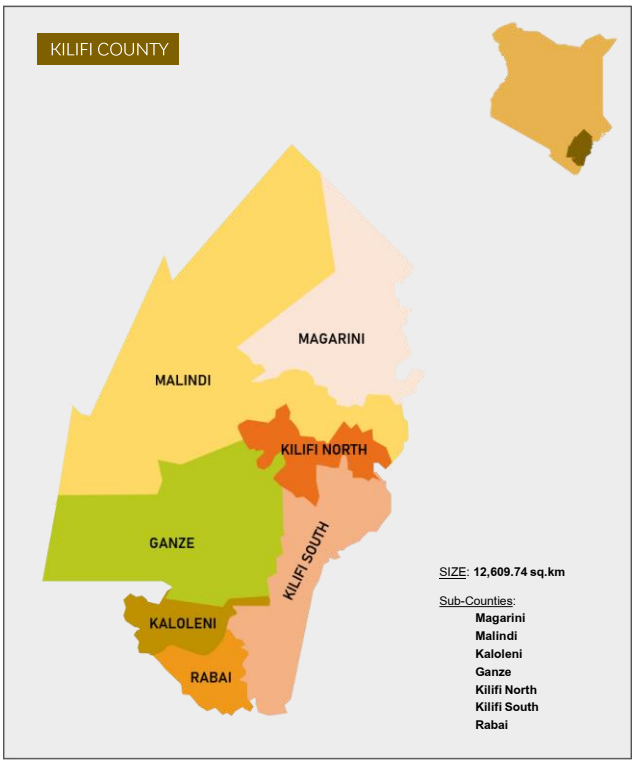


In Kwale County, based on 2009 census, 74.9% of the population lives under the poverty datum line. This poverty created the problem of forest and coastal ecosystem destruction for food, fuel, settlement and

grazing of livestock. Main economic activities included; fishing, mixed farming, apiculture, commercial businesses, mining, forestry and tourism with main forest-based attractions being Tsavo National Park, Shimba Hills National Reserve, Mwaluganje Elephant Sanctuary, Sheldrick Falls, Maji moto springs and the mangrove beaches.

80% of Kwale County lies in arid and semi-arid lands (ASAL; average temperature is 24.2°C and rainfall amounts range between 400mm and 1,680mm per annum), which is suitable for livestock rearing. The most important livestock species are; dairy cattle and goats, sheep, poultry and bees. Kwale County is overlapped by the humid, higher rainfall coastal belt and the semi-arid interior, presenting a stark contrast between the eastern and western climatic zones.

The western semi-arid interior covers a greater portion of the county. The eastern part of the district has high humidity displaying a more varied mix of vegetation, including forest areas, indigenous and exotic vegetation compared with the homogenous character of thorny Acacias, Commiphora, Euphobias and savanna grasses of the western zone. The background context of Kwale County justifies why the county falls in both the ASAL and pockets of poverty regions of Kenya.



3.3.8 Kilifi County

Kilifi County is located in the former Coast Province. Kilifi County is about 420km south-east of Nairobi and 60km north of Mombasa. It covers an area of 12,609.74 km^2. Kilifi shares its borders with four other counties; Mombasa and Kwale to the south, Tana River to the north, and Taita-Taveta to the west. Kilifi County constitutes seven sub counties: Kilifi North, Kilifi South, Kaloleni, Rabai, Ganze, Malindi and Magarini. Kilifi County is home to 1,109,735 people (male - 48% and female - 52%), according to the 2009 National Census. The main communities living in Kilifi County include Mijikenda, Swahili, Bajuni, Indians, Arabs and European settlers. Other communities of Kenya including Kamba, Kikuyu, Luo, Kalenjin and Luhya are found in Kilifi County as well. Most people from these communities are early settlers who migrated from their native regions during the colonial times while others came in to work or engage in small and large-scale businesses.

Kilifi County has two major towns; Located about 60km north of Mombasa, is Kilifi town which is the main stop on the Mombasa-Malindi highway. The town is set on Kilifi Creek between Mombasa and Malindi, which is about 52km away. Kilifi is renowned for its tourist attractions such as Bofa Beach - located 2.5km from the town, Mnarani Ruins and the Vasco da Gama Pillar.

Kilifi town is home to many resorts including Kilifi Bay Beach Resort and Bofa Beach Resort. Malindi which is located about 120km north of Mombasa is yet another major town in the county. With its pristine beaches and favourable weather, Malindi is popular tourist destination in Kenya. Other urban centres in Kilifi County include Mtwapa, Mariakani, Watamu, Majengo, Mazeras and Magarini. Kilifi County despite having reach tourism sites, the largest part of the county falls within the ASAL and pockets of poverty margins of Kenya.

3.4 Target Population

The assessment targeted all LCBS in Turkana, Kajiado, Narok, Garissa, Tana River, Taita-Taveta, Kwale and Kilifi. This was premised on the fact that are so many reasons that necessitated the introduction of LCBSs in the Kenyan Education system ranging from international goals of education to local problems such as those affecting the communities in the marginalized areas e.g. poverty, insecurity and a nomadic lifestyle. Therefore there was need to assess such schools so as to inform the government on the progress made towards attainment of set goals and the interventions required to make the program a success.

Students on their way to school

3.5 Sample and Sampling Procedures

Although the assessment targeted all LCBS, the sampled schools consisted of those that were receiving low cost boarding school grants since reliability and use of this grant as well as accountability were key areas of assessment. Other respondents in the sampled schools provided information that was required. Number of sampled schools and respondents were as stipulated in **Table 2**.

Table 2:

County	No of Sampled Schools	No. of Respondents
Turkana	60	60
Kajiado	16	26
Narok	30	30
Garissa	31	42
Tana River	8	16
TaitaTaveta	12	12
Kwale	12	12
Kilifi	22	20
Total	191	218

Distribution of the Sampled Schools and Respondents

3.6 Research Instruments

Data collection tools used in this assessment were; questionnaires, focus group discussions, observation and document analysis guides.

3.6.1 Questionnaire

The questionnaire that was used to collect data from a large number of respondents consisted of both open and closed ended items which gave respondents more freedom to present their views. The questionnaire consisted of seven sections as follows; Demographic information, boarding program, infrastructure, nutrition and health, environment conservation, climate change and food security & smart agriculture.

3.6.2 Focus Group Discussion

The study used focus group discussions involving community and stakeholder at the institutional level. This ensured inclusion of all relevant stakeholders' views and ideas. Focus group discussion which was held at the beginning of the exercise allowed respondents gain more insight into the key issues pertaining to the model of LCBS, gaps in infrastructure, environmental and climate change awareness in each context. Key informants included heads and management of LCBS, the Legislatures and other relevant government agencies.

3.6.3 Document Analysis Guide

Most of the documents were analyzed through desk top review where researchers reviewed available MOE documents on LCBS as well as other documents related to the area of assessment in the identified Counties. Information accessed through this method as well as the meeting with NACONEK, NDMA and GKIT assisted officers to develop a well-informed inception report, assessment tool, methodology to be used and work plan.

3.7 Data Collection Procedure

Before conducting the exercise, the assessment team trained on site the local county field team of data enumerators which included the County and Sub County directors of education. This assessment was conducted over a period of one month i.e. May-June 2019 in seven counties; Turkana, Kajiado, Narok, Garissa, Tana River, Taita-Taveta, Kwale and Kilifi. This was the second cycle of this assessment; the first phase having involved Baringo and Samburu Counties conducted in March 2019.

3.8 Data Analysis and Presentation

Data collected during this assessment required both qualitative and quantitative. Descriptive statistics was used to analyze quantitative data. Statistics used included frequency counts, means and percentages. Quantitative data analysis was aided by use of Statistical Package for Social Sciences (SPSS) which is able to handle large amount of data. On the other hand, qualitative data was analyzed by organizing them into themes and tallying the number of similar responses. The findings were presented in form of frequency distribution tables, bar graphs and pie charts.

3.9 Ethical Consideration

During the study the researcher focused on some ethical issues during the data collection phase. The ethical issues that were considered in this study included confidentiality and privacy of the information collected and anonymity of the questionnaires.

CHAPTER 4:
FINDINGS AND DISCUSSIONS

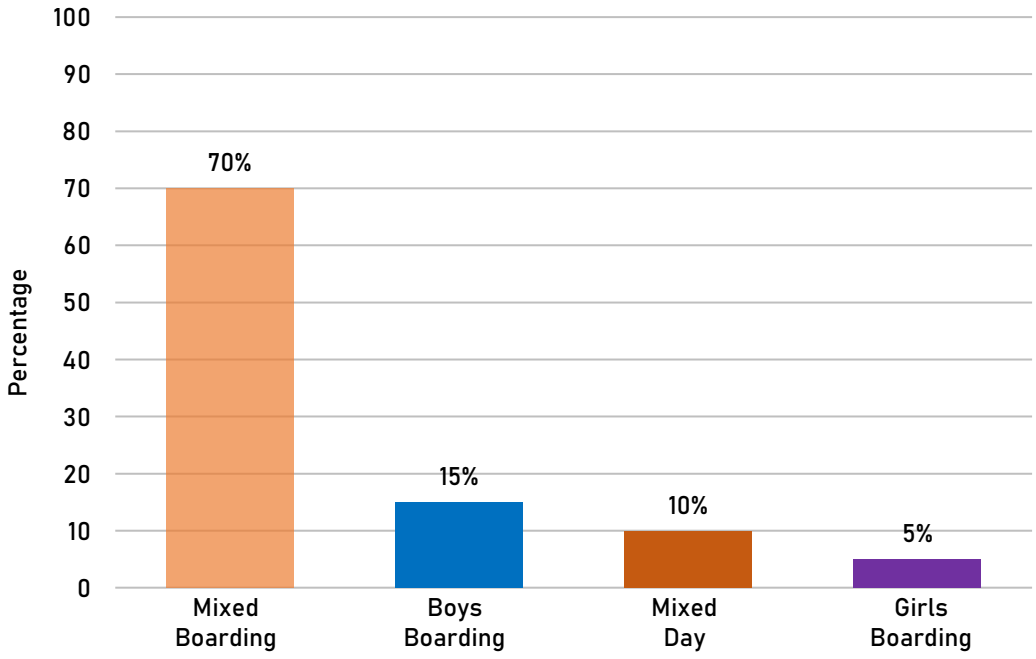
4.1 Demographic Information

The study gathered the following demographic data of the institutions from the Counties of the study; school type, land size, registration status, distance from National and County Office, postal address and email address. Number of teachers per gender and employment status; that is whether TSC or BOM employed was gathered. Learners' enrolment per gender was sought. Enrolment of learners with disability and nature of disability was collected. Number of learners per gender in terms of boarders and day scholars was as well addressed. The findings were as presented here in;

4.1.1 Type of School

The specific type of school in which learning takes place is very crucial in many aspects such as development of communication, collaboration, problem solving and critical thinking skills in learners. Therefore, type of public primary schools' information in the following categories was sought; mixed boarding, boys boarding, girls boarding, mixed day, boy's day and girl's day. The findings per County were as shown in **Figure 3**.

Figure 3:



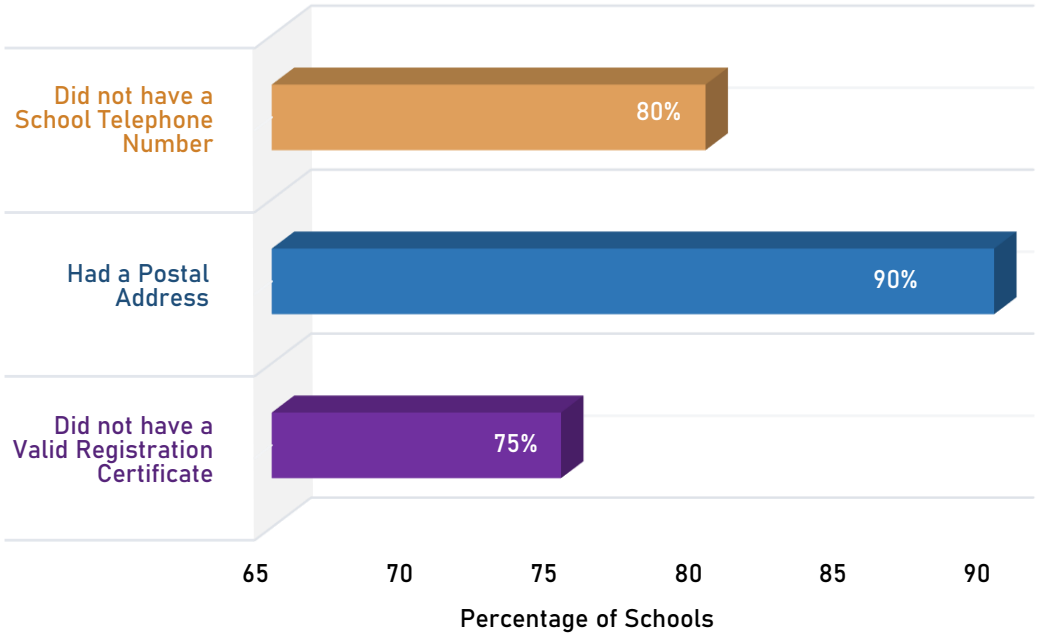
Distribution of the Types of Schools

As shown in Figure 3, the most popular type of school was mixed boarding (70%), followed by boys' boarding (15%), mixed day (10%) and Girls' boarding (5%). Boys' and Girls' day did not attract any school. It is important for stakeholders to consider giving intense interest to this type of school so as to improve them more.

4.1.2 School Registration Status, Availability of Postal Address, Telephone Number and Email Address

School's registration status other than authenticating it serves as an important aspect of security against land grabbers and other insecurities such as encroachments. School's phone number, postal and email address serves the school well in enhancing various communications to key stakeholders. To this end, the study sought information on school's registration status, availability of postal and email address. The findings of the study indicated that most (75%) of the schools across the Counties of study did not have valid registration certificates. They were either expired, did not reflect the current status of the schools or they were not registered at all. Whereas 90% of the schools had postal address, majority (80%) of the schools did not have telephone number and email address and they were using head teachers' personal contact and email address. This could hinder effective communication as well as accountability of information received. **Figure 4** presents this information.

Figure 4:



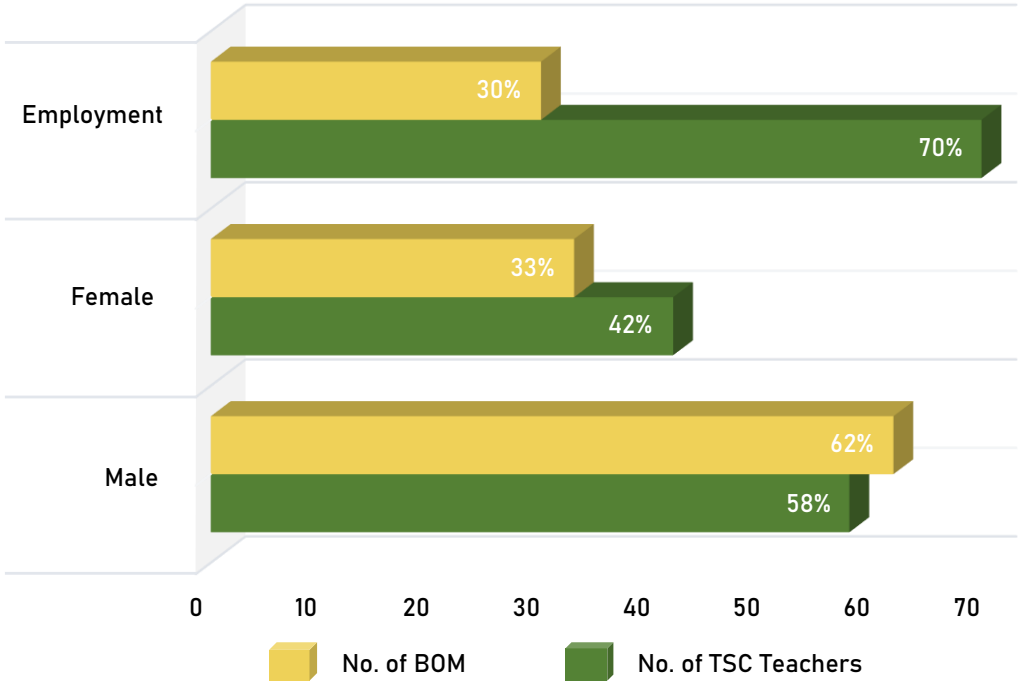
School Registration Status, Availability of Postal Address, Telephone Number

4.1.3 Number of Teachers Employed by TSC and BOM in Gender

Teachers play a pivotal role in imparting desirable knowledge, skills, values and attitudes in learners. Adequacy of teachers in a school is very important since it enables each teacher to have manageable workload for effective and efficiency in curriculum delivery.

Employment status of a teacher, TSC or BOM employed also has a diverse effect on their stability of mind in terms of performance. It is also an indicator of expenditure in schools since BOM teachers are paid by the school. **Figure 5** displays information of teachers' employer per gender in percentages.

Figure 5:



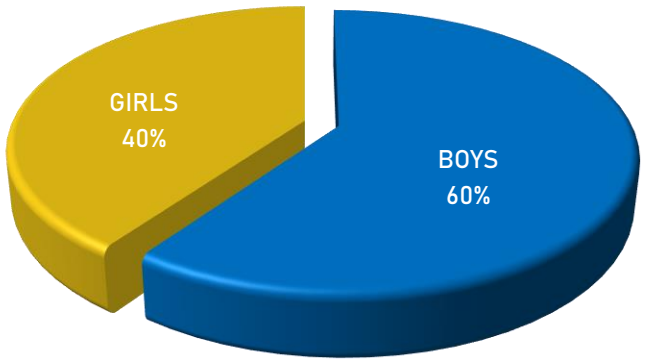
Distribution of Number of Teachers employed by TSC and BOM in Gender

As shown in Figure 5, 58% of the TSC teachers in the schools visited were male while 42% were female. Similarly, a large number (62%) of teachers employed by BOM were male while 33% were female. This trend indicates that there were more male teachers than female in ASALs schools. It is also noted that about 70% of the teachers especially in Garissa, Tana River, Taita-Taveta and Kwale were employed by TSC while 30% were employed by BOM. This could somehow strain school's financial resources since these teachers were paid by schools.

4.1.4 Types of Disabilities per County

Every child has a right to education as clearly stipulated in the Kenya Constitution, 2010 as well as basic education Act, 2013. Therefore, the study sought information on the number of learners living with different types of disabilities in the Counties under study. The information would be necessary in making decision on provision of resources to enable such learners' access quality education. **Figure 6** presents information on number of learners living with disability per gender.

Figure 6:



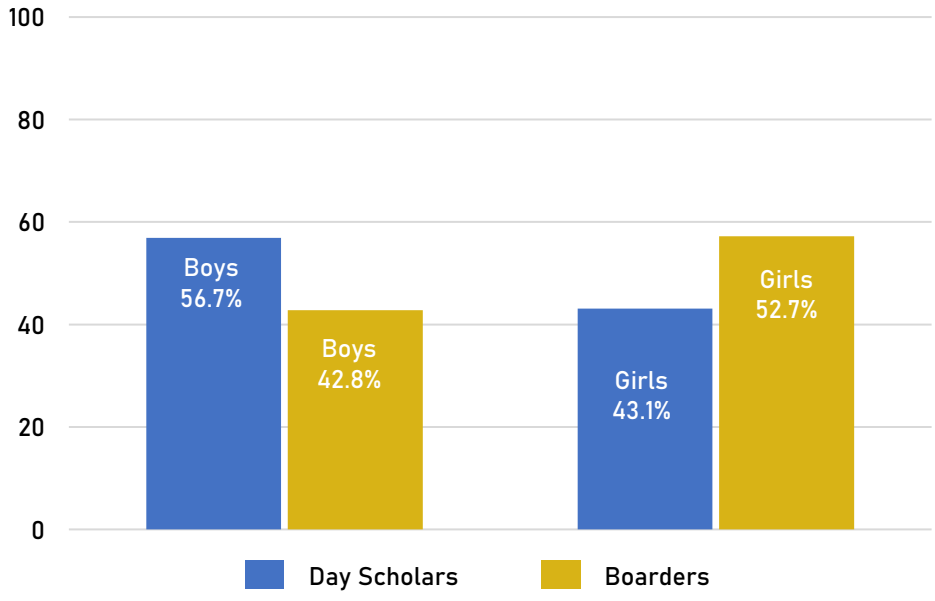
Distribution of Learners Living with Disabilities Based on Gender

As shown in Figure 6, 60% of the learners living with disabilities were boys while 40% were female. It is important for more disability friendly infrastructure to be put in place to assist increase access and retention rates for learners living with disabilities.

4.1.5 Number of Boarders and Day Scholars' Learners per Gender in Five Counties

Learners have different experiences depending on whether they are boarders or day scholars. Such experiences can affect how they learn, resources they require and strategies of curriculum implementation. Therefore, the study collected information on number of boarders and day scholars per County per gender which is presented below in **Figure 7**.

Figure 7:



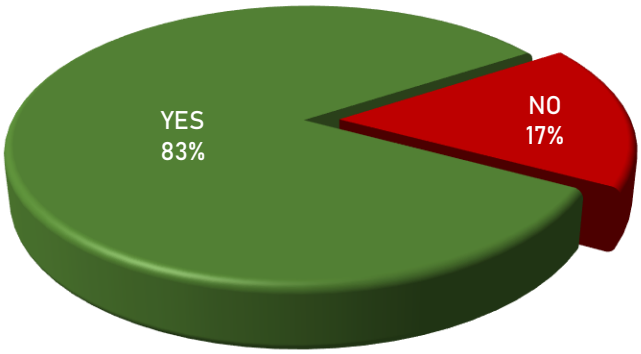
Distribution of Percentage of Boarders and Day Scholars per Gender

As depicted on Figure 7, there were fewer (43%) boys who were boarders than girls. Similarly, more boys (57%) were day scholars as compared to girls (43%). This could be attributed to the nomadic nature of ASAL where boys tend to have more chores at home than girls especially tending to the livestock.

4.1.6 Number of Schools Registered to Green School Program and Number of Green School Programs Available

The task of preparing young generation for an ever-changing world requires the adaptation of educational programs and teaching methodologies to help students understand the dynamic and complex challenges and teach them practical, critical and creative thinking skills needed for problem solving and informed decision making. Under the Green Schools Program, schools are helped to implement environmental education programs that encompass school environmental sustainability projects and practical actions. These projects and actions are aimed at solving environmental problems, creating awareness, promoting hands-on, experiential learning (thereby developing all learning domains), generating income (hence imparting entrepreneurial skills) and complementing and reinforcing classroom learning by enriching the existing topics (that have otherwise been covered theoretically) with practical components. Based on this, the study gathered information on the number of schools registered to green school program as well as number of green school programs available. Information was presented in **Figure 8**.

Figure 8:



Percentage Distribution of Schools Registered to Green School Program

As shown in Figure 8, irrespective of the importance of green school program, only 17% of the schools had initiated at least one program per school. This indicates that there is need for a lot of capacity building to be undertaken in LCBS communities on the importance of these programs not only for food security but also as an environmental conservation activity.

4.2 Boarding Programme

Boarding education provides several benefits to learners especially those from low social economic backgrounds faced with challenges such as food insecurity, long distances between home and school, cultural conflicts, domestic instabilities, retrogressive cultural practices, child abuse and child labor among others. Such a learner, through boarding education is afforded an opportunity to excel in academic performance, personal growth and exploration where programs and activities are abundant and where success is celebrated. This objective sought information on the following; number of schools that receive grants, adequacy of boarding facilities, adherence to health and safety standards, provision of adequate and balanced diet and availability of trained boarding and security personnel.

4.2.1 Number of Schools that receive Regular Low Coast Boarding Grant

Provision of grants to LCBS have become a useful tool to address barriers to access quality education in ASAL with a focus on inclusion in national systems, while reducing barriers to enrolment and attendance, and using education as a means to protect people. Poverty level presents significant challenges for children to enroll and remain in school and parents often have limited ability to support their children's education for a variety of reasons, including limited livelihoods opportunities. Therefore, the study sought to establish number of schools that regularly received grants and whether those grants matched the enrolment per County. The findings were as stipulated in **Table 3.**

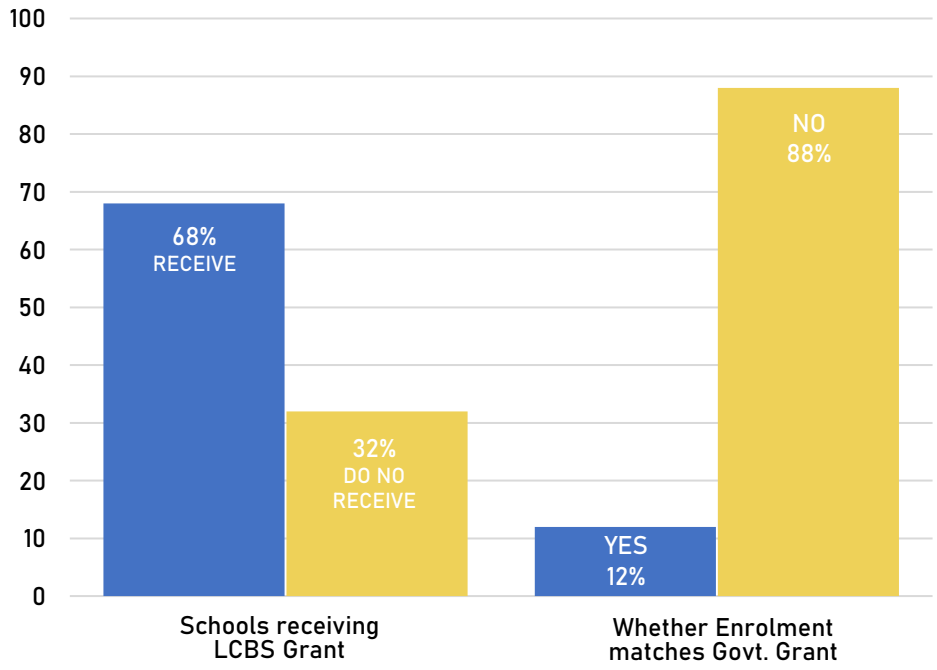
Table 3:

County	Number of Schools that receive Regular Low Cost Boarding Grant				Whether enrolment match the Government Grant			
	Number	YES	Number	NO	Number	YES	Number	NO%
Turkana	60	100%	-	-	-	-	60	100%
Kajiado	16	100%	-	-	-	-	16	100%
Narok	27	90%	3	10%	-	-	30	100%
Garissa	7	21%	24	79%	16	51%	15	49%
Tana River	2	25%	6	75%	3	38%	5	62%
Taita Taveta	9	75%	3	25%	1	8%	11	92%
Kwale	5	42%	7	58%	1	8%	11	92%
Kilifi	3	14%	19	86%	1	5%	21	95%
TOTAL	129	68%	62	32%	22	12%	169	88%

Distribution of Number of Schools that receive Regular Low-Cost Boarding Grant and how it matched Enrolment per County

It is evident from Table 3 that 129 (68%) schools had received regular low-cost boarding grant while 62 (32%) were of contrary opinion. On the same note, 169 (88%) schools felt that this grant did not consummate with the enrolment while only 22 (12%) reported otherwise. This is an indication that there is need to revisit distribution procedures and policy coupled with proper monitoring and evaluation mechanisms to ensure all schools benefit from the grant to enhance learning. While Garissa and Kajiado Counties reported 100% regular receipt of grants, they were as well 100% certain that this grant did not match the enrolment which greatly inhibited the purpose for which it was established. In summary, 88% of the schools consider that the enrollment does not match the grants given by the government (see **Figure 9**).

Figure 9:



Distribution of Receipt of Government Grant and how it resonates with Enrolment

4.2.2 Adequacy of Boarding Facilities such as Beds, Toilets and Bathrooms

Learners in a boarding school spend reasonable amount of time in the dormitories. It is therefore very crucial for dormitories and its related facilities such as beds, furniture, toilets and bathrooms to be adequate, appropriate and safe to foster required environment to enhance learning processes, reduce absenteeism and dropout rates. In boarding schools, dormitories are the single most used physical infrastructure, where learners spend the longest continuous period of time in a day. It is therefore important to keep these structures clean and properly ventilated. In every school, care should be taken to observe the following health and safety measures such as;

being clean and well maintained, spacious and ventilated, wide doors, availability of fire extinguishers and emergency exits among other measures. Information of health and safety standards of boarding facilities was as presented on adequacy of boarding facilities per County were as shown in **Table 4**.

Table 4:

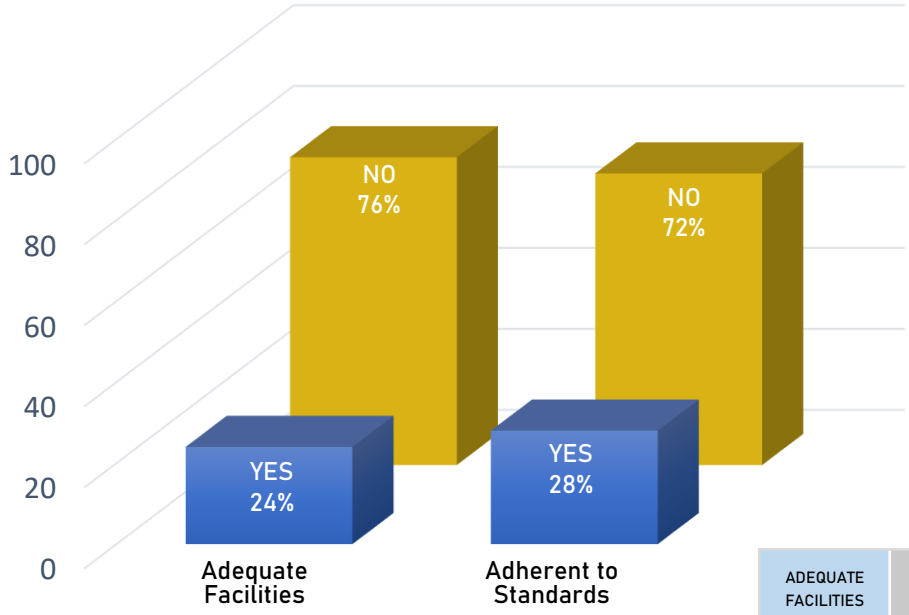
County	Adequacy of Boarding Facilities such as Beds, Toilets and Bathrooms				Adherence to Health and Safety Standards			
	YES		NO		YES		NO%	
	Number	%	Number	%	Number	%	Number	%
Turkana	15	25%	45	75%	16	56%	44	73%
Kajiado	4	25%	12	75%	2	12%	14	88%
Narok	8	27%	22	73%	9	30%	21	70%
Garissa	3	11%	28	89%	8	26%	23	74%
Tana River	6	75%	2	25%	2	25%	6	75%
Taita-Taveta	3	25%	9	75%	3	25%	9	75%
Kwale	-	-	12	100%	3	25%	9	75%
Kilifi	7	30%	15	70%	11	50%	11	50%
TOTAL	46	24%	145	76%	54	28%	136	72%

Distribution of Adequacy and Adherence to Health and Safety Standards of Boarding Facilities per County

As depicted on Table 4, 46 (24%) of all schools assessed had inadequate boarding facilities and 136 (72%) did not adhere to health and safety guidelines. This was not only a health hazard to learners and staff but could also have negative effect on curriculum implementation. Kwale County registered 100% inadequacy of boarding facilities with dilapidated dormitories while Kajiado had the highest percentage (88%) of non-adherence to safety and health standards. In some counties such as Turkana, Narok and Garissa, up to three learners were sharing beds while others slept on the floor, the most affected were boys as compared to girls.

In Garissa, where there was 89% inadequacy of boarding facilities and 74% non-adherence to health and safety standards, about 70% of all dormitories required reconstruction since they had cracked floors and wall which was very risky for users. In the same County, toilets were inadequate and poorly maintained and some three schools risked being closed due to lack of toilets. It is important to note that almost all schools did not have fire extinguishers, sanatorium, safety policy, wide doors and emergency exit among others. Majority of the schools did not have a perimeter fence to secure both lives and property apart from Tana River County where all the schools had been fenced.

Figure 10:



ADEQUATE FACILITIES		ADHERENT TO STANDARDS	
YES	NO	YES	NO
24%	76%	28%	72%

Distribution of Adequacy and Adherence to Health and Safety Standards of Boarding Facilities

4.2.3 Whether Learners are provided with Three Meals per Day (Breakfast, Lunch and Dinner)

School meals are a powerful educational support: improving behavior, ability to focus and academic performance. School meals are also an important source of nutrition for all school-age children with school meals being more nutritious than what most children access at home. Many children from low economic background rely on school meals as their most consistent source of quality food. Information gathered on provision of three meals per day per learn in school per County was as indicated in **Table 5**.

Table 5:

County	Provision of meals three times per day	
	YES	%
Turkana	60	100
Kajiado	16	100
Narok	30	100
Garissa	31	100
Tana River	8	100
Taita-Taveta	12	100
Kwale	12	100
Kilifi	22	100
TOTAL	191	

Distribution of Number of Providing Learners with Three Meals per Day

4.2.4: Whether there are Trained Boarding Matrons and Security Personnel

The boarding masters and mistresses have responsibility for the academic, pastoral, cultural and spiritual welfare of pupils in the dormitory. The matron is also responsible for pupils 'discipline and moral guidance and for the safety, hygiene and sound maintenance of the house premises. In short, the boarding masters and mistresses are expected to offer the same level of care and attention that a good parent would.

Regarding security personnel, students and teachers have the right to feel safe and secure with the peace of mind that should a situation arise they have the right security measures and procedures in place to keep themselves and those around them safe. Parents too should feel reassured with the knowledge that when their child attends school, they will be safe in the care of the teachers and the security of the building. Therefore, the study aimed at establishing availability of trained boarding matrons and security personnel. The Findings were as presented in **Table 6**.

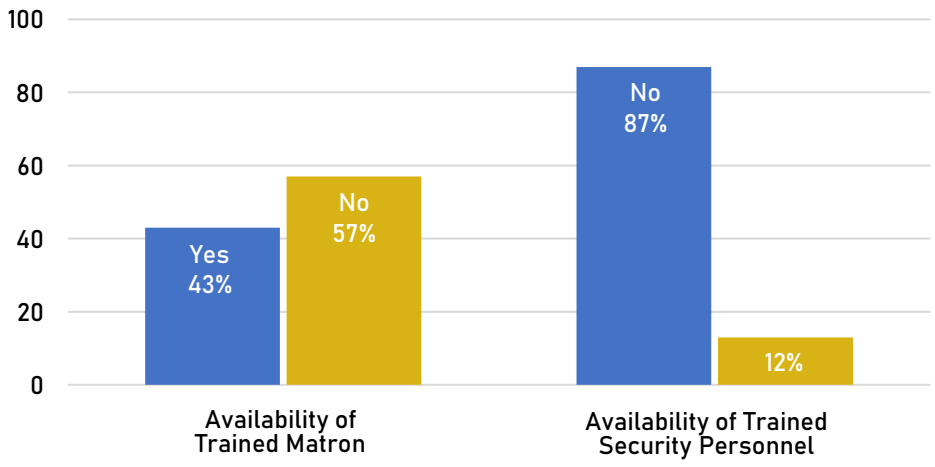
Table 6:

County	Availability of Trained Matrons				Availability of Trained Security Personnel			
	YES		NO		YES		NO%	
	Number	%	Number	%	Number	%	Number	%
Turkana	10	17	50	83	50	83	10	17
Kajiado	6	38	10	62	10	62	6	38
Narok	30	100	-	-	28	93	2	7
Garissa	10	32	21	68	28	89	3	11
Tana River	2	25	6	75	8	100	-	-
Taita-Taveta	2	17	10	83	12	100	-	-
Kwale	8	67	4	33	12	100	-	-
Kilifi	15	70	7	30	18	80	4	20
TOTAL	83	43	108	57	166	87	25	13

Distribution of Number of Schools per County with Trained Matron and Security Personnel

According to Table 6, Turkana and Taita Taveta Counties had the highest number of schools; 50 (83%) without trained matrons while all schools in Narok County had trained matrons. Generally, majority of the schools in the counties under study did not have trained matrons which could jeopardize lives and safety of learners in different ways. It is encouraging to note that all the schools assessed had more than 60% trained security personnel, a clear indication that learners and schools property were accorded required security.

Figure 11:



Distribution of the Availability of Trained Matron and Security Personnel

4.3 School Infrastructure

School infrastructures such as classrooms, laboratories, dormitories, libraries, dining hall, kitchens and special rooms among others are crucial elements of learning environments. There is strong evidence that adequate, appropriate and safe infrastructure facilitates better instruction, improves student outcomes, and reduces dropout rates, among other benefits. The study examined adequacy of classrooms and furniture, toilets, water availability, water source, distance to the water source, storage and reliability and electricity availability.

4.3.1 Friendliness of School Facilities to Learners, adherence to Health and Safety Standards and Adequacy of Classrooms and Furniture

Friendly and safe school facilities are important aspects for effective teaching and learning process. Classroom environment is one of the most important factors affecting student learning. Simply put, students learn better when they view the learning environment as positive and supportive. A spacious, well-lit and ventilate classroom with adequate and appropriate furniture provides an environment where students feel a sense of belonging, trust others, and feel encouraged to tackle challenges, take risks, and ask questions. Such an environment provides relevant content, clear learning goals and feedback, opportunities to build social skills, and strategies to help students succeed. To this end, the study sought to establish friendliness and safety of school facilities as well as adequacy of classrooms and furniture. The findings were as indicated in **Table 7.**

Table 7:

County	Friendliness of Facilities to Learners				Adherence to Safety and Health Standards				Adequate Classroom and Furniture			
	Yes		No		Yes		No		Yes		No	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Turkana	9	15	51	85	16	56	44	73	9	15	51	85
Kajiado	10	63	6	37	2	12	14	88	10	63	6	37
Narok	23	75	7	25	20	67	10	33	23	75	7	25
Garissa	25	80	6	20	8	26	23	74	25	80	6	20
Tana River	4	50	4	50	2	25	6	75	4	0	4	50
Taita-Taveta	9	75	3	2	3	25	9	75	9	75	3	2
Kwale	7	58	5	42	3	25	9	75	7	58	5	42
Kilifi	14	65	8	35	11	50	11	50	14	65	8	35
TOTAL	101	53	90	47	65	34	126	66	101	53	90	47

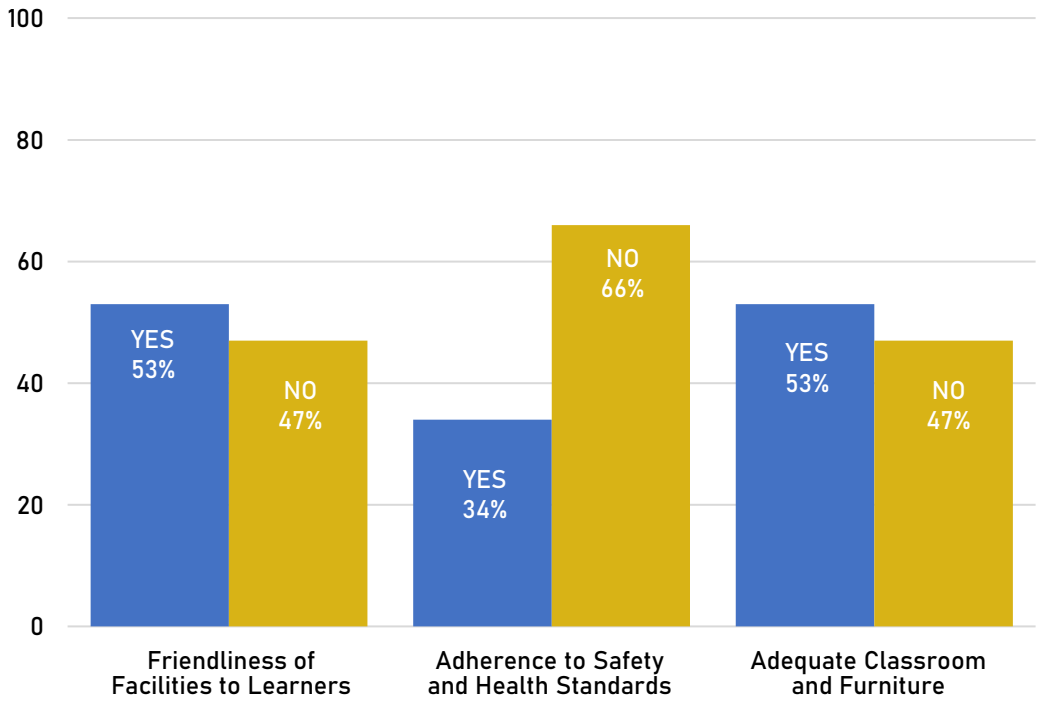
Distribution of Number Schools per County regarding Friendliness to Learners, adherence to Safety and Health Standards and adequacy of Classrooms and Furniture

As depicted on Table 7, Garissa County had the highest number of schools 25(80%) that had learner friendly facilities as well as adequate classrooms and furniture, however, there was 74% non-compliance of school facilities to safety and health standards. Majority of schools; 51 (85%) in Turkana County had inadequate classrooms and facilities which were also unfriendly to learners. Cited cases included dilapidated desks, floors, beds, roofs, walls, doors and windows. The image below shows an illustration of how the schools look like.

Decrepit Classrooms (Potholed Floors & Crack riddled walls)

In Kajiado County, friendliness and adequacy of school facilities was at 63%, however, the County had 88% non-compliance to health and safety guidelines which was putting learners at a great risk. Inadequate classrooms and furniture were causing congestion and other safety hazards that could deter not only learners' performance but health related issues.

Figure 12:



Percentage Distribution of Schools regarding Friendliness to Learners, Adherence to Safety and Health Standards and Adequacy of Classrooms and Furniture

4.3.2 Whether Toilets are adequate, are providing Privacy and Security and are Friendly to Learners Living with Disabilities

A lack of access to proper sanitation facilities poses a huge barrier to education as children frequently miss school due to hygiene-related diseases. Toilets and proper washing stations can help stop the spread of many diseases and parasites such as diarrhea. Provision of designated toilets for girls and boys, young learners and for those living with disability not only provides privacy but also safety and convenience for users which are necessary for access, retention and transition rates.

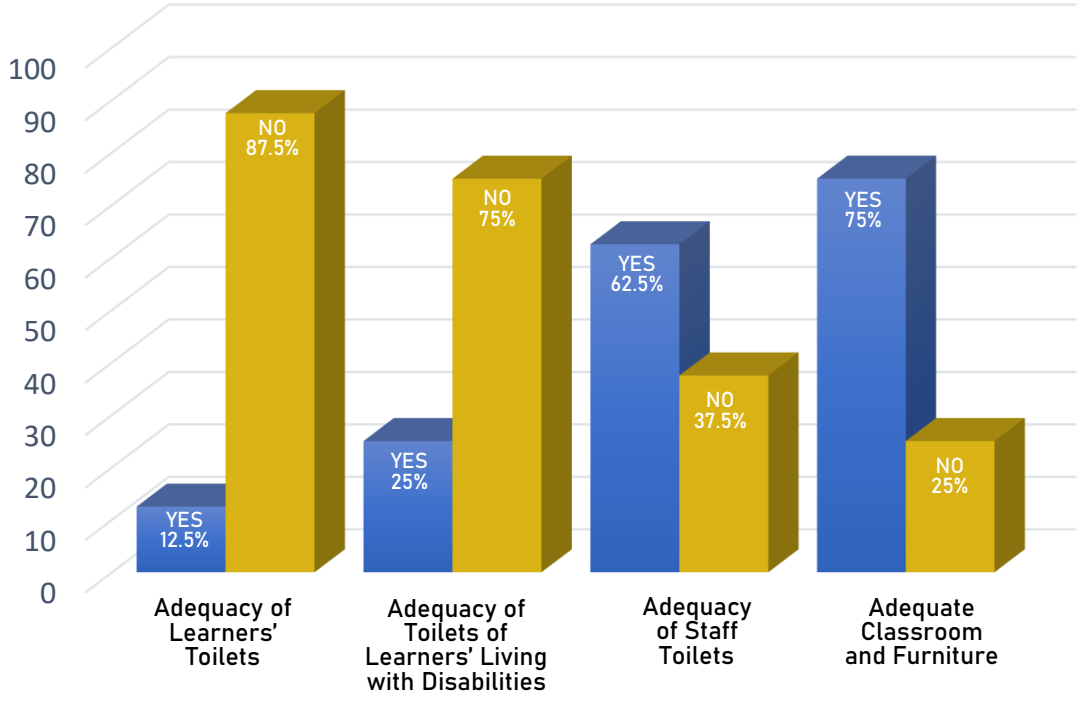
According to **Table 8**, it is only one County; Kwale County where learners toilets with and without disabilities were adequate. Otherwise in all the other seven Counties there were no adequate toilets for all learners which is a major concern. It is very clear that non-teaching staff's toilets 50% adequacy which is commendable to some extent. About 75% of all Counties' toilets did not provide security and privacy to the users.

Table 8:

County	Adequacy of Learners' Toilets		Adequacy of Toilets of Learners' Living with Disabilities		Adequacy of Staff Toilets		Adequate Classroom and Furniture	
	Yes	No	Yes	No	Yes	No	Yes	No
Turkana		√		√	√			√
Kajiado		√		√	√			√
Narok		√		√	√		√	
Garissa		√		√		√		√
Tana River		√		√		√	√	
Taita-Taveta		√		√	√			√
Kwale	√		√			√		√
Kilifi		√	√					√
TOTAL	1	7	2	6	4	3	2	6

Distribution of Counties on how their Schools have Adequate Toilets for All Learners, Staff and on Provision of Security and Privacy

Figure 13:



Percentage Distribution on the Adequacy of Toilets and Provision of Security and Privacy in Schools

Similarly, the following image shows how the condition of toilets in one of the schools in Turkana County.

Sinking Toilet in Turkana County

4.3.3 Availability of Hand Washing Facilities and Cleanliness of the Bathroom

Keeping hands clean is one of the most important steps we can take to avoid getting sick and spreading germs to others. Many diseases and conditions are spread by not washing hands with soap and clean, running water. Similarly, without proper cleaning, bathrooms can become breeding grounds for germs that can spread disease throughout the school population. In addition to an effective cleaning strategy, schools can fight the dissemination of germs by selecting the right fixtures and equipment to keep the facility clean. Therefore, provision of adequate hand washing facilities well distributed to the proximity of learners in school compound and keeping bathrooms clean is important for keeping learners safe and healthy. Information regarding hand washing facilities and keeping bathroom clean was gathered and the findings were as presented in **Table 9**.

It is evident in Table 9 that about 53% of the schools under study had not provided hand washing facilities for the learners. At the same note 57% had not kept their bathrooms clean. However, about 47% and 43% of the schools had provided hand washing facilities and had clean bathrooms respectively. It is notable that Kilifi County was leading (95%) in provision of hand washing facilities while Tana River was the least (25%) in provision of hand washing faculties. Regarding keeping bathrooms clean, Kilifi was still the leading (65%) County while 70% of the schools in Turkana County were not maintaining cleanliness of the bathrooms.

Table 9:

County	Availability of Hand Washing Facilities				Cleanliness of Bathrooms			
	YES		NO		YES		NO%	
	Number	%	Number	%	Number	%	Number	%
Turkana	18	30	42	70	18	30	42	70
Kajiado	6	37	10	63	6	37	10	63
Narok	17	58	13	42	17	58	13	42
Garissa	9	29	22	71	9	29	22	71
Tana River	2	25	6	75	2	25	6	75
Taita-Taveta	9	75	3	25	9	75	3	25
Kwale	7	58	5	42	7	58	5	42
Kilifi	21	95	1	5	14	65	8	35
TOTAL	89	47	102	53	82	43	109	57

Distribution of Schools per County on Availability of Hand Washing Facilities and Cleanliness of the Bathrooms

4.3.4 Water Availability

Drinking adequate amounts of water regularly throughout the day can protect health and contribute to well-being of learners and teachers. It can also help prevent a range of short and long-term health problems from headaches, bladder, kidney and bowel problems to cancer. When adequate water is provided in schools, pupils learn well and keep clean environment. Enough water is also necessary for cleaning school premises and learners' personal use as well as irrigation. Data on water availability was as shown in **Table 10**.

Table 10:

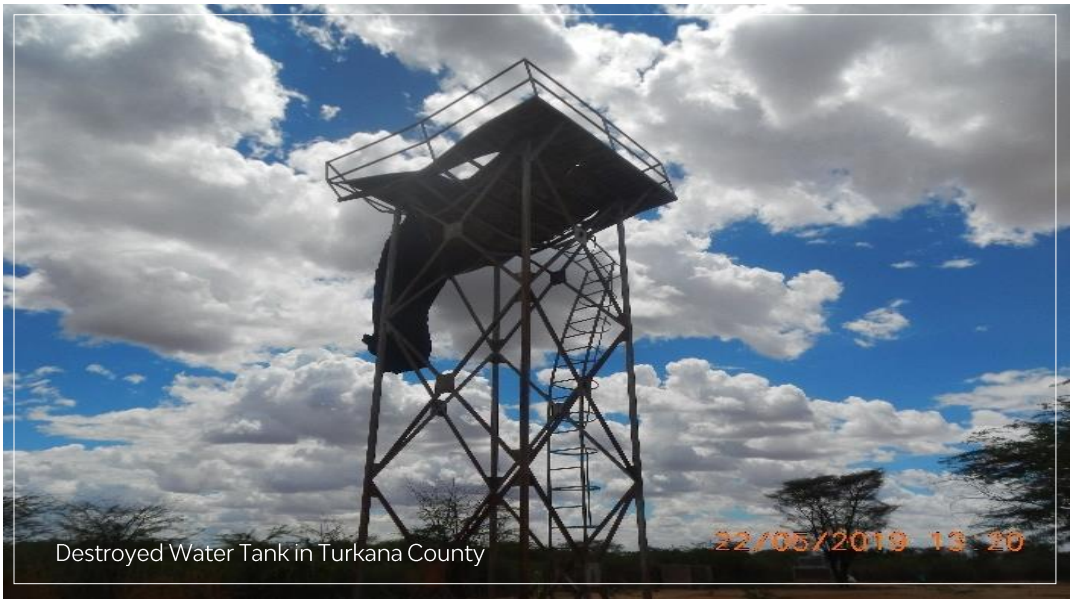
County	Availability of Adequate Water	
	Yes	No
Turkana		√
Kajiado		√
Narok	√	
Garissa	√	
Tana River	√	
Taita-Taveta		√
Kwale		√
Kilifi		√
TOTAL	3 (38%)	5(62%)

Distribution of Water Availability in Schools per County

According to the information on Table 10, 38% of the counties visited had adequate water in their LCBS. However, 62% of the Counties did not have adequate water; this could cause healthy issues to learners. In Narok County, most schools obtained water from Mara River itself, its tributaries and springs which are quite reliable, however there were frequent break downs of pumping machines; forcing learners to rely on other alternative water sources like rainwater etc.

In Garissa County, there is dire need of water since water reliability is mostly 25-50% on the average. The average storage facilities in schools are tanks of 10,000 litres. About 13 schools rely on inadequate piped water, 11 have boreholes producing saline water, 6 schools are supplied with hand carts which compromises water safety of the, 3 schools get water from shallow wells and 2 schools are supplied water by bowers. In Tana River County, about 50% of the schools do not have water source in the school hence water reliability is between 25-50% and the water storage tanks have the capacity of 20,000 litres. Most schools in Tana River get their water from wells, irrigation canals and TAWASCO. 505 of the schools harvest rain water and about 2 schools learners carry water from their homes.

In Turkana County, few (15%) schools had stable and adequate water source, however there were rampant evidences of untreated, salty, faulty pumps across the target LCBS. The image below shows a destroyed water tank in Turkana County.



Destroyed Water Tank in Turkana County

In Taita-Taveta, 75% of the schools were using piped water, 33% rainwater and 17% relied on Rivers. The schools in Taita-Taveta, Kwale and Tana River counties that had less water were buying from vendors, County government was filling the storage tanks, fetching water from the dams near the school, Mzima springs were also supplying water, Mombasa Cement was filling water tanks after every 2 weeks and sometimes parents were bringing water to the schools.

Eighty-four (84%) of the schools in Kilifi County were relying on piped water and 42% on rainwater. The schools with boreholes in Kilifi County mentioned the following as the ones who were responsible for the construction/drilling of the borehole; Bhohora Community, Chinese Government, Coast Board Water Services Board, Community, County Government, Missionaries in 1923, Member of Parliament and World Vision.

4.3.5 Availability of Power

The lack of access to electricity greatly reduces the teaching resources and use of learning resources. Without electricity, teachers and learners are not able to connect to the internet to research what activities or materials are available online. They also cannot access online resources, such as videos and other multimedia sources, in their classrooms as valuable methods for instruction. As a result, teachers are unable to provide their students with the quality of education they deserve. Information collected on availability of electricity is shown in **Table 11**.

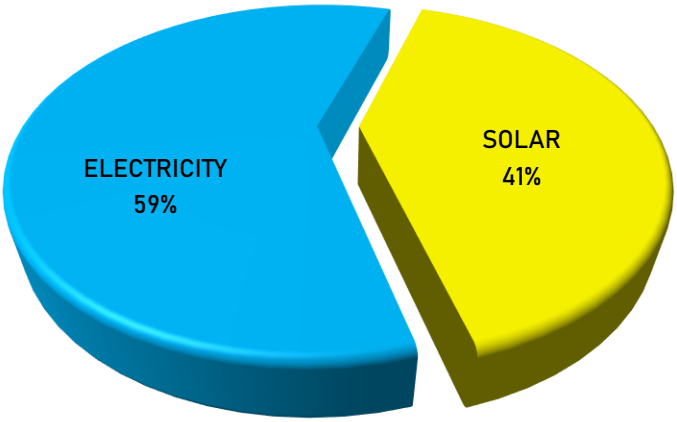
Table 11:

County	Source of Power			
	ELECTRICITY		SOLAR	
	Number	%	Number	%
Turkana	24	40	36	60
Kajiado	14	90	2	10
Narok	6	20	24	80
Garissa	22	70	9	20
Tana River	4	50	4	50
Taita-Taveta	12	100	-	-
Kwale	12	100	-	-
Kilifi	18	80	4	20
TOTAL	112	59	79	41

The Source of Power in Schools in the Counties of Study

According to Table 11, 112 (59%) of the schools assessed were using electricity while 79 (41%) were using solar as the source of power (see **Figure 14**). Kajiado was at 90% and Kilifi at 80% in the use of electricity. Taita-Taveta and Kwale Counties were relying on electricity 100% while Narok had the highest number (80%) of schools using solar as the renewable source of energy which was not only cost effective but also friendly to the environment.

Figure 14:



Distribution of Schools Using Electricity and Solar Power

4.4 Nutrition and Health

Childhood and adolescence are critical periods for health and development as the physiological need for nutrients increases and the consumption of a diet of high nutritional quality is particularly important. Eating habits, lifestyle and behavior patterns are established during this period that may persist throughout adulthood.

4.4.1 School Feeding Program, Food Security and Safety

School feeding programs help to get children to school and help to keep them there by enhancing enrollment and reducing absenteeism. Once they are in school, the program contributes to their learning by keeping them satisfied leading to enhanced cognitive abilities. Food security exists when all people, always have physical, social and economic access to enough, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life. At the same time, food safety is an umbrella term that encompasses many facets of handling, preparation and storage of food to prevent illness and injury. Therefore, these processes are important for effective in the learning processes. The study sought information on school feeding program as well as food security and safety. The findings were as discussed in **Table 12**.

As indicated in Table 12, all counties had made some efforts in running school feeding program with 38% of the Counties having successfully implemented the program while 62% had done so to some extent. This information makes it necessary for the government and other partners to do all what is possible to support school feeding programs in LCBS. On the same note, 62% of the counties had observed food security and safety measures while only 38% had not. This a commendable trend since much of health problems related to food could be reduced among the learners.

Table 12:

County	School Feeding Program			Food Security and Safety		
	Yes	No	Some extent	Yes	No	Some extent
Turkana			√	√		
Kajiado	√			√		
Narok			√			√
Garissa	√			√		
Tana River			√	√		
Taita-Taveta	√			√		
Kwale			√			√
Kilifi			√			√
TOTAL	3 (38%)		5 (62%)	5 (62%)		3 (38%)

The Source of Power in Schools in the Counties of Study

Other findings indicated that, in Turkana County, SFP had been implemented to some extent since there were 45% cases of malnutrition among ECDE to Grade 4 learners and all schools in Kibish, North and West had not received SFP supplies. It was also noted that 90% of LCBS did not provide balanced diet to their learners; however, the few (10%) that showed some positive trend towards provision of balanced diet to their learners; with a supply of a fruit in every meal. In most (80%) schools, the food storage was secure. An added advantage was witnessed across most (95%) of the schools with evidence of proximity of Health facilities, however most schools did not have a sanatorium.

In Garissa County, SFP was reliably being supplied by the Government. There were no cases of malnutrition noted in the County among ECDE to Grade 4 learners since they were provided with 3 meals per day comprising of rice, ugali, beans, green grams and lentils. However, there was need to enrich this food with vitamins and micro-nutrients for the pupils' basal metabolic functions, cognitive development, health and general growth. It was noted that 80% of the LCBS in Garissa spend about 60% of their budgets to purchase food to supplement the SFP and the LCBS grants. The capitation for schools which was last revised in 2013 and was Ksh. 3,000 per child. Inflation and other economies of scale have made this figure unviable to support the SFP due to huge influx of boarders who have not been considered to receive the requisite grants hence causing strain to the schools' food and nutrition programme. 90% of schools had relatively adequate and safe food storage facilities with 93% of the schools having storage facilities that were safe. However, some of them needed renovation to avoid food contamination from pathogens, insects and rodents.

In Kajiado County, it was seen that there were no cases of malnutrition and learners were accessing balanced diet. It was attributed to the fact that schools were spending more than 60%

of their revenue on food. Notably, schools that were receiving SPF grant indicated that food given was irregular and unreliable; additionally, there were chronic delays in the disbursement of the grant thus making planning very difficult. Out of the total schools reached, only 20% of them had kitchen inventory books for proper record keeping especially on the health status of the food handlers. Food preparation areas were clean, and health and hygiene protocol was largely observed. It is worth noting that 80% of the schools in Kajiado County had a health facility less than 1 kilometer away but stakeholders felt there was a need of having a dispensary and a registered nurse in every school to guarantee learners adequate medical attention.

In Narok County, SFP was implemented to some extent. It was established that in some 3 schools, there were cases of malnutrition among ECDE to grade 4 learners, this could be attributed to the fact that all schools assessed had not received SFP grant for the last one year. In most schools (70%), food handlers were reported to have undergone health checks on regular basis with valid medical certificates in their files. In 85% of the schools, kitchens were relative clean with cooks dressed in appropriate gear. However, in 20% of the schools, food was prepared in open areas which could lead to food contamination. Schools in Tana River County had implemented school feeding program to some extent. This was evidenced by the fact that in 65% of the schools, food handlers did not have health certificates.

In Taita-Taveta County, SFP for all learners had been implemented in 75% of the schools. There was as low rate as 25% of malnutrition in ECDE to grade 4 learners. This could be attributed to the fact that 68% of all schools were receiving SFP ration and about 58% of the schools were spending more than 60% on food provision. There was regular and reliable SFP in 67% of the schools and the same number of schools was providing balanced diet to the learners. It is important to note that 83% of the schools had plans to expand SFP to ensure all learners were accessing health food so as to improve access, retention and completion rates among learners in LCBS. Regarding food security and safety, 83% of the schools in Taita-Taveta County had safe and secure food storage facilities, 58% had kitchen inventories and in 68% of the school's food handlers had updated medical certificates. Food was hygienically prepared in all the schools and about 78% of the schools were organizing medical visits and talks to enlighten learners on health habits. On average, the distance between schools to health facility was less than one kilometer for enhanced access to medical care.

Kwale County had implemented SFP for all learners in about 47% of the schools. 42% of the schools had malnutrition cases among ECDE to grade 4 children. Slightly more than half (58%) of the schools had received SFP ration, however, majority of the schools (83%) were not receiving regularly and reliable supply of SFP. Only 67% of the schools were providing learners with balanced diet. On the food safety and security, 67% of the schools were on the right track with about 42% with maintained kitchen inventory and 50% having food handlers with medical certificate. All schools in Kwale County were preparing food under

good hygiene condition while 83% of the schools had visited or held health talks to enlighten learners on health practices. The distance between schools and health facilities was less than one kilometer.

4.5 Environment Conservation

Environmental conservation is the protection, preservation, management, or restoration of natural environments and the ecological communities that inhabit them. Schools have a unique role in environmental conservation. Schools also help students to become conscientious stewards and advocates for environment, protecting it for themselves and generations to come. The study sought information on the implementation of various environmental conservation aspects such as; water harvesting initiative, access to weather station, availability of environmental green clubs, waste management, use of renewable energy, use of energy saving jikos and bulbs and use of chimneys to disperse smoke. The findings are as stipulated in **Table 13**.

Table 13

ENVIRONMENTAL CONSERVATION ASPECTS	Turkana	Kajiado	Narok	Garissa	Tana River	Taita Taveta	Kwale	Kilifi
Water Harvesting	15%	-	38%	55%	50%	-	-	-
Weather Station	-	-	17%	-	-	8%	8%	-
Nearest Weather Station	More than 5kms	More than 5kms	More than 5kms	More than 5kms	More than 5kms	More than 5kms	More than 5kms	More than 5kms
Availability of Green Club	15%	-	-	4%	25%	8%	75%	-
Waste Management	Burn waste	Burn waste	Burn waste	Burn waste	Burn waste	Burn waste	Burn waste	Burn waste
Use of Energy Saving Jikos	80%	20%	70%	79%	88%	75%	25%	30%
Availability of Chimney for Smoke Dispersal	10%	10%	20%	76%	10%	58%	17%	10%
Use of Energy Saving Bulbs	20%	10%	15%	85%	80%	-	75%	-

Distribution of Various Environmental Conservation Aspects in Schools per County

As indicated on Table 13, only four Counties; Turkana, Garissa, Narok and Tana River had made some efforts to harvest rainwater with Garissa leading at 55% of the schools. The rest had not made remarkable progress in harvesting rainwater despite its importance in both environmental conservation and cutting down on school expenditure.

It was notable that, in some of the schools that were harvesting rainwater, gutters were not properly maintained and storage facilities were mostly inappropriate and inadequate. The image bellow shows efforts made in one of the schools to harvest rainwater.

Effort of Rooftop Water Harvesting

Irrespective of the fact that weather stations in schools are important aspects in environmental conservation since it enables users to take precise measurements of outdoor weather conditions and generate accurate forecasts for useful activities, only few schools in three Counties had one. These were; Narok (17%), Taita-Taveta (8%) and Kwale (8%). It is clear from Table 13 that the nearest weather station to all the schools in the Counties under study was more than 5 kilometers away. This could inhibit regular visits to these stations by the learners.

Green clubs in schools empowers learners to participate and take up meaningful environmental activities and projects. It is a forum through which students can reach out to influence, engage their parents and neighborhood communities to promote sound environmental behavior. However, some Counties like Kajiado, Narok and Kilifi had little or no initiatives of green clubs in their schools. Some Counties like Garissa (4%), Tana River (25%), Taita-Taveta (8%) and Kwale (75%) had implemented green clubs to an extent. In Turkana County, most schools had evidence of adhoc environmental clubs with no structured activities. In Kwale County which was doing quite well in school green club implementation, some of the program/projects in place were Tree Planting Initiatives, Tree Nurseries, Kitchen Gardens, Green Houses, Livestock Keeping, Maize Farming, Poultry Farming, Environment Club, Terracing, Trenching, and Solar Energy Harnessing.

Proper waste management in schools is very crucial not only in maintaining cleanliness of the surrounding but also keeping good health of the people. Proper waste management require logical and meticulous planning by all stakeholders. It is only a few schools (10%) that had clearly labelled waste collection bin to allow litter separation hence proper disposal. As indicated on Table 13, burning waste was very common in all the schools; this was detrimental because of its adverse environmental and health impacts on human beings and the whole environment. The image (next page) shows a common waste disposal pit in most of the schools.

Waste Disposal Pit

It is notable that a number of schools across all counties under study were using energy saving jikos which curbs health problems, deforestation, saves time and money. Tana River County was leading with 88%, followed by Turkana (80%) and Garissa (79%). Counties that had least use of energy saving jikos were Kilifi (30%), Kwale (25%) and Kajiado (20%). It was also noted that all the schools used firewood which was either fetched or provided by the local merchants. This could not only accelerate deforestation but also contribute to both indoor and outdoor air pollution. On the same note, most of the schools did not have chimneys to vent products of combustion apart from schools in Garissa (76%) and Taita-Taveta (58%). This could lead to health problems among learners, teaching and non-teaching staff.

Use of energy saving bulbs minimizes electricity consumed and helps in reduction of carbon footprint of the premises where it is used. The study established that majority of the schools in Garissa (85%), Tana River (80%) and Kwale (75%) were using energy saving bulb which was a good practice. However, there was little use of energy saving bulbs in Turkana (20%), Narok (15%) and Kajiado (10%).

Charcoal Burning

4.6 Climate Change

Climate change describes a change in the average conditions such as temperature and rainfall in a region over a long period of time. It is important for pupils to learn about the causes and effects of climate change as well as possible responses to it. This knowledge helps in promotion of climate-resilient development and reduction of vulnerability of communities in the face of an uncertain future. Crucially, it helps individuals to make informed decisions as well as preparing learners to face natural hazards, enhance disaster risk reduction (DRR) skills and engage in responsible actions to reduce greenhouse gas emissions through more sustainable lifestyles. Therefore, the study sought information regarding awareness on climate change, migration of families in search of water and pastures, temperature raise and change in rainfall patterns as well as human wildlife conflict. The findings were as presented in **Table 14**.

Table 14

ASPECTS OF CLIMATE CHANGE	Turkana	Kajiado	Narok	Garissa	Tana River	Taita Taveta	Kwale	Kilifi
Awareness of Climate Change	65%	10%	15%	40%	10%	100%	92%	-
Migration due to Lack of Water and Pasture	20%	-	-	75%	70%	8%	17%	30%
Temperature Rise and Change in Rainfall Patterns		-	75%	80%	75%	75%	83%	80%
Human Wildlife Conflict	45%	20%	75%	60%	20%	75%	58%	58%

Distribution of Various Aspects of Climate Change in percentage per County

As indicated in Table 14, there has been awareness of climate change to some extent with Taita-Taveta and Kwale leading with 100% and 92% awareness rate respectively. In Turkana County 65% of the schools were aware of climate change. In Kajiado County, there was minimal advocacy and campaigns on reduction of effects of climate change such droughts, flooding and unpredictable weather patterns among others. In Garissa County, only 40% of the schools had knowledge on the impact of climate change and any mitigating and adaptive climate resilient programs to be implemented. A notable effort was in Balambala Primary that had developed a forest in an acre piece of land. Most schools had no tree cover and were adversely affected by strong winds which caused havoc by uprooting roofs and destroying structures including solar panels. There were visible cracks on classrooms and dormitories walls making them dangerous for pupils since they could collapse any time. Some entities that conducted campaigns on climate change in Narok County were Mara Conservancy, Friends of Mara, philanthropists and Government of Kenya departments/agencies.

While sponsors of climate awareness campaign in Taita-Taveta and Kwale Counties were 4K Club partnership with Plan International, Barazas, parents meetings, community, County Government, Kenya Forest Department, Mazingira (Bamboo Trees), National Environmental Management Authority NEMA, Penda Nchi Panda Mti, The Red Cross and Teachers.

Modern Kitchen Facility in Turkana County

It is notable that there were learners whose parents had moved away from their homes for search of water and pasture in six Counties (75%) hence affecting their learning. The Counties that were mostly affected included Garissa (75%) with about 1,500 pupils having been affected in a period of only one year and Tana River (70%) with about 1,000 pupils having been disrupted in the current year.

School Children in search for water

Regarding temperature raise and change in rainfall patterns, almost all Counties reported more than 70% experience with Kwale (83%) and Kilifi (80%) reporting the highest percentage. In Kwale and Kilifi Counties, crops like bananas, coconuts, lemon, guavas, maize, vegetables, beans, cabbages, cassava, green grams, sweet potatoes, coshorina trees, oranges, pineapples, millet, sorghum, arrow roots, pumpkins, mangoes, mpampa, sugarcane, green peas, and yams have decreased with about 67%.

All Counties reported cases of human wildlife conflict with Taita-Taveta registering the highest (75%). In Turkana County, schools close to the lake experienced crocodile attack while others experienced attacks from hyenas. Due to proximity of Nairobi National Park to Kajiado County, there were some cases of human wildlife conflict that affected learning. In Narok County, there were cases of human wildlife conflict since most schools were located within Mara conservancy or along the wildlife corridor. In Garissa County, human wildlife conflict cases were reported regarding pupils who were learning from under trees and were exposed to attacks from animals including lions. This was rampant in areas bordering Meru national reserve in Danyere and Sankuri areas. In Tana River County, human wildlife conflict mostly arose from animals like baboons, Elephants, monkeys, buffalos and hippopotamus among others that move from their habitat to look for food and water due to droughts. They mostly move from Sarova Sanctuary and Tsavo East.

4.7 Food Security and Smart Agriculture

Food security is defined as a situation in which all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life. Smart agriculture is defined as sustainably increasing agricultural productivity and incomes, adapting and building resilience to climate change and reducing greenhouse gases emissions. In this study information was sought at the community level through focus group discussions on the issues of food security and smart agriculture. The findings were as discussed in this section.

In Turkana County, it was observed that there was increase in number of hungry day scholars who could hardly have three meals per day. Due to scarcity of food, there were high cases of absenteeism among learners as well as high transfers to schools that were providing meals. On whether the cost of food had increased, one respondent from Kajiado County had this to say;

> *"Food prices have been increasing in an alarming rate; it is becoming increasingly hard to purchase foods such as maize and wheat flour among others. This has made it difficult for me to provide balanced diet for my children given that it is difficult to grow vegetables due to lack of water."*

It was evident in all the counties visited that the ever-increasing food prices had affected people's purchasing power given that most of them were not in any form of employment. Most (75%) people in Taita-Taveta owned between 1-2 acres of land with an average household member of 6-10. Food adequacy was at 30% in Taita-Taveta, Kwale and Kilifi and much was not produced locally.

It is also crucial to note that majority of the community members in most counties were not in formal and reliable employed, rather, they engaged in SME and farming which was affected by natural weather patterns and poor selling prices. In the context of food scarcity, some coping mechanisms noted included; buying food from local markets, Tanzania, relief food, charcoal burning, government supply, school feeding program, skipping meals and working for food among others.

In Narok County, there were a lot of agricultural activities taking place with maize, beans, sugar and wheat farming taking the lead. However, there were few cases of SMART agriculture. Notably there are large scale farmers and ranchers especially in Trans Mara and Narok West and East Sub Counties. All households in Narok County spend huge amount of resources (over 60% of household income) on food every month. Land tenure system in the area is both communal and individual; especially in farming areas of Kilgoris and Narok West and East Sub Counties. Food is mainly produced within the sub counties and surplus traded outside the county. The predominant foods consumed in the area were wheat, sugar, maize, beans and meat.

Through focus group discussions and observation, it emerged that in Taita-Taveta, Kilifi and Kwale Counties, crop farming in small scale farms was predominant. However, the farming was not doing very well due to lack of proper seedlings and seeds, reliable rainfall and unpredictable weather patterns. The sources of water for agriculture in the counties were boreholes, dam, irrigation, rain dependant agriculture, river, springs and streams. There were governments and agencies such as Red Cross to fight hunger through various initiatives such as; provision of cashew nuts seedlings, certified seeds, construction of dams, County government free seeds, fertilizers, improved chicken, drilling of boreholes, food aid and relief, gum trees planting, home grown solutions, Plan International trainings and ploughing machines at affordable cost.

Small Scale Kitchen Garden

CHAPTER 5:
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter gives the general summary of the study, conclusions drawn from the study and recommendations.

5.2 Summary

The purpose of the study was to assess Low Cost Boarding Schools (LCBSs) in the Arid and Semi-Arid Lands (ASALs) and Pockets of Poverty regions of Kenya on the impact of climate change to ensure sustainability. The assessment was guided by the following objectives;

- To assess boarding programs in LCBS in ASALs and Pockets of Poverty regions in Kenya in terms of grants received;
- Adequacy and safety of facilities as well as meals provided;
- Examine availability, adequacy and safety of school infrastructure such as classrooms, toilets, water and electricity in LCBS in ASALs and Pockets of Poverty regions in Kenya;
- Assess nutrition and health practices such as SFPs, food security and safety in LCBS in ASALs and Pockets of Poverty regions in Kenya;
- Identify best approaches for environment conservation in use of renewable energy, appropriate waste management in LCBS in ASALs and Pockets of Poverty regions in Kenya;
- Identify climate change relevant adaptive capacity designs/models (green infrastructures) for ending drought emergencies in LCBS in the ASALs and Pockets of Poverty; and
- Identify ways of ensuring food security by embracing climate smart agriculture and other initiatives in LCBS in ASALs and Pockets of Poverty regions in Kenya.

Descriptive survey design was used as the framework to guide the study. To achieve the objectives of the study, data were collected from 191 schools as well as from the community in the sampled Counties. Data collection instruments used in the study included; questionnaires, document analysis and observation guides as well as focus group discussion. Quantitative data was analyzed using descriptive statistics while qualitative data was analyzed thematically and presented in narratives. The summary of the findings are based on the study objectives as follows;

1. Demographic information indicated that most schools had no valid registration certificates, title deeds, official postal and email address and were understaffed.
2. Facilities in most schools were not friendly to people living with disabilities and majority of the schools had no green school programs.
3. On boarding program, 65% of the schools had received regular LCBS grants and 88% indicated that grant did not match the enrolment. According to 76% of the schools, boarding facilities were inadequate, inappropriate and unsafe; learners, especially boys were sharing beds while others slept on the floor.

4. Regarding school infrastructure, in most of the Counties (6), toilets were inadequate, were not friendly to people living with disabilities and were not providing required safety and privacy. Hand washing facilities were inadequate in about 53% of the school while 57% of the schools didn't have clean bathrooms. Water was inadequate in 62% of the schools.
5. On nutrition and health, majority of the schools did not provide balanced diet to learners, 80% had secure and safe food storage facilities and 95% of the schools were close to a health facility. It was noted that 80% of the schools used 60% of its budget on food.
6. Regarding environmental conservation, about 50% of the schools were harvesting rainwater while 90% did not access weather station and majority, 90% were burning waste generated in schools.
7. On issues of climate change, 50% of the schools were aware of various aspects of climate change. There were reported migrations in search of water and pasture in the counties under study; this had negative impact on teaching and learning processes.
8. In all the counties under study, there was notable (50%) human wildlife conflict brought about by scarcity of resources due to climate change.
9. In line with food security and smart agriculture, it emerged that most day scholars were dropping out of school because of hunger and there were high cases of absenteeism, there was increase in food prices necessitating skipping of meals in the community, many households (70%) consisted 1- 6 members and most people were relying on small enterprise businesses and farming which was adversely affected by unpredictable weather patterns. This brought about high dependency on relief from both National and County governments as well as on humanitarian agencies.

5.3 Conclusions

Based on the findings of the study, the following were the conclusions

- LCBS were few compared to the number of school going age children in the ASAL. This brought about increased number of day scholars which could affect quality of education as well as overall performance.
- The teacher pupil ratio was a challenge since some class sizes were as large as 1:95. This had negative impact on curriculum implementation and some school's board of managers had to employ teachers. This caused financial strain and deterred other developments. Some schools were not registered and did not have title deeds. This put such institutions at risk of land grabbers and encroachment.
- Majority of the schools did not have adequate, appropriate and safe physical infrastructure. There was scarcity of water in some schools which put learner's health at risk. Droughts had become more common in most of the target counties areas, reducing crop yield and affecting livestock, thus subsequently impacting on child malnutrition in these LCBS;

- Across the target counties it was evident that climate change was threatening child survival and development, and it would continue to do so in the future as climatic challenges intensify and cause increasing risk and uncertainty.
- There was tremendous opportunity and goodwill from the targeted LCBS to ensure that their schools are well-equipped with the skills and knowledge to not only survive, but also thrive within the environmental challenges.

5.4 Recommendations

The implication of these findings affect, all stakeholders in the education sector, MOE, NACONEK, NDMA, GKIT and LCBS management among others. The study recommends that the following steps can be taken to have climate resilient green model schools for environmental conscious community;

1. The schools that are still struggling with registration and title deeds need to be supported to fast track the registration and acquisition of title deeds;
2. Ministry of Education and its partners should invest (budget allocation) in schools' infrastructures to ensure conformity to safety standards and ensure learner-friendly environment.
3. GoK to allocate more funds to school feeding program to enhance its reliability to help improve access, retention and completion rates among children in ASALs.
4. Educate school communities towards establishing green schools and other climate resilient initiatives in schools to inculcate the climate change realities in children at tender ages in life
5. Schools need support on how to practice kitchen gardening and fruit - tree planting to supplement vitamins which is lacking in learners' diets.
6. Undertake rainwater harvesting and flood proof sanitation to guarantee safe sources of drinking water, prevent adverse health risks to children.
7. Design adaptation programs to respond to the impacts of climate change in order to put LCBS and adjacent communities ready to cope with the increasing intensity of impacts predicted for the future.
8. NACONEK to enhance its efforts to activate and operationalize its function of school feeding program. This will effectively assist ALL the LCBS to enhance 50% to 70% of their budget which can be used for other budgetary vote heads other than plugging in the deficit that has been experienced with the SFP as it is currently administered.
9. NACONEK, NDMA and GKIT to come up with a Home-grown project plan of action to develop sustainable agribusiness value chains targeting the schools and community which will cushion the schools from the vagaries of hefty and exorbitant food prices that are perennially grown outside Kajiado County.

10. NACONEK, NDMA and GKIT to address water sustainability challenge to enable all LCBS have enough clean water both for domestic and commercial utility.
11. Increase the number of LCBS across the ASALs and in pockets of poverty regions of Kenya to ensure increased access, retention, transition and completion rates in education.
12. Renovate the delipidated dormitories and WASH facilities in LCBS and construct gender and disability WASH facilities.

REFERENCES & APPENDICES

Belachew, T., Lindstrom, D., Gebremariam, A., Lachat, C., Huybregts, L., & Kolsteren, P. (2012). Predictors of Chronic Food Insecurity among Adolescents in southwest Ethiopia. BMC Public Health, 12:604.

FAO (2013).The state of food insecurity in the world: the multiple dimensions of food security. Retrieved from www.fao.org/docrep/018/i3434e/i3434e.pdf

FICCF (2014). A Review of Climate Smart Agriculture in the Non-ASAL areas of Kenya: Finance Innovation and Climate Change Fund. Nairobi.

GOK (2010). National Climate Change Response Strategy. Ministry of Environment and Mineral Resources, Nairobi.

Hadley, C., Stevenson, E., Tadesse, Y., & Belachew, T. (2012). Rapidly Rising Food Prices and the Experience of Food Insecurity in Urban Ethiopia: Impacts on Health and Well-being. SocSci Med, 75(12): 2412–9.

Hrestha R.M., Ghimire M., & Shakya P. et al. (2019). School Health and Nutrition Program Implementation, Impact, and Challenges in Schools of Nepal: Stakeholders' Perceptions. Trop Med Health, 47, 32.

Kabubo-Mariara J. & Kabara, M. (2015). Climate Change and Food Security in Kenya. Environment for Development. Discussion Paper Series No. 15-05.

Kumar, R. (2005). Research Methodology. London. Sage Publications.

Matheson, D., Varady, J., Varady, A., & Killen, J. (2002).Household food security and nutritional status of Hispanic children in the fifth grade. Am J ClinNutr, 76(1): 210–7.

Muro, P., & Burch, F. (2007). Education for Rural People and Food Security: A cross country analysis, Rome. Retrieved from www.fao.org/docrep/010/a1434e/a1434e00.htm

Ochieng, J., Kirimi, L., & Makau, J. (2016). Adapting to Climate Variability and Change in Rural Kenya: Farmer Perceptions, Strategies and Climate Trends. Natural Resources Forum, 41(4): 195–208.

United Nations Economic and Social Council (2012). Status of Food Security in Africa, Addis Ababa, Ethiopia. Retrieved from http://www.uneca.org/sites/default/files/uploaded-documents/CFSSD/CFSSD8/3

Wineman, A., Mason, N.M., Ochieng, J., & Kirimi, L. (2017). Weather Extremes and Household Welfare in Rural Kenya. Food Secure, 9(2): 281–300.

NACONEK
NATIONAL COUNCIL FOR NOMADIC EDUCATION IN KENYA

NATIONAL COUNCIL FOR NOMADIC EDUCATION IN KENYA (NACONEK)

Republic of Kenya | National Drought Management Authority | Greening Kenya Initiative Trust

ASAL SCHOOLS CLIMATE CHANGE IMPACT ASSESSMENT TOOLKIT FOR ENSURING SUSTAINABILITY

Date: ..... GPS Coordinates: .....

Time Start: ..... Time End: .....

A: Instructions to Monitors

One questionnaire should be filled for each school.

The assessment tool has six broad areas namely:

- School Contact & General information;
- Boarding Programme;
- School Infrastructure;
- Nutrition & Health;
- Environment Conservation;
- Climate Change.

A: SCHOOL CONTACTS & GENERAL INFORMATION

A1: Name of School: .....

A2: School Type: *(tick against)*

1. Primary Public Mixed Boarding School ☐
2. Primary Public Boys Boarding School ☐
3. Primary Public Girls Boarding School ☐
4. Primary Public Mixed Day School ☐
5. Primary Public Boys Day School ☐
6. Primary Public Girls Day School ☐

A3: Year School Started: ..... **A4:** Registration No.: .....

A5: Land Size (acres): ..... **A6:** Title Deed No.: .....

A7: Ward: ..... **A8:** Sub-County: .....

A9: County: .....

A10: Distance from Sub-County Offices (km): ☐

A11: Distance from National Headquarters (km): ☐

A12: Distance from County Headquarters (km): ☐

A13: Town/City: .....

A14: School Telephone Number: .....

A15: School Postal Address: .....

A16: Email Address of School: .....

A17: Total number of Teachers (TSC Employed): Male: ☐ Female: ☐ Total: ☐

A18: Total number of Teachers (BOM Employed/TSC Employed): Male: ☐ Female: ☐ Total: ☐

A19: Current Enrolment *(existing)* pupils *(verify by observation)*: Boys: ☐ Girls: ☐ Total: ☐

A20: Total number of Students with Special Needs *(verify by observation)*: Boys: ☐ Girls: ☐ Total: ☐

A21: Kind of Special Needs (differently abled) *(verify)*:

	Boys:	Girls:	Total:
1. Visual Impairment	☐	☐	☐
2. Deaf or Hard of Hearing	☐	☐	☐
3. Mental Health Conditions	☐	☐	☐
4. Intellectual Disability	☐	☐	☐
5. Acquired Brain Injury	☐	☐	☐
6. Autism Spectrum Disorder	☐	☐	☐
7. Physical Disability	☐	☐	☐
8. Multiple Disabilities *(specify)*	☐	☐	☐
9. Other *(specify)*	☐	☐	☐

A22: Enrolment for the last four years *(trends)*:

GENDER	2015	2016	2017	2018
BOYS				
GIRLS				
TOTAL				

A23: Number of Boarders: Boys: ☐ Girls: ☐ Total: ☐

A24: Number of Day Scholars: Boys: ☐ Girls: ☐ Total: ☐

A25: Student Data for 2018: Reason for Absenteeism *(check register)*

Sickness:		Pregnancy:		Early Marriage:		School Fees:	
Insecurity:		Suspension:		Expulsion:		Transfer:	
Cattle Rustling:		Others: *(specify)*					

A26: KCPE Performance Records

YEAR	2015	2016	2017	2018
MEAN SCORE				

A27: Year of (to Green-School Program) *if applicable* Registration: Year: Graduation: Year:

A28: Does the school have any green school program/project? Yes: No:

A29: If yes, list them .....

.....

.....

.....

B: BOARDING PROGRAMME

INDICATORS

B1: Does the school receive regular low cost boarding grant? Yes: No:

B1.1: If yes, how much? Kshs. .....

B1.2: Evidence: .....

B2: Does the enrolment match the government grant? Yes: No:

B2.1: Evidence: .....

B3: Are there adequate boarding facilities? *(Number of beds, toilets bathrooms)* Yes: No:

B3.1: Evidence: .....

B4: Do the boarding facilities meet the health and safety standards? *(e.g. fire extinguishers. Verify through observation)* Yes: No:

B4.1: Evidence: *(tick where available)*

1. Wider Doors: ☐ 2. Emergency Exits: ☐ 3. Labels: ☐ 4. Safety Policy: ☐

5. Fire Extinguishers: ☐ 6. Sanatorium: ☐

7. Others: *(specify)* ..... ☐

B5: Are the boarders provided with three meals? *(Breakfast, lunch, supper)? (Verify from the learners and records)* Yes: ☐ No: ☐

B5.1: Evidence: .....

B6: Are the boarding facilities secured and fenced? *(Verify through observation)* Yes: ☐ No: ☐

B6.1: Evidence: .....

B7: Is there a trained boarding matron/master to take care of the children? Yes: ☐ No: ☐

B7.1: Evidence: .....

B8: Is there security personnel to take care of the children? Yes: ☐ No: ☐

B8.1: Evidence: .....

C: SCHOOL INFRASTRUCTURE

INDICATORS

C1: Are the school facilities friendly to learners? Yes: ☐ No: ☐

C1.1: Evidence: .....

C2: Do the facilities meet the health and safety standards? Yes: ☐ No: ☐

C2.1: Evidence: .....

C3: Are there adequate classrooms and furniture provided to all learners? Yes: ☐ No: ☐

C3.1: Evidence: .....

C4: Do the toilets provide privacy and security? *(Verify through observation)* Yes: ☐ No: ☐

C4.1: Evidence: *(tick where available)*

	Male:	Female:	Total:
Number of toilets for learners without disability			
Number of toilets for learners with disability			
Number of toilets for staff			

C5: Are there proper hand washing facilities? *(Verify through observation)* Yes: ☐ No: ☐

C5.1: Evidence: .....

C6: Are the bathroom facilities provided and kept clean? *(Verify through observation)* Yes: ☐ No: ☐

C6.1: Evidence: .....

C7: Is water available for the school? Yes: ☐ No: ☐

C7.1: If Yes, what are the sources of water for the school? *(Tick against all that apply)*

1. Borehole Water: ☐ 3. Rainwater: ☐ 5. Rivers: ☐
2. Piped Water: ☐ 4. Water Pans: ☐

6. Others: *(specify)* .....

C7.2: If No, how the pupils cope? .....

C7.3: If source is Borehole, Is it (Tick against all that apply)

1. Functional: ☐ 2. Salty: ☐ 3. Treated: ☐ 4. Other: .....

C7.4: Who supported the drilling of the borehole? .....

C8: What is the distance from the school to the nearest water source?

1. Less than 1km: ☐ 3. 3 – 6km: ☐ 5. More then 10km: ☐
2. 1 – 3km: ☐ 4. 6 – 10km: ☐ 6. Don't know: ☐

C9: If the water storage is tanks, what is the capacity of the tanks? *(Tick against all that apply)*

1. 5,000 lts: ☐ 2. 10,000 lts: ☐ 3. 20,000 lts: ☐ 4. Over 20,000 lts: ☐

C9.1: C9.1. How many litres of water are currently in the storage tanks? ..... liters

1. Very Poor: ☐ 2. Poor: ☐ 3. Moderate: ☐ 4. Good: ☐ 5. Excellent: ☐

C10: What is the percentage reliability of water?

1. Less than 25% ☐ 2. 25% – 50% ☐ 3. 51% - 75%: ☐ 4. 76% - 100%: ☐

C11: Does the school have electricity? Yes: ☐ No: ☐

C11.1: If Yes, what is the source?: .....

D: NUTRITION & HEALTH

INDICATORS

D1: From ECD to Class 4, are there children who suffer from malnutrition? Yes: ☐ No: ☐

D1.1: Evidence: .....

D2: Does the school receive the School Feeding Program (SFP) ration? Yes: ☐ No: ☐

D2.1: Evidence: .....

D3: Does 60% of the school income go food acquisition to compliment SFP? Yes: ☐ No: ☐

D3.1: Evidence: .....

D4: Is there a School Feeding Program (SFP) for all learners? Yes: ☐ No: ☐

D4.1: Evidence: .....

D5: Is the School Feeding Program (SFP) regular and reliable? Yes: ☐ No: ☐

D5.1: Evidence: .....

D6: Are there plans to expand the School Feeding Program (SFP)? Yes: ☐ No: ☐

D6.1: Evidence: .....

D7: Is a balanced diet provided for all learners? Yes: ☐ No: ☐

D7.1: Evidence: .....

D8: Is the food storage secure and safe? *(Verify through observation)* Yes: ☐ No: ☐

D8.1: Evidence: .....

D9: Is there an updated inventory of the school kitchen equipment? Yes: ☐ No: ☐

D9.1: Evidence: .....

D10: Do the food handlers have current food handlers' medical certificates? Yes: ☐ No: ☐

D10.1: Evidence: .....

D11: Is the food hygienically prepared?
(Verify through observation) Yes: ☐ No: ☐

D11.1: Evidence: .....

D12: Does the school organize for medical visits and health talks? Yes: ☐ No: ☐

D12.1: Evidence: .....

D13: What is the distance from the school to the nearest Health facility?

1. Less than 1km: ☐ 3. 3 – 6km: ☐ 5. More then 10km: ☐
2. 1 – 3km: ☐ 4. 6 – 10km: ☐ 6. Don't know: ☐

D14: Is there a School Feeding Program (SFP) for all learners? Yes: ☐ No: ☐

D14.1: Evidence: .....

E: ENVIRONMENT CONSERVATION

INDICATORS

E1: Are there water harvesting initiatives in the school? Yes: ☐ No: ☐

E1.1: If Yes, list them: .....

E2: Does the school have a mini-weather station within it? Yes: ☐ No: ☐

E2.1: Evidence: .....

E3: Is the distance to the nearest weather station less than 5km? Yes: ☐ No: ☐

E3.1: Evidence: .....

E4: Is there any environmental green club/program in the school? Yes: ☐ No: ☐

E4.1: Evidence: .....

E5: Does the school have clearly labelled waste collection bins? Yes: ☐ No: ☐

E5.1: Evidence: .....

E6: Does the school burn waste material? Yes: ☐ No: ☐

E6.1: If Yes, how often? .....

E7: Does the school apply the use of renewable energies such as briquette/solar/biogas in the school kitchen? Yes: ☐ No: ☐

E7.1: Evidence: .....

E8: Does the school use energy saving institutional *jikos*? Yes: ☐ No: ☐

E8.1: Evidence: .....

E9: Does the school have chimney for smoke dispersal? Yes: ☐ No: ☐

E9.1: If Yes, has the school kitchen chimney ever undergone any modification or retrofitting?

Yes: ☐ No: ☐

E9.2: If Yes, who led it? .....

E10: What are the sources of wood fuel?

1. School wood lot: ☐ 3. Local Supplier/Merchant: ☐ 5. Don't know: ☐
2. Fetching: ☐ 4. KFS/Govt: ☐ 6. Other (specify): .....

E11: How much does the school used on wood fuel per term?

1. Less than 30,000/- ☐ 2. 30,000 – 50,000/- ☐
3. 51,000-100,000/- ☐ 4. Over 100,000 ☐

E12: Is there solar powered initiatives as a source of energy? Yes: ☐ No: ☐

E12.1: Evidence: .....

E13: Does the school use energy saving bulbs in classrooms/ dormitories/ for security lighting? Yes: ☐ No: ☐

E13.1: Evidence: .....

F: CLIMATE CHANGE

INDICATORS

F1: Is the school aware of the impacts of Climate Change? Yes: ☐ No: ☐

E1.1: If Yes, list them. If No, give reasons: .....

F2: Have there been climate change advocacy campaigns by the parents/students/community? Yes: ☐ No: ☐

F2.1: If Yes, name the sponsor & show evidence: .....

F3: Have there been initiatives for creating awareness of Climate Change for the pupils over the past five years? Yes: ☐ No: ☐

F3.1: If Yes, by whom: .....

F4: Is there a climate change topic taught within the curriculum? Yes: ☐ No: ☐

F4.1: If Yes, who teaches? .....

F4.2: If No, would the school support its inclusion? Yes: ☐ No: ☐

F5: Does the school have children whose parents have moved away from the areas due to lack of water and pasture? Yes: ☐ No: ☐

F5.1: If so, how many? .....

F6: Has there been a temperature rise during the last five years? Yes: ☐ No: ☐

F6.1: Evidence: .....

F7: Have cases of human wildlife conflict increased over the years? Yes: ☐ No: ☐

F7.1: If so, what has been the main cause? .....

F8: Are there crops that used to grow in the school five years ago that have disappeared? Yes: ☐ No: ☐

F8.1: If Yes, which one? .....

F9: Has there been a change in rainfall patterns over the past 3 years? Yes: ☐ No: ☐

F9.1: Evidence? .....

F10: Do residents in the area use motor transport? Yes: ☐ No: ☐

F10.1: Evidence? .....

G-A: FOOD SECURITY AND SMART AGRICULTURE (AT SCHOOL LEVEL)

INDICATORS

G-A1: Are the pupils provided with 3 meals daily at household level? Yes: ☐ No: ☐

G-A1.1: Evidence: .....

G-A2: Are there students who suffer from malnutrition e.g. underweight, kwashiorkor etc.? Yes: ☐ No: ☐

G-A2.1: Evidence: .....

G-A3: Is there an increase in number of hungry day-scholar pupils? Yes: ☐ No: ☐

G-A3.1: Evidence: .....

G-A4: Has there been school dropouts due to food insecurity? Yes: ☐ No: ☐

G-A3.1: Evidence: .....

G-A5: Is there a school garden? *(Verify through observation)* Yes: ☐ No: ☐

G-A5.1: Evidence: .....

G-A6: Does the school practice sustainable smart agriculture? Yes: ☐ No: ☐

G-A6.1: If Yes, which techniques do you employ .....

G-A6.2: If No, would it be interested .....

G-B: FOOD SECURITY AND SMART AGRICULTURE (AT COMMUNITY LEVEL)

INDICATORS

G-B1: Has the cost of food produced increased in the area? Yes: ☐ No: ☐

G-B1.1: If Yes, How has the food price affected the purchasing power of the community?

.....

G-B2: What percentage of household income goes to acquisition of food?

1. 20% - 30%: ☐
2. 31% - 40%: ☐
3. 41% - 50%: ☐
4. 51% - 60%: ☐
5. Over 60%: ☐
6. Don't know: ☐

G-B3: Indicate *(by ticking/marking in the box)* the causes of food insecurity in that area**.**

1. Rapid population growth ☐
2. Trans-boundary conflicts ☐
3. Illiteracy ☐
4. Poor health & sanitation ☐
5. Deforestation ☐
6. Poor saving habits (financial) ☐
7. Limited employment ☐
8. Natural resources constraints ☐
9. Rain dependent farming ☐
10. Others *(specify)*: .....

G-B4: Is land in the area communally owned? Yes: ☐ No: ☐

G-B4.1: If No, what the average acreage of land owned by each household?

1. 1 – 2 Acres ☐ 2. 3 – 5 Acres ☐ 3. 6 – 10 Acres ☐ 4. Over 10 Acres ☐

G-B5: What the average number members in each household in the area?

1. 0 – 5 members: ☐ 2. 6 – 10 members ☐ 3. Over 10 members: ☐

G-B6: Are there members of your household in any form of employment? Yes: ☐ No: ☐

G-B6.1: If Yes, In what sectors are they employed?

1. Public service: ☐ 3. Agriculture: ☐ 5. Education: ☐
2. Private sector: ☐ 4. SME: ☐ 6. Any other sector: ☐

G-B7: Is food produced in the area enough at the household level? Yes: ☐ No: ☐

G-B7.1: If No, What are the coping mechanisms in place? .....

G-B8: Is the food consumed in the area locally produced? Yes: ☐ No: ☐

G-B8.1: If Yes, mention the kind of food processing industries in the area? .....

G-B9: Is crop farming dominant in the area? Yes: ☐ No: ☐

G-B9.1: If No, list the sources of water for agriculture in the area? .....

G-B10: What average land size in acres is specifically set aside for crop farming in the area?

1. 0 – 5 acres: ☐ 2. 6 – 10 acres ☐ 3. Over 10 acres: ☐

G-B11: Is the food consumed in the area balanced? Yes: ☐ No: ☐

G-B12: List the preferred foods consumed in the area??

.....

G-B13: Is there a market for crop produce in the area? Yes: ☐ No: ☐

G-B13.1: List the preferred foods produced in the area?

.....

G-B14: Are there food processing industries around the area? Yes: ☐ No: ☐

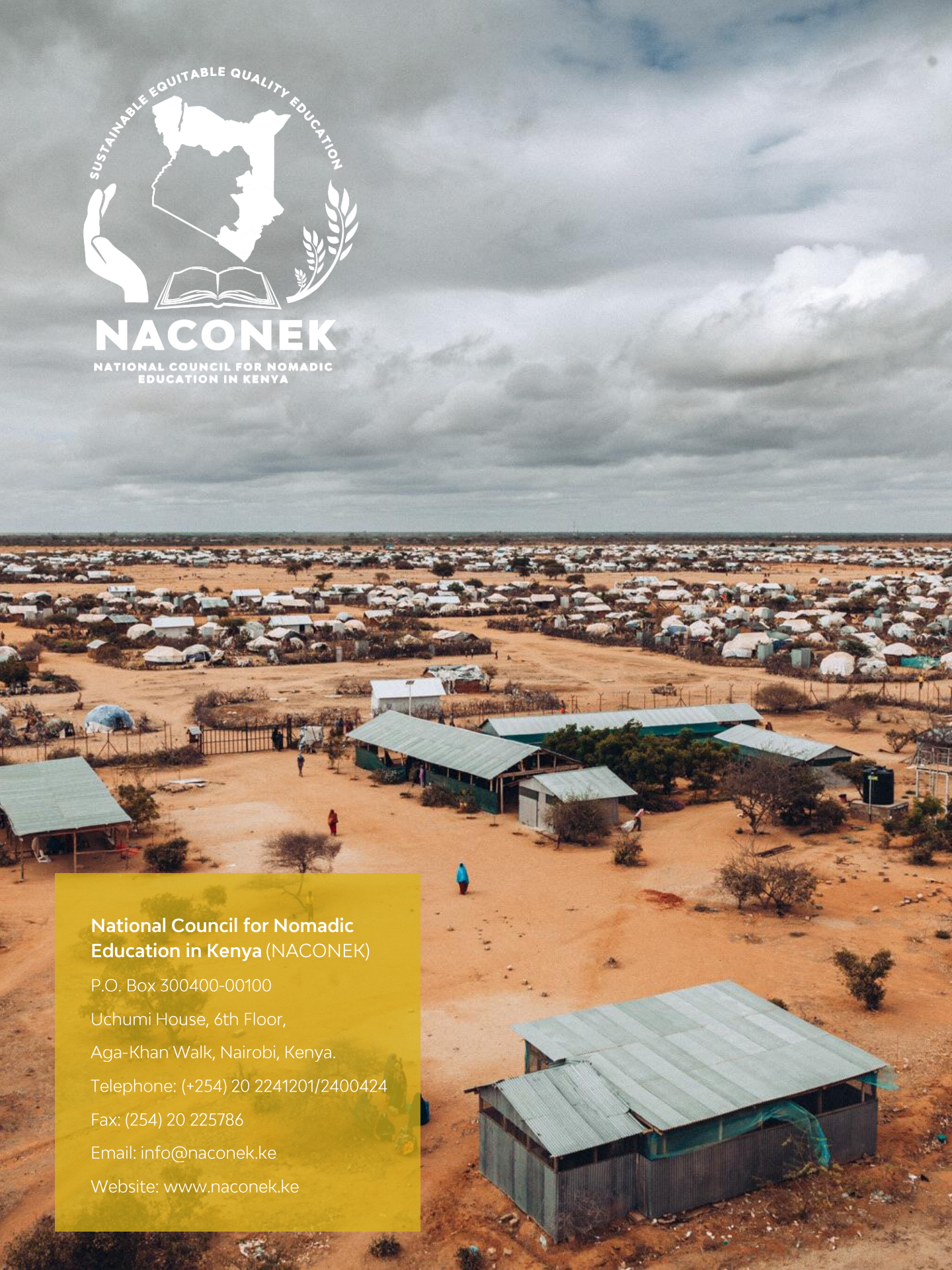
G-B14.1: If Yes, List the food processing industries around the area:

.....

G-B15: Have there been cases of food aid in area by humanitarian agencies such as the Red Cross? Yes: ☐ No: ☐

G-B16: Mention the initiatives by Government/agencies to fight hunger in the area?

.....



National Council for Nomadic Education in Kenya (NACONEK)

P.O. Box 300400-00100

Uchumi House, 6th Floor,

Aga-Khan Walk, Nairobi, Kenya.

Telephone: (+254) 20 2241201/2400424

Fax: (254) 20 225786

Email: info@naconek.ke

Website: www.naconek.ke