

**CLIMATE CHANGE AWARENESS FOR FUTURE CLIMATE CHANGE
GOVERNANCE AMONG YOUTHS IN LUANSHYA DISTRICT, ZAMBIA**

by

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CERTIFICATE OF APPROVAL

The dissertation, of Evans Mwanza has been approved as partial fulfillment of the requirements for the award of the Master of Science in Environmental and Natural Resources Management by the University of Zambia.

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ABSTRACT

This study evaluated the effectiveness of climate change awareness done to youths in Luanshya District so as to prepare them in future climate change governance. The objectives of the study were: to identify the methods of climate change awareness available to youths in Luanshya District, to examine the youth's involvement in projects of climate change importance in Luanshya District, to evaluate the effectiveness of the climate change governance training done to youths in Luanshya District, Zambia, to assess the preparedness of youths for climate change governance in Luanshya District, Zambia. The aim of the study was to explore levels of awareness of climate change among youths as a way assessing the effectiveness of climate change governance for future climate change governors. Qualitative and quantitative approaches were used in the study while descriptive and case study designs were also adopted to (n = 160) randomly selected respondents who were drawn from four purposively selected townships within Luanshya District. The townships were: Mpatamatu, Roan, Mikomfwa and Fisenge respectively. Case study enabled the use of research questions and also helped the researcher to use more than one method of data collection for validation and in a natural setting. Further, its findings were detailed and could not be generalized. They helped the researcher to use more than one method of data collection, in natural setting. Further, its findings are detailed while descriptive design helped in measuring the hypothesis. The chi-square and descriptive statistics were used to analyze data. Four key informants were also purposively selected from different ministries and later interviewed. The results indicated that youths felt the awareness methods used were not effective 45 percent, 25 percent thought they were effective while 13 percent agreed that the methods were very effective respectively. Further, the results revealed that, Luanshya had no deliberate programmes aimed at preparing the youths for climate change governance. On insufficient information: Mpatamatu recorded 87 percent; Roan had 95 percent, Mikomfwa 40 percent and Fisenge 93 percent. In conclusion, despite having many youths who attended formal education and having participated in climate change awareness programmes, insufficiency in climate change knowledge showed that the climate change awareness among youths was not effective. Ministries that work with youths need to partner in order to plan how to introduce more modes of climate change awareness and need to revamp the programme for it to be effective. The youths need to engage in effective climate change awareness for them to be equipped in future governance and develop interest in climate change campaign.

Keywords: Climate change, climate awareness, Luanshya District, climate governance

DEDICATION

The dissertation is dedicated to my wife, Maggie, my daughter Beverly, three sons Conrad, Erasmus and Elijah.

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ACRONYMS

| | |
|--------|--|
| GHG | Greenhouse gases |
| NGO | Nongovernmental Organization |
| IPCC | Intergovernmental Panel on Climate Change |
| NCCP | National Climate Change Policy |
| UAE | United Arab Emirates |
| UN | United Nations |
| CYP | Commonwealth Youth Programme |
| NPA | Nation Plan of Action |
| AYC | African Youth Chatter |
| LMC | Luanshya Municipal Council |
| KWSC | Kafubu Water and Sewerage Company |
| ZESCO | Zambia Electricity Supply Corporation |
| AER | Agro Ecological Region |
| ZAMEFA | Zambia Metal Fabrication |
| CBD | Central Business District |
| CSO | Central Statistics Office |
| CNMC | China Non-Ferrous Metal Company |
| SPSS | Statistical Package of Social Sciences |
| DRGS | Directorate of Research and Graduate Studies |

CHAPTER ONE: INTRODUCTION

1.1 Introduction

This chapter provides the background of climate change awareness and relates it to climate change governance. It also explains the statement of the problem and the study aim, objectives, hypothesis, research questions and the rationale.

1.2 Background

Climate change is one of the biggest adverse phenomena facing mankind today. Its effects have been cross-cutting in all sectors of the national economies. In low income countries, climate change has exacerbated the poverty levels of vulnerable communities due to the countries' weak adaptive capacities and inadequate climate change awareness for adaptation (Anderson, 2010). Rosen *et al* (2021) supported that, the prolonged drought has resulted in low yields of crops especially to small scale farmers. Shortage of water has also impacted crop yields and livestock production due to moisture stress and shortage of pasture for animal grazing (Nhamo *et al*, 2018).

A study by Wolf and Moser (2011) indicated insufficiency of knowledge on climate change issues among youths, highlighting the need for climate change awareness among these future climate change governors. Taber and Taylor (2009: 2) suggested that, "children should be informed about the areas of personal, national and historic concern and yet feel empowered to make positive contributions." This is an active practical knowledge and the measure of its effectiveness on youths is done through assessments of several active attributes manifested in youths, *vis-à-vis* relevance, perceptibility, tangible change, and sustainability of climate smart-life skills. The objective of the awareness is to instill knowledge and understanding, attitude and behavioural change among youths (Chang & Pascua, 2012). The awareness further aims to transform youths from knowing and doing something to being a global citizen ready to engage in global climate change discourses.

Climate change awareness plays a critical role in preparing future climate change governors for challenges involving adaptation and mitigation to impacts of climate change. Considering the impacts of changed climatic conditions are already manifest (IPCC 2001; 2007: 2014), climate change awareness should be an integral component of both the formal and informal awareness systems of any civilized society. The need to start inculcating climate change awareness in youths' education from an elementary level is so as to instill behavioural change as well as shape the 'future' climate change

governor's attitudes at an early age. While youth involvement in climate change governance issues is still token at best in most countries, there is still cause for optimism. For example, Poppleton (2016) reported that presence of the youth at the COP22 meeting that was held in Morocco in 2016 amplified the importance of the awareness and the need for voices of the youths at the international climate negotiations.

In many countries climate change awareness has been undertaken by large institutions such as the non-governmental organizations as well as by the local governments. These institutions usually face challenges in generating appealing messages to corresponding audiences (UNCED, 1992). As a way of combating this challenge, Lee *et al* (2013) proposed peer to peer knowledge transfer as a strategic way to solve the problem. This involves sharing of knowledge among contemporaries or colleagues using various methods of training and learning. However, the disadvantage of using such a method in awareness is that, it's ineffective if no one among the peers is adequately aware of the subject at hand. In some instances, information among peers in the same age group may not be taken seriously. Hence, such a method could best be used as a supplementary method of learning about climate change (Lee *et al* 2013).

Social networking sites such as Twitter, Face book and Wikipedia are also effective modes of transmitting climate change information to diverse audiences suggested by Lee *et al* (2013) and added that climate information disseminated on social media should be 'catchy', concise and direct to the point in order to arouse interest in the reader. However, the disadvantage of using social networking sites for awareness in preference to formal awareness is the plethora of unauthentic and misleading information that can be posted by anyone which may mislead the readers. UNESCO (2015) has been promoting climate change awareness through the Education for Sustainable Development (ESD) programme by helping youths understand the causes and consequences of climate change and prepare them to live with its impacts. When youths realize the importance of the information they are receiving, it becomes easier to hold their attention and educate them. Reporting on the importance of climate change awareness UNESCO (2016:3) posits that "climate change awareness is a powerful tool for helping people respond to climate change. Youths are helped to understand the causes and consequences of climate change and are empowered to take appropriate actions." UNESCO is of the view that in training youths about climate change governance, climate change literacy is improved through active training activities using integrated cross discipline methods of knowledge transmission.

1.2.1 Climate change governance (CCG) and climate change awareness.

“Governance is a system of values, policies and institutions by which a society manages its economic, political and social affairs through interactions within and among the state, civil society and private sector” UNDP (2004: 287). Mubanga (2016) defines resource governance as the exercise of authority and power, decision making processes and local citizenry involvement. Governance is influenced by institutions and local cultural norms for purpose of enhancing sustainable management and sustainable utilization of resources. Climate change governance refers to a political administrative system that is adapted to handle all aspects of climate change activities (Ministry of National Development Planning, 2016).

Climate change awareness relates to climate change governance in that climate change awareness is the process through which formal and informal institutions prepare and produce future climate change governors. Climate change awareness includes institutions which impart knowledge, attitude, understanding and behavioural change in youths while climate change governance ensures that these institutions provide effective climate change awareness. Of course the objectives of climate change governance are much broader than just regulating institutions of climate change awareness. Climate change governors are a product of climate change awareness through formal and non-formal institutions. Effective awareness prepares climate change governors for making decisions related to mitigation and adaptation against impacts of climate change (World Bank, 2020).

Recently, aspects of climate change governance in Zambia have included mainstreaming climate change into all sectors of the government and the economy (Ministry of National Development Planning, 2016). Another factor cardinal to the success of climate change governance is understanding and transmission of accurate climate change scientific findings. Since climate change is a complex and uncertain subject, stakeholders should play the active role of ensuring community involvement in not only climate change policy formulation but also in carrying out policy directives on the ground. This helps ascertain real behavioural change among communities to ensure climate change conscious in their everyday living. Governance institutions are also charged with sensitizing communities to ensure effective behavioral change among people so they become climate conscious in their everyday living. Governance institution is also obliged to set up regulatory bodies for approving and assessing compliance of projects with potential climate change impacts as well as learning from other countries on how to handle climate change related problems (Meadowcroft, 2010).

Climate change governance can also entail inter-institutional cooperation involving different actors structured in hierarchical forms of regulation so as to identify and monitor the levels at which climate change inputs are being managed. Frolich and Knieling (2013) clarify the inter-institutional nature of climate change governance when they said; it is the governance that consists of inter-relationships between stakeholders and coordination processes. It should be informed by knowledge emanating from a review of theories and global research on climate change policy as well as insights from national and international programmes (Bahadur *et al.*, 2017). Drexhage (2008) observes that, developing countries should institutionalize climate change issues to domestic government agencies that can create ‘champions’ for adaptation and mitigation within governments. While this kind of institutionalization of climate change issues is feasible at a local level, the global scenario is different. Bernauer and Schaffer (2010) explain that cooperation at the global level is difficult, because the Earth has one atmosphere that is indivisible and it can be used by anyone as a carbon sink for greenhouse gas (GHG) emissions globally but the effects are felt collectively.

1.3 Statement of the problem

The lack of awareness on climate change issues among young people (Wolf and Moser, 2011) due to the fact that climate change awareness was not comprehensively implemented in all the subjects in Zambia Pruneau *et al.*, (2001 in Dal *et al.*, 2015); climate change was taught as a cross cutting issue in the Zambian school curricula and not embedded in all the subjects (Anderson, 2012); there were no comprehensive assessment of the youths exclusively on climate change skills since it was only covered as a cross cutting issue in different subjects; also, there was need to assess the youths on their environmentally friendly life style, since climate change is a practical subject; other scholars had made similar observations, for example Fortner (2001 in Dal *et al.*, 2015) explained that the knowledge of teachers on the climate change content was inadequate to teach it.

Namukoko (2014) reported that the content was insufficient and resources for training climate change governance were not available in schools thereby making it ineffective. This is in line with Santambo (2011) who stated that ‘quality education could be measured by looking at youths’ success and performance when they leave education institutions in their further education and work places. ‘Not participating youths in climate change, is emphasized by Mudombi *et al.*, (2011) that youths are victims to climate change even though they did not contribute to past human activities.

The consequences of not imparting climate change awareness in youths could result in unable to prepare future climate change governors. That could result into failure to combat devastating effects of climate change in terms of adaptation and mitigation strategies. Ojala and Lakew (2017) added that, youths comprised of future society leaders apart from being today's citizens. Not involving them would result in failure to participate in programmes related to climate change. Hence, this study aimed at making an assessment of whether the youths in the study area were effectively made aware of climate change issues for them to be prepared to play effectiveness roles in climate change governance.

1.4 Aim of the study

The study explored the levels of awareness of climate change among youths in Luanshya District.

1.5 Study objectives

The study had the following objectives:

- i. To identify the methods of climate change awareness creation available to youths in Luanshya District.
- ii. To examine youths' involvement in projects of climate change projects in Luanshya District.
- iii. To evaluate the effectiveness of the climate change governance training provided to youths in Luanshya District, Zambia.
- iv. To assess the preparedness of youths for climate change governance in Luanshya District, Zambia.

1.6 Hypothesis

The methods of imparting climate change awareness in youths lacked effectiveness to prepare them for the role of future climate change governors.

The Chi-square hypothesis 1:

Ho: There was no statistically significant association in levels of awareness between sex of youths and methods of climate change awareness in Luanshya District.

H₁: There was a statistically significant association in levels of awareness between sex of youths and methods of climate change awareness in Luanshya District and those who were not.

The Chi-square hypothesis 2:

Ho: There was no significant association between sex of youths and the effectiveness of climate change governance training offered to youths in Luanshya District.

H₁: There was a significant association between gender of youths and the effectiveness of climate change governance training offered to youths in Luanshya District.

1.7 Research questions

The following were the research questions of the study:

- i. What were the modes of disseminating climate change awareness to youths in Luanshya District?
- ii. What could be the best way of imparting climate change awareness to youths in Luanshya District?
- iii. How often did the youths in Luanshya District participate in climate change awareness projects?
- iv. What were some of the local climate change awareness projects available for youths in Luanshya District?
- v. Was the climate change awareness training offered to the youths in Luanshya District effective?

1.8 Rationale

This research explored the levels of awareness on climate change among youths in Luanshya District. A study of climate change awareness could help the civil society in understanding measures that could have been put in place among the youths and suggest the best way of responding to causes and effects of climate change. The results of this study could help youths in having better understanding of the local impacts associated with climate change, response strategies for mitigating impacts as well as improve decision making in case of climate change disasters (Ministry of National Development Planning, 2016).

The study may provoke further researches on climate change awareness both at local and national level. Further, the study would remind stakeholders of their role in coming up with programmes and projects relating to climate change to prepare the youths for future roles as leaders. Youths would be

helped get prepared for climate change governance through their involvement in climate change awareness projects. It would also, help youths realize their role in governance issues and refrain from activities that contribute to climate change. Further, the study may enhance behavioural and social change among youths due to their realization of the seriousness and urgency of climate change concerns. The results of this study may, therefore, be relevant to educators and other stakeholders to include climate change awareness into their programmes targeting youths. It may also highlight the need to re-evaluate the methods used to instill climate awareness in youths as well as improve educational aspects of the next generation and ensure that the future climate change governors are nurtured from youth.

In order to design policies that would be supported by the public, the policy makers needed to know the level of youths understanding about climate change (Bord, *et al.*, 1998; Dal *et al.*, 2015). Therefore, the results may inform policy makers to come up with appropriate programme designed for youths on climate change and enhance their levels of awareness. Responding to climate change awareness needed urgent measures necessary for preparing future climate change governors whose mandate was to look into governance matters and policy formulation.

1.9 Organization of the dissertation

Chapter one outlines the background of the study, statement of the problem, aim of the study, study objectives, hypothesis, research questions and the rationale.

Chapter two reviews literature on climate awareness, measuring effectiveness of climate awareness, case studies of climate change globally, continental and national perspectives, climate change and the youths, linking climate change awareness to climate change governance and the role of National climate change Policy (NCCP) for Zambia in climate change awareness.

Chapter three consists of the description of the study area in terms of location and administration, physical characteristics, demographic characteristics, economic activities and the study sites.

Chapter four presents the methodology used in the study. The epistemological and ontological positions, research approach, research design, target population, data sources, data collection instruments and data analysis, validity and reliability, ethical considerations and limitations of the study.

Chapter five presents the findings of climate change governance training to youths in Luanshya District.

Chapter six presents the discussion of the results.

Chapter seven concludes and gives recommendations of the study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Literature review is the selection and analysis of other researchers work (Tichapondwa, 2013). It helps the researcher to focus on what has not been done by other studies. A complete research needs to have this part written in a critical way (Bryman, 2008). This chapter links climate change awareness to climate change governance. It starts with climate change, a relationship between climate change awareness and climate change climate change governance, modes of climate change awareness, involvement of youths in projects of climate change awareness, effectiveness of climate change awareness, preparedness of youths in climate change awareness, climate change awareness in Zambia, climate change awareness and the youths, linking climate change awareness to climate change governance, the role of National Climate Change Policy (NCCP) in Zambia in climate change awareness and summary of literature reviewed.

2.2 Climate change

The Intergovernmental Panel on Climate Change (IPCC) defines climate change as, the shift in the mean state of climate over an extended period of time (decades or longer) which may be due to natural changes or prolonged anthropogenic changes in the state of the atmosphere or in land (IPCC, 2001). The UNFCCC (1992) defines it as a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods of about 30 years. That was the climate change definition that was adopted in this study. Offorma (2006 in Dlamini 2016) explains that climate change was caused by human activities such as farming, mining, manufacturing and processing industries while Ozor, (2006) argues that climate change is caused by natural factors like volcanoes, solar output and ocean variations among others. Awareness is the knowledge or sensitization that is received from various sources, for example reading literature, listening to the radio, watching television and searching information on internet based on climate change.

2.3 Climate Change Awareness

Climate change awareness is the knowledge that is acquired through formal and informal learning, training and sensitization which aims at changing the behaviour, attitudes and reduces the impacts of climate change (Anderson, 2010). It educates about climate change and it supports climate change adaptation, such as reducing vulnerabilities, disaster risk reduction, and preparation in communities for uncertain futures (Narksompong & Limjirakan, 2015).

2.4 A relationship between climate change awareness and climate change governance

Climate change awareness is related to climate governance through the following attributes: relevance, perceptibility, tangible change and sustainable climate-smart life skills. Effectiveness involved the degree to which something was successful in producing desired results (Keenan, 2015). Hence, effectiveness of climate change awareness could be defined as estimating the degree, to which youths understood and appreciated the climate change knowledge they were taught formally or informally. Climate change awareness could be measured using the following attributes: relevance, perceptibility, tangible change and sustainable climate-smart life skills.

Relevance is the knowledge that is expected regarding climate change awareness. Climate change is supposed to be an important practical subject that should have helped them adopt environmentally friendly practices capable of reducing their carbon foot print on the atmosphere (UNESCO, 2010). Climate change awareness should have an impact on the youths' mental capabilities and should have been able to relate the subjects' importance and apply it. Relevance of climate change could be measured through how youths apply the environmentally friendly practices they had acquired and how they made the lessons a key part of their day to day lives. The relevant information needed to be appreciated by the youths (Lee *et al.*, 2013).

Perceptibility was the process of understanding based on what was observed (Muchanga, 2011). It involves knowledge about climate change youths should be able to explain based on own observations. For instance, the observable sea level rise or global warming could be perceived as a result of anthropogenic induced environmentally unfriendly activities. Climate change aware youths could have such content on the subject and should be able to explain the processes and intricacies involved. Perceptibility could be demonstrated through the youths understanding and application of knowledge from climate change awareness.

Tangible behavioural change in climate change awareness is observed in the youths’ activities that are meant to reduce their contribution to a changed climate. It also implied that the youths observably refrain from activities that resulted in climate change. For example, open ambient burning of waste to avoid releasing more greenhouse gases (GHG) in the atmosphere. It should be an action oriented knowledge which connects fully understanding of broader problem with actions that a learner could utilize for the entire life (Lee *et al.*, 2013).

Sustainability of climate-smart life skills involved youths ‘acquisitions of the set of skills that were acquired through awareness that lead to prolonged and sustainable skills. These were skills that formed a part of youths’ lifestyles, shaping their attitude towards environmental issues (Anderson, 2010). For example, avoiding deforestation and practicing conservation agriculture.

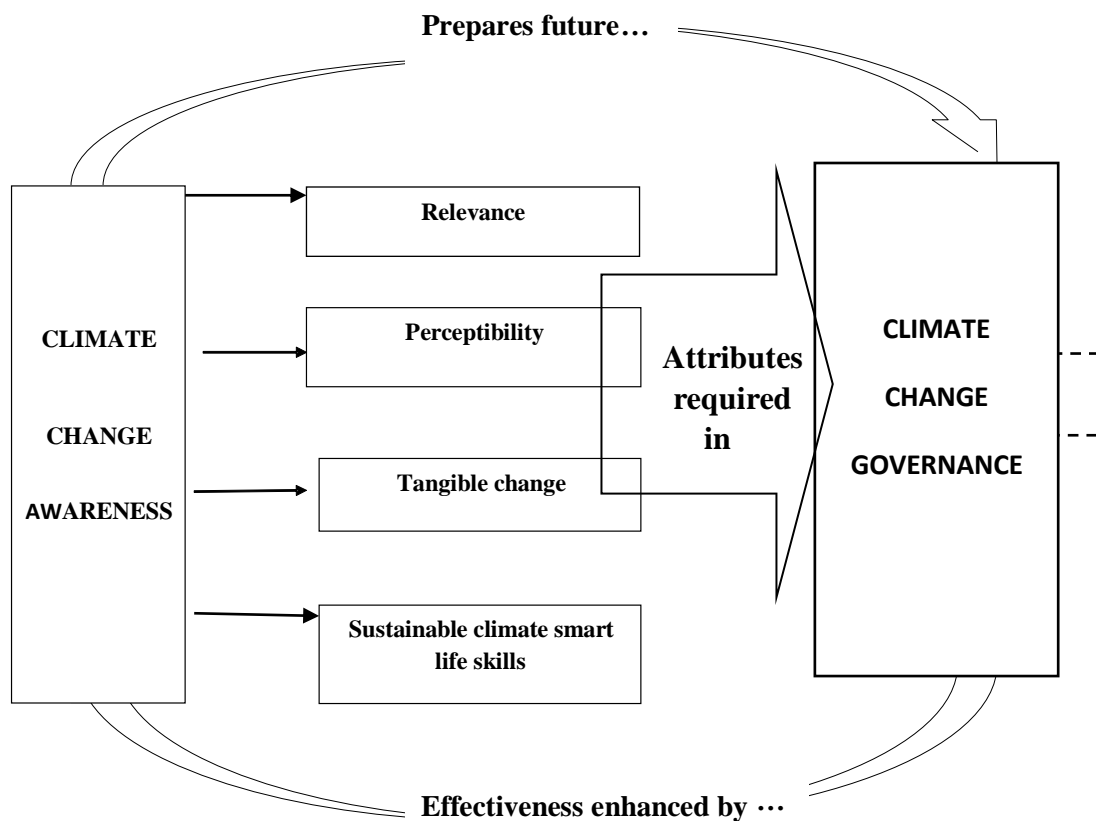


Figure2.1: Climate change awareness and climate change governance

The effectiveness of climate change awareness is assessed by measuring the attributes of climate change awareness from youths point of view (Figure 2.1). These attributes are: relevance, perceptibility, tangible change and sustainable climate smart life skills. They are critical in preparing the youths to be future climate change governors. Attributes of climate change awareness were expected to be relevant to the youths. For example, perceptive youths ought to practice environmental friendly activities.

2.5 Modes of climate change awareness

UNDP assessment report (2012) that was conducted in Cambodia aimed at assessing climate change awareness and knowledge level to farmers, councilors, district and provincial officers so that it could come up with adaptive measures in agriculture. A focus group discussion was used and representatives were randomly selected from targeted villages. Results showed that, people realized the climate change through changes on the onset of rains, temperature, frequent and intense of droughts. Less than 50 percent of the respondents claimed that deforestation was the cause of climate change. The study further showed that, the awareness and understanding of the people who participated in the climate change awareness campaign increased and youths were pointed at to be the most vulnerable to climate change (UNDP, 2012). The climate change awareness in Cambodia was low.

Miler *et al* (2012) carried out a study in Czech Republic and sampled from Masaryk University of grammar students participated in the quantitative study and showed no awareness of climate change at all. Attitudes of students on climate change had been investigated by universities, governmental and nongovernmental organizations after its inclusion in framework curricula documents. Natural science was taught as an integrated subject among lower primary pupils and divided to Physics, Chemistry, Biology and Geography at upper and secondary schools. The climate change knowledge test was conducted and who had climate change knowledge students performed better. Therefore, the results showed that, knowledge of students on climate change was low even though 81 percent of the respondents knew the definition of climate. The percentage of students who differentiated global warming and climate were about 32 percent. Teachers had little knowledge except Physics teachers only (Miler *et al.*, 2012). It further revealed that, males were better than females in terms of knowledge. It was established that, interdisciplinary approach and comprehensive materials was required. Teachers found the topic complicated and lesson planning consumed time. They resolved to

provide segmented education to such groups and an on-line educational application on global CO₂ emissions was developed.

Ajuang, *et al*, (2016) observed that, African continent was among the vulnerable to climate change because of lack of research on awareness and low level of knowledge. Increasing the levels of understanding was the top priorities in climate change research. The research aimed at determining the levels of awareness among Upper Nyakach Division. A cross-sectional survey was designed targeting 384 households. Heads were selected as respondents from 11 sub locations within Nyakach. A questionnaire was used in data collection and 100 percent had observed changes in the climate. To gain insights on variables that were more significant determinant of climate change, a generalized linear model with poisson error distribution was used. Results showed that household head, educational level and age significantly influenced respondents' awareness of climate change. 87 percent households reported that rising of temperatures while 55 had observed declining of rains, 75 percent reported, increased droughts, 87 percent had noticed changes in water sources, the educated observed increased prevalence of malaria. Nyakach Division was aware about climate change but it was recommended that more effort was needed in mitigating climate change. In order to increase the knowledge, awareness campaign was recommended among the community members.

2.6 Involvement of youths in projects of climate change awareness

Bozdogan, (2009) conducted the study in Turkey on perceptions of teachers candidates who were responsible for preparing various education activities for students on climate change. The study was conducted at Giresun University and a total number of 89 teacher candidates participated in the study. Using an open ended questionnaire, the results showed that more than one third of teachers had insufficient knowledge on climate change. The results revealed that, most of them had good suggestions on how to reduce the problem but failed to put it into practice and did not even show ways of decreasing global warming. Turkey resolved on educating all sectors of education starting from elementary up to tertiary. In order for teachers to improve, they were advised to participate in social activities such as the use of video materials, tree planting, photograph exhibitions, painting, poetry (Bozdogan, 2009). Further, they suggested arranging activities so as to improve critical thinking and find a lasting solution on environmental issues. To make students become sensitive about environmental issues, they suggested to address teachers that, the world is not inherited from our forefathers but borrowed from our children. The level of awareness in Turkey was low.

Bojovic and Dooel (2014) conducted an online survey in Macedonia, using 473 questionnaires that were distributed on social media. Participants of different age groups from Skopje and Municipalities took part. Among them, 80 percent were degree holders, 68 percent were employed in government and 32 percent private sector. The study revealed that Macedonians were aware about climate change because they were using alternative mode of transport, saving water and energy (Bojovic and Dooel, 2014). Also, the high number of participants showed that they were enthusiastic about collaboration on this topic and ready to involve themselves in climate change issues.

A study was carried out by Albuegasim and Daiban (2017) in United Arab Emirates (UAE) aimed at determining the level of public awareness on climate change. A total of 4,000 survey respondents were administered with questionnaires, using a systematic random sampling procedure. The results showed that 40 percent had no knowledge and awareness on climate change.

2.7 Effectiveness of climate change awareness

A study of students, both public and private schools of Tehran was conducted by (Yazdanparast *et al.*, 2013) on knowledge about global warming. It aimed at examining knowledge of students on global warming for authorities to had better imagination for educational planning and cultural aspects of the next generation of which climate change was among. To evaluate high school students, a total of 1,035 closed and open ended questionnaires were completed to measure their knowledge on causes and remedies of global warming. The results showed that 5 percent of the students explained greenhouse correctly and half failed. The students had misconceptions in their minds because were mixing the causes and consequences of global warming with those of the ozone layer depletion. Their sources of information on global warming were school, internet, television, magazines, radio and newspapers. Because students' knowledge was low, there was need for educational planning through school and television (Yazdanparast *et al.*, 2013). They recommended starting education programmes from lower grades.

A study by Carr (2015) that was conducted in Dar-es Salaam, Tanzania, aimed at identifying what was not known based on the climate change awareness. It aimed at improving the Dar-es Salaam University College of Education (DUCE) and the nations' adaptive capacity as the way of improving climate change awareness. The result showed that, dissemination of climate change awareness was

generally of low priority. The education sector was equipped with climate change content; little was known about students' knowledge.

Dlamin (2016) carried out a study in Swaziland to establish the understanding and teaching of climate change in secondary school. Document analysis, focus group discussions and questionnaires were used to collect data from 16 schools, 16 head teachers, 32 Geography teachers, four senior environmental officers from different regions. Results showed that climate change awareness was low as 66 percent of the teachers did not have climate change education as part of their course. The study recommended education to be the powerful tool that can help individuals make informed decisions. It has the ability to provide relevant education on disasters and climate change that can enable reduce vulnerability of communities.

2.8 Preparedness of youths in climate change awareness

Wang *et al*, (2013) researched on public perceptions on climate change. The paper analyzed public concern, perception of the causes and impact, confidence on government's response on climate change and the influence of climate change policies. A survey that was divided into two was used; small scale test and random sampling survey. Small scales were taken in Beijing, consisting of 50 questionnaires. A total of 509 questionnaires were obtained for the survey, from 21 districts. About 277 questionnaires were received in the network among them, 272 were effective. Small scale test was done in the districts of Beijing and it had 50 questionnaires. On network, sampling survey and field survey were used. A total of 509 questionnaires were obtained for the survey, from 21 districts, 4 autonomous regions and 4 municipalities. A result showed that 93 percent of the respondents had climate change awareness. It was established that, public activities caused climate change. China's public awareness about climate change was high. This could have been due to national programmes in response to climate change and the governments promoting energy conservation and emission reduction. The results on individual action to cope with climate change, the majority agreed that individuals can play a role in response to climate change. Specifically, 71 percent of the students agreed that they were responsible for mitigation (Wang *et al*, 2013).

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The results showed that 40 percent of the population had no knowledge and awareness on climate change.

2.9 Climate change awareness in Zambia.

Zambia lacks public discussions about climate change in line with the study that was conducted. It is through public discourse the general public, including the youths comes to understand the importance of climate change and develop the component of laws and policies (Swim *et al*, 2018). The climate change knowledge can be useful to policy makers in order for them to make sound decisions. Greenhouse Gas emissions increased in early 2000, communicating to the fact that, climate change awareness is lacking. Climate change has affected vulnerable groups whose livelihoods depend on natural resources. In order to mainstream the climate change agenda, the nation had adopted the adaptation strategy that was said to be to developmental friendly that starts with the information, developing countries already have concerning agriculture, water resources and public health. The human being is protected in the face of climate change (Burton *et al*, 2004). Although experts lack certain information to inform the decisions on climate change (Blackdot Media, 2016).

It was also discovered that there were few studies reviewed in Zambia that evaluated awareness of climate change issues among youths Mubanga *et al*, (2022) evaluated the quality of climate change education received by students in schools. Further, it investigated the opinions from teachers and pupils on making climate change, a compulsory subject. Nyanga, (2011) investigated the extent to which small holder farmers perceived conservation farming as a strategy to climate change. Hence, this is aimed at filling the gap.

2.10 Climate change awareness and the youths.

If Zambia was to yield meaningful development, youths could not be ignored. The youth's were mandated to pick up the mantle of climate change governors. Ojala and Lakew, (2017) explained that, young people is one group to include in efforts to combat climate change. The group of young people comprises the future leaders of society, besides being leaders of today. They will be the ones who will face the negative impacts that will result from climate change. The young people are future researchers and decision makers. Beside these, young people are unique, in that many are involved in formal education system making it easy to reach them. Rahman, *et al.*, (2014) supported that, effective dissemination of knowledge among the youths during high school days is crucial while Ceaser, *et al.*,

(2019) stresses that, the number of young people taking action in climate change, is increasing in most parts of the world.

The term youth had different definitions from country to country and community to community. The United Nations (UN) defined youths as male or female aged between 15 and 24 years whilst Commonwealth Youth Programme (CYP) defined it as a male or female aged between 15 to 29 years and the national youth policy defined a youth as a male or female between the age of 18 and 35 while the Nation Plan of Action (NPA) in line with African Youth Charter (AYC) defined a youth as a male or female between the age of 15 and 35 years (Ministry of Youth and Sport, 2015). The definition for NPA had been adopted in this study.

2.11 Linking Climate Change Awareness to Climate Change Governance.

Climate change awareness is related to climate change governance. In order to have knowledge on governance there was need to be aware about climate change. The way of acquiring the said knowledge was through training youths in awareness. A nation that did not train climate change concepts to youths lacked climate change governance. The importance of preparing future governors was so as to enhance the awareness, adapt to mitigate the impacts of climate change. The other important factor was to come up with good policies on climate change. That was necessary because training the youths about climate change could also support climate change adaptation, such as enhancing adaptive capacity, preparing institutions and communities for uncertain futures (Narksompong & Limjirakan, 2015).

2.12 The role of the National Climate Change Policy (NCCP) for Zambia in Climate Change awareness.

The national policy advocates for climate change awareness because climate change has impacted all sectors of the national economy. The national policy coordinates climate change programmes national wide with the aim of achieving the vision 2030. The vision 2030 is the first ever long term written plan, aimed at expressing the aspirations of Zambians by the year 2030. It contains different long term developmental policies at different points that would be attained by 2030. This is done through the involvement of both local and traditional leaders with the use of indigenous knowledge. The other role of NCCP is to minimize the vulnerability of climate change through risk reduction measures. Further, the national policy strengthens the public awareness of climate change even in other sectors

countrywide and sensitization of climate change to the general public. NCCP outlined its awareness activities in various sectors and ministries within the nation (Ministry of National Development Planning, 2016).

The other roles of the NCCP have been identified from the researches that have been carried out at national level. They have been of help in the following areas: to ensure better understanding of climate change impacts, improve its impacts assessments so as to reduce vulnerabilities caused by climate change. It is also the aim of NCCP to ensure that citizens are informed on appropriate mitigation and adaptation strategies. This helps them respond to climate change. The other role of NCCP is to initiate programmes about climate change (Ministry of National Development Planning, 2016).

2.13 Summary of literature reviewed

Climate change can be seen from the onset of rains, intense heat and droughts. In most instances, youths are regarded as the most vulnerable without adaptation and mitigation measures (UNDP, 2012). That, demands putting up awareness programmes in order to combat climate change. Levels of awareness varied from age to age and that demands segmented education. Other groups of people who are aware about climate change, lacks adaptation strategies (Miler *et al.*, 2012).

The modes of climate change awareness that worked in Cambodia were dependent on government institutions that were expected to sensitize the multitude in order to mitigate and adapt to the impact of climate change. Education was also considered a vital mode of climate change awareness, especially for the youths as most of them were in formal and informal education. Even though the education sector played a role in awareness campaign, other countries still recorded a low awareness (Bozdogan, 2009). In order to involve youths in climate change, social activities had been recommended, such as painting, poetry, conferences and projects (Bozdogan, 2009). Climate change awareness had been observed to be ineffective because, transmission of the content had been a problem Carr (2015).

Evaluating the effectiveness of climate change awareness, it was established that, the following sources of knowledge namely: school, internet, television, magazines, radio and newspapers were found to be ineffective because of students' misconceptions on the causes of global warming with that of ozone layer depletion (Yazdanparast *et al.*, 2013). Preparedness of youths for climate change showed contradiction results. Wang (2013) showed high awareness in climate change among youths.

Knowledge and awareness on climate change was noticed to be low. Albueldgasim and Daiban (2017) revealed that, 40 percent were aware about climate change.

Emerging from such, it was imperative to explore the levels of climate change awareness in Luanshya District so as to prepare future climate change governors who would help promote communication among stakeholders and disseminate climate change information to enhance awareness, understanding of its opportunities and impacts for climate change governance among youths (Ministry of National Development Planning, 2016). That would demand different stakeholders to come on board and tackle climate change awareness in a multi-sectoral approach.

CHAPTER THREE: DESCRIPTION OF STUDY AREA

3.1 Introduction

This chapter describes the study area of Luanshya District and the study sites. The chapter is divided into four main sections. The first section describes the location and administration of Luanshya District. Section two is the demographic characteristics; section three is the physical features, where the climate, drainage, geology and soils are described; section four describes the economic activities of the people in the study area.

3.2 Location and administration

Luanshya District was a mining town on the Copperbelt Province with an area of 1,007. 6087 km² and altitude of 1,200 meters above sea level. It is located between coordinates 13⁰ south and 28⁰ East. It is 320 kilometers away from Lusaka, the capital city of Zambia and 36 kilometers south-west of Ndola, the provincial headquarters for the Copperbelt Province. It is bordered with rural districts, Mpongwe and Masaiti districts that were known as Ndola rural in the past, Luanshya District is bordered by Kitwe on the west, another mining town with economic activities Ndola, on the north-east, Masaiti on the south-east, Mpongwe district on the south-west near Kafue River and Lufwanyama District on the north-west (Bwalya, 2019). The district is administered by both central and the local government. After decentralization policy, all townships are run by the local authority under Luanshya Municipal Council (LMC). The local government is in charge of housing, transport, roads, local infrastructure provision, collecting garbage, levies and land rates. Water reticulation and sewerage had been mandated to Kafubu Water and Sewerage Company (KWSC) a regional water utility while the national electricity parastatal, the Zambia Electricity Supply Corporation (ZESCO) supplied power to residents and companies of the district.

3.3 Physical characteristics

3.3.1 Climate

The district has a tropical climate with three distinctive seasons namely: cool-dry, hot - dry and rain season. The cool-dry season which starts in May to September; the hot - dry season which was from

October to November and the rain season from December to April. The mean temperature for Luanshya was 20⁰ C with a daily mean minimum temperature of 13.4⁰ C and a mean maximum of 27.2⁰ C. Rainfall is influenced by the movement of Inter Tropical Convergence Zone (ITCZ) as well as the southern oscillation (UNDP, 2012). The mean annual rainfall is about 1,239 mm and the wettest month is January while the coldest month is June and October is the hottest month of the year. The climate was favourable for human settlement.

The area receives 1,000-1,500 mm rainfall per annum. The soils are highly weathered and leached (White, 1983). The area has generally red and orange sandy, clay and loam soils. Also, Malachite and Laterite are found in selected areas of Roan, Mpatamatu, Mikomfwa and Fisenge townships. The climate is favourable for human settlement. It fell in agro ecological region (AER) III with an altitude of 1,200 meters and over, above sea level.

The vegetation of Luanshya District just like Zambia was dominated by the miombo forest (*Brachystegia – Julbernadia*) which is characterized by open woodland (Chidumayo, 1986). It consists of scattered trees mixed with dense grass. In poor soils, woodlands that shade their leaves during the dry season are very common (Day *et al*, 2014).

3.3.2 Relief and drainage

Luanshya District was part of the Central African Plateau just like the rest of Zambia. It lied in Kafue river basin which provided abundant water resources for the district. The main source of water was the Luanshya stream among other streams, namely: *Fisansa, Kafubu, Masasa, Kansumbi and Chitwi*.

3.3.3 Geology and soils

It is covered by the deep weathered sedimentary rocks of *Katanga* region. The dominant rocks of the district are dolomites, shales and tilites. The area has generally red and orange sandy, clay and loam soils which have been leached. Red colour is related to the presence of hematite (Zientek *et al*, 2014).

3.4 Demographic characteristics

Luanshya District is home of 156, 059 people (77,368 males and 78,691 females) with 29,043 households (Table 1). The rural area consisted of 22,691 people (11,711 males and 10,980 females) whilst urban had 133, 368 people with 65,657 males and 67, 711 females (CSO, 2014). Youth is

defined as male or female aged 15 to 35 (Ministry of Youth and Sport, 2015). The number of youths is at 63,594 with males at 31,128 and 32,467 females (Bwalya, 2019).

In terms of percentages, males were at 50 percent and females at 50 percent respectively. The total population density for Luanshya district is 192.4 persons per square km, which is approximately two times less than that of Ndola, with 409.1 persons per square km, with a growth rate of 1 percent. Comparing Luanshya population density to Copperbelt; it is about two and half times larger than Copperbelt which is at 63 persons per square km. The population density for Luanshya is approximately, ten (10) times larger than national average at 17 persons per square km (CSO, 2012).

Table 3.1 Total population for Luanshya District

| Luanshya District | Population by sex and region | | |
|-------------------|------------------------------|---------|---------|
| | Males | Females | Total |
| | 77,368 | 78,691 | 156,059 |
| | Rural | | |
| | Males | Females | Total |
| | 11,711 | 10,980 | 22,691 |
| | Urban | | |
| | Males | Females | Total |
| | 65,657 | 67,711 | 133,368 |

Source: 2012 CSO

The district is divided into two parliamentary constituencies, namely: Roan and Luanshya respectively. The constituencies' have 14 wards each, which constitute to 28, wards altogether (Table 3.2). Luanshya constituency is home of 19,037 households with a population of 98,498 (48,744 males and 49,754 females). The two study sites, Mikomfwa and Fisenge were among the wards of Luanshya constituency. On the other hand, Roan constituency is home of 10,006 households with a total population of 57, 561 (28,624 males and 28,937). The two study sites, Roan and Mpatamatu were within Roan constituency (CSO, 2012).

Table 3.2 Luanshya population characteristics per constituency

| Constituency | Ward | Households | Males | Females | Total |
|--------------------------|---------------|---------------|---------------|---------------|---------------|
| Luanshya | Mipundu | 965 | 2,664 | 2,817 | 5,481 |
| | Misaka | 2,237 | 5,558 | 5,313 | 10,871 |
| | Fisenge | 1,511 | 3,584 | 3,473 | 7,057 |
| | Twashuka | 190 | 418 | 360 | 778 |
| | Chitwi | 482 | 1,118 | 1,131 | 2,249 |
| | Chifulube | 194 | 425 | 369 | 794 |
| | Buntungwa | 3,002 | 7,614 | 7,709 | 15,323 |
| | Mpelembe | 1,194 | 3,073 | 3,190 | 6,263 |
| | Buteko | 1,940 | 5,008 | 5,273 | 10,281 |
| | James Phiri | 1,660 | 4,154 | 4,324 | 8,478 |
| | Levi Chiko | 1,329 | 3,546 | 3,708 | 7,254 |
| | Mikomfwa | 2,140 | 5,709 | 5,864 | 11,573 |
| | Zambezi | 1,260 | 3,227 | 3,441 | 6,668 |
| | Mulungushi | 933 | 2,646 | 2,782 | 5,428 |
| Constituency Grand Total | | 19,037 | 48,744 | 49,754 | 98,498 |
| Constituency | Ward | Households | Males | Females | Total |
| Roan | Muva Hill | 98 | 258 | 228 | 486 |
| | Kafubu | 544 | 1,547 | 1,573 | 3,120 |
| | Nkoloma | 470 | 1,395 | 1,384 | 2,779 |
| | Lumumba | 1,249 | 3,524 | 3,711 | 7,235 |
| | Kafue | 1,461 | 4,059 | 4,147 | 8,206 |
| | Chilabula | 374 | 909 | 863 | 1,772 |
| | Mpatamatu | 934 | 2,563 | 2,726 | 5,289 |
| | Justine Kabwe | 751 | 2,143 | 2,204 | 4,347 |
| | Nkulumashiba | 490 | 1,423 | 1,448 | 2,871 |
| | Baluba | 540 | 1,763 | 1,742 | 3,505 |
| | Milyashi | 1,193 | 3,245 | 3,257 | 6,502 |
| | Ngebe | 624 | 2,129 | 2,151 | 4,280 |
| | Kansengu | 785 | 2,604 | 2,589 | 5,193 |
| | Kawama | 493 | 1,062 | 114 | 1,976 |
| Constituency Grand Total | | 10,006 | 28,624 | 28,937 | 57,561 |

Source: Adapted from (CSO, 2012)

3.5 Economic activities of the study area

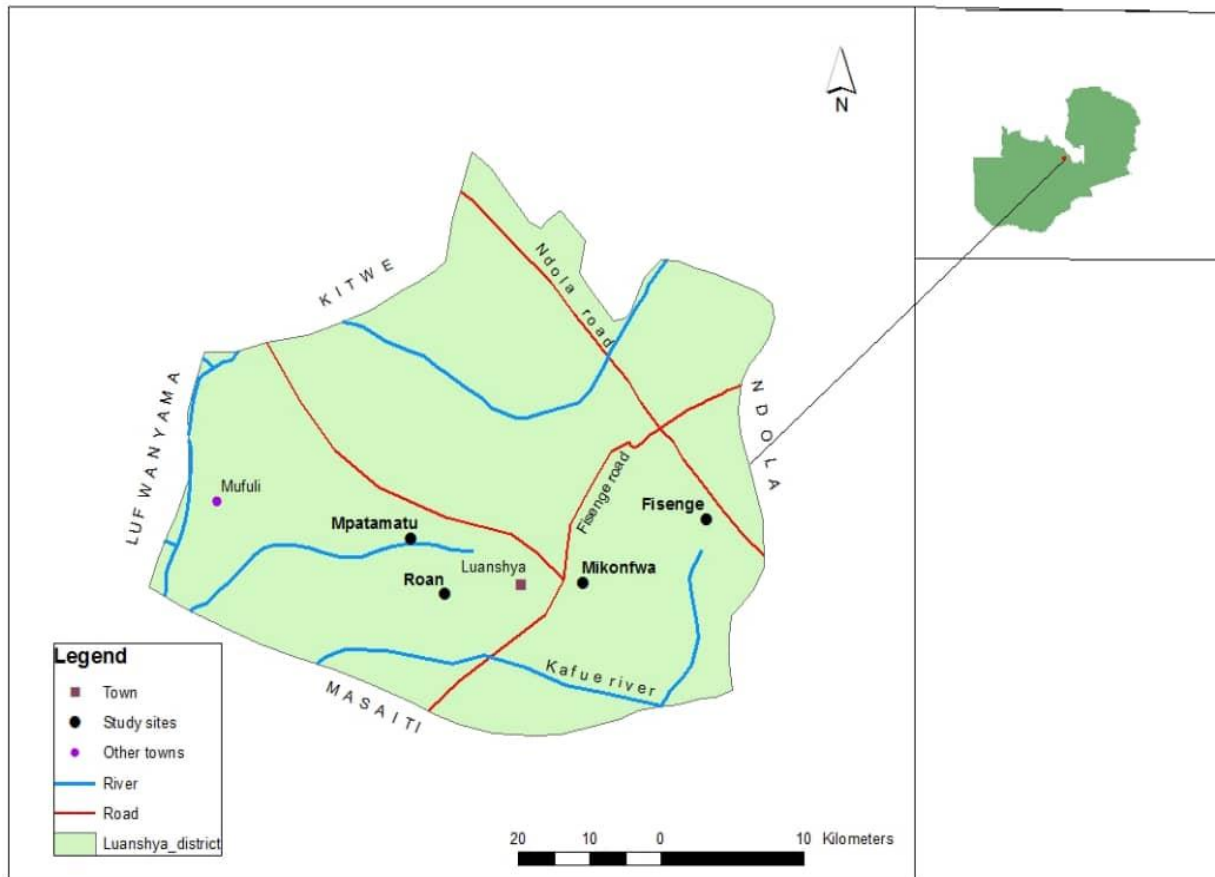
Luanshya District is a mining district and endowed with minerals and mine deposits such as Mulyashi Open Pit and Baluba Mine. Baluba mine employs maximum of about 5,000 employees. Manufacturing industries such as the Zambia Metal Fabrication (ZAMEFA) industry that processed copper ore into electrical wires provides employment to residents (Kambole, 2019). The other income generating that provides employment are: Herman Farming Enterprises that processes soya beans into cooking oil and Roan Antelope Milling produces stock feed, flour and mealie meal (Bwalya, 2019).

Daily trading activities, in markets and commodities such as agro supplies, vegetables and household needs are sold. The area has fertile soil and abundant water that provide good opportunity for crop production, fish farming, poultry and livestock rearing among the residents. Agriculture is also an important economic activity for residents. The staple crop for Luanshya is Maize (*Zea mays*) while other crops grown include Soya beans (*Glycine max*), Cassava (*Manihot esculenta*), Groundnuts (*Arachis hypogaea*) Irish potatoes (*Solanum tuberosum*), Watermelons (*Citrullus lanatus*) and Sweet potatoes (*Ipomoea batatas*). Luanshya has 1,286 small scale farmers and seven large scale farmers (Bwalya, 2019). Livestock rearing, formal and informal trades are also important economic activities. Commonly reared livestock included chickens, pigs, cattle and goats. Due to presence of mine dumps, quarrying has been identified as part of economic activity for the district (Bwalya, 2019).

3.6 Study sites

Selected townships of Luanshya district were picked for the study, namely: Roan, Fisenge, Mpatamatu, and Mikomfwa Townships. Fisenge Township is located south-east of the Central Business District (CBD) and is a low income area with residents engage in trade, livestock rearing and subsistence farming. Most of the township consists of farmers who engage in crop, fish farming, poultry, piggery and dairy farming. Fisenge is an informal settlement that is created due to pressure from people who were looking for employment in the mines. It is located north - east of the Central Business District. Mikomfwa Township is adjacent and south-east of the Central Business District. It is a low income area and some residents engage themselves in both formal and informal employment.

Luanshya district was picked for a study, based on the livelihoods of the residents. The four study sites practice urban agriculture that needs knowledge on climate change, which affects their crops. It is also, vital for the youths to have climate change awareness as they are not exempted from the devastating impacts of climate change, such as drought and intense heat. The careless refuse disposal and ambient bush burning which increase green house gases, prompted the researcher to assess the awareness on climate change as a way of preparing them for future governance.



Source: UNZA cartography, 2019.

Figure 3.1 Location of the study sites, Mpatamatu, Mikomfwa, Roan and Fisenge in Luanshya District.

The two Townships of Mpatamatu and Roan, located south-west of the CBD, are characterized by high urban poverty that has persisted due to the mines privatizations, followed by withdraw and retrenches of workers (Luanshya Municipal Council, 2017 in Sakuwaha, 2018).

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 Introduction

Research involves methods, tools and techniques that are used for any kind of investigation intended to uncover new facts (Walliman, 2011). It aims at achieving the research objectives and provides answers to the research questions. The first section of this chapter is the epistemological and ontological position of the study. Section two is the research approach and section three explains the research design, sampling, sampling technique and data collection methods. Section three explains the validity and reliability of the research and how the researcher ensured them in the study. Section four is on ethical considerations and last section explains the limitations of the study.

4.2 Epistemological and ontological positions

Tichapondwa (2013) defines epistemology as what is known to be true, while Bryman (2008:27) explains it as “the question of what is regarded as acceptable knowledge in a discipline.” Walliman (2011:16) describes it as ‘a theory of knowledge, especially about its validation and the methods used. It deals with how we know things and what can be regarded as acceptable knowledge in a discipline.’ Epistemology is the theory of knowledge and includes ways in which knowledge is acquired. It is embedded into two natural science traditions namely; positivism and interpretivism. Positivist researchers detach themselves from the research being conducted by allowing the research to speak on its own through what is revealed from the research. The philosophical basis is that the world exists and it can be studied (Tuli, 2010). Interpretive epistemology asserts that social reality is constructed. It argues that knowledge is a product of society and it cannot be studied independently. Thus, a research cannot be free from the researcher’s influence and that knowledge is acquired. Therefore, in this research, epistemological positivism was used.

Ontological position is concerned with the nature of social entities that entails whether the social entities or constructed knowledge can be considered as real or not (Bryman 2008). It is the branch of philosophy that deals with what exists in the society. Objectivism argues that the meaning of social phenomenon is independent of social actors. Constructivism is an ontological position that asserts that social phenomenon and their meanings are accomplished by social actors. This implies that a social phenomenon is not the product of social interaction. Meanings are socially constructed by people and

it is up to the researcher to understand them or not. Also, as people interact with the reality, they construct their own meanings of reality.

The researcher used positivism and constructivism approaches as influenced by the epistemological and ontological positions (Bryman, 2008). The essence of employing ontological constructionist was to understand people's perceptions, such as their beliefs and understandings. It aimed at revealing the reality and beliefs of individuals who took part in the research. The researcher should understand meanings that are constructed by research participants. The responses of the research questions revealed the constructive knowledge from respondents as there were based on their own opinions. Also, following respondents in their own households showed that data was collected in a natural setting. On the other hand, epistemological positivism purports that, there is a gap between the researcher and reality.

The ontological and epistemological positions further, guided the researcher on the choice of the research designs. The researcher used case study design to collect data through interactions. Case study enabled the researcher to interview the key informants in order to ascertain the preparedness of youths in climate change governance. The design also, did not restrict the researcher to specific questions for clarity. It guided the researcher to use descriptive design that used the random selected sample.

4.3 Research approach

The adoption of the positivism and constructivism positions influenced the researcher to use both qualitative and quantitative approaches in the research. Parry (1998) claims that quantitative approach is insufficient in coming up with satisfactory answers to the research. Quantitative and qualitative approaches were used in the study. The approach aimed at testing the hypothesis and also the information was in form of numbers for easy quantification. Qualitative approach helped the researcher in coming up with answers from respondents on the matter through constructivism. It helped in understanding complex phenomena that were impossible to capture using quantitative methods (Ospina, 2004). This approach was supported by Denzin and Lincoln (2000) who explains that, qualitative research deals with the interpretation of phenomena in their natural settings and meanings people bring to these settings. This implies that they gather information by conducting a face to face discussion with respondents.

Qualitative approach was achieved through individuals' understandings and opinions. The realities were presented on the effectiveness of climate change training through generating themes based on the responses. On the other hand, quantitative approach enabled the researcher to observe reality in one perspective by believing that, it could not be constructed. The approach believes that there is only one reality which can be quantified and generalized. The research explored methods of climate change awareness and youth's involvement in climate change projects for Luanshya District.

4.4 Research Design

The research design is a systematic plan outlining stages of research development from assumptions to specifying the selection of respondents, the data collection techniques and the data analysis to be done in the proposed study (Maree, 2007). Degu and Yigzaw (2006:26) explain the research design as “a logical model that guides and leads the researcher in the various stages of the research.” It is the systematic arrangement of methods and procedures used during a study and that is where logical interpretations are based at the end of the study (Tichapondwa, 2013). Further, a research design “provides a framework for the collection and analysis of data” (Bryman 2008: 46).

The research utilized case study and descriptive survey designs. The case study allows a variety of data collection methods and best served to answer the research questions (Leedy and Ormrod, 2010). The descriptive design enabled the researcher to obtain in-depth information, which can be used deductively to facilitate generalization of one's findings (Maree, 2007). It allowed collection of data in a short period of time through questionnaires. It also described the climate change awareness among youths.

The descriptive survey design gathered data on the levels of quality climate change knowledge among youths in Luanshya District. Further, the data was analyzed for frequencies and patterns. The data was also used to seek relationships between levels of climate change awareness and climate change governance for future climate change governors among youths.

4.5 Target population

A population is the universe of units from which a study sample is selected (White, 2003). It is a group of elements from which the sample is drawn and the findings generalized. This study targeted all youths in selected townships of Luanshya District aged fifteen (15) to thirty five (35) (Ministry of Youth and Sport, 2015).

4.6 Sampling

Degu and Yigsaw, (2006) explain sampling as the selection of the respondents. On the other hand, sample acts as the representative of the whole population. Stratified sampling is the division of population in two or more strata (Tichapondwa, 2013). Two sampling procedures were used in the study and these were stratified and purposive. Stratified simple random sampling procedure was used to sample households. The townships were the strata while simple random sampling in each stratum was used to select individual respondents. In simple random sampling technique, each member had an equal chance of being selected (Bryman, 2008). Random number generating was employed using the RANDBETWEEN function of Microsoft excel to generate 160 random numbers that corresponded to household numbers within each strata. The apriori analysis of G-power 3.2 software was used to determine the sample size, a moderate two tailed effect size, with a significance level of 0.05 size (Erdfelder *et al.*, 1996).

The method arrived at the total sample of 160 households in four selected townships, namely: Roan, Mpatamatu, Mikomfwa and Fisenge of Luanshya District. A total of 40 households were drawn from each township. Quota sampling was used to sample respondents by townships and gender. Equal number of respondents was selected from each township. Thereafter, generated random numbers were followed per township. Households that had no youth were ignored and not included on the sample.

The four townships were purposively sampled so that data could be collected from different geographical areas within the district. Four (4) key informants were purposively drawn from key government institutions working with young people as they were deemed to have expert knowledge of the subject. These key informants were purposively sampled from Ministry of Education, Ministry of Youth and Sports and Child Development, Luanshya Town Council and Ministry of Community Development and Social Services.

4.7 Data Collection methods

The study utilized questionnaires to collect data from 160 respondents on climate change awareness in four selected townships of Luanshya District, while key informant interviews were used to collect data from four key informants. Direct field observations were also used in the collection of data in the selected townships. Also, the non-verbal language of key informants during their responses to the interviews was noted and it supplemented other instruments of data collection.

4.7.1 Primary sources

Primary data is the first hand information usually aimed at meeting research objectives (Dawson, 2012). Primary data is the first hand information that is in two forms: qualitative and quantitative. Qualitative data was collected using semi-structured interviews with key informants and observations that were conducted with key informants. Primary data was also collected using questionnaires allowed quantification, comparisons and generalization.

4.7.1.1 Structured Interviews and Key Informant Interviews

The researcher used questionnaires with open and closed ended questions to collect quantitative data among youths in Luanshya District. The questionnaires were self-administered as most respondents were literate and able to read and write in English which was the language in which the questionnaire was written. Much as the researcher was also administering the questionnaires, he sought the help of a research assistant who was well trained to help administer the said questionnaires.

Key informant interviews were in-depth interviews with officers who were believed to have comprehensive information on the research topic. Key informant interviews were used on selected officers with the aim of obtaining detailed information and ideas of the research (Kombo and Tromp, 2006). They were purposively sampled from government institutions such as the Ministry of General Education, Ministry of Youth and Sports, Luanshya Town Council and Ministry of Community Development.

The insights that were collected from various experts of different ministries can be used for various recommendations on climate change awareness among youths in Luanshya District. The selected officers are in charge of youth's sensitization and education on various aspects, including climate change awareness. They were purposively picked in order to provide information on youth's projects and their intentions as they prepare them for future governance. They were identified based on their positions at workplace. The interview schedule was formulated in themes that were attempted step by step while the researcher guided it. Narratives from key informants on climate change awareness were noted and written down. The face to face interaction enabled the researcher to probe some questions for detailed explanation.

4.7.1.2 Observations

Structured observation is used in the research as an instrument of data collection. Bryman (2008: 270) states that, "it is the method for systematically observing the behaviour of individuals in terms of a

schedule of categories.” It involves the taking down notes based on what is observed, situations or things experienced with senses or an instrument such as the camera, tape recorder, pen and a note book among others (Walliman, 2011). Both, the non-verbal language and physical observations were conducted. The observation enabled the researcher to take note of the key informants, tone of their voices, gestures and facial expression during interactions with the key informants from different ministries. The main aim of the observation is to ensure that each participant is observed and recorded so that the non- verbal language of all those in the sample is collected. Also, youths’ activities that could be related to their knowledge of climate change within the townships were observed and recorded. This included, throwing litter anyhow and ambient burning. Further, it was observed that there were few climate change projects for the youths in Luanshya District.

4.7.2 Secondary sources

Secondary data is the information that is already collected and compiled by someone and ready to be used by the researcher (Kombo and Trump, 2011). This data need to be re-analysed to qualify to be secondary data. In this study only literature from books, magazines, journals and other published material was used as literature and such were not re-analysed.

4.7.2.1. Desk research

Desk research helped in the collection of secondary data. Further, the desk research reviewed literature on the subject under investigation so as to gain insights on previous but related research findings. Therefore, it is a key source of secondary data for this research. Published literature on the internet gave insights on climate change awareness. This is done during phase of the study and it gave a clear picture of the methods of climate change awareness programme used in Luanshya District. The following literatures both in soft and hardcopies were reviewed, these include: journal articles, books, theses and magazines.

4.7.3 Data analyses

Data analysis is process where results are clearly displayed (Kombo and Tromp, 2013). It describes either qualitative or quantitative or both approaches of the study. Analysis of data helps us to come up with and suggesting conclusions.

4.7.3.1 Quantitative data analysis

Quantitative data collected from questionnaires were analyzed through Chi-square using Statistical Package of Social Sciences version 16 (SPSS). The data was entered in the Microsoft excel and a Chi square test was used to test the hypotheses. This formed the basis for interpreting the variables. Continuous variables such as age, was summarized in frequencies. For easy reading, the analyzed data was presented in tables and figures

4.7.3.2 Qualitative data analysis

Qualitative data is analyzed after making themes according to similar responses. The main aim of analyzing qualitative data is to identify meaning of words in the language and make sense of their interaction (Dey, 2005). Themes were identified through coding. Coding is the process of recognizing the phrases and sentences so as to come up with emerging themes. The data collected from key informants and observations were analyzed through thematic analysis by coding. In thematic analysis, coding was the process of recognizing the phrases and sentences so as to come up with themes. Qualitative data that was collected was run in into SPSS. This was achieved by grouping similar categories, thereby reducing the data in themes and the output was displayed in tables.

4.7.3.3 Data reduction

Qualitative data is bulky in nature; it needs to be reduced in readiness for analysis. Coding and editing helped in the reduction of data without changing the meanings. Themes were merged and data was summarized. In the process of reduction, data was displayed in different forms (Punch, 2005).

Thematic analysis was used to analyze data as it needed the presentation of themes. There was need to familiarize the qualitative data thereafter, similar themes were noticed. Similar responses were differentiated from the rest, by highlighting hem. Labeling helped the researcher to differentiate them from each other based on the meanings. They were then grouped together to form themes. Asking the key informants some follow up questions, helped in understanding the meanings. Themes were later, assigned names in readiness for analysis. They were then analyzed, thematically to come with qualitative results of the study. There was need to familiarize the qualitative data that was collected from key informants by reading through. The themes that emerged were categorized for analysis.

Some responses from key informants were differentiated from the rest, by highlighting them. Then, they were labeled according to their meanings and that formed codes. They were then grouped together to form themes and later, assigned names in readiness for analysis.

4.8 Validity and reliability

There are various types of validity that are used in quantitative research, external and internal validity. Tichapondwa, (2013:34) elaborates on internal validity as “the extent to which research results can be accurately interpreted while external validity is the extent to which research results can be generalized to populations and conditions.” The other author defines it as “the question of whether the results of the study can be generalized beyond the specific research context” (Bryman 2008:47). This was ensured quantitatively, as results were generalized to give the true picture on climate change awareness in Luanshya District. Qualitatively, there was accuracy and credibility in the manner the results were interpreted. The other variable that was ensured is compatibility; it is the description of features in the research so that knowledge can be extended by other researchers. Also interpretation of the results should be done by other researchers and this is called, translatability. Therefore, the ability to interpret results is known as internal validity while being able to generalize is known as external validity (Tichapondwa, 2013; Walliman, 2011).

Validity was ensured through generalizing the quantitative results that came from Chi - square test to a larger population on the effectiveness of climate change awareness offered to youths in Luanshya District. Validity also enabled the researcher to be consistent during the interviews with key informants. Collecting credible information was another way in which research validity was ensured. Maintaining validity, helped in minimizing the researcher bias through adopting some phrases.

Reliability means repeatability, consistence and replicability of the research (Tichapondwa, 2013). “Reliability is concerned with the question of whether the results of the study are repeatable” (Bryman 2008:46). Just as validity, it is in two categories; external and internal reliability. Internal reliability is the consistence in the collection, analysis and interpretation of results while external validity is the manner in which researchers can replicate studies. During the conduction of this research, reliability is achieved as consistence is observed. Also, through the use of appropriate sampling techniques, data collection instruments like the semi-structured questionnaires and data analysis (Tichapondwa, 2013).

Reliability was observed in the manner data was collected using the proposed and appropriate instruments which were the questionnaires, interviews and observations. Also, data collection, analysis and interpretation were done in a reliable way. The youths were not helped by the researcher when answering the questionnaire but help was rendered in instances where youths were unable to read or comprehend what was being asked. Uniformity was observed in the manner the questionnaires were administered to all the youths in the selected townships. The age of the respondents was strictly monitored to help target youths. Also the interviews were conducted correctly to the key informants who were purposively selected. The analysis of results was based on the data that was collected.

Permission was sought from the participants before collecting data. The participants were guaranteed with confidentiality and anonymity was observed and that made data collection easy and successful. In that regard, reliability was highly applied. The responses from key informants helped the researcher to merge the results.

4.9 Ethical considerations.

Consent informed was sought from the participants in order for the study to succeed. An introductory letter was collected from the Directorate of Research and Graduate Studies (DRGS) with permission from school of Natural Sciences under Department of Geography and Environmental Studies, at The University of Zambia (UNZA). Copies were taken to the different ministries such as the Luanshya Municipal Council, Ministry of Community Development and Social Services, Ministry of Education and Ministry of Youth, Sports and Child Development. Also, consent was sought in person for them to participate in the study willingly. Participants were treated with respect and they were informed that their participation was voluntary as the data to be collected was purely for academic purposes if they so wished, they could withdraw at any point during the interview or as they filled in the questionnaire. The respondents were informed not to answer questions they were not comfortable with for sake of their privacy as the information, collected was for academic purpose only. The sources of information quoted in this research were acknowledged.

CHAPTER FIVE: PRESENTATION AND DISCUSSION OF RESULTS

5.1 Introduction

The results in this chapter are presented in accordance with the objectives of the study. The hypotheses were tested at 95percent confidence level or level of significance 0.05. The main purpose of the study was to examine climate change awareness for future climate change governance among youths in Luanshya District. Section one was divided into two parts and presents demographic information of the sampled youths in the selected townships of Luanshya District in terms of gender: part two of section one presents the age groups and part three presents the education levels, part four presents the marital status of respondents and part five presents the employment status. Section two presents climate change awareness available to youths in Luanshya District, section three is the youth's involvement in projects of climate change importance in Luanshya District. Section four presents the effectiveness of climate change awareness methods done to youths in Luanshya District and section five assessed the preparedness of youths for climate change governance.

5.2 Demographic information of the sampled youths in the selected townships of Luanshya District

The demographic characteristics of respondents included their gender, age and level of education, marital and employment status.

The total number of youths who participated in the research was 160. They were drawn from Mpatamatu, Roan, Mikomfwa and Fisenge townships of Luanshya District. Out of 160, 45 percent were males and 55 percent were females. That implied more females participating in the research than males.

5.3 Age makeup of the respondents in sampled townships of Luanshya District

Table 5.1 shows the percentage and frequency responses of the respondents with regards to the age group.

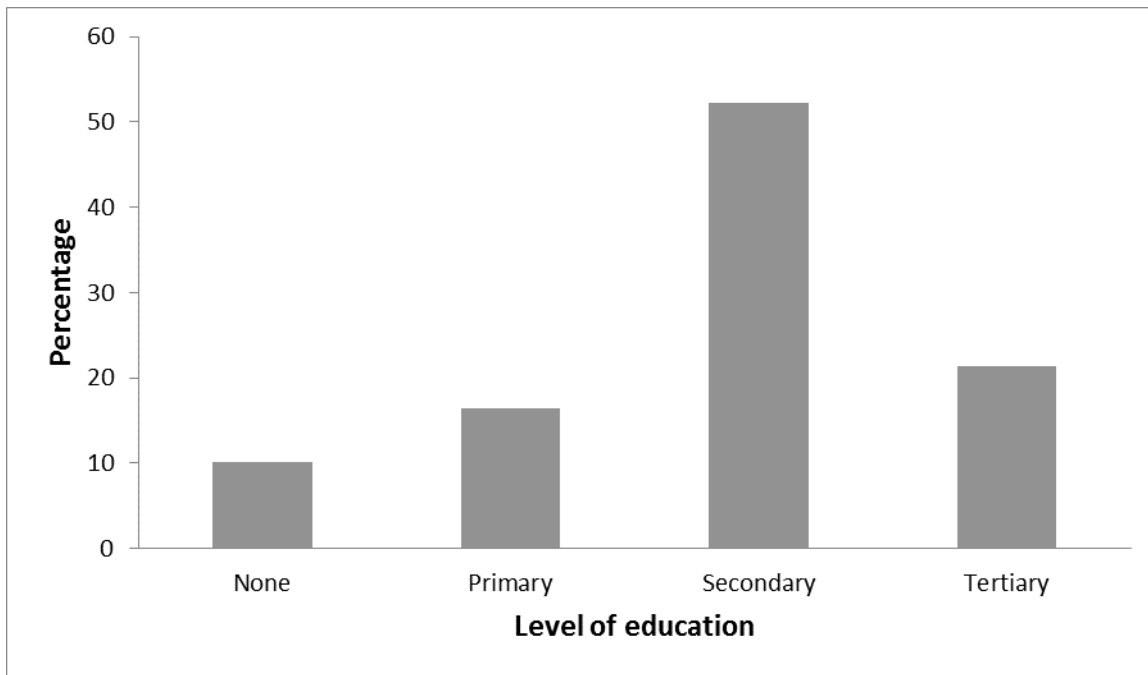
Table 5.1 Age of respondents in sampled townships of Luanshya District

| Age group (years) | Frequency | Percentage |
|-------------------|------------|------------|
| 15-20 | 56 | 35 |
| 21-25 | 27 | 17 |
| 26-30 | 44 | 27 |
| 31-35 | 33 | 21 |
| Grand total | 160 | 100 |

Source: *Field Work (2020)*

5.4 Education levels of the sampled youths in selected townships of Luanshya District

The respondents were categorized according to their education levels which could have either been none; primary, secondary or tertiary (Figure 5.2).



Source: *Field data, (2020)*

Figure 5.1 Education levels of the sampled youths in selected townships of Luanshya district

The results show that most of the youths were still in school. The level of education is classified according to the Zambian education system. In the Zambian formal education system, the first seven years post pre-school represents primary education, while the next five years after primary are secondary school years. Tertiary education is done in colleges or universities after the secondary school years.

The study endeavored to ascertain the climate change awareness based on their level of education. They were categorized in a group that did not attend education, those who attained primary, those who had secondary education and those who attained tertiary. Those with secondary education recorded 52 percent awareness. The reason could be that, it might be the same group that consisted of school going youths. Second group consisted of those who attended tertiary education; they recorded 21 percent. They seemed not be interested due to not paying attention to real problems such as climate change. The awareness might be obtained from other stakeholders who carried out tree planting projects. Those with primary education had 16 percent awareness. They could have obtained it from sensitization that was done by Luanshya Municipal Council of keep Luanshya clean programme. The last group was those who did not attain education with 10 percent awareness. If Luanshya District had a variety of climate change projects, even the least group could have benefitted in terms of awareness.

5.5 Marital status of youths in Luanshya District

From the 160 youths who participated in the research, 68 percent were single. The married youths were only 24 percent of the sample; widowed youths were 3 percent and 5 percent were divorced. Apart from the school going youths, others had completed their secondary education while others dropped out of school. The categories that added up to 32 percent comprised of school dropouts from whom 24 percent were married off and later 5 percent, divorced while 3 percent were widowed in the process.

The youths were obliged to be aware about climate change as future leaders. In that regard, they were asked about climate change awareness in the following categories: single, married, divorced and widowed. The results showed that those who were single had vast awareness among the categories of 70 percent. That could be due to the information they had received from formal education as the majority of them were in secondary school. Youths could have obtained their awareness on radio and television during their leisure time. The other reason could be that, their inquisitive in learning new things might have contributed to their scope of knowledge. The married recorded 24 percent of climate change awareness. That group was expected to know more as they were in their adulthood;

unfortunately, they lacked interest due to their busy schedules as the majority was in employment. They did not pay attention to climate change awareness even after attaining tertiary education. Reasons could be due to the programmes they pursued at tertiary level could have not contained climate change .The divorced had 5 percent awareness. This group could have lacked interest in climate change because of their engagement in other busy daily routines.

5.6 Employment status of youths in study sites

The sample consisted of 60 percent of the youths who were unemployed, while 24 percent were in informal employment with only 16 percent employed.

To establish the climate change awareness in line with employment status of the sampled youths in Luanshya District, 59 percent of the unemployed youths agreed that they were aware while 41 percent were not aware about climate change. The rise in number could be due to the group of youths who attended formal education and those who engaged in projects. Others could have obtained the awareness from other ways such on radio and television. The figure amounted to 25 percent of youths who were in informal employment admitted that they were aware while 75 percent were not aware. The youths in formal employment, recorded 16 percent of being aware about climate change while 64 percent were not aware.

5.7 Climate change awareness among youths in Luanshya District

The impacts of climate change have not spared any part of the world, because of persistence droughts, extreme heat and crop failure among others that are experienced globally. From this background, climate change awareness is very cardinal as it is the way of preparing youths for governance. The responses of youths with regards to their climate change awareness were very cardinal.

Respondents were interviewed about awareness on climate change in Luanshya district and 59 percent were aware while 41 percent were not aware. In order to determine the available modes of climate change awareness in Luanshya, respondents who were aware on climate change were asked to mention the source of information. Majority of them, 65 percent mentioned school, 18 percent mentioned radio while 17 percent were aware through television. The results entailed that, Luanshya had few deliberate programmes aimed at preparing the youths for climate change governance apart from the knowledge they acquired from school.

The ability of any country to mitigative and adaptive capacity depends on the availability of public awareness, among them, climate change awareness (UNEP, 2006). Therefore, it was ideal to ascertain the modes of climate change awareness that were available in Luanshya District. The study revealed

that the methods of climate change awareness among youths were generally inadequate although, all the actions and policies that were initiated by the stakeholders required the involvement of both youths as well as adults. According to the study, the modes of climate change awareness that were available in Luanshya District did not adequately target youth’s awareness as they were not solely packaged to ensure effective youth awareness as the target. Methods would be expected to stimulate their thinking and perceptive powers. That was supported by Ojala and Lakew, (2017) who stated that ‘it was at youthful stage when youths’ abstract thinking started and that was when the interest in global problems such as climate change was developed. In the case of Luanshya, these activities would have a bigger impact if they were designed to target youths and they incorporated large numbers of youths. The results of the study on modes of climate change awareness were very similar with other studies conducted in different countries by different researchers. The UNDP, (2012) during its study in Cambodia investigated that, climate change awareness levels increased with the increase in campaigns. Similarly, those who attended school were more aware than those who did not. Also, those who were sensitized were more aware as compared to those who were not sensitized. Having climate change awareness was different from being knowledgeable. This was proven by the research that was conducted by Miler *et al*, (2012) in Czech Republic, who revealed those youths who had awareness, failed to explain climate change.

5.8 Levels of climate change awareness among youths

The levels of climate change awareness were highest in Fisenge 70 percent, followed by Mpatamatu 60 percent and Roan 54 percent townships (Table 5.2). The lowest awareness levels were recorded in Mikomfwa 53 percent township.

Table 5.2 Levels of climate change awareness among youths in selected townships of Luanshya

| Mpatamatu | | Roan | | Mikomfwa | | Fisenge | |
|-----------|---------------|-----------|---------------|-----------|---------------|-----------|---------------|
| Aware (%) | Not Aware (%) | Aware (%) | Not Aware (%) | Aware (%) | Not Aware (%) | Aware (%) | Not Aware (%) |
| 60 | 40 | 54 | 46 | 53 | 47 | 70 | 30 |
| 100 | | 100 | | 100 | | 100 | |

Some of the youths felt the awareness methods used were not effective 45 percent, with only 13 percent saying the methods were very effective. Conversely, the responses showed that the methods of climate change awareness used were not seen to be effective by the subjects who were meant to be prepared as future climate change governors.

Further, a chi-square test was conducted, to show an association between sex and methods of climate change awareness that were used among youths in Luanshya District.

5.9 Effectiveness of climate change awareness methods available to youths in Luanshya District

Based on the effectiveness of the awareness methods in Luanshya District, the question with multiple responses was asked to youth and responses per township are displayed in the (Table 5.3) below.

Table 5.3: Effectiveness of climate change awareness methods

| Mpatamatu township | | | Roan township | | |
|---------------------|-----------|-----|---------------------|-----------|-----|
| Responses | Frequency | % | Responses | Frequency | % |
| Not effective | 20 | 50 | Not effective | 11 | 28 |
| Partially effective | 9 | 23 | Partially effective | 13 | 33 |
| Effective | 6 | 15 | Effective | 10 | 25 |
| Very effective | 5 | 13 | Very effective | 6 | 15 |
| Total | 40 | 100 | Total | 40 | 100 |
| Mikomfwa township | | | Fisenge township | | |
| Responses | Frequency | % | Responses | Frequency | % |
| Not effective | 23 | 58 | Not effective | 18 | 45 |
| Partially effective | 6 | 15 | Partially effective | 10 | 25 |
| Effective | 5 | 13 | Effective | 8 | 20 |
| Very effective | 6 | 15 | Very effective | 3 | 8 |
| Total | 40 | 100 | Total | 39 | 100 |

Source: (Field data, 2020)

In Luanshya district, climate change awareness methods utilized by actors and stakeholders included radio, school and television. In this section, multiple responses were utilized to rate the effectiveness of these methods of climate change awareness among youths in the district (Table 5.3). The effectiveness of climate change awareness methods was paramount in an effort to prepare successful future climate change governance. Having high levels of climate change awareness was not a guarantee in having effective climate change awareness. The parameter of gauging effectiveness was through ascertaining the effectiveness of climate change awareness methods used. The effectiveness of climate change awareness was assessed from multiple responses in a question which stated as to whether the climate change awareness methods used among youths in Luanshya District were not effective, partially effective and very effective.

Table 5.4 Chi-square Test to show the level of climate change awareness methods used among youths in Luanshya District

| Youths | Observed and Expected Counts | Awareness of climate change awareness methods used in Luanshya District | | Total | Statistic | Value | Df | p-value |
|--------|------------------------------|---|-------|-------|--------------------|-------|----|---------|
| | | Yes | No | | | | | |
| Male | Count | 11 | 58 | 69 | Pearson Chi-Square | 3.833 | 1 | .50 |
| | <i>Expected Count</i> | 7.3 | 61.7 | 69.0 | | | | |
| Female | Count | 5 | 77 | 82 | | | | |
| | <i>Expected Count</i> | 8.7 | 73.3 | 82.0 | | | | |
| Total | Count | 16 | 135 | 151 | | | | |
| | <i>Expected Count</i> | 16.0 | 135.0 | 151.0 | | | | |

Regarding the results from table (5.4) above, the methods of climate change awareness used in Luanshya District were not adequate for the youths. The insignificant levels of awareness showed that

more methods needed to be introduced. Increasing the climate change awareness methods would have proved the consideration that was rendered to them.

5.10 Youths involvement in projects of climate change importance in Luanshya District

The government and civil society were obliged to adequately involve youths in projects of climate change and provide opportunities for them to become informed citizens. Their involvement in projects, called for concerted efforts in the implementation of projects as it was a way of educating and empowering them. Data was obtained by interviewing key informants. The questions in this section intended to establish the actual involvement of youths in climate change projects in Luanshya District and if at all there were deliberate projects meant to prepare them for climate change governance. Table 5.5 presents the projects that were offered, coordinating authority, number of youths and the climate change awareness skills that were imparted in youths.

Table 5.5 Involvement of youths in projects of climate change importance in Luanshya District

| Name of Project | Coordinating Institution | Number of youths engaged | Climate governance skills imparted |
|--|----------------------------|--------------------------|---|
| Tree planting | WeForest | 20 | Carbon sequestration, forest restoration, Afforestation and reforestation |
| Tree planting | Department of Forest | 28 | Carbon sequestration, forest restoration, Afforestation and reforestation |
| Environmental protection in markets and dump sites | Luanshya Municipal Council | 11 | Removal of garbage in markets and dump sites, avoid burning, discourage illegal dump sites and installation of solar street lights |
| Conservation farming | Ministry of Agriculture | 20 | Water conservation by planting a buffer of trees along the stream, treat the soil to decrease emissions of GHGs, uproot weeds reduces carbon, afforestation, improved manure management to decrease emissions, no till agriculture, bio-energy emissions and organic production |

Source: *Field data, (2020)*

The key informant interviews established that, coordinating agencies partnered to carry out tree planting project. The WeForest taught women and youths a lot of skills, of which tree planting was one of them. Youths did not benefit much in the project even after knowing that trees play an important role on the environment but the most important in this regard is carbon sequestration and forest restoration.

During interviews with key informants, it was also revealed that different departments collaborated in an effort to empower youths. The Department of Forest, worked with the Community Development Office to empowered youths during social cash transfer. Further, it was revealed that an empowered youth was given 15 tree plants for planting. Trees have a lot of benefits among them, carbon sequestration and forest restoration.

Luanshya Municipal Council played a role of sensitizing the communities and youths in climate change. It managed to involve the youth in different activities, of which some were in line with climate change. Youths involved in solar street lights installation, clearing of dump sites during the keep Zambia clean campaign. Also, clearing of designated and undesignated areas, avoid burning and discourage illegal dump sites.

The Ministry of Agriculture worked with the Ministry of Community Development during social cash transfer. The Ministry of Agriculture trained farmers in conservation agriculture, including the youths. The benefit of conservation agriculture that aimed at reducing the emissions of Greenhouse Gases (GHG) were: treatment of the soil, uproot the weeds by hand, improved manure management, no till agriculture, use of Bio-energy and organic production.

Trees played a role in absorbing carbon dioxide, a greenhouse gas (GHG) through the process of photosynthesis. The GHG molecules had the capacity to absorb high amount of radiation which later on transmit the radiation back to the atmosphere and that resulted to greenhouse effect (Cogut, 2016). Deforestation was done during mineral exploration and excavations emanating from the mining sites. Discovery of the mineral ores at the site resulted into more harm on the environment, as roads were expected to be built and some shelters in the long run, destroying the vegetation which was considered as carbon sinks. The findings on the level of climate change awareness were vital to corporate institutions in making informed decisions such as how to deliver the information to the youths. The

challenge of reduced climate change awareness for youths was not endemic to Zambia. Literature reviewed indicated that regardless of numerous studies conducted at national level and world over, the vast majority of people and youths across the world, especially in developing countries were un aware about climate change (Bostrom., *et al* 1984 in Ochieng, 2014).

Luanshya did not have deliberate programmes that required youths to be ambassadors of climate change awareness. The youths needed participation in climate change awareness because, they were the most affected and they had a big role to play in climate change governance. In the context of climate change awareness, group communities could operate well. The engagement of youths in different projects was going to advantage them with the content of climate change.

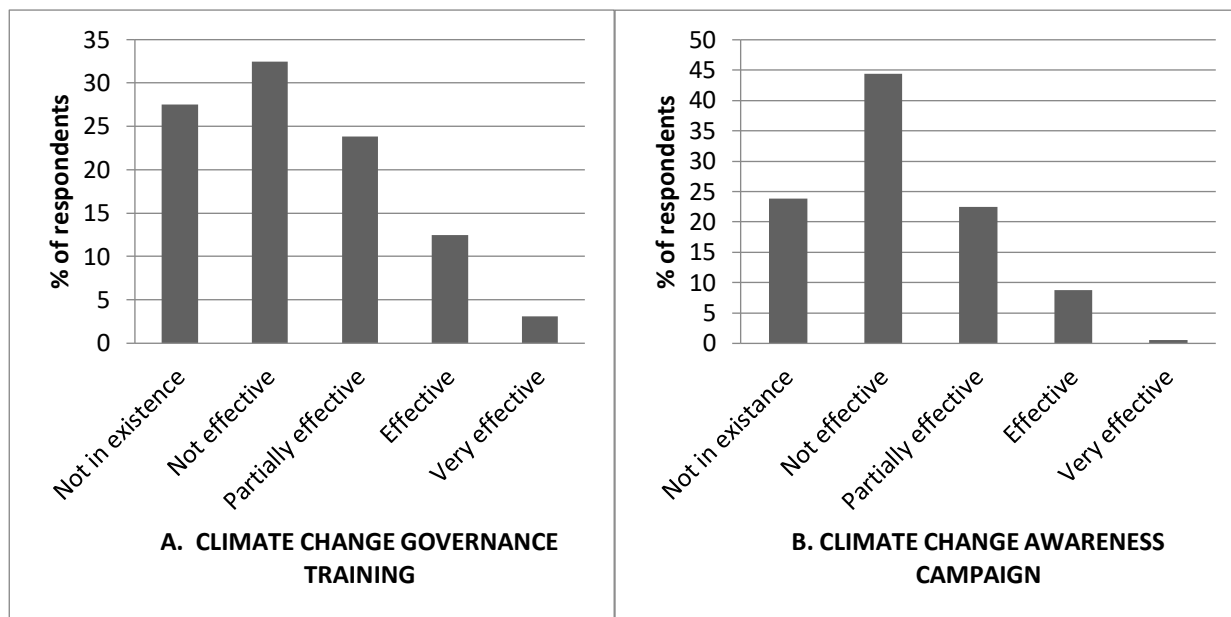
Key informants explained how their ministries helped youths with regards to climate change. Ministry of Community Development and Social Welfare explained how they supplied fertilizer to households within the district. The ministry distributed different crops like 10 kilograms (kg) Maize bag (*Zea mays*), 5 kg Rice (*Oliva sativa*), 5 kg Sorghum (*Bicolor sorghum*), Groundnuts (*Arachis hypogaea*), 10 kg Beans (*Phaseolous vulgaris*), 10 kg Cowpeas (*Vigna unguiculata*) and 10 kg Soya beans (*Glycene max*).The beneficiaries, were the chronically ill youths, the aged and the vulnerable .The said ministry had no content on climate change awareness. Further, it was established that the government was supportive, although climate change programme was lacking. The key informants affirmed this with confidence and their body language could tell when explaining. Its focus was to ensure food security in households. The key informant from Ministry of Education affirmed that they taught youths formally on climate change awareness. They also planted pine trees within the school surrounding. Planting of fruit plants was another activity that was done. Training youths about climate change had its disadvantage, as some youths did show interest in the programme.

The department of Forest worked in collaboration with the Ministry of Community Development which is charge of empowering youths in social cash transfer programme and distributed 15 tree plants to each empowered youth of which could help absorb carbon dioxide. Trees played a role in reduction of (GHG), carbon sequestration and water conservation. The involvement of youths in climate change projects was unsatisfactory, because 14 percent participated in installation programme, 61 percent participated in tree planting and 25 percent participated in conservation farming. Percentages of youths in various projects, showed their interest in projects.

In order to involve youths in climate change, Bodzogan, (2009) conducted a study in Turkey recommended social activities like painting, poetry, conferences and projects (Bozdogan, 2009). Climate change awareness had been observed to be ineffective because, transmission of the content had been a problem Carr (2015). In a study by Pruneau *et al*, (2001 in Ojala and Lakew, 2017) argued that youths showed less confidence in the possibility of mobilizing themselves for climate change. The other study showed a limited sense of agency among youths whose action was dependent on parents, politicians and governmental community. They perceived climate change as something that did not relate to them (Ballantyne *et al*, 2016 in Ojala and Lakew, 2017). Mudombi *et al*, (2011) explained that, youths were victims to climate change in future even though they did not contribute to the past. They would be the ones to regulate climate change institutions.

5.11 Effectiveness of climate change governance training done to youths in Luanshya District

Training youths in climate change governance was a way of empowering them for governance. Hence, it needed to be effective so that youths can be properly grounded in governance issues. The effectiveness of the governance training was listed. Each question had five responses, not in existence, not offered, partially effective, effective and very effective.



Source: *Field work data, (2020)*

Figure 5.2 Responses of youths on effectiveness of (A) climate change governance training and (B) climate change awareness campaign

5.12 Multiple responses on effectiveness of climate change awareness methods to youths

In Luanshya district, climate change awareness methods utilized by actors and stakeholders included radio, school and television. In this section, questions with multiple responses were utilized to rate the effectiveness of these methods of climate change awareness among youths in the district. The effectiveness of climate change awareness methods was paramount in an effort to prepare successful future climate change governance. Having high levels of climate change awareness was not a guarantee in having effective climate change awareness. The parameter of gauging effectiveness was through ascertaining the effectiveness of climate change awareness methods used. The effectiveness of climate change awareness was assessed from responses in questions which stated as to whether the climate change awareness methods used among youths in Luanshya District were effective or not.

This emanated from the fact that, some of the methods were not available but just suggested to youths. On how effective the climate change awareness method offered at school was, 6 percent said it was not offered. These could be youths who did not take subjects embedded with climate change and did not participate in climate change awareness method while, 3 percent said it was not effective. These witnessed the climate change methods but they were not satisfied with methods used. Those who said,

it was partially effective were 8 percent, 41 percent responded as effective and 42 percent said the method was very effective. On the effectiveness of climate change method offered on radio, 6 percent said it was not offered while 4 percent responded as not effective. 11 percent said it was partially effective and 56 percent responded as effective and 23 percent said that, it was very effective. Youths admitted that, the climate change awareness that was done in schools and radio was effective.

On television, responses on climate change awareness methods, 4 percent said that it was not offered while 6 percent responded as not effective, 11 percent agreed that, it was partially effective, 48 percent confessed receiving effective climate change awareness and 32 percent said it was very effective. Further, the researcher found out whether the climate change awareness that was offered in news papers, whether it was effective or not. 6 percent said it was not offered, 17 percent opposed not to be effective, 15 percent was not satisfied and responded as partially effective, 48 percent affirmed that, it was effective and 13 percent said it was very effective. The other question was on nongovernmental organization. 4 percent refused that climate change awareness was not offered, 8 percent said it was not effective, 18 percent responded as partially effective, 57 percent said it was effective and 14 percent said it was very effective. Television, newspaper and nongovernmental organizations were deemed to be offering effective climate change awareness methods.

Youths responses on internet as a climate change awareness campaign offered, 6 percent said internet was not offered, 6 percent said not effective, 15 percent responded as partially effective, 49 percent said it was effective and 24 percent as very effective. Using posters to disseminate climate change, 6 percent said it was not offered, 11 percent said not effective, 16 percent said, partially effective, 54 percent said effective, 13 percent said very effective. Dissemination information using messages on phone, 6 percent said it was not offered, 9 percent said not effective, 13 percent said partially effective, 60 percent said effective and 12 percent said, very effective. Using the magazine, 6 percent said it was not offered, 16 percent said not effective, 18 percent said, partially effective, 53 percent said, effective and 7 percent said very effective. Ascertaining how mega phone would have be used on climate change awareness, 9 percent said, it was not offered, 15 percent said not effective, 15 percent said partially effective, 52 percent said effective and 95 percent said very effective.

Arising from the fact that, there were various climate change awareness methods that were suggested, the responses showed that they would have been benefitted the youths. In that regard, introducing the suggested methods would have yielded positive results in terms of effective climate change awareness

Training youths in climate change governance was a way of preparing them for future governance. Hence, it needed to be effective so that youths could be properly grounded in governance issues. The effectiveness of the governance training was revealed in the Chi-square test that was conducted to show the association between sex of youths and their effectiveness of climate change governance training offered in Luanshya District.

Table 5.6 Chi-square test between sex of youths and the effectiveness of climate change governance training offered to youths in Luanshya District.

| Gender | Observed and Expected Counts | Levels of climate change awareness in Luanshya District | | Total | Statistic | Value | Df | p-value |
|--------|------------------------------|---|-------|-------|--------------------|-------|----|---------|
| | | Yes | No | | | | | |
| Male | Count | 12 | 49 | 61 | Pearson Chi-Square | 1.851 | 1 | .174 |
| | <i>Expected Count</i> | 9.2 | 51.8 | 61.0 | | | | |
| Female | Count | 9 | 70 | 79 | | | | |
| | <i>Expected Count</i> | 11.8 | 67.2 | 79.0 | | | | |
| Total | Count | 21 | 119 | 140 | | | | |
| | <i>Expected Count</i> | 21.0 | 119.0 | 140.0 | | | | |

The Chi-square test showed that p-value (0.174) was greater than the level of significance (0.05, effect size 0.115). That entailed, failing to reject the null hypothesis of no significant association between sex of youths and the effectiveness of climate change governance training offered to youths in Luanshya District ($\chi^2 = 1.851; df = 1; P = 0.174$). The alternative hypothesis was rejected. Findings did not show evidence of association between sex of youths and effectiveness of climate change awareness. As such, how well the youths in Luanshya received climate governance training was not affected by their gender.

This result could present confidence to climate change trainers and this could help them incorporate a wider base of youths regardless of their sex.

5.13 Preparedness of youths for climate change governance in Luanshya District.

It was imperative to assess the preparedness of youths for future climate change governance through climate change awareness, so that it may translate into action. This section presented the responses of youths from Fisenge, Mpatamatu, Roan and Mikomfwa townships on their preparedness for the climate change governance. The themes were: interested or not interested, aware or not aware, important or not important, sufficient information or insufficient information and responses were 'yes' or 'no'. To find out whether the youths were interested in climate change governance or not, youths from Fisenge, Mpatamatu, Roan and Mikomfwa townships were administered with questionnaires and responses from Mikomfwa showed that youths were interested while the rest of the townships did not show any interest. The other question which ascertained whether youths was aware about climate change governance or not, all the four townships refuted not to be aware, with Roan recording 100 percent of ignorance. Finding out how important the climate change governance was among youths, Mpatamatu was the only township that had high number of youths who supported it to be important while the rest of the townships said it was not important, the other vital question was on the depth of information of climate change possessed by youths of which, all the four townships proved to have insufficient information.

Effectiveness of climate change awareness was supposed to be a concerted effort from other sectors such as the international agencies private and public sectors in line with the national policy that emphasizes on coordinating climate change awareness with the inclusion of youths. The effectiveness of climate change governance training among youths in Luanshya District was not satisfactorily addressed in the town where mining activities had been detrimental environmentally.

Table 5.7 Responses on preparedness of youths for climate change governance

| Township | Mpatamatu | Roan | Mikomfwa | Fisenge |
|--|------------------|-------------|-----------------|----------------|
| Preparedness for climate change governance | % | % | % | % |
| Interested in climate change awareness | 46 | 45 | 70 | 05 |
| Not interested in climate change awareness | 54 | 55 | 30 | 95 |
| Total | 100 | 100 | 100 | 100 |
| | | | | |
| Aware about climate change | 15 | 00 | 45 | 5 |
| Not aware about climate change | 85 | 100 | 55 | 95 |
| Total | 100 | 100 | 100 | 100 |
| | | | | |
| Regarding climate change as important | 70 | 48 | 05 | 13 |
| Regarding climate change as not important | 30 | 52 | 95 | 87 |
| Total | 100 | 100 | 100 | 100 |
| | | | | |
| Sufficient information on climate change | 13 | 05 | 60 | 08 |
| Insufficient information on climate change | 87 | 95 | 40 | 92 |
| Total | 100 | 100 | 100 | 100 |

Source: *Field data, (2020)*

The youths in Luanshya District, did not receive the required training because of limited institutions that involved in the climate change programmes. As shown from the study, having limited number of youths who participated in projects was another factor that made them not to be equipped in climate change. Climate change training was supposed to cater alot of youths but this was contrary to what was on the ground. The corporating partners, which was the Lunshya Munincipal Council and the Forest Department were expected to increase the awareness for the sake of the youths behavioural change. The behaviour could be used as a measure of assessing the preparedness.

5.14 Are the youths prepared for the role of climate change governors?

The study showed that, some youths could not explain causes and effects of climate change. They were expected to be conversant with the causes and terms used in climate change if they were to appreciate its importance. Youths understanding would have entailed their preparedness but that is lacking. Some of the youths in Luanshya District were not aware about climate change. This highlighted why they had not developed interest in climate change activities. Their inadequate knowledge simplified the fact that they were unprepared for governance. Taking a leading role in projects as well as showing interest would had been evidences enough for youths readiness. Their inadequate knowledge potraid that youths were not ready in governance issues.

Some youths in Luanshya District, did not receive the required training because of limited institutions that were involved in the climate change programmes. As shown from the study, having limited number of youths who participated in projects was another factor that made them not to be equipped in climate change. Climate change training was supposed to cater alot of youths but this was contrary to what was on the ground. The corperating partners, which was the Lunshya Munincipal Council and the Forest Department were expected to increase the awareness for the sake of some youths behavioural change. The behaviour of some youths could be used as a measure of assessing the preparedness . Hence, it was needed if some youths were to be ready in climate change awareness.

CHAPTER SIX : CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter draws the conclusion and recommendation of the study, after having collected , analysed the data and discussed the findings.

6.2 Conclusion

Based on the study, it was very vital for youths to acquire climate change awareness so as to be ready for future climate change governance. A similarity in results was established with Mubanga *et al*, (2022) who assessed the knowledge of pupils and teachers in secondary schools within Lusaka, regarding climate change. The study revealed that the level of climate change in Lusaka was not significantly low. Stakeholders need to come on board from non-governmental organizations and help provide more modes of climate change awareness for the youths. The results of the study were very similar with the one that was conducted by UNDP, (2012) in Cambodia. The dependency of the climate change awareness was entirely on government. With increase in sensitization, it was reported that Cambodia increased the awareness as well. The education sector played a huge task regards imparting the awareness skills in youths. The district would fail to equip future governors whose responsibility is to run the agenda of the nation with regards to climate change. It would have been a challenge to acquire knowledge of climate change and be able to explain concepts on the subject. Involving other stakeholders seemed difficult in the absence of climate change modes, as introducing them would be a way of partnering with other stakeholders both private and public.

The study demonstrated that, involving youths in projects of climate change is another milestone in an effort to prepare governors. It is a way of bringing other stakeholders on board to fight climate change. Lack of projects would have been disastrous to the future governors in terms of mitigation and adaptation for the betterment of citizens at large. Policy makers on climate change are anchored on having the projects for the youths. The implication would have been failure to formulate and implement policies on how best climate change could handle. Another devastating impact would be unable to monitor institutions responsible for climate change awareness at district, provincial and national level as the two works in collaboration with each other. The district might run out of laws on refuse disposal and keep Zambia clean campaign was not going to be supported in absence of projects.

In line with objective three of assessing the effectiveness of climate change awareness offered to youths. The expected climate change awareness is not supposed to be just mere awareness but rather effective. The effectiveness of climate change awareness is the core of the study. The climate change awareness is as a result of climate change governance of course and vice versa, that is where youths are expected to be transformed by actors of climate change awareness. An effective awareness could be seen in youths behavioural change regarding activities that cause climate change. For example, not throwing litter anyhow be able to explain the consequences emanating from lack of preparedness in climate change.

Further, assessing the effectiveness of climate change awareness among youths is based on the framework that contains the attributes of climate change awareness, among them relevance, perceptibility, behavioural change and sustainable smart-life skills. The youths with ineffective climate change awareness would be those without attributes such as climate smart- life skills which would help obtain long life skills and practice activities that prevent contributing to climate change. Not having perceptibility would result in having youths who could not explain signs of climate change, such as prolonged droughts, intense heat among others. Effectiveness helps youths in engaging in practices that prevent climate change. The daily activities done, such as farming and livestock rearing depends on effectiveness. Farmers could not learn new methods of farming like conservation because of having ineffective climate change programme. A collapse would be recorded to stakeholders such those who introduce new seed varieties that could withstand, the harsh conditions of climate change. Coming up with innovations is as a result of having effective climate change awareness. Innovativeness would have collapsed in absence of climate change awareness in youths.

Youths should have interest in global problems in order to show preparedness and in climate change awareness. Relating the results of the study with other studies, preparedness and the results on climate change was contradicting. Wang (2013) showed high awareness in climate change among youths. Knowledge and awareness on climate change was noticed to be low. Albueldgasim and Daiban (2017) revealed that, 40 percent were aware about climate change. Lack of interest in climate change awareness as shown from the results of study is worrisome for future governors. The climate change agenda in conjunction with institutions that run climate change issues such as the , Ministry of Green Economy, Ministry of Forestry, Zambia Environmental and Management Agency, the Local authorities and Ministry of Education would face challenges in their operations as these institutions

require climate change knowledge for their operational. Not preparing youths in climate change awareness could result in not having activities such as poems, drama and songs based on climate change sensitization in social gatherings.

6.3 Recommendations

1. Ministries that work with youths need to partner in order to plan how to introduce more modes of climate change awareness for the youths in Luanshya District.
2. The ministries in charge of disseminating climate change information need to revamp the programme for it to be effective.
3. The youths need to engage in effective climate change awareness for them to be equipped in future governance.
4. Youths need to develop interest in climate change campaign if they are to run governance affairs in future.

6.4 Suggestion for future studies

The following is the suggestion for the future studies:

- Future studies should aim at finding out how stakeholders such as chiefs, church and NON governmental organizations (NGOs) have teamed up in the sensitization of climate change among youths.

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Appendix A

A questionnaire on climate change awareness for future climate change governance among youths in
Luanshya District

Target: Youths



THE UNIVERSITY OF ZAMBIA

SCHOOL OF NATURAL SCIENCES

DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES

QUESTIONNAIRE NO:DATE:...../...../20....TOWNSHIP:.....

Dear sir/madam,

*The bearer of this questionnaire is a Master of Science (MSc) student in Environmental and Natural Resources Management in the school of Natural Sciences at the University of Zambia. You have been randomly selected to participate It is for the research on **CLIMATE CHANGE AWARENESS FOR FUTURE CLIMATE CHANGE GOVERNANCE AMONG YOUTHS IN LUANSHYA DISTRICT**. The data to be collected is for academic purposes only. Neither your name nor your position will be recorded as proof of having participated in answering the questionnaire. **Thank you***

Instructions: ***Please write your answer in the provided spaces or tick(√) inside the appropriate box. Where needed indicate your response in word(s).***

PART ONE: DEMOGRAPHIC INFORMATION

1. Sex of respondent: a) Male b) Female
Age of respondent.....
2. Level of education attained
 - a) None
 - b) Primary
 - c) Secondary
 - d) Tertiary
3. Marital status

- a) Single
 - b) Married
 - c) Widowed
 - d) Divorced
4. Employment status
- a) Formal
 - b) Informal
 - c) Unemployed
 - d) Other.....
5. Household size
- a) Number of children
 - b) How many males?
 - c) How many females?

PART TWO: METHODS OF CLIMATE CHANGE AWARENESS AVAILABLE TO YOUTHS IN LUANSHYA DISTRICT.

1. Are you aware about climate change (CC)?
- a) Yes
 - b) No

If the answer to (question 1) above is ‘Yes,’ where did you learn about climate change?

- a) School
- b) Radio
- c) Television
- d) Other.....

2. Are you aware about the methods climate change awareness that are used for youths in Luanshya District?
- a) Yes
 - b) No

If the answer to (question 2) above is ‘Yes’, name the methods of climate change awareness available to youths in Luanshya District.

.....

.....

.....

3. How effective are the methods of climate change awareness used to youths in Luanshya District?

| | | | | |
|----------------|-----------|---------------------|---------------|------------|
| 1 | 2 | 3 | 4 | 5 |
| Very effective | Effective | Partially effective | Not effective | Don’t know |

PART THREE: YOUTH’S INVOLVEMENT IN PROJECTS OF CLIMATE CHANGE IMPORTANCE IN LUANSHYA DISTRICT.

1. Have you ever been involved in climate change awareness projects?
- a) Yes
 - b) No
- If the answer to (question 1) is ‘Yes,’ mention the agency of the climate change awareness project that you involved in.
- a) Governmental Organization
 - b) Non-Governmental Organization

2. Is the agency mentioned (above) effective in the manner it is addressing climate change awareness?
- a) Yes
 - b) No

3. Currently, do you have any climate change project that Luanshya youths have embarked on?

- a) Yes b) No

If the answer to (question 3), is 'Yes', mention the climate change awareness project

.....

4. Explain how you involve yourself in climate change projects.

.....

5. How is the climate change awareness projects that are in Luanshya helping you?

.....

6. Is the government doing its level best in climate change awareness projects?

- a) Yes b) No

PART FOUR: THE EFFECTIVENESS OF THE CLIMATE CHANGE GOVERNANCE TRAINING DONE TO YOUTHS IN LUANSHYA DISTRICT

1. Is the climate change awareness training offered to youths in Luanshya District effective?

- a) Yes b) No

2. If the answer to(question 2) is 'Yes,' explain how effective it is

.....

Questions numbers 3 to 12 consist of statements on **effectiveness of climate change governance training done to youths in Luanshya District**. Rate them on a scale of **1-5** expressing how much you agree with each statement. Where 1 = **Not in existence**, 2 = **Not effective**, 3 = **partially effective**, 4 = **Effective**, 5 = **Very effective**. (Tick inside (v) the appropriate box)

EFFECTIVENESS OF CLIMATE CHANGE GOVERNANCE TRAINING DONE TO YOUTHS IN LUANSHYA DISTRICT.

| STATEMENT | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 3. The youths regard climate change awareness as | | | | | |
| 4. Climate Change knowledge possessed by youths shows that CCG is.....? | | | | | |
| 5. The way youths engage themselves in climate change (e.g. ambient open burning), shows that it is.....? | | | | | |
| 6. The behaviour of youths shows that climate change awareness is.....? | | | | | |
| 7. Explanation on the impacts of climate change is.....? | | | | | |

| | | | | | |
|---|--|--|--|--|--|
| 8. Youths do not contribute to climate change, this shows | | | | | |
| 9. The way youths understand climate change governance.....? | | | | | |
| 10. Climate change awareness training done to youths is.....? | | | | | |
| 11. The awareness of youths about climate change signifies that it is.....? | | | | | |
| 12. Regarding climate change as important shows that it is.....? | | | | | |

13. Suggest the best ways of imparting climate change awareness to youths in Luanshya District.

- a) School
- a) Radio
- b) Television
- c) News paper
- d) Nongovernmental organization
- e) Internet
- f) Peer to peer (conference)
- g) Text messages on phone
- h) Magazines
- i) Use of mega phone to households
- j) Other.....

Questions number **14 to 23** consist of statements on **effectiveness of climate change awareness methods done and suggested to youths**. Rate them on a scale of **1-5** expressing how much you agree with each statement. Where **1 =it's not offered, 2 = Not effective, 3 = partially effective, 4 = Effective, 5 = Very effective**. (Tick inside **(v)** the appropriate box)

EFFECTIVENESS OF CLIMATE CHANGE AWARENESS METHODS DONE AND SUGGESTED TO YOUTHS

| STATEMENT | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 14. Climate change awareness method offered by school is?..... | | | | | |
| 14. Climate change method offered on radio is?..... | | | | | |
| 16. Climate change method offered on television is?..... | | | | | |
| 17. Climate change method offered in news papers is?..... | | | | | |
| 18. Climate change awareness offered by Nongovernmental is?..... | | | | | |
| 19. Climate change method offered on internet would have | | | | | |

| | | | | | |
|---|--|--|--|--|--|
| been?..... | | | | | |
| 20. Climate change awareness offered on posters would have been?..... | | | | | |
| 21. Climate change awareness offered on phone would have been?..... | | | | | |
| 22. Climate change method offered in magazines would have been?..... | | | | | |
| 23. Climate change method offered using mega phonewould have?..... | | | | | |

PART FIVE: ASSESSMENT OF THE PREPAREDNESS OF YOUTHS FOR CLIMATE CHANGE GOVERNANCE

1. Are you interested in the issues of climate change?

Yes [] No []

If the answer to (question 1 above) is 'Yes,' explain why you are interested

.....

2. Are you aware about climate change governance?

Yes [] No []

If the answer to (question 2 above) is 'Yes,' how have you been enriched by climate change governance programmes.

.....

3. Do you think it is important to have climate change governance?

Yes [] No []

If the answer to (question 3) is 'Yes,' how can the information be of help to you as an individual?.....

.....

4. Do you have sufficient information on climate change awareness?

Yes [] No []

END OF QUESTIONS, THANK YOU VERY MUCH

Appendix B

Semi -structured key informant interview guide on climate change awareness

Target: key informants

Introduction

*I'm a second year student at The University of Zambia, perusing Master of Science in Environmental and Natural resources Management. I'm conducting the research on **CLIMATE CHANGE AWARENESS FOR FUTURE CLIMATE CHANGE GOVERNANCE AMONG YOUTHS IN LUANSHYA DISTRICT**. I would like to ask you some questions on this research topic so as to help guide and inform my research. The information that will be provided is for academic purposes and will be strictly confidential. Neither your name nor your position will be recorded as proof of having participated in the interview. May I interview you?*

Thank you

No:.....

Date of interview:...../...../.....

PART ONE: DEMOGRAPHIC DATA

- 1. Gender (a) Male [] (b) Female []
- 2. Position
- 3. Contact details

PART TWO: EFFECTIVENESS OF CLIMATE CHANGE AWARENESS INFORMATION.

- 1. What role should youths have in climate change governance?
.....
.....
.....

- 2. What climate change projects have you been promoting to prepare youths for future climate change governors?
.....
.....
.....

3. In your opinion, would you say the projects (mentioned in question 2) have enough content or not to address the key issues relating to climate change among youths? Explain your response.

.....
.....
.....

4. What challenges do you face in training youths in climate change awareness?

.....
.....
.....

5. In your view, do youths respond positively to climate change projects?

Yes No

6. Should youths be offered professional training on climate change?

Yes No

7. Would you say the government has been supportive in climate change awareness programmes for youths?

.....
.....
.....

8. How would you rate the climate change awareness done by government?

- A) Not adequate
- B) Partially adequate
- C) Adequate
- D) Very adequate

END OF INTERVIEW, THANK YOU VERY MUCH

Appendix C

Structured observation for key informants

Name of township:.....

Date of interview:...../...../.....

PART ONE: DEMOGRAPHIC DATA

9. Gender (a) Male [] (b) Female []

10. Position

.....

11 Contact details

| No | Key issue to be observed | Comment |
|----|--|---------|
| 1. | Gestures of the key informant during an interview | |
| 2. | Tone of the voice in regards to responses of the interview | |
| 3. | Facial expression of the key informant during an interview | |
| 4. | Body language of a key informant during an interview. For example, smiling | |
| 5. | Eye movement during an interview | |

The end