CONTRIBUTION OF KITALE NATURE CONSERVANCY TOWARDS
CREATION OF ENVIRONMENTAL AWARENESS IN SCHOOLS IN TRANS NZOIA COUNTY, KENYA

BY

OTIENO NASSER ONUONG’A (B.Ed, Arts)

N50/CE/26164/2014

A research project report submitted in partial fulfillment for the degree of Master of Science (Environmental Education) in the school of Environmental Studies of Kenyatta University

MAY, 2019
DECLARATION

I hereby declare that this project is my original work and that it has not been presented in any other university or institution for a degree award.

OTIENO NASSER ONUONG’A ( B.Ed ,Arts)

N50/CE/26164/2014

Signature……………………………………… Date…………………………

Department of Environmental Education

Kenyatta University

I confirm that the work reported in this project was carried out by the candidate under my supervision.

DR. EVERLYN WEMALI

Signature……………………………………… Date…………………………

Department of Environmental Education

Kenyatta University
DEDICATION

This project is dedicated to my wife, Naomi Chelangat, my daughter Ivanna Gould and my brothers for their support and encouragement.
ACKNOWLEDGMENT

First and foremost my gratitude goes to The Almighty God for enabling me to reach this far.

Secondly, special thanks to my supervisor, Dr. Everlyn Wemali for her immense contribution in guiding me and working round the clock to ensure I was well equipped in the fine tuning of my research project. I also wish to thank Kenyatta University, Environmental Education department including all the lecturers who guided me through my course work for their support and guidance.

My sincere appreciation goes to all principals of the various secondary schools for allowing me to carry out the research in their institutions. I also express my gratitude to the director, Kitale Nature Conservancy for willingly providing information for this study.

Lastly, I thank my parents, Mr. Peter Otieno and Mrs. Rose Ajwang for their support, prayers and encouragement.

God bless you all.
ABSTRACT

Education has been recognized as a very important tool to use in order to achieve ethics, values and behavior which promote sustainable development. Establishment of education centers which meet this standard has been the main challenge in our economic development. This study sought to determine the contributions of Kitale Nature Conservancy towards creation of environmental awareness and action in schools. The specific objectives were: to assess the extent to which programs offered in Kitale Nature Conservancy promote environmental sensitivity and behavior change; to analyze the relevance of the themes in programs offered at Kitale Nature Conservancy to school curriculum and to assess the influence of knowledge gained at Kitale Nature Conservancy in promoting environmental action in schools. The study adopted descriptive research design to solicit data on the knowledge acquired from the conservancy and the impact on environmental consciousness and action. A total of 24 secondary schools were identified to form the sample. Stratified sampling was used to select 12 schools that had visited the conservancy while simple random sampling was used to select 12 other schools that had not visited the conservancy. Questionnaires, key informant interview and environmental status checklist of schools in the two categories were used to collect data. Environmental awareness and attitude towards conservation of nature were analyzed using the Likert Scale. Quantitative data collected were coded and entered into an SPSS (version 22) for analysis. Pearson’s coefficient of correlation was used to compute the kind of relationship between schools which had visited the conservancy and those that had not visited the conservancy. The findings of the study have shown that major activities offered at the KNC such as excursion, tree identification and naming, video watching and environmental conservation projects offer an opportunity for the learners to have contact with nature and makes environmental conservation more practical. The programs are very creative and flexible thus compliments what is learnt in class. A correlation analysis between quality of education and knowledge gained among students and teachers showed positive significant correlation at P=0.01 level (2-tailed) as indicated by r (.378) for students and r (.137) for teachers. Results further revealed that environmental knowledge acquired by students was statistically significant (m=4.0, SD=0.71) and non-sensitized (m=2.81, SD=0.69) groups; t(406)=17.696, P=0.025. Environmental education programs offered at the KNC foster positive attitude towards the environment as they lead to creation of environmental awareness and action. But there is need for the conservancy to partner with schools so as to integrate the conservancy’s environmental practices and formal environmental learning experiences in the curriculum so that the learners internalize sustainable attitudes and behaviors to develop a lifelong relationship with the environment.
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<tbody>
<tr>
<td>AWF</td>
<td>Africa Wildlife Foundation</td>
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<tr>
<td>BNC</td>
<td>Boston Nature Center</td>
</tr>
<tr>
<td>CEP</td>
<td>Conservation Education Program</td>
</tr>
<tr>
<td>DESD</td>
<td>Decade for Education for Sustainable Development</td>
</tr>
<tr>
<td>EA</td>
<td>Environmental Awareness</td>
</tr>
<tr>
<td>EC</td>
<td>Environmental Conservation</td>
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<td>EE</td>
<td>Environmental Education</td>
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<tr>
<td>EEP</td>
<td>Environmental Education Programs</td>
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<td>EMCA</td>
<td>Environmental Management and Coordination Act</td>
</tr>
<tr>
<td>ESD</td>
<td>Education for Sustainable Development</td>
</tr>
<tr>
<td>IUCN</td>
<td>International Union for Conservation of Nature</td>
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<td>KNC</td>
<td>Kitale Nature Conservancy</td>
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<td>LEAF</td>
<td>Leaders Environmental Action for the Future</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goals</td>
</tr>
<tr>
<td>NEMA</td>
<td>National Environment Management Authority</td>
</tr>
<tr>
<td>NEPAD</td>
<td>New Partnership for African Development</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-Governmental Organizations</td>
</tr>
<tr>
<td>SD</td>
<td>Sustainable Development</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for Social Science</td>
</tr>
<tr>
<td>UNEP</td>
<td>United Nations Environment Programme</td>
</tr>
<tr>
<td>UNESCO</td>
<td>United Nations Education, Social and Cultural Organization</td>
</tr>
<tr>
<td>UNCHE</td>
<td>United Nations Conference on Human Environment</td>
</tr>
<tr>
<td>WCED</td>
<td>World Commission on Environment and Development</td>
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CHAPTER ONE: INTRODUCTION

1.1 Background to the Problem

Education has been recognized as a very important tool to use in order to achieve ethics, values and behavior which promote sustainable development (UNEP, 2007). According to a report from UN conference on environment and development, agenda 21, Environmental Education (EE) is stated to be vital in creating environmental awareness and ethics amongst society. Apparently countries with the highest percentage of educated people have left the deepest ecological footprints. It is reported that the most educated nations leave the deepest ecological footprints (UNESCO, 2002). In United States of America (USA) more than 80 percent of the population has at least a post-secondary education while 25 percent of the populations possess not less than a degree certificate from the universities and yet the waste generated in the country and the per-capita energy use is ranked among the highest in the world (UNESCO, 2002). According to this case of USA climbing in the ladder of formal education does not necessarily lead to improvement in the level of environmental sustainability. These reports indicate that formal education may not be sufficient as far as environmental awareness and action is concerned thus highlighting the need to emphasize environmental awareness and action in schools

Studies have shown that even though environmental awareness is of great significance, it has not been given prominence in our schools. A study by Kartikeya & Sarabhai, 2004 on The Thoughts of Environmental Education at school level indicate that the most effective way of creating environmental awareness is to engage the students so as to be active in
the learning process through going out in nature and learning through contact and observation. According to Wells & Lekies, 2006, Nature Conservancies offer programs that instill in learners values and ethics which lead to environmental advocacy and conservation.

In New York City for instance, The Leaders Environmental Action for the Future (LEAF) Nature Conservancy has developed programs which are designed to assist the young people in the city to gain skills and values which create environmental awareness, love for nature and also empowering them to take on environmental advocacy and leadership. According to Zaradic & Pergams, 2011 the LEAF programs have created skills that promote environmental stewardship, values and support for environmental conservation leading to promotion of sustainable environment.

The need to transform attitude and practices towards the environment has captured the global concern since 1970s when the importance of environmental education started to gain more prominence in the intergovernmental forums. However, environmental education depends on the social, economic and political situations in each country especially in making it part of the curriculum through formal education and non-formal education by supporting outdoor activities to compliment the knowledge leant in class. Such outdoor activities should include visits to nature conservancies where individuals are taken through the programs in the conservancies. This was recognized at the Tbilisi conference when a declaration was made by the United Nations (UN) to design programs which would lead to behavior change as a result of acquisition of knowledge and skills which would ultimately lead to protection and conservation of the environment (UNESCO, 1977).
In a bid to implement the United Nations Decade of Education for Sustainable Development (UNDESD), the African countries committed themselves to institute various activities within their policies such as the then Millennium Development Goals (MDGs) and the United Nations declaration on the New Partnership for African Development (NEPAD). However, a report by UNESCO, 2009b on the progress of Decade of Education for Sustainable Development (DESD) indicated that no African nation had made any progress towards achievement of sustainable development.

Kenya being one of the member states in the international conferences came up with many initiatives including instituting the National Environmental Management Authority (NEMA), a regulatory body handling coordination of environmental issues in Kenya. Environmental education is also included in the Kenya curriculum at all levels since 1990s. Kamunge J.M. (1980). Kenya has also initiated the development of conservation centers such as national parks, museums, zoos and aquariums with the aim of promoting conservation and environmental awareness.

Keown et al., 2012 also indicated that so far a number of environment-related activities in different aspects of development have been initiated and are being spearheaded by government agencies, non-governmental organizations, higher learning institutions and other learning centers. The main purpose being to empower the society to take an active part in environmental action. There are also a number of nature conservancies in Kenya including Kitale Nature conservancy, Lewa wildlife conservancy in Isiolo, Nairobi Aboretum, American embassy memorial garden, Oloolua nature trail, elephant hill and a number of museums, zoos and parks some of which are privately managed while others
are under the management of the government but all purport to promote environmental conservation.

According to Gathuku, 2013 in a study to identify the Contributions of Conservation Education Centers towards Sustainable Environmental Awareness in Schools, she asserted that the main focus of the Giraffe center conservancy was to provide education about and in the environment. The study further revealed that the conservancy provides guided tours and education within its environment to the people who visit the place. The programs instill in learners values and ethics necessary in promoting environmental conservation and awareness. However, the study did not explore the extent to which such programs could be replicated in other conservation centers to give similar results thus it became necessary to carry out research in other education centers outside Nairobi specifically Kitale Nature Conservancy which portray both the urban and rural characteristics.

Jepkoech, 2014 showed that Kitale Nature Conservancy (KNC) has successfully led to the conservation of a variety of animals and plant species including those which were born with abnormalities and endangered plant species totaling to about eight hundred in number. The endangered or rare species include; *Tragelophus spekei* (semi aquatic Sitatunga Antelope), *Cercopethicus neglectus* (Debrazzas Monkey) and *Girafa camelopardalis rothschildii* (Rothschild Giraffe). About nine hundred and eighty six different groups have visited the conservancy including special groups, university students, secondary school students and primary school pupils with secondary students recording the highest number of close to four hundred schools since its inception in the year 2006.
The conservancy thus endeavors to educate the public on aspects and issues pertaining to the environment and its associated challenges. Education is critical for promoting sustainable development which ideally encompasses empowerment of a people to address current and future environmental challenges. Through the visits students are expected to learn by taking responsibility for themselves, others and the environment since nature conservancies are known to educate all those that visit them to enable people gain knowledge and skills and develop values which should empower them to be environmentally responsible citizens. Achievement of this goal necessitates methodologies and programs that engage while developing confidence and behaviours that enable environmental conservation and hence sustenance of the planet earth.

This study thus purposed to examine the extent to which KNC contributes to creation of environmental awareness and inculcation of knowledge skills and attitudes that would enable commitment of individuals towards active participation in resolving environmental problems.

1.2 Problem Statement

Nature conservancies expose learners to outdoor learning experiences which can help academic content learnt in class to be put in practice. The students apart from being sensitized on the significance of protecting and conserving biodiversity, are also given opportunity to develop environmentally responsible behavior which enables them acquire knowledge hence gaining an understanding of different environmental functions. Environmental sensitivity also entails development of the ability to identify environmental problems through investigation hence initiating search for solutions to
such challenges. The individuals also get committed and motivated towards participating in environmental conservation and protection activities (Parker & Wade, 2008).

Education curriculum offered in the nature conservancies should help students to develop a better understanding of the global implications of individual’s daily actions to enable him/her take responsibility for the same. Learning experiences in nature conservancies should provide students with opportunities for conservation initiatives in an effort to create a more caring sustainable society. Ideally it is important that the curriculum offered in the nature centers help learners to develop an ethic of care for the environment. Although studies have been done to show what nature conservancies offer, little is known on how what is offered translates to action for the environment. This study sought to find out the contribution of themes in programs offered at the Kitale Nature Conservancy on students’ attitudes towards the environment. The study posits that students visiting nature centers ought to engage in participative practices to develop new skills which enable them to work first at school level and in the communities to produce change. This study sought to investigate the contributions of Kitale nature conservancy in creating environmental awareness in schools.

Findings from the study will help in improving how programs in nature conservancies are designed in order to effectively contribute to creating of environmental awareness and actions leading to a sustainable environment. The findings will enhance relevance of curricula offered in the nature centers enabling achievement of goals of education in Kenya and specifically goal number 8 which stipulates in part that education should foster positive attitudes towards environmental development and conservation. (KIE, 2002).
1.3 Objectives of the Study

1.3.1 General Objective
The overall objective was to evaluate the contribution of Kitale Nature Conservancy in creating awareness and promoting a sustainable environment.

1.3.2 Specific Objectives
1. To assess the extent to which programs offered in Kitale Nature Conservancy promote environmental sensitivity and behavior change.
2. To analyze the relevance of the themes in programs offered at Kitale Nature Conservancy with classroom curriculum.
3. To assess the influence of knowledge gained at Kitale Nature Conservancy in promoting environmental action in schools.
4. To evaluate ways in terms of environmental learning actions in which schools that have visited KNC differ from those that have not?

1.4 Research Questions
The above objectives guided the formulation of the following research questions that guided in the research process:

1. To what extent do the programs offered in KNC promote environmental sensitivity and behavior change in schools?
2. How relevant are the themes offered in programs at KNC to the classroom curriculum in schools?
3. What is the influence of knowledge gained at KNC in promoting environmental actions in schools?
4. In which ways in terms of environmental learning actions do schools that have visited KNC differ from those that have not?

1.5 Research Hypotheses

Hₐ: There is a difference in environmental learning actions between schools that have visited Kitale Nature Conservancy and those that have not.

H₀: Knowledge gained at Nature Conservancies does not significantly influence environmental actions.

1.6 Justification of the Study

The study was motivated by the need to understand the contributions of nature conservancies in creating environmental awareness and action in schools with the aim of promoting a sustainable environment. This necessitated a need to analyse the themes in programs at Kitale Nature Conservancy as a representative of other nature conservancies. The analysis was done with the main aim of making recommendations which would enhance programs design in the conservancies so as to be more effective in contributing towards creating new behavior towards environment among the learners and the society at large.

1.7 Limitations of the Study

The researcher investigated the contribution of KNC in only two of the five sub counties due to financial constraints and limited time. Inferences from the results therefore limit generalization to only the two sub counties. A study of all factors contributing to the creation of environmental awareness in schools was complex since classroom knowledge, indigenous knowledge and nature conservancies’ contribution overlapped. The error was
minimized by comparing students in the same level in terms of formal education curriculum. Due to the complexities of what a sustainable environment is this study chose to limit the variables to only those that could be observed or inferred in a school setting to serve as a representative of all other variables that encompass a sustainable environment.

1.8 Basic Assumptions
The study was based on the assumption that the respondents who answered the research questions were honest and unbiased in their responses. The researcher also assumed that sampled respondents had homogeneous characteristics as the target population thus was a fair representation of the rest.

1.9 Theoretical and Conceptual Framework of the study
The theoretical framework underpinning this study is based on the theory of behavior change proposed by Hungerford and Volk, 1996. According to the theory responsible environmental behavior is as a result of major and minor variables which interact or work together to make it more likely that someone will act to protect the environment. These determinants of behavior can be addressed in the education settings including formal and non-formal education such as the nature conservancies to achieve the set goals and objectives. These variables start from environmental sensitivity and awareness, to ownership and empowerment which lead to responsible environmental behavior (Figure 1.1).
Environmental sensitivity and awareness is the entry level which is a prerequisite to environmental knowledge and interest including empathetic perspective towards the environment. They also include basic ecological knowledge, pollution, technology and economics. (Hungerford and Volk, 1996)

The second variable is ownership variables; these include issues such as in-depth knowledge of environmental issues and their consequences. They help individuals to personalize environmental issues and build a personal investment as well as commitment.
to issue resolution as a result of prior experiences or knowledge. Third are empowerment variables which give individuals a sense that their actions can help resolve an environmental problem. They must perceive that they have the skill and knowledge to act effectively as well as the belief that they have the locus of control thus they can and should act.

These variables can be addressed through age-appropriate educational programs that increase environmental sensitivity and knowledge, engage people in direct experiences such as tree planting to build personal relationship with nature thus developing environmental sensitivity and awareness or field study and excursion to explore a local issue in great depth, and practice with skills to improve proficiency with action taking. The programs should also be tailored towards an issue investigation and analysis skills to emphasize ownership and empowerment variables. Environmental based projects and programs have been developed by researchers to address environmental sensitivity and awareness, improve specific investigation and analysis skills leading to action taking skills that help learners engage in community environmental problem solving such as conservation of biodiversity, proper waste management, persuasive communication and political action. Marcinkowski, (2004). The effectiveness of any Nature conservancy therefore depends on the scope of environmental education programs offered as the programs offered are expected to develop environmental sensitivity and awareness which in turn develop the necessary skills and knowledge to empower individuals to take responsible action towards environmental conservation.

This study posits that for a sustainable environment to be realized, relevant programs that are aimed at causing behavior change are paramount. Opportunity given to learners will
help develop environmental sensitivity a necessary entry variable towards behavior change as proposed by Hungerford and Volk, 1996. The learners exposed to such programs will develop environmental sensitivity that should stir them to seek to have an in-depth understanding of problems affecting the environment and together with curriculum offered at school, the learners should thus develop an ethic to actualize what is learnt through establishment of activities that promote the environment. The activities enable development of responsible environmental behavior that should inform practices in and out of school.
1.10 Definition of Operational Terms

**Conservancy:** A body concerned with the preservation of natural resources.

**Conservation Education:** Teaching and learning experiences in the formal or informal education whose main aim is to promote environmental conservation.

**Education for Sustainable Development:** Learning which instill in learners skills, knowledge and attitude enabling them to utilize resources to meet their present needs while conserving its quality for the next generation.

**Curriculum:** this is the total guided learning experiences designed to facilitate learners learning for establishing quality relationship between what is learnt and what operates outside the school.

**Environmental Awareness:** Having understanding of natural environment and making choices that benefit rather than hurt the earth. (Mckewon, 2002)

**Environmental Education:** Teaching and learning practices aimed at creating environmental consciousness.

**Nature Center:** An organization established to provide education about the environment.

**Programmes:** Learning experiences that learners are exposed to in nature conservancy. (Otiende & Boisvert, 2011)

**Sustainable Environment:** Natural environment with resources that are exploited to satisfy the present human needs while preserving its quality for the future generation.

**School:** The term ‘school’ as used in this context refers to secondary schools. Primary schools were not included in this study
CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter discussed past studies on Nature conservancies. It discussed the scope of the programs offered in the nature conservancies, knowledge gained as a result of the conservancies’ education programs and the impact of nature conservancies towards environmental conservation and management. Conceptualization of the study was informed by knowledge gaps in the literature reviewed. These are presented towards the end of the chapter.

2.2 Nature Conservancies and Environmental Education

According to Parker & Wade, 2008, Nature centers are places set aside with facilities to provide education about and in the environment in order to create or improve environmental understanding and awareness. These centers are expected to provide the much needed information and knowledge that would instill in learners nature conservation virtues.

Zaradic & Pergams, 2011 in a study to evaluate the long term effect Leaders Environmental Action for the Future (LEAF) program on the environment revealed that the LEAF program in New York have developed quite a number of activities whose main objective is to educate students and young people about conservation of flora and fauna in their natural habitat as well as enlightening them to take environmental conservation in urban centers seriously. The research further revealed that the themes in the LEAF programs are tailored towards training the students to be more responsible and also providing tools and empowerment to take on environmental advocacy. This enabled the
students and the youths to spread the conservation message across the region and through them the local community learnt how to be better environmentalists.

The study however, did not show how other factors such as indigenous knowledge and level of formal education played roles in educating the students about nature conservation, thus further research is necessary to clearly bring out the part played by formal education and informal education in creating environmental awareness and conservation.

According to Muli, 1990 informal environmental education such as guided visit to game parks, field excursions, field trips or workshops bring about experience, sharing, creativity, pleasure and sensitivity towards the environment. This is because such activities lead to internal motivation as learning is voluntary with varied content which in most cases un-sequenced. Kerre and Obura, 1992 also state that informal education especially in nature conservancies is more creative and flexible as compared to formal education; it compliments what has been learnt from formal education. The research further revealed that programs offered in the nature conservancies provide an opportunity for the learner to have contact with the environment and makes environmental conservation more practical. The study however failed to pinpoint how the knowledge gained translates to activities that enhance environmental sustainability, a knowledge gap that this study sought to fill.

According to Ballantyne, 2008 in a study to determine the role played by environmental education centers and outdoor activities and their corresponding impacts on the environment revealed that nature centers provide special opportunities to learn especially
the practical aspects of environmental management by exposing the students to natural environment which enable them to have close contact with nature thus learning through hands on and observation learning techniques. The study revealed further that the themes in the programs education centers compliment what is learnt in the formal education curriculum in schools.

According to a report by International Union for Conservation of Nature (IUCN,2003, the world conservation union in their support of UNDESD agenda asserted that Environmental Education encompasses new behavior patterns since it is through knowledge and understanding that behavior change occur at personal level first, then societal and finally at global level.

The sessional paper number six of the year 1999 on environment and development and the Environmental Management and Coordination Act (EMCA, 1999) also recognize the significant influence of non-formal education, nature conservancies included, on the environmental conservation and management. Research by Roland etal.,1995 on The bottom line on Corporate Experiential Learning revealed that the key mandate of nature conservancies is to ensure that their programs contain themes and activities that develop environmental sensitivity among the visiting groups. This view is supported by Hopkins & Putnam, 1993 by suggesting that the underlying philosophy of outdoor activities, nature conservancies included, is the creation of environmental awareness and action among the individuals.

Gathuku, 2013 in a study to Evaluate Contributions of the Giraffe center in Nairobi towards Sustainable Environmental Awareness in schools assert that the main focus of
the center is education about the environment. The research further revealed that staff employed in the conservancy must have undergone training on education and environment thus enabling them to effectively provide educational requirements, design programs and give guidance to the people who visit the place. These programs are designed in such a way that they lead to education about the environment thus helps to nurture positive attitude towards the environment and environmental conservation.

However, it is not enough to learn about the environment, but it is also important that people learn for the environment as well as learning in an endeavour to acquire a responsible environmental behavior to attain a sustainable environment. This study thus sought to make an enquiry into how what is learned about the environment is translated to be for the environment through promotion of environmental action learning.

Burer, 2014 in a study to determine Influence of Environmental Education on Conserving Environment in Kenya revealed that informal education influence conservation of environment to a great extent. The findings indicated that environmental conservation practices and exhibition centers such as wildlife sanctuaries, environmental talks and campaigns in Moiben region in Kenya have brought about a great impact on the environmental conservation measures in the region. The research further indicated that indigenous knowledge and formal education provide platform for better conservation of environment since they improve learners’ knowledge and attitudes towards the environment.

From the literature discussed in this section, it could be easily concluded that the main aim of conservation education centers is to provide opportunities for the visiting people
to develop or gain knowledge and awareness of the environment, get experience of problems and challenges facing the environment. The ultimate result is expected to be a sustained environment.

However, since all conservation education centers do not have one body of management the extent to which each nature conservancy promote environmental consciousness through environmental education rests entirely on the management body which decide on which programs and activities to offer and when to offer them. It is in this reason that a research study should be done in all nature conservancies to ascertain their role in environmental education.

2.3 Nature Conservancies, Environmental Sensitivity and Programs

According to Keown, et al., 2012, Nature conservancies in the world are designed with the view of addressing challenges facing environmental conservation. These challenges can be addressed by tackling different topics of interest in different environmental activities according to level of knowledge of the individuals. The activities, regardless of the level of development, are expected to raise awareness, develop capacity and skills and empower the individuals to participate actively in environmental action.

2.3.1 Workshops

According to Zaradic & Pergams (2011) in a study to evaluate The Nature’s long term LEAF program in New York, one the programs offered is professional development workshops to educators which is aimed at addressing topics of common interest including opportunities for peer mentoring and support network among educators and students, access to scientific resources of nature conservancies and sharing of tools, best practices
and resources among member schools. The research further revealed that the workshop is mainly to professionally train educators, create in them a passion for nature and empower them to be environmental leaders so they can transfer the same knowledge to the urban youths, enable them to gain critical thinking and empower them to be future environmental leaders.

LEAF program is also designed to offer trainings under the following topics for high school partners; nature works everywhere, climate hazard the cool green science blog and the atlas of global conservation. According to the program, these topics can be addressed by creating conducive environment for the students to share tools and resources, access to the scientific resources of the nature conservancy and also provide opportunities for peer mentoring and support network among the educators (https://www.nature.org/leaf/resources for teachers).

Burer, 2014 in a study to evaluate Influence of Environmental Education on Conserving Environment in Moiben Constituency, Kenya, revealed that conservation education activities in nature conservancies especially workshops and seminars focus on educating students about nature conservation and also provide tools necessary to take environmental action. This leads to environmental awareness and environmental action thus complimenting what is learnt in formal education. The research further revealed that the workshops and seminars provide an opportunity for the learners to have contact with nature and makes environmental conservation more practical.

The extent to which these workshops in different conservation education centers translate to environmental action and conservation among the students is yet to be established. It
would be interesting to note or establish how these workshop programs change the students’ attitude towards the environment and ultimately lead to conservation especially in the catchment area for Kitale Nature Conservancy.

2.3.2 Excursions and Creation of Environmental Awareness

Studies done in different conservation education centers have indicated field trips and excursions as part of the programs offered in the centres. In Boston Nature Center (BNC) and wildlife sanctuary in the United States of America, a wide variety of programs for people of all ages are offered without forgetting field excursions and trips. These programs include; pathways to nature- which provides a high quality nature pre-school for children aged between 3 to 6 years. These children discover the natural world through activities fostering academic and social growth. They are also allowed to explore the BNC woods where they get the opportunity to think critically, make investigations and make inquiries where necessary since they are to be under the guidance of an environmental expert. Each of the programs at every level of learning is tailored in such a way that it meets the demands of the students at that specific level. (www.masaudubon.org).

El-Raham, 2003 in a study on Indigenous Knowledge of the Bedouin of South Sinai, London assert that outdoor learning or education which include field study, field trip and field excursion, which enable the learners to get practical skills when they go out in nature for observation and hands on learning. This idea was later supported by Ballantyne, et. al. 2008 in a study on The Role and Impact of Outdoor and Environmental Education Centers on Learning and Sustainability, which revealed that nature centers
play a very important role in complimenting what is learnt in the formal education curriculum in schools.

According to Zaradic & Pergams, 2011, The LEAF program in New York provides sustained exposure to nature through various programs including field study, field trip and excursions. Research by Gathuku, 2013 revealed that The Giraffe Centre in Kenya sponsors field trips and field study for children from humble background who are not privileged to afford cost for the field works. In most cases these children come from needy families and living in slums and rehabilitation centres and are either primary or secondary level of education. These students are offered to visit selected environmental education centers such as, David Sheldrick Wildlife Trust Nairobi Animal Orphanage/ Nairobi Safari Walk, Mamba Village and the Giraffe Centre itself.

The results from these studies clearly show that field study, field trips and excursions play a major role in promoting environmental awareness and action among the individuals. However, since every conservation education center offer different activities at every level of the outdoor programs depending on the learner characteristics and specific objectives of the activity, generalization of the findings cannot be done to all other nature conservancies hence the need to carry out research in every conservation center to determine the programs and knowledge gained and ultimately how the knowledge gained influence environmental action and conservation.

2.3.3 Environmental Projects for Community Mobilization

According to Zaradic & Pergams, 2011, the LEAF program uses scientific approaches to set up various projects according to goals to be achieved at every level of learning. The
study further revealed that the projects undertaken in the conservancy are aimed at serving as living laboratories where new ideas for protecting nature are tested. These projects include; waste management programs, sustainable development, leaders’ environmental action and environment for the future.

Africa Wildlife Foundation (AWF) have also initiated projects where they use technology such as the social media features with the main aim of ensuring that wildlife management practices are being accomplished successfully (www.awf.org). They support a number of projects in various conservation education centers in Africa including the Bale mountain national park in Ethiopia. Since most of the African communities heavily rely on the natural resources as their main source livelihoods, the projects have been designed to mobilize the community and enlighten them on the significance of protecting these species and environmental conservation

Giraffe Centre in Nairobi for instance, has initiated a range of micro projects in various schools which have agreed to partner with them. Such projects include; the School greening program, waste management program and the millennium fuel project. These are intended to become model projects for teaching with the especially to sensitize the learners on sustainable environmental conservation (AFEW –K, 2008 and 2010). They also provide environmental competitions which require the students to develop critical thinking as they tackle environmental concerns.

Lewa Wildlife Conservancy has also initiated varied projects but the major one which was established in the 2010 is known as the Conservation Education Program (CEP). This project was established purposefully to design programs which would complement
formal education in imparting environmental values among the visiting students. The project aims at promoting behavior change in conservation and creating environmental awareness especially in youths and children. Other projects in Lewa conservancy include outreach program to Lewa supported schools to initiate various environmental activities including implementing environmental curriculum in schools through demonstrations, wildlife clubs and exhibitions. A study of Lewa conservancy further revealed that the conservancy managed to initiate the establishment of wildlife clubs in about ten schools in its surrounding from June 2013 to December 2016 through the CEC program (www.lewa.org). It is of great significance to study projects in other conservation education centers in order to determine their achievement as far as environmental awareness and action is concerned.

2.4 Impact of Nature Conservancies on the Environment

Burer, 2014 assert that nature conservancies have been created mainly to move education from focusing exclusively on provision of information to Environmental Education and Awareness among the individuals who visit them. The study further noted that nature conservancies in the world are designed with the view of addressing challenges facing environmental conservation. The study further revealed that the programs developed contribute to environmental consciousness of learners. The study however, did not explore the extent to which such programs find replication though on a small scale to the visiting schools.

Buttel & Flinn 1998 in a study on Impacts of Party Identification and Political ideology on Environmental Attitudes revealed that knowledge is the first ingredient to changing behavior and that a person’s level of education is strongly related to a person’s level of
concern for the environment. This finding implies that environmental destructive behavior is either as a result of inadequate or lack of knowledge and therefore it is expected that more environmental education lead to better environmental management and conservation. However, knowledge gained by visiting schools in the conservation education centers not only depends on the activities that the students engage in but also on other factors such as previous knowledge and beliefs. This is acknowledged by Ballantyne & Packer, 1996 which revealed that students construct new understanding by building on old knowledge and understandings. This means that the previous knowledge plays a very critical role in learning thus it would be prudent to do independent study on every conservancy to determine the knowledge gained after participating in their programs.

According to Yerkes and Haras, 1997, outdoor education can change or improve people’s attitudes and that media also has a major role to play in the development of positive environmental attitudes and values. The study further noted that increase in knowledge in a particular area leads to attitude change.

According to Encalada, 1995, in a study on Raising Environmental Awareness in planning Education to care for the earth asserted that even when educational programs increases people’s knowledge towards environmental issues and make them to be even more sympathetic, it does not necessarily imply a specific behavior change. For instance, education programs that emphasize on reforestation do not necessarily mean an increase in the number of trees planted. The study supported this idea by indicating that there are other intervening obstacles such as economic, social and political factors.
2.5 Knowledge gaps

Parker & Wade, 2008 indicated that Nature Centers have been recognized for the environmental education they offer which foster positive attitude development as a result of providing opportunity for critical and positive thinking. The environmental education in the centers seeks to develop environmentally sustainable practices in schools and by extension the society.

In responding to this goal several studies have been done to examine the content and programs offered in nature conservancies. Although studies reviewed have revealed useful information towards this goal, a gap still exists on how nature conservancies can contribute to the development of environmental sensitivity in schools an area of research that this study sought to fill. Studies reviewed have shown that nature conservancies offer programmes based on the learner characteristics, how the knowledge offered relates to the school curricular was however limited.

Nature conservancies offer varied outdoor learning depending on learner characteristics. However, a comparative study to show how what is learnt is translated to action is limited, a gap that this study sought to fill. A change in attitude and consequently behavior is the important indicator of environmental learning that nature conservancies ought to promote. Knowledge on how programmes offered in KNC promotes attitudes and practices was scanty, an area of vital knowledge that this study has filled.

The change in attitude should be easily noticeable especially on how these people who have visited the conservancy practice sustainability as compared to those who have not visited the conservancy. This study sought to establish the contributions of Kitale Nature Conservancy towards creation of environmental awareness in schools.
CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the study area, the target population, the scope of the study, research design used, and sample size, sampling procedures, research instruments as well as the methods for data analysis used.

3.2 The Study Area

The study was carried out in Kitale Nature Conservancy and the schools around it. The conservancy is located in Trans-Nzoia County including Kitale town and its environs (fig 3.1). Schools within Kitale town provide urban characteristics while its environment in the rural setup provides rural characteristics.

Trans Nzoia County is located in the Rift Valley region and occupies an area of 2469.9 square kilometers. It lies between latitudes 1° 00’ North and 1° 15’ North and between longitudes 34° 45’ East and 37° 20’ East. Trans Nzoia county is bordered to the west by Uganda, to the North by West Pokot county, to the south east by Uasin Gishu County, to the east by Elgeyo Marakwet county, and to the south west by Bungoma county as shown in figure 3.1.
Trans Nzoia County is divided into five sub counties namely; Saboti, Kiminini, Endebess and Kwanza. Schools from these five sub-counties constituted the target population. The county also has 25 electoral wards and a total of 103 secondary schools (95 public secondary schools and 8 private secondary schools). The research evaluated 24 secondary schools. This constituted 23.3% of the total schools.

3.2.1 Climate of the Study Area

Trans Nzoia County which hosts Kitale Nature Conservancy experiences mild and generally warm climate. The average annual temperature ranges between a minimum of
$10^0\text{C}$ to a maximum of $27^0\text{C}$ while the annual rainfall ranges between a minimum of 1000mm to a maximum of 1200mm with the wettest periods being experienced between April and October.

### 3.2.2 Socio Economic Activities

The main economic activity in the area is agriculture as most of the communities in the area practice a mixture of large scale and small scale farming, with maize farming being the dominant industry. Livestock keeping especially beef and dairy farming is part of the economic activity. The National Museum located at Kitale also attracts tourism while other communities also engage in business and trade especially in the urban centers.

### 3.3 Research Design

The study employed the use of descriptive research design in the study. This is the process whereby data was collected in order to answer questions concerning the current status of the subjects under study. Descriptive research design provided a fairly accurate description of observations of phenomena thus was considered to be the most effective method of collecting descriptive data that was aimed at answering research questions regarding to the contribution of Kitale Nature Conservancy towards creation of environmental awareness and action in schools.

Descriptive research was used to investigate the level of environmental awareness and attitudes between schools which have visited the conservancy and those that have not. The study collected both quantitative and qualitative data. The qualitative data was collected in order to gather information which would give an in-depth understanding of the occurrences and behaviour in the two categories of groups under study. Quantitative
data on the other hand was used to collect information on facts about the respondents in the two categories of respondents. Information on the level of knowledge gained and retained on visiting the conservancy including their possible impacts on the environment was also collected using a combination of qualitative and quantitative data (Mugenda & Mugenda, 2003).

3.4 Target Population

The target population was all secondary school students in Trans Nzoia County. The county had 103 secondary schools giving a total of 41200 students according to the ministry of education data base. The study focused on both boys and girls in the secondary schools.

3.5 Sampling Procedures

The study targeted 103 schools since this is the total number of schools in the county. These schools fall into two categories; the first category are those schools which have participated in the KNC environmental conservation programs while the second category are those schools which had not had a chance to participate in KNC environmental conservation programs.

The study used simple random sampling method to select two sub counties out of five sub counties. The selected sub counties were arrived at by assigning numbers to the five sub counties on pieces of paper which were then put in a box. Two were randomly picked from the box to form the sample population. The two sub counties selected were Kwanza and Cherangany which had 51 schools with a total of 20102 students. This constitutes
48% of the target population thus in accordance with Mugenda & Mugenda, 2003 which argues that 30% of the target population is an acceptable sample population.

The schools were classified into two categories; schools that had visited KNC and those which had not had opportunity to visit KNC. Simple random sampling was again used to identify 12 schools in each category. Simple random sampling was used since it is the method which had the ability to give equal probability of the samples selected. The principle of randomization was applied where the names of the schools were written on a piece of paper that were then placed in a basket and thoroughly mixed. A blindfolded subject sequentially picked the first 12 schools from each of the categories of schools giving a total of 24 schools.

3.6 Sample Size

The following formula Reid and Boore (1991) was employed in the calculation of the sample size.

\[ n = \frac{N}{1 + N(e)^2} \]

Where \( n = \) sample size of adjusted population, \( N = \) population size and \( e = \) accepted level of error taking alpha as 0.05

By substituting 41200 students which is the target population in the formula, a sample size of 396 students was arrived at.

\[ n = \frac{41200}{1 + 41200(0.05)^2} = 396 \]
The researcher then divided the 396 (sample size) by 24 (number of schools) to get 16. This means that data was collected from 16 students in every school. One administrator or teacher was also included from every school sampled since they were considered to have different characteristics from the students. This increased the sample size to 408 as shown in table 3.1.

Table 3.1 Sample Size

<table>
<thead>
<tr>
<th>Schools that had visited KNC</th>
<th>No. of schools</th>
<th>Students</th>
<th>Teachers</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>192</td>
<td>12</td>
<td>204</td>
<td></td>
</tr>
<tr>
<td>Schools that had not had opportunity to visit KNC</td>
<td>12</td>
<td>192</td>
<td>12</td>
<td>204</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>384</td>
<td>24</td>
<td>408</td>
</tr>
</tbody>
</table>

3.7 Methods of Data Collection

Both primary and secondary data were collected for the study. Primary data was collected with the help of semi structured questionnaires and interview schedules. Field observations were also employed where the researcher used school environmental status checklist to identify activities and programs which depict environmental awareness among the students. The available secondary data especially from the school library and calendar of events was also collected to complement the primary data in answering the research questions.
3.8 Research Instruments

The research instruments which were used to collect data for the study include the following:

3.8.1 Questionnaires

The questionnaires were administered to students in the two categories. These questionnaires consisted of both closed and open ended questions. The questions were designed in such a way as to elicit responses which would answer the research questions in reliable manner. Mugenda & Mugenda, 2003 defined reliability as the consistency with which an instrument or research process repeats itself or which a survey or test can be repeated. During the piloting stage, the researcher compared the consistency of responses in each questionnaire in order to ascertain the reliability of the research instrument. The piloting study involved administering the same questionnaire twice to the same students within an interval of seven days from the previous test. The completely filled questionnaires were collected and analyzed to determine vague questions which could not elicit same response when repeated.

3.8.2 Checklists

A checklist to evaluate the environmental management and conservation activities and status of schools in the two different categories of respondents was prepared and used to collect data on the state of environment and the various environmental activities at the schools. A set of questions on the environmental standards and activities was prepared and the researcher was required to make observations based on the checklist and tick as appropriate.
3.8.3 Key Informant Interview

Interview schedule was prepared and an interview arranged with the key informant who is the manager of KNC. The purpose of this interview was to enable the researcher to get in-depth information on KNC in terms of its objectives, achievements, challenges and opportunities and the range of programs as well as the daily activities of the conservancy.

Another interview schedule was prepared and interviews conducted to solicit information from the school administrators or teachers.

3.8.4 Likert Scale

The attitude of students and teachers towards the environment including environmental management and resultant problems were determined by the use of Likert scale.

According to Ali, 2009 attitude can be measured on a five-point Likert scale which could range from very poor (1) to excellent (5). This would produce ordinal scale which was analyzed using the SPSS.

3.9 Data Analysis Procedures

The data collected from the checklists, interviews and questionnaires were analysed using both quantitative and qualitative methods of data analysis. Statistical Package for Social Sciences (SPSS) version 22 was used to analyze the data where the data was coded and scored for analysis and interpretation. The ordinal scale generated by the Likert scale provided the required information to understand the effects outdoor learning activities and experiences on the students and teachers.

An independent sample t test was conducted to compare environmental knowledge and learning actions in schools that had visited KNC and those that had not. A one way
Analysis of Variance (ANOVA) was used to test whether there was a significant difference in the overall level of environmental awareness between students who have visited KNC and those that have not. In order to determine the kind of relationship that existed between schools which have visited the conservancy and those that have not visited the conservancy, Pearson’s coefficient of correlation (r) was used where the correlation was significant at the 0.01 level (2-tailed). The correlation was also used to test the hypotheses stated.
CHAPTER FOUR: RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presented the results of data analysis. Data was obtained using questionnaires, checklists and interview schedules. The ordinal data generated was analyzed using the SPSS. The questionnaires contained both open ended and close-ended questions that addressed the objectives of the study. The results presented were derived from 408 respondents and flow according to the objectives of the study. Pearson Product moment correlation was used to compute relationship between environmental education and awareness programs and their impact to students and teachers as well as test the significance of the relationship obtained from the hypotheses.

4.2 Respondents Demographic Characteristics

The study on this item sought to determine the characteristics of the respondents in terms of their demographic information to enable the researcher describe the sample used for the study and to know the type of respondents. The information sought in this section included the age and gender of the respondents.

4.2.1 Gender of Respondents

The information on gender of the respondents were sought since it was believed that boys and girls may perceive things differently especially in regard to environmental awareness and action. Results show that 50% of the students who completed the knowledge level questionnaire were females and 50% males. The findings were represented as shown in figure 4.1 below.
These findings indicate that both male and female had equal opportunities in participating in environmental conservation programs in the county that is why they participated in answering the questionnaires without bias towards any gender. It appears that the results obtained are not influenced by gender inclinations.

4.2.2 Age of Respondents

Data on the age brackets of the respondents was sought because age plays a very important role in environmental education, awareness and action since older people are more experienced and likely to understand and relate issues better than the young ones (Hungerford & Volk, 1990). The information on the age of the respondents helped to determine the level of maturity of the respondents.

Findings of this item showed that majority of the respondents were 18 years old, followed by those who were aged 17 years of age, as shown in figure 4.2 below.
4.3 The Extent to which Programs offered at KNC Promote Attitudes and Behavior

This section presents results to show the extent to which programs offered at KNC promote attitudes and behavior among the respondents. The frequency of visits and the scope of programs are presented.

4.3.1 Frequency of Visits at the Kitale Nature Conservancy

Frequency of visits to the KNC was sought to determine whether number of visits to the conservancy have any influence on understanding of environmental conservation and action among the respondents. Those who have visited the place more than once have had varied experience with the conservancy and are in a better position to explain the influence of the conservancy on environmental conservation and awareness. On the other
hand, those who have visited the conservancy only once are likely to give their first time experience which in most cases is unique. Respondents were required to indicate the number of times they had visited the Kitale Nature Conservancy.

The findings indicate that a majority (82%) of respondents had visited the Kitale Nature Conservancy only once while those who had visited twice were (15%). In addition 2% of the respondents indicated that they had visited the centre four times, while only 1% of the respondents showed that they had visited the conservancy thrice as indicated in figure 4.3 below.

![Figure 4.3: Frequency of visits to KNC by the Respondents](image)

The results show that most of the respondents had first-hand experience which gave a true picture of the impact of the conservancy on their environmental knowledge and attitude. The fact that 18% of the respondents had visited the conservancy more than once was deemed to be due to the relevant programs and services which promoted environmental awareness and conservation and also due to the nature of the school set up
where the schools regularly take the students of different levels to KNC and so a student could have visited the conservancy more than once depending on class level.

**4.3.2 Scope of the Environmental Education and Awareness programs offered at the Kitale Nature Conservancy**

In order to determine the scope of environmental education and awareness programs offered at the KNC respondents were required to indicate the programs they participated in during the visit to KNC. Respondents were further required to indicate on a scale of one to five the degree of agreement that the activity mentioned influence attitude towards the environment. The programs and activities are as discussed below.

**4.3.2.1 Excursions using Nature Trail**

Respondents indicated field excursions as one of the programs they were taken through during the visit to KNC. According to findings from the key informant interview, the main objective of the excursion is to enable the students to interact with nature in order to develop environmental consciousness. The findings further indicated that during excursion they were guided through nature trail in tree naming and identification. They were also able to observe river profile, different fish species in the fishpond and other wildlife including animals with deformities.

The degree of agreement that field excursions influenced the respondents positively towards the environment is as indicated in table 4.1. Findings of this item indicate that majority of the respondents (70%) strongly agree that excursions through nature trails influence their attitude towards the environment. 26% of the respondents were in
agreement, 01% of the respondents were undecided and 03% of the respondents disagreed with the statement.

Table 4.1 Degree of Agreement with Excursions towards Environmental Consciousness

<table>
<thead>
<tr>
<th>Degree of agreement</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>142</td>
<td>70</td>
</tr>
<tr>
<td>Agree</td>
<td>54</td>
<td>26</td>
</tr>
<tr>
<td>Undecided</td>
<td>02</td>
<td>01</td>
</tr>
<tr>
<td>Disagree</td>
<td>06</td>
<td>03</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>204</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

The study concluded that field excursions through nature trails play a big role in creating environmental consciousness among students. This finding agreed with Burer, 2014 which revealed that informal education especially through nature walks has articulated environmental conservation well enough because it offers an opportunity for the learners to have contact with the environment and make environmental conservation more practical. Hopkins & Putman, 1993 supported this view by asserting that it is in the environment where challenges are experienced and witnessed thus providing opportunity for personal learning and growth as the people seek for solutions to such challenges.
4.3.2.2  **Oral lectures and demonstrations on environmental conservation and sustainable development**

Respondents indicated oral lectures and demonstrations on environmental conservation practices and sustainable development as some of the activities in which they were taken through. According to findings from key informant interview, the objective of oral lectures and demonstrations is to improve students’ knowledge and attitude towards the environment by making the activities more creative and flexible as compared to formal education. The findings further indicated that oral lectures and demonstrations have been successful in achieving its objective since students enjoy learning from what they can see and touch.

The degree of agreement that oral lectures and demonstrations influenced the respondents positively towards the environment is as indicated in table 4.2. Findings of this item show that majority of the respondents (66%) strongly agree that oral lectures and demonstrations on environmental conservation practices and sustainable development influence their attitude towards the environment. 23% of the respondents were in agreement, 02% of the respondents were undecided and 05% of the respondents disagreed with the statement while 04% of the respondents disagreed strongly.
Table 4.2 Degree of agreement with oral lectures and demonstrations towards environmental consciousness

<table>
<thead>
<tr>
<th>Degree of agreement</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>135</td>
<td>66</td>
</tr>
<tr>
<td>Agree</td>
<td>46</td>
<td>23</td>
</tr>
<tr>
<td>Undecided</td>
<td>05</td>
<td>02</td>
</tr>
<tr>
<td>Disagree</td>
<td>10</td>
<td>05</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>08</td>
<td>04</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>204</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

The study concluded that oral lectures and demonstrations on environmental conservation practices and sustainable development improve learners’ knowledge and attitude towards the environment. This finding is in agreement with Yerkes and Haras, 1997 which indicated that outdoor education can change or improve people’s attitudes and that demonstrations and media also play a very important role in the development of positive attitudes and values as well as awareness towards the environment.

4.3.2.3 **Video Watching on Wildlife Management**

Respondents indicated they were allowed to watch videos on wildlife management. Response from the key informant interview confirms that video watching on wildlife management and conservation is one of the major activities that they organized for visiting students. The main objective of video watching is to improve students’ knowledge and attitude towards wildlife and wildlife management.
The degree of agreement that wildlife management and conservation influenced the respondents positively towards the environment is as indicated in table 4.3. Findings of this item show that majority of the respondents (64%) strongly agree that wildlife management and conservation influenced their attitude towards the environment. 32% of the respondents were in agreement, 03% of the respondents disagreed with the statement and 01% of the respondents strongly disagreed.

Table 4.3 Degree of agreement with video watching on wildlife management towards Environmental Consciousness

<table>
<thead>
<tr>
<th>Degree of agreement</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>131</td>
<td>64</td>
</tr>
<tr>
<td>Agree</td>
<td>65</td>
<td>32</td>
</tr>
<tr>
<td>Undecided</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>Disagree</td>
<td>06</td>
<td>03</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>02</td>
<td>01</td>
</tr>
<tr>
<td>Total</td>
<td>204</td>
<td>100</td>
</tr>
</tbody>
</table>

The study concluded that video watching on wildlife management and conservation improve students’ attitude towards wildlife and wildlife management. The findings agreed with Muli, 1990 which asserted that use of media including documentaries and radio programs compliments what has been learnt from classroom and bring about pleasure and sensitivity towards the environment.
4.3.2.4 Environmental Projects

Respondents indicated that they participated in environmental projects during the visit to KNC. According to findings from the key informant interview, the main objective of the projects is to mobilize the community and enlighten them on the significance of protecting endangered animals and plants and environmental conservation. These projects include; green project (entails planting and identification of trees and their uses), waste management project and initiating and supporting environmental clubs in the surrounding schools.

The degree of agreement that environmental projects influenced the respondents positively towards the environment is as indicated in table 4.4. Findings of this item show that majority of the respondents (80%) strongly agree that environmental projects influence their attitude towards the environment. 16% of the respondents were in agreement, 01% of the respondents were undecided and 03% of the respondents disagreed with the statement.

Table 4.4 Degree of agreement with environmental projects, towards environmental consciousness

<table>
<thead>
<tr>
<th>Degree of agreement</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>163</td>
<td>80</td>
</tr>
<tr>
<td>Agree</td>
<td>33</td>
<td>16</td>
</tr>
<tr>
<td>Undecided</td>
<td>02</td>
<td>01</td>
</tr>
<tr>
<td>Disagree</td>
<td>05</td>
<td>03</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>01</td>
<td>00</td>
</tr>
<tr>
<td>Total</td>
<td>204</td>
<td>100</td>
</tr>
</tbody>
</table>
The study concluded that environmental projects play a big role in creating environmental consciousness among students. This finding is in agreement with Zaradic & Pergams, 2011 in a study of The LEAF program nature conservancy in which it was revealed that the projects which were being initiated by the conservancy provided a solid foundation upon which new ideas were emanating from. According to Gathuku, (2013) in a study to find out the contributions of the Giraffe centers towards sustainable environmental awareness in schools, the centre has initiated a range of micro projects in different schools which have become model projects for sensitizing the students, teachers and support staff in schools on sustainable environmental conservation.

4.3.2.5 Training Workshops

Only 17 respondents, constituting 08% of those who had visited the conservancy indicated that they got the opportunity to participate in the workshops organized by the KNC. Findings from key informant interview indicate that workshop programs are organized annually for environmental club patrons (teachers) and environmental club leaders who have registered with the conservancy with the aim of addressing topics of common interest including opportunities for peer mentoring and support network among educators and students, access to scientific resources of nature conservancies and sharing of tools, best practices and resources among member schools.

All the 17 respondents agreed strongly that the training workshops have influenced their attitude towards environmental conservation and management. This could signify that training workshops play very important role in shaping peoples attitude towards environmental management and conservation. According to research study by Zaradic & Pergams, 2011 workshops are organized mainly to professionally train educators, create
in them a passion for nature and empower them to be environmental leaders so they can transfer the same knowledge to the youths, enable them to gain critical thinking and empower them to be future environmental leaders.

4.3.3 Kitale Nature Conservancy Environmental Education Programs and the Classroom Curriculum

Research study analyzed themes covered in KNC programs using environmental education programs checklist to establish their relevance with the secondary school curriculum. The themes covered in KNC which are infused in secondary curriculum were summarized in table 4.5

Table 4.5: Relevance of KNC environmental education program to the school curriculum

<table>
<thead>
<tr>
<th>Program/Theme</th>
<th>Related subject area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate change</td>
<td>Geography</td>
</tr>
<tr>
<td>Environmental pollution</td>
<td>Geography/Agriculture</td>
</tr>
<tr>
<td>Water conservation</td>
<td>Geography/Agriculture</td>
</tr>
<tr>
<td>Wildlife conservation and management</td>
<td>Geography</td>
</tr>
<tr>
<td>Forestry and agroforestry</td>
<td>Agriculture/Geography</td>
</tr>
<tr>
<td>Management and conservation of environment</td>
<td>Geography/Agriculture</td>
</tr>
<tr>
<td>Interrelationship of organism and ecosystem</td>
<td>Biology/Agriculture/Geography</td>
</tr>
<tr>
<td>Tree nursery management</td>
<td>Agriculture/Geography</td>
</tr>
</tbody>
</table>
The summary of KNC environmental education programs vis-à-vis the school curriculum contained various subjects indicated that there are quite a number of themes covered in KNC environmental education programs which are also infused in the secondary subjects such as Geography, Agriculture and Biology.

However, it was revealed that these themes are fragmented into different subjects and topics in the syllabus thus making it difficult to relate various sub topics in different subject areas. It was further noted that despite KNC educating students on environment related themes which are consistent with school curriculum, there are still more environment related topics in the secondary school syllabus especially in chemistry and biology which are not yet covered in the conservancy. This calls for the expansion of environmental education programs in KNC to include a wide range of environmental concepts taught in school curriculum.

The research study therefore concluded that the environmental education programs offered at the KNC are relevant to the school curriculum and give practical experience. This finding agrees with Zolho, 2005 which argued that, Environmental Education relates the acquisition of knowledge and skills to a change in attitudes and consequently new behavior pattern emerge which promote environmental conservation and management. Otiende, et al. (2011) also states that environmental education is a process through which individual learners recognize various environmental concepts and develop values which are geared towards acquisition of skills and various approaches in order to understand the relationship between man and his culture as well as the biophysical environment.

The focus of environmental education programs offered at the KNC therefore are in agreement or compliment (KIE, 2002) which states that one of the main focus of formal
education is environmental conservation and management including; soil erosion and conservation measures, animal production and the challenge of overgrazing and overstocking, hydrological cycle and the problem of desertification, energy production and consumption and the challenge of waste disposal as well as water and wildlife conservation in the ecosystem.

4.3.4 Rating of the Kitale Nature Conservancy achievement in provision of Environmental Education

The respondents who had visited the conservancy were required to rate the environmental education they received in KNC by indicating, labeling as very good, good or poor. The findings are summarized in table 4.6 below.

Table 4.6: Respondents’ rating of the Kitale Nature Conservancy achievement in provision of Environmental Education

<table>
<thead>
<tr>
<th>Rating</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very good</td>
<td>134</td>
<td>66</td>
</tr>
<tr>
<td>Good</td>
<td>63</td>
<td>31</td>
</tr>
<tr>
<td>Poor</td>
<td>07</td>
<td>03</td>
</tr>
</tbody>
</table>

| Total    | 204       | 100        |

The findings show that majority (66%) of the respondents indicated that the Kitale Nature Conservancy environmental education programs enabled them to better understand environment and environmental conservation issues thus it was very good, (31%) indicated that the education programs were good while the remaining (2%) of the respondents indicated that the programs were poor and needed improvements.
The researcher therefore concluded that the KNC provided environmental education programs which were above average in terms of providing relevant environmental education to individuals who visit the conservancy.

4.4 **Assessment of Level of Knowledge gained at KNC.**

Assessment of the level of environmental knowledge gained at KNC was done as per the categories discussed as follows:

4.4.1 **Students Understanding of Environmental Concepts and Issues**

The study of this item sought to determine whether there was a significant difference in the level of understanding of environmental concepts such as environmental conservation, endangered animals and plants and environmental issues related to pollution and climate change between the groups which had visited KNC hence considered sensitized about environmental conservation and the group which had not visited the conservancy hence considered non sensitized. This information was very vital since for individuals to come up with environmental conservation measures, they must first understand the problems facing the environment. An independent samples t-test was conducted to compare the level of understanding of the environmental issues for sensitized and non sensitized groups. The finding was as shown in table 4.7.
Table 4.7: Comparison of levels of understanding of environmental concepts and issues between sensitized and non-sensitized group

<table>
<thead>
<tr>
<th></th>
<th>Sensitized</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-sensitized</td>
<td>1.00</td>
<td>204</td>
<td>4.0392</td>
<td>.70776</td>
<td>.04955</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td>204</td>
<td>2.8137</td>
<td>.69097</td>
<td>.04838</td>
</tr>
</tbody>
</table>

Levenes test for equality of variance

<table>
<thead>
<tr>
<th>F</th>
<th>Sig</th>
<th>t</th>
<th>df</th>
<th>Sig(2-tailed)</th>
<th>Mean difference</th>
<th>Std error</th>
<th>95% confidence level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.23</td>
<td>.26</td>
<td>17.69</td>
<td>406</td>
<td>.025</td>
<td>1.2255</td>
<td>.0692</td>
<td>Lower 1.089 1.089 6</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
<td>6</td>
<td>405.76</td>
<td>.025</td>
<td>1.2255</td>
<td>.0692</td>
<td>Upper 1.361 1.361 6</td>
</tr>
</tbody>
</table>

=variances assumed
=variances not assumed

The findings of the study indicate that there was a significant difference in the scores for sensitized (m=4.0, SD=0.71) and not sensitized (m=2.81, SD=0.69) groups; t(406)=17.696, P=0.025. These results suggest that exposure to environmental education
programs and activities do have an effect on understanding of environmental issues and concepts such as environmental conservation, environmental pollution, climate change and endangered animals and plants. Specifically the results suggest that when students visit KNC they improve their environmental knowledge.

4.4.2 Level of Understanding and Action in solving Environmental Problems

The study of this item sought to determine whether there was a significant difference in the level of understanding of wildlife management between the groups which had visited KNC hence considered sensitized about environmental conservation and the group which had not visited the conservancy hence considered not sensitized. Respondents were required to list down actions that should be taken to protect wildlife from being threatened. This information was necessary since it reflected the knowledge the respondents have on wildlife management. An independent samples t-test was conducted to compare the level of understanding of wildlife management for sensitized and non sensitized groups. The finding was as shown in table 4.9.
Table 4.8. Comparison of level of understanding of wildlife management

<table>
<thead>
<tr>
<th>Group Statistics</th>
<th></th>
<th></th>
<th></th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sensitized</td>
<td>N</td>
<td>Mean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-sensitized</td>
<td>1.00</td>
<td>204</td>
<td>3.8971</td>
<td>1.09823</td>
<td>.07689</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td>204</td>
<td>2.2941</td>
<td>1.11936</td>
<td>.07837</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Levene's test for equality of variance</th>
<th>t-test for equality of means</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Sig</td>
</tr>
<tr>
<td>= variances assumed</td>
<td></td>
</tr>
<tr>
<td>= variances not assumed</td>
<td></td>
</tr>
<tr>
<td>.88 4</td>
<td>.34 8</td>
</tr>
<tr>
<td>.88 4</td>
<td>.34 8</td>
</tr>
</tbody>
</table>

52
The findings of this item indicate that there was a significant difference in the scores for sensitized (m=3.9, SD=1.1) and not sensitized (m=2.3, SD=1.1) groups; t(406)=14.6, P=0.005

These results suggest that environmental education programs and activities do have an effect on understanding of wildlife management in terms of action to be taken to overcome wildlife threat. Specifically the results suggest that when students visit KNC their understanding of wildlife management increase. Some of the actions taken to overcome wildlife threat as identified by the respondents include; educating individuals on the importance of conserving wildlife, recycling waste to avoid pollution and establishment of proper policy on wildlife management.

4.4.3 Overall Environmental Knowledge between Sensitized Students and Non sensitized Students

The study of this item sought to determine whether there was a significant difference in the overall level of environmental awareness between students who have visited KNC and those that have not. This information was necessary since it formed the basis for testing the research hypotheses. One way Analysis of Variance (ANOVA) was used in this test and results were recorded as indicated in table 4.9.
Table 4.9 Comparison of overall environmental knowledge between sensitized and non-sensitized students

**ANOVA**

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>41.766</td>
<td>5</td>
<td>8.353</td>
<td>45.748</td>
<td>.002</td>
</tr>
<tr>
<td>Within Groups</td>
<td>60.234</td>
<td>402</td>
<td>.150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>102.000</td>
<td>407</td>
<td>.150</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The findings indicate that there was a statistically significant difference between the groups as determined by one way ANOVA with a p value of 0.02 which is less than the significant level of 0.05, hence the researcher failed to reject the alternative hypothesis which posits that there is a difference in environmental learning actions between schools that have visited Kitale Nature Conservancy and those that have not.

4.5 **Comparisons of environmental status between schools that had participated in KNC environmental education programs and those that had not**

The study of this item sought to establish whether there is a significant difference in the school environmental status between schools that had visited KNC and those that had not had an experience from the conservancy. The data was collected from environmental status checklist which had indicators of sustainable environmental management practices (appendix IV). The data was then analyzed using an independent-sample t-test and result presented as shown in table 4.10.
Table 4.10. Comparisons of environmental status between schools that had participated in KNC environmental education programs and those that had not

<table>
<thead>
<tr>
<th></th>
<th>Sensitized</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-sensitized</td>
<td>1.00</td>
<td>204</td>
<td>4.5686</td>
<td>1.14048</td>
<td>.07985</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td>204</td>
<td>3.3186</td>
<td>1.31735</td>
<td>.09223</td>
</tr>
</tbody>
</table>

Levenes test for equality of variance

<table>
<thead>
<tr>
<th></th>
<th>t-test for equality of means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>= variances</td>
<td>1.70</td>
</tr>
<tr>
<td>assumed</td>
<td>9</td>
</tr>
<tr>
<td>= variances</td>
<td>10.24</td>
</tr>
<tr>
<td>not assumed</td>
<td>4</td>
</tr>
</tbody>
</table>

The findings of this item indicate that there was a significant difference in the scores for sensitized (m=4.6, SD=1.1) and non-sensitized (m=3.3, SD=1.3) groups; t(406)=10.246, P=0.003
These results suggest that environmental status between schools which had visited KNC and those that had not visited the conservancy were statistically significant thus the null hypothesis is rejected. The conclusion of the study is that knowledge gained at Nature Conservancies significantly influence environmental action in schools.

4.6 Comparison of Students’ Attitude towards Environmental Conservation and Management

This study was carried out to establish whether there was significant difference in the attitude of students towards the environment from the categories of schools which had visited KNC and those that had not visited the conservancy. The students were required to indicate the activities they are willing to do for the school and community in order to conserve the environment. An independent samples t-test was conducted to compare students’ attitude towards environmental conservation for sensitized and not sensitized groups. The finding was as shown in table 4.11.

The findings of this item indicate that there was a significant difference in the scores for sensitized (m=4.9, SD=1.1) and not sensitized (m=3.5, SD=1.2) groups; t(406)=11.789, P=0.021

These results suggest that students attitude towards the environment between schools which had visited KNC and those that had not visited the conservancy were statistically significant.
Table 4.11. Comparison of students’ attitude towards environmental conservation and management

**Group Statistics**

<table>
<thead>
<tr>
<th></th>
<th>Sensitized</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-sensitized</td>
<td>1.00</td>
<td>204</td>
<td>4.8873</td>
<td>1.10174</td>
<td>.07714</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td>204</td>
<td>3.5147</td>
<td>1.24559</td>
<td>.08721</td>
</tr>
</tbody>
</table>

Levenes test for equality of variance

<table>
<thead>
<tr>
<th>F</th>
<th>Sig</th>
<th>t</th>
<th>df</th>
<th>Sig(2-tailed)</th>
<th>Mean difference</th>
<th>Std error</th>
<th>95% confidence level</th>
</tr>
</thead>
<tbody>
<tr>
<td>= variances assumed</td>
<td>5.33</td>
<td>.02</td>
<td>11.78</td>
<td>406</td>
<td>.021</td>
<td>1.37255</td>
<td>.1164 3 1.1436 7 1.601 4</td>
</tr>
<tr>
<td>= variances not assumed</td>
<td>11.78</td>
<td>9</td>
<td>400.03</td>
<td>5</td>
<td>.020</td>
<td>1.37255</td>
<td>.1164 3 1.1436 7 1.601 4</td>
</tr>
</tbody>
</table>

The research study therefore concluded that environmental education programs offered at the KNC foster positive attitude towards the environment as they lead to creation of environmental awareness. This view is held by Parker & Wade, 2008 when they said that,
nature education facilities are instituted mainly to create and improve knowledge and awareness of wildlife and their habitat including their economic and social value. Parker & Ballantyne, 2005 also, revealed that zoos and aquariums, which are examples of conservation education centers, consider education to be one of their central focuses in their endeavor to conserve the wildlife. They noted that the aquariums and zoos have employed staff who are well trained to offer facilitate environmental learning and consciousness in different departments through the programs established for the visiting group to participate in, with the main aim of creating environmental awareness and action. Gathuku, 2013 also reveals that Environmental Education programs are designed in such a way that they lead to education about the environment thus helps to nurture positive attitude towards the environment and environmental conservation.

The respondents who had visited KNC were further required to indicate where appropriate the programs which they learnt in KNC and had implemented in their respective schools. The findings were as shown in table 4.12.

Table 4.12: Whether the programs indicated were implemented at school or not.

<table>
<thead>
<tr>
<th>Programs implemented at school</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental pollution control</td>
<td>125</td>
<td>145</td>
</tr>
<tr>
<td>Preparation and proper management of tree nurseries</td>
<td>147</td>
<td>123</td>
</tr>
<tr>
<td>Proper waste management techniques</td>
<td>103</td>
<td>167</td>
</tr>
<tr>
<td>Proper water harvesting techniques</td>
<td>169</td>
<td>101</td>
</tr>
<tr>
<td><strong>Percentage</strong></td>
<td><strong>44</strong></td>
<td><strong>56</strong></td>
</tr>
</tbody>
</table>
The research findings indicate that majority (56%) of those who participated in KNC environmental education programs did not implement what they have learnt in their school. Only 44% managed to implement the knowledge they received in the different aspects of environmental conservation.

The research study therefore concluded that mere acquisition of knowledge leading to change of attitude towards environmental conservation does not automatically translate to environmental action among the individuals. It was evident that there are other intervening variables that influence environmental action in schools and that was the reason why only 44% of the respondents could manage to implement environmental action in schools which were cited as administrative factors, economic factors and fixed schedule in schools.

The research study used the Pearson Product moment of correlation to test the kind of relationship that existed between the programs that the students participated in during the visit to KNC and the impact they have on attitude and behavior of students. The result was presented as shown in Table 4.13 below.
The findings show that there was a positive correlation between the variables tested. Specifically, it was observed that there was a positive correlation between the educational programs and knowledge level among students as indicated by $r (0.378)$ at $P=0.01$ level. Based on these findings the researcher rejected the null hypothesis thereby accepting the alternate hypothesis that there is a difference in environmental learning actions between schools that have visited Kitale Nature Conservancy and those that have not.

The Pearson Product moment of correlation was also used in to test the kind of relationship between the programs offered at KNC and the corresponding change in knowledge gained by teachers who have visited the conservancy. The result was presented as shown in Table 4.14 below.
Table 4.14: Relationship between the environmental education and awareness programs and their impact to teachers

**Correlations**

<table>
<thead>
<tr>
<th></th>
<th>Programs</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programs</td>
<td>Pearson</td>
<td>Pearson</td>
</tr>
<tr>
<td>Correlation</td>
<td>1</td>
<td>.137**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>12</td>
<td>.050</td>
</tr>
<tr>
<td>N</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Students</td>
<td>Pearson</td>
<td>Pearson</td>
</tr>
<tr>
<td>Correlation</td>
<td>.137**</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.050</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

The findings show that there was a positive correlation between the variables tested. Specifically, it was observed that there was a positive correlation between education programs offered at KNC and knowledge gained among teachers who visited the conservancy as indicated by r (.137) at P=0.01 level. Based on these findings the researcher rejected the null hypothesis thereby accepting the alternate hypothesis.

It was also noted that there was variation between r (.137) for teachers and r (.378) for students which could be attributed to the fact that students are always more willing and ready to learn and embrace change as compared to the teachers (adults) who quite often try to resist change unless convinced otherwise.
CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary of the study undertaken, provides conclusion and makes recommendations based on the findings. The last section of the chapter provides suggestions for further research.

5.2 Summary of Findings

The purpose of the study was to evaluate the contributions of Kitale Nature Conservancy in creating awareness and promoting sustainable environmental conservation in schools.

Data was collected with the help of questionnaires, interview schedules and checklists. Data was analyzed using SPSS where Pearson coefficient of correlation, independent sample t test and one way ANOVA were carried out. Major findings were organized according to the objectives as indicated below.

The first objective of the study was to assess the extent to which programs offered in KNC promote environmental sensitivity and behavior. Findings of this item showed that KNC has employed a range of strategies as evidenced in the themes covered in their programs which include; excursions using nature trail, tree identification and naming, video watching and oral lecture on environmental conservation and sustainable development. Information from key informant interview also showed that environmental micro projects and training workshops are part of the programs offered in KNC. These programs are designed to support sustainability by addressing learners’ knowledge,
attitudes and behavior thus empowering individuals to take positive action for a better conserved environment.

The second objective was to analyze the relevance of the themes in programs offered at Kitale Nature Conservancy with classroom curriculum. Findings on this item suggest that EE programs in KNC provide learning themes which promote the achievement of educational goals in Kenya specifically goal number 8 which stipulates in part that education should foster positive attitudes towards environmental development and conservation. These themes include; wildlife management and conservation, environmental pollution, climate change, forestry among others. A study of the secondary school curriculum revealed that these themes are fragmented in different subjects and topics thus making it difficult to relate various sub topics in different subject areas. It was also realized that there were other environmental related topics especially in chemistry and biology which were yet to be covered in the conservancy.

The third objective was to assess the influence of knowledge gained at KNC in promoting environmental action in schools. Findings on this item suggest that environmental education programs and activities do have an effect on understanding of environmental issues such as environmental conservation, environmental pollution, climate change and endangered animals and plants as showed by the scores for sensitized (m=4.0, SD=0.71) and non sensitized (m=2.81, SD=0.69) groups; t(406)=17.696, P=0.025 from independent sample t test. Specifically our results suggest that when students visit KNC they improve their environmental knowledge. There was a statistically significant difference between the groups as determined by one way ANOVA with a p value of 0.02 which is less than the significant level of 0.05.
A correlation analysis between quality of education and increased knowledge level among students and teachers showed positive significant correlation at P=0.01 level as indicated by \( r (0.137) \) for teachers and \( r (0.378) \) for students.

Further findings on this item showed that majority (66\%) of the respondents indicated that the Kitale Nature Conservancy environmental education programs enabled them to better understand environment and environmental conservation issues thus it was very good, (31\%) indicated that the education programs were good while the remaining (2\%) of the respondents indicated that the programs were poor and needed improvements. Majority (56\%) of those who participated in KNC environmental education programs did not implement what they learnt in their school. Only 44\% managed to implement the knowledge they received in the different aspects of environmental conservation.

### 5.3 Conclusion

i. KNC has employed a range of strategies as evidenced in the themes covered in their programs which include; excursions using nature trail, tree identification and naming, video watching and oral lecture on environmental conservation and sustainable development. These programs are designed to support sustainability by addressing learners’ knowledge, attitudes and behavior thus empowering individuals to take positive action for a better conserved environment.

ii. EE programs in KNC provide learning themes which promote the achievement of educational goals in Kenya specifically goal number 8 which stipulates in part that education should foster positive attitudes towards environmental development and conservation. The themes are fragmented in different subjects and topics thus making it difficult to relate various sub topics in different subject areas. It was
also realized that there were other environmental related topics especially in chemistry and biology which were yet to be covered in the conservancy.

iii. Environmental education programs and activities do have an effect on understanding of environmental issues such as environmental conservation, environmental pollution, climate change and endangered animals and plants. However, environmental action was observed to be affected not only by the knowledge gained and positive change of attitude, but also by other factors such as administrative goodwill in schools and financial support.

iv. The study concluded that the knowledge gained from KNC environmental education programs helped students to understand their environment better, identify environmental problems and to seek alternative solutions to these problems and to be committed to taking action geared towards alleviating or solving such problems. However, majority (56%) of those who participated in KNC environmental education programs did not implement what they learnt in their school. Only 44% managed to implement the knowledge they received in the different aspects of environmental conservation.

5.4 Recommendations

The study has observed that EE programs offered at the KNC enabled learners to have contact with nature and makes environmental conservation more practical thus foster positive attitude towards the environment as they lead to creation of environmental awareness and action. However, Kitale town and its environs still suffer from poor environmental practice such as deforestation and poor solid waste management. The study therefore recommends that;
1. Kitale Nature Conservancy should broaden the scope of EE programs with the main focus on experiential education so as to ensure that everybody who participates in the programs is well equipped to take environmental action.

2. Although KNC programs find relevance to themes in the carrier subjects in the formal school curriculum, the programs should seek to have themes in subjects like chemistry by mounting programs that enable learners to link content in such subjects with outdoor learning.

3. There is need for KNC to partner with schools so as to integrate the conservancy environmental practices and formal environmental learning experiences in the curriculum so as to equip the learners to develop attitude and behavior which are sustainable. This will enable the learners to continue in their environmental exploration and development throughout their lifetime.

4. KNC should develop follow-up programs in order to explore the long term impact of the learning experiences in schools and society at large.

5.5 **Suggestions for Further Research**

Based on the conclusion and recommendation of the study, the study suggests that further research to be done on;

1. Conservation education centres in other counties to establish the impact of environmental education programs towards environmental awareness and action.
2. Factors that influence environmental action in schools.
REFERENCES


UNESCO, Tbilisi Declaration, 1978


APPENDICES

5.6 APPENDIX I: QUESTIONNAIRE FOR STUDENTS

Questionnaire No.  Date

Instructions
i. Do not write your name on this questionnaire
ii. Indicate your choices by the use of a tick where the brackets are indicated ( )
iii. Fill in the blank space where applicable.

SECTION A: Background information

Gender: Male [ ] Female [ ]

SECTION B: Knowledge questions

1. How many times have you visited the Kitale Nature Conservancy?
   a) Once [ ] b) Twice [ ] c) Thrice [ ] d) Four ≥ [ ] e) Never [ ]

   If your answer is ‘never’, skip question 2, 3 and 4

2. Which activities did you engage in during the visit?
   a) Field excursions [ ] b) Environmental projects [ ] c) Watching video[ ] d) Oral lecture[ ]
   e) Others (specify)

3. Briefly explain what each of the mentioned activities entail

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   …………………………………………………………………………………………………………

   …………………………………………………………………………………………………………
4. Do you agree that the programs and activities you participated in during the visit to KNC influenced your attitude towards the environment?
   a) Strongly agree[ ]  b) Agree[ ]  c) Undecided[ ]  d) Disagree[ ]  e) Strongly disagree[ ]

5. Do you understand the meaning of the following terms?

<table>
<thead>
<tr>
<th>Environmental terms</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental conservation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Climate change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endangered animals and plants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental pollution</td>
<td></td>
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</tr>
</tbody>
</table>

6. If yes where did you learn them?
   a) School  b) Kitale nature conservancy  b) Others (specify)
   ……………………………………………………………………………………………
   ……………………………………………………………………………………………

7. List down five actions that can be taken to overcome wildlife threat?
   a) ………………………………………………………………………………………
   b) ………………………………………………………………………………………
   c) ………………………………………………………………………………………
   d) ………………………………………………………………………………………
   e) ………………………………………………………………………………………

8. Write down what you can do to improve your environment
   a) ………………………………………………………………………………………
   b) ………………………………………………………………………………………
   c) ………………………………………………………………………………………
   d) ………………………………………………………………………………………
   e) ………………………………………………………………………………………
9. Do you think that the environmental activities engaged in during the visit at the Kitale Nature conservancy are related with what we learn in the secondary school curriculum?

a) Yes [ ]  b) No [ ]

If yes, specify the activities .................................................................

SECTION C: Attitude questions

10. Did the way you perceive or do things changed as a result of your visit to Kitale Nature Conservancy?

Yes [ ]  No [ ]

If yes briefly explain how?
.....................................................................................................................................................

11. Which of the activities listed below are you willing and ready to do for the school and community in order to conserve the environment?

a) Planting trees [ ]  b) Water conservation [ ]  c) Proper litter disposal [ ]

d) Community sensitization [ ]  e) Others (specify) ..........................................................

12. Indicate where appropriate, the lessons or activities you learnt from KNC and you have implemented in school

a) Environmental pollution control [ ]  b) Waste management techniques [ ]

c) Water harvesting techniques [ ]  d) Proper management of tree nursery [ ]

e) Others (Specify) .........................................................................................................................
13. Rate the education you received from Kitale Nature Conservancy towards environmental conservation.

   a) Very good [ ]  
   b) Good [ ]  
   c) Poor[ ]
5.7 APPENDIX II: INTERVIEW SCHEDULE FOR ADMINISTRATORS

Interview no.…………………. Date………………

SECTION A:

1) How did your school learn about the Kitale Nature Conservancy?
   a) Social media [ ]
   b) TV/ Radio [ ]
   c) Posters [ ]
   c) Others (specify) ………………………………………

2) What are the activities that your students participated in during the visit?

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3) Does Kitale Nature Conservancy provide programs with themes that enhance environmental consciousness?

   Yes [ ]  No [ ]
   If Yes, briefly explain these programs

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4) Rate the education programs offered in the conservancy based on the ability to promote environmental education


5) Is there any theme in the programs at the conservancy that can find relevance in the secondary school syllabus?

   Yes [ ]  No [ ]
If Yes, specify

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6. Has there been any change in the students perception of the environment since the visit at the conservancy?
Yes [ ] No [ ]

If yes, briefly explain the changes
………………………………………………………………………………………………
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8. What do you think can be done to improve environmental awareness and action in schools?
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10. Outline the things you have done differently as a result of the knowledge gained from Kitale Nature Conservancy
a) Planting trees [ ] b) Water conservation [ ] c) Proper litter disposal [ ]

d) Others (specify). ……………………………………………………………………………
………………………………………………………………………………………………
………………………………………………………………………………………………
5.8 APPENDIX III: INTERVIEW SCHEDULE FOR KNC MANAGER

1. Briefly explain objectives of Kitale Nature Conservancy

2. Highlight the groups of people who have visited the conservancy since its opening day

3. What are the challenges that the conservancy is facing in working towards achieving its objectives?

4. Briefly explain the programs that KNC conduct
5. Briefly explain the level of achievement of each of the programs mentioned above
5.9 **APPENDIX IV: SCHOOL ENVIRONMENTAL STATUS CHECKLIST**

<table>
<thead>
<tr>
<th>Checklist No.</th>
<th>Date</th>
</tr>
</thead>
</table>

**Key** 1. (Very poor) 2. (Poor) 3. (Satisfactory) 4. (Good) 5. (Excellent)

- **a) Presence of well planted flowers**
  1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )

- **b) Absence of litters including waste papers**
  1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )

- **c) Well-managed litter bin and pit**
  1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )

- **d) Well organized waste separation methods**
  1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )

- **e) Presence of well-maintained incinerator**
  1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )

- **f) Trees which are planted in patterns and labeled properly**
  1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )

- **g) Properly maintained footpaths**
  1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )

- **h) Presence of properly maintained tree nursery in the compound**
  1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )
i) Properly maintained water collection and recycling system

1. ( )
2. ( )
3. ( )
4. ( )
5. ( )

j) Rate the environmental status of this school

1. ( )
2. ( )
3. ( )
4. ( )
5. ( )
APPENDIX V: ENVIRONMENTAL EDUCATION PROGRAMS

CHECKLIST

Key: 1. (Very Poor) 2. (Poor) 3. (Satisfactory) 4. (Good) 5. (Excellent)

a. Oral lectures
   1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )

b. Excursions
   1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )

c. Lessons on animals with deformities
   1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )

d. Use of printed materials (posters, guide books & brochures)
   1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )

e. Tree planting lessons
   1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )

f. Teaching on micro-projects
   1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )

g. Educational Field trips
   1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )

h. Lessons on culture and superstitions
   1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )

i. Funding & monitoring of school micro-projects
   1. ( ) 2. ( ) 3. ( ) 4. ( ) 5. ( )