RESEARCH ARTICLE

European Journal of Development Studies
www.ej-develop.org

Effectiveness of Climate Change Awareness among Youths in Luanshya District, Zambia

Evans Mwanza, Kabwe Harnadih Mubanga, and Clement Sichimwa

ABSTRACT

This study evaluated the effectiveness of climate change awareness among youths in Luanshya District so as to prepare them for future climate change governance. The aim of the study was to explore levels of climate change awareness among youths in Luanshya District. The study used a mixed methods approach. Descriptive design was adopted to analyze responses of (n = 160) randomly selected respondents who were drawn from four purposively selected townships within Luanshya District. The chi-square was used for analysis of quantitative data. Structured questionnaires were employed for data collection under the descriptive design, which helped in measuring the hypothesis and generalize the findings. Thematic analysis was used to analyze qualitative data. The results indicate that most youths in Luanshya District found the modes of climate change awareness available in their area to be ineffective in reaching them and in content provision. About 88 percent of youths in Mpatamatu, 95 percent in Roan, 40 percent in Mikomfwa and 93 percent in Fisenge felt that the climate change information offered to them by stakeholders was insufficient. These modes which included school, radio, television, newspaper, magazines, internet and megaphone generally did not present enough accessible climate change content to prepare the youths for climate change governance. While most youths felt that school, radio, television and the internet were more effective means for them to receive climate change awareness, these methods had shortcoming that reduced the youths' access to climate change information. The limited number of youths having access to the various modes of climate change awareness meant even the peer-to-peer method of awareness was limited as few youth peers had access to climate information for them to share. It was therefore concluded that the involvement of different stakeholders in the sensitization of climate change should be reinforced by strengthening awareness at all levels. This should include increased climate content for mass media dissemination of information. Information packaging should also be targeted to ensure the right audiences are reached, which may call for packaging climate information that appeals to the young in order to enhance levels of awareness. Strengthening the modes of communicating climate information would strongly enhance the preparedness of Luanshya youths for climate change governance.

Keywords: Climate Awareness, Climate Change, Luanshya District, Climate Governance.

Published Online: March 16, 2023

ISSN: 2736-660X

DOI:10.24018/ejdevelop.2023.3.2.236

E. Mwanza*
The University of Zambia, Department of Geography and Environmental Studies, Zambia
(e-mail: mwanzaevans29@gmail.com)
K. H. Mubanga
The University of Zambia, Department of Geography and Environmental Studies, Zambia
C. Sichimwa
The University of Zambia, Department of Geography and Environmental Studies, Zambia

****Corresponding Author***

I. Introduction

Climate change affects natural and human activities globally. The developing countries' weak adaptive capacities and their inadequate climate change awareness have increased the poverty levels of their vulnerable communities (Anderson, 2010). The devastating effects of climate change are regarded to have had impacted Africa whose livelihood is dependent on farming, thereby threatening food security (Ng'ombe *et al.,* 2020). UNESCO (2016, p. 3) argues that "climate change awareness is a powerful tool for helping people respond to climate change." It is imperative for citizens of countries, especially the majority youths, to have a wider knowledge about climate change in order to strengthen response to it. The acquired climate change knowledge is perceived as part of formal learning that makes informed decisions among youths (Rahman *et al.,* 2014). In the same vein, climate change awareness prepares future climate change governors in adaptive and mitigation strategies. A relationship exists between climate change awareness and climate change governance. Resource governance is defined as the exercise of authority and power, decision making processes and local citizenry involvement (Mubanga, 2016). 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 can be pointed out as the process through which formal and informal institutions prepare and produce climate change governors.

Effectiveness of climate change awareness is the manner in which youths appreciate and apply the climate change skills they are taught formally and informally. In this study, effectiveness of climate change awareness is measured using the attributes: relevance, perceptibility, tangible change and sustainable climate-smart life skills (Fig. 1).

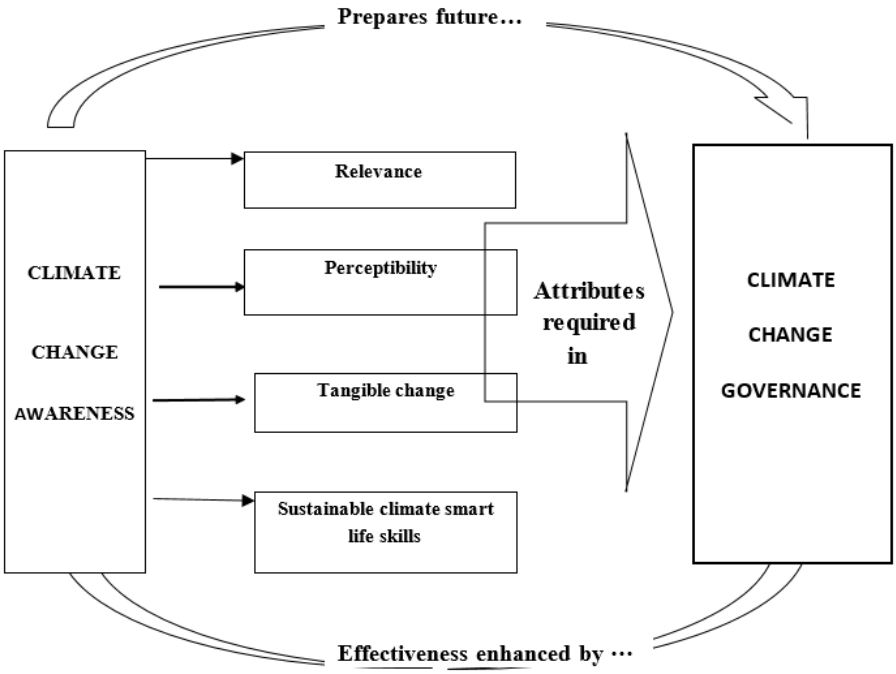


Fig. 1. Attributes affecting the effectiveness of climate change awareness.

Relevance of climate change awareness is seen in the manner youths apply sensitization awareness available to them, as an important practical knowledge that should help them adopt to environmentally friendly practices (UNESCO, 2010). The youths are expected to appreciate relevant information that is offered to them (Lee *et al.,* 2013). Perceptibility is the process of understanding that emanates from what is being observed (Muchanga, 2011). It connects understanding with actions that youths are obliged to utilize for their entire life (Lee *et al*., 2013). Sustainability of climate-smart life skills involves youths' acquisitions of long-life skills that would lead to sustainable skills. These are skills that should form part of youths' lifestyles, shaping their attitude towards environmental issues (Anderson, 2010). The aim of the study was to explore levels of climate change awareness among youths in the Luanshya District. The depth of climate change knowledge exhibited among youths in Luanshya District is evidence of their preparedness for climate change governance, as well as the effectiveness of their climate change awareness (Wolf & Moser, 2011).

A. Study Area and Sites

Luanshya District is a mining town on the Copperbelt Province with an area of 1,007.6087 km^2 and altitude of 1,200 meters above sea level. It is located 320 kilometers away from Lusaka, the capital city of Zambian and 36 kilometers south-west of Ndola, the provincial headquarters for the Copperbelt Province. It is bordered with Mpongwe and Masaiti districts that were known as Ndola rural in the past. Luanshya District is also 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 all form part of the administrative boundaries of Luanshya District (Bwalya, 2019). The district is administered by both central and the local government Luanshya Municipal Council (LMC). Four townships in Luanshya District were selected as study sites: Roan, Fisenge, Mpatamatu, and Mikomfwa Townships (Fig. 2). Roan Township is located south-east of the Central Business District (CBD). Fisenge is in the north-east of the Central Business District. Mikomfwa Township is in the south-east of the Central Business District. Mpatamatu Township is located north-west of the CBD.

European Journal of Development Studies
www.ej-develop.org

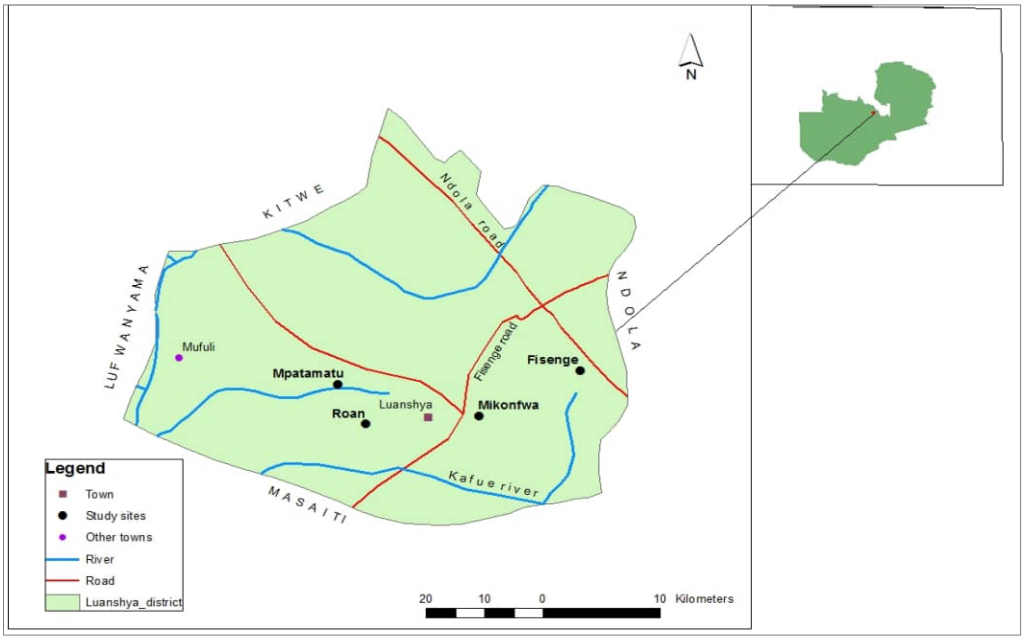


Fig. 2. Map of Luanshya District showing study sites.

B. Demographic Characteristics

The total population for Luanshya District is estimated at 156, 059 (77,368 males and 78,691 females) with 29,043 households rural Luanshya is home of 22,691 people (11,711 males and 10,980 females) whilst urban Luanshya accommodates 133, 368 people, with 65,657 males and 67, 711 females (CSO, 2014). A youth is a male or female aged 15 to 35 (Ministry of Youth and Sport, 2015). The youths were 63,594 with males at 31,128 and females at 32, 467 (Bwalya, 2019). Luanshya District has two parliamentary constituencies, namely: Roan and Luanshya respectively. The constituencies have an equivalent number of fourteen (14) wards each, which add up to twenty-eight (28) wards altogether (Table I). Total households for Luanshya constituency were 19,037 households with a population of 98,498 (48,744 males and 49,754 females). Roan constituency is home of 10, 006 households with a population of 57, 561: with 28, 624 males and 28,937 females (CSO, 2012).

TABLE I: 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
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

Adapted from: (CSO, 2012).

European Journal of Development Studies
www.ej-develop.org

II. Methodology

A. Sampling

Stratified sampling and purposive sampling were used in the study. Stratified sampling is the division of population in strata, and it was used to sample households in this study (Tichapondwa, 2013). Individual respondents were picked using simple random sampling. The Random number generation, known as the RANDBETWEEN function of Microsoft excel, was used to generate house numbers for each township. Random numbers were generated that corresponded to household numbers within each stratum. The sample size was calculated in G Power 3.2 statistical software using apriori analysis to determine the sample size, using a moderate two-tailed effect size, with a significance level of 0.05 (Erdfelder *et al*., 1996). The study had a total sample size of 160 households in four selected townships, namely: Roan, Mpatamatu, Mikomfwa and Fisenge of Luanshya District. The households were allocated temporal numbers that ranged from 1 to 160. Thereafter, random numbers were generated per township.

Purposive sampling was used to sample four townships to enable collection of data from different geographical areas within the district. Four (4) key government institutions working with youths provided key informants who were knowledgeable on the subject. The four (4) key informants from Ministry of Education, Ministry of Youth, Sports and Child Development, Luanshya Town Council and Ministry of Community Development and Social Services were purposively sampled.

B. Data Collection

Qualitative data was collected using key informants' interviews, and through observation of respondents. Key informant interviews were used on selected officers with the aim of obtaining detailed information and ideas about the research (Sidik, 2005). The face-to-face interviews conducted enabled a full range of communication between interviewer and respondent, with both being able to respond to each other's non-verbal communication (Harding, 2013). Structured observation was also used in the process of data collection. Bryman (2008, p. 270) states that, "it [structured observation] is the method for systematically observing the behaviour of individuals in terms of a schedule of categories." Structured questionnaire was used to collect quantitative data among youths in Luanshya District.

1) Questionnaires

Quantitative data was collected using structured questionnaires with open and closed ended questions among youths in Luanshya District. A questionnaire was administered to 160 respondents and was selected so as to organize the questions and receive replies without talking to every respondent (Walliman, 2011). The merits of the questionnaire are; it is easy to administer because there is no interviewer during the administration of the questions and it contains few questions. Open ended questions enable the researcher to have access to in-depth information from the respondents.

2) Structured interviews and key informant interviews

Key informants were dependable officers believed to have comprehensive information on climate change awareness. Key informant interviews were used on selected officers with the aim of conducting in-depth interviews that can allow the researcher to develop keen understanding of the research (Sidik, 2005). They were sampled purposively, from government institutions such as the Ministry of Education, Ministry of Youth and Sports and Child Development, Luanshya Town Council and Ministry of Community Development and Social Services.

3) Secondary sources

Secondary data was collected by consulting various sources of literature. The literature consulted included books, peer reviewed journal articles, dissertations, research reports, published and unpublished documents and materials relevant to the topic under study. Secondary data was based on literature of climate change awareness among the youths and was the quickest and cheapest way to understand the subject matter (Kabir, 2016). It included demographic characteristics from Central Statistics Office (CSO).

C. Data analysis

Quantitative data collected from questionnaires were analyzed using chi-square statistical test using Statistical Package of Social Sciences version 16 (SPSS). Several associations between different variables were tested using chi-square, for example, the association between the sex of youths and their perception of effectiveness of climate change awareness. Continuous variables such as age, was summarized in frequencies. For easy reading, the analyzed data was presented in tables and figures.

Qualitative data collected from key informants was analyzed through thematic analysis. In thematic analysis, coding was the process of recognizing the phrases and sentences so as to come up with emerging themes. The qualitative data collected was run in SPSS. This was achieved by grouping similar categories based on objective, thereby reducing the data in themes and the output was displayed in tables.

European Journal of Development Studies
www.ej-develop.org

III. Results

A. Levels of Climate Change Awareness among Youths in Luanshya District

Respondents in Luanshya District were asked if they had heard about climate change and 59 percent were aware about climate change while 41 percent were not. In order to determine the available modes of climate change awareness in Luanshya District, respondents who were aware about climate change were asked to mention their source of information. Majority 65 percent mentioned school, 18 percent mentioned radio while 17 percent were aware through television. The levels of climate change awareness were highest in Fisenge (70 %), followed by Mpatamatu (60 %) and Roan (54 %) townships (Table II). The lowest awareness levels were recorded in Mikomfwa (53 %) township.

TABLE II: 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. The modes of climate change awareness utilized by actors and stakeholders in Luanshya District were; radio, school and television. Installation of solar lights, tree planting exercise, and the garbage collection that happened during the keep Luanshya clean campaign, were among the modes of climate change awareness that were done in practice. The results of the study on modes of climate change awareness were very similar with other studies conducted in different countries by different researchers (Mochizuki & Bryan 2015; Miler, *et al*., 2012; Henderson & Holman, 1993). The UNDP, (2012) during its study in Cambodia found that climate change awareness levels increased with the increase in campaigns. Similarly, those who attended school were more aware about climate change than those who did not. Those who were sensitized on climate change were more aware as compared to those who were not. 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 seemed knowledgeable, failed to explain the term, climate change.

B. Effectiveness of Climate Change Awareness Methods to Youths in Luanshya District

In Luanshya district, climate change awareness methods utilized by actors and stakeholders included radio, school, Non-Governmental Organizations (NGOs), Newspapers, Megaphones and television (Fig. 3). The effectiveness of climate change awareness methods was paramount in an effort to prepare successful future climate change governors. The effectiveness of climate change awareness was assessed from responses to questions which stated as to whether the climate change awareness methods used among youths in Luanshya District were effective or not. Generally, school, television, radio and the internet were seen as very effective methods of enhancing climate change awareness among youths. Magazines, megaphones and newspapers were not seen as very effective methods to communicate climate change messages to youths (Fig. 3).

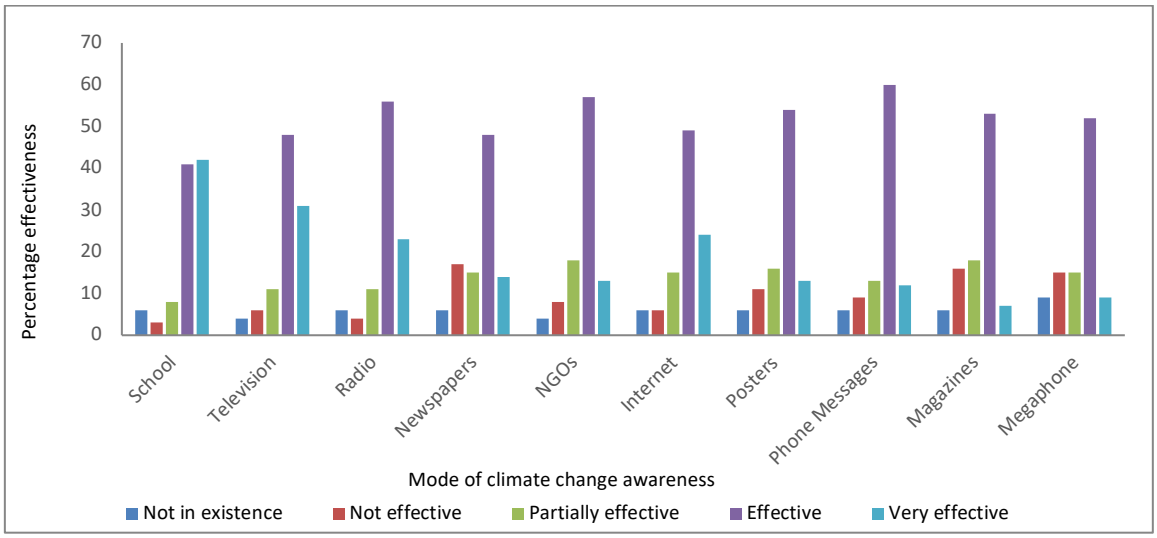


Fig. 3. Effectiveness of different modes of climate change awareness in Luanshya District.

As regards the effectiveness of climate change awareness through formal learning at school, six (6) percent said the climate change subject was not offered at school, hence their low levels at awareness. Generally, these were youths who did not take subjects embedded with climate change and did not participate in climate change awareness. The sample had three (3) percent respondents who rated the climate change awareness methods in Luanshya as not effective. These youths were exposed to some form of climate change awareness method but were not satisfied with the methods used. There were eight (8) percent who rated the methods of climate change awareness as partially effective, (41) percent who found the methods effective and (42) percent said the methods utilized were very effective.

C. Effectiveness of Climate Change Awareness through Youth Involvement in Climate Change Projects in Luanshya District

The government and civil society are mandated to involve youths in climate change projects for them to acquire leadership, as well as mitigation and adaptation skills. Key informant interviews were conducted to establish whether the climate change messages to youths were effective and that youths were equipped with deliberate projects meant to prepare them for climate change governance. Many youths were not involved in the projects of climate change significance such as tree planting, conservation farming and garbage collection and recycling.

Luanshya generally had projects of climate change significance that youths could be involved in. WeForest taught women and youths a lot of skills, of which tree planting was one of them. The project had little youth involvement despite many youths knowing that trees play an important role on the environment through carbon sequestration and forest restoration among others. The Department of Forest worked with the Community Development Office to empower youths through social cash transfers of which tree planting was an activity that was said to be embedded in the project. During the time of data collection, a key informant from the Community Development Office indicated that they had supplied selected youths with (15) tree seedlings for planting as a way of increasing climate change awareness among youths. The sampled youths in this study were asked to rate the effectiveness of the methods of climate change awareness provided by different actors in the climate change space in Luanshya District. A question with multiple responses was used where sampled youths rated the methods of climate change awareness on a scale of 'not effective,' 'partially effective,' 'effective' and 'very effective.' Table III illustrates the results.

TABLE III: RATING THE EFFECTIVENESS OF CLIMATE CHANGE AWARENESS THROUGH YOUTH INVOLVEMENT IN CLIMATE CHANGE PROJECTS IN LUANSHYA DISTRICT

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

Generally, the involvement of youths in climate-related projects in Luanshya District as a way of making them aware of the climate problem was not effective as Mpatamatu and Roan Townships recorded a high number of respondents in two categorical ratings of 'not effective 'and 'partially effective.' The results implied that, there was no effective climate change awareness in the two townships. The climate change awareness methods in Fisenge and Mikomfwa Townships were also generally not effective as the highest rating for both townships were 'not effective.' Conversely, majority of youths in Luanshya District felt that the climate change awareness methods utilized by actors were not effective preparing the future climate change governors.

In order to show the association between the methods of climate change awareness that were used and their effectiveness in making youths aware about climate change in Luanshya District, a chi-square test was conducted. The hypothesis tested was that there was no significant association between the sex of youths and the effectiveness of climate change governance training offered to youths in Luanshya District.

The chi-square test showed that p-value (0.174) was greater than the level of significance (0.05, effect size 0.115). This meant that there was no significant association between the sex of youths and the effectiveness of climate change governance training offered to youths in Luanshya District (X^2=1.851; df=1; p = 0.174). Findings did not show evidence of an association between sex of youths and effectiveness of

climate change awareness. So both male and female youths considered the climate change awareness methods used in Luanshya to be ineffective.

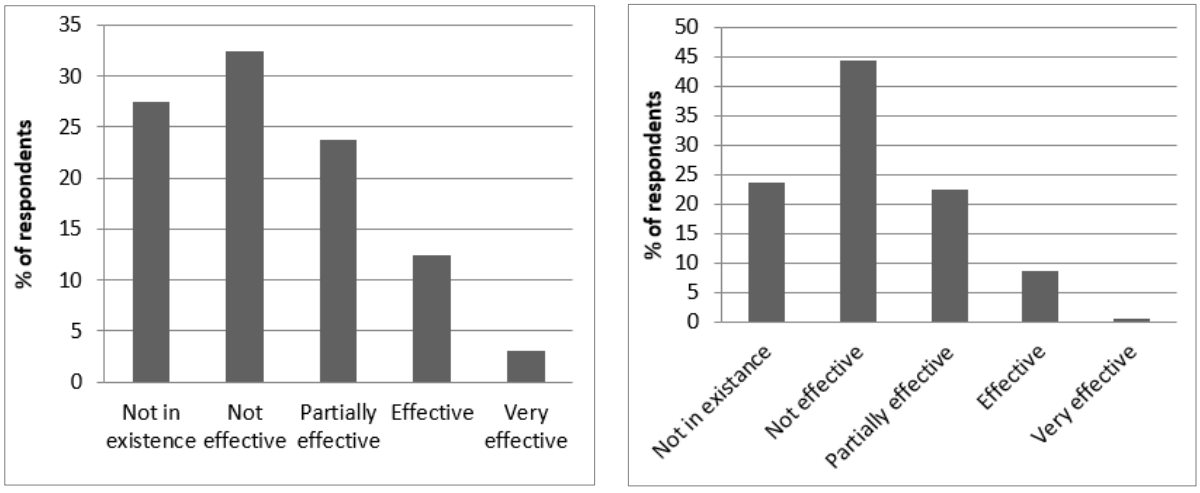
Luanshya did not have deliberate programmes that required youths to be ambassadors of climate change awareness. The youths needed participation in climate change awareness because, they were affected stakeholders and they had a big role to play in climate change governance. In the context of climate 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. Table IV highlights the projects that had youth involvement in Luanshya during the period of data collection.

TABLE IV: 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 dumpsites	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, treating the soil to decrease emissions of GHGs, afforestation, improving manure management to decrease emissions, zero-tillage agriculture, bio-energy emissions and organic production

D. 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 effective,' 'partially effective', 'effective' and 'very effective.' The climate change governance training, which is supposed to be conducted by various stakeholders, ranging from the government to non-governmental organizations was rated as 'not effective' by respondents (Fig. 4). The same score was given for climate change awareness campaign. The general low levels of climate change knowledge among the youths could be attributed to their not finding the modes of climate change awareness, training and campaigns as not effective.



(a) (b)

Fig. 4. Responses of youths on effectiveness of: a) climate change governance training; b) climate change awareness campaign.

E. Preparedness of Youths for Climate Change Governance in Luanshya District

The preparedness of youths for climate change governance was assessed through an investigation of the level of interest of the youths, their awareness of the climate change subject and the level of information possessed by the youths (Table V). The results show that youths from Mikomfwa showed more interest while the rest of the townships were not enthusiastic about the subject. The levels of climate change awareness were generally low in all the four townships. As regards the youth's consideration of the important of climate change governance, Mpatamatu was the only township that had high number of youths who felt climate change governance was cardinal. On the other hand, all the youths in the four townships generally possessed insufficient information on climate change.

TABLE V: 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	5
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	5	13
Regarding climate change as not important	30	52	95	87
Total	**100**	**100**	**100**	**100**
Sufficient information on climate change	13	5	60	8
Insufficient information on climate change	87	95	40	92
Total	**100**	**100**	**100**	**100**

The climate knowledge test for youths involved them being able to explain the causes and effects of climate change. The youths were expected to be conversant with the causes, effects and terms used in climate change if they were to appreciate its importance. The results in Table V indicate that climate knowledge is still lacking, calling into question their preparedness for climate change governance. Further, involvement in climate change projects as well as showing interest would have been evidence enough for youths' preparedness on climate change governance.

IV. DISCUSSIONS

In order to involve youths in climate change, Bodzogan (2009) conducted a study in Turkey recommended social activities 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). This challenge was also observed in Luanshya District where most methods of climate change awareness were seen as ineffective by the youths who were intended beneficiaries of climate change awareness. The commonly utilized methods of climate change awareness in Luanshya District were school, radio, television, newspaper, magazines and megaphone. Pruneau *et al.* (2001) (*in* Ojala & Lakew, 2017) argued that youths showed less confidence in the possibility of mobilizing themselves for climate change. There was generally a limited sense of agency among youths whose action was dependent on parents, politicians, the government and community. Most youths perceived climate change as something that did not relate to them. Mudombi *et al*. (2011) explained that youths were victims to climate change in future even though they did not contribute to the past as they would be the ones to regulate climate change institutions.

The attitude of youths demonstrates their preparedness for climate change governance, which should include demonstration of interest, positive behavioural change towards climate-smart living as well as be knowledgeable about the subject. From this perspective, the majority of youths in Luanshya District were not prepared for climate change governance as results showed that most youths were not interested in climate change governance, and were not knowledgeable of the basics of the climate change subject. Most projects that provided opportunities for youth involvement in climate action such as tree planting or waste management had very little youth involvement. Further, most youths did not understand the causes and effects of climate change, let alone explain what was meant by climate change. This showed the need for increased effort in awareness and training campaigns aimed at preparing youths for future climate governance. Much of the training in climate change was done through formal schools, but with climate concepts only included in few optional subjects, most youths who did not take the options had few opportunities to be enlightened on climate change governance. Luanshya District did not have tertiary or vocational training skills that specialised in climate change education, which further reduced the training options in the field. Peer-to-peer education is only strengthened when there are available modes of awareness where youthful peers can draw the knowledge to pass on to fellow peers. Strengthening these modes of communicating climate information in Luanshya District would strongly enhance the preparedness of the youths for climate change governance.

V. CONCLUSION

Youths in Luanshya District found the modes of climate change awareness available in their area to be ineffective in reaching them and in content provision. These modes which included school, radio, television, newspaper, magazines, internet and megaphone generally did not present enough access to climate change content to prepare the youths for climate change governance. While most youths felt that school, radio,

television and the internet were more effective means for them to receive climate change awareness, these methods had shortcoming that reduced the youths' access to climate change information. In school, climate change was limited to optional subjects which highly reduced the access by youths who were not enrolled in the optional subjects. The climate change content on radio and television was very limited while internet access was a challenge for many youths. These challenges with the available modes of climate communication significantly reduced the effectiveness of the modes of climate change awareness among the youths. Practical learning through involvement in climate related projects was also hampered by many youths' lack of interest in the climate change subject as well as the low numbers of youths on such projects. The limited number of youths having access to the various modes of climate change awareness meant even the peer-to-peer method of awareness was limited as few youth peers had access to climate information for them to share. It was therefore concluded that the involvement of different stakeholders in the sensitization of climate change should be reinforced by strengthening awareness at all levels. This should include increased climate content for mass media dissemination of information. Information packaging should also be targeted to ensure the right audiences are reached, which may call for packaging climate information that appeals to the young in order to enhance levels of awareness. It was recommended that strengthening these modes of communicating climate information in Luanshya District would strongly enhance the preparedness of the youths for climate change governance.

ACKNOWLEDGEMENT

Great thanks to all participants. This article would have not been done without them.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

REFERENCES

Anderson, A., (2010). *Combating Climate Change through Quality Education.* Washington DC: The Booking Institution. Policy Brief. 2010-03. https://www.brookings.edu/research/combating-climate-change-through-quality-education.

Bozdogan, E. A. (2009). An Investigation of Turkish Prospective Primary School Teachers' Perceptions about Global Warming. *Giresun: Giresun University, 7*(1), 43-48. https://www.researchgate.net/publication/294714318.

Bryman, A. (2008). *Social Research Methods* (4th Ed). New York: Oxford University Press.https://books.google.co.zm/books?id=vCq5m2hPkOMC&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false

Bwalya, N. C. (2019). *Luanshya District Investment Profile*. Luanshya: Luanshya Municipal Council. https://docslib.org/doc/6096066.

Carr, P. (2015). *Climate change awareness amongst secondary level students and teachers in a Dar es Salaam University College of Education (DUCE) affiliated school in urban Tanzania*. Dublin: Trinity College Dublin-University College.https://www.semanticscholar.org/paper/Climate-change-awareness-amongst-secondary-level.

Central Statistical Office (2012). Zambia 2010 Census Population and Housing: *Population Summary Report*. Lusaka: Central Statistical Office.

Central Statistical Office (2014). Zambia 2010 Census Population and Housing: *Copperbelt Province Analytical Report.* Lusaka: Central Statistical Office. https://www.bing.com/search?

Erdfelder, E., Faul, F., Buchner, A. (1996). GPOWER: A general power analysis program. *Behavior Research Methods, Instruments, & Computers, 28*(1), 1–11. https://www.researchgate.net/publication/226660676.

Harding, J. (2013). *Qualitative data analysis from start to finish*. London: Sage.www.qualitativesociologyreview.org/ENG/Volume37/QSR_12_2_Asadi.

Henderson, S., & Holman, S. R. (1993). Global climate change education: technology transfer to schools. *Climate Research, 3*(1/2), 137–140. http://www.jstor.org/stable/24863339.

Kabir, S., M., S. (2016). Methods of Data Collection, (1st Ed.). In *Basic Guidelines for Research: An Introductory Approach for All Disciplines* (pp.201-275) Ch. 9. Book Zone Publication.

Lee, J. A., Ceyhan, P., Jordan-Cooley, W. C., & Sung, W. (2013). GREENIFY. *Simulation & Gaming, 44*(2–3), 349–365. https://doi.org/10.1177/1046878112470539.

Mubanga, K. H. (2016). Land Resources Regimes in Zambia: Implications on Local Food Systems. *Asian Journal of Environment & Ecology, 1*(2), 1-13.

Muchanga, M. (2011). Perceptions of Climate Change Adaptation and Learning among Residents of Selected areas of Zambia's Lusaka Province. *Asian Journal of Environment & Ecology.*

Mochizuki, Y., & Bryan, A. (2015). Climate Change Education in the Context of Education for Sustainable Development: Rationale and Principles. *Journal of Education for Sustainable Development, 9*(1), 4–26. https://doi.org/10.1177/0973408215569109.

Morrison, R., & De Vellis, J. (1981). Growth of purified astrocytes in a chemically defined medium. *Proceedings of the National Academy of Sciences of the United States of America, 78*(11), 7205–7209. https://doi.org/10.1073/pnas.78.11.7205.

Mudombi, S., Weisheit, A., & Nzeyimana, E. (2011). A Youth Perspective on Climate Change Opportunities and Challenges for Climate Resilient Development. *Proceedings of Africa Adapt Climate Change Symposium.*

Miléř, T., Hollan, J., Válek, J., & Sládek, P. (2012). Teachers' Understanding of Climate Change. *Procedia - Social and Behavioral Sciences, 69*, 1437–1442. https://doi.org/10.1016/j.sbspro.2012.12.083.

Ministry of National Development Planning (2016*). National Policy on Climate Change.* Lusaka: Ministry of Lands, National Development and Environmental Protection. Retrieved from: https://leap.unep.org/sites/default/files/legislation/zam174957.

Ministry of Youth and Sport (2015*). National Plan of Action for 2015 Youth Policy*. Lusaka: Ministry of Youth and Sport. Retrieved from: https://www.ilo.org/wcmsp5/groups.

Ng'ombe, J. N., Tembo, M. C., & Masasi, B. (2020). "Are They Aware, and Why?" Bayesian Analysis of Predictors of Smallholder Farmers' Awareness of Climate Change and its Risks to Agriculture. *Agronomy, 10*(3), 376. https://doi.org/10.3390/agronomy10030376.

Ojala, M., & Lakew, Y. (2017). Young People and Climate Change Communication. *Oxford Research Encyclopedia of Climate Science*. https://doi.org/10.1093/acrefore/9780190228620.013.408.

Rahman, S. S., Tasmin, S., Uddin, M. S., Islam, M. T., & Sujauddin, M. (2014). Climate Change Awareness among the High School Students: Case Study from a Climate Vulnerable Country. *International Journal of Built Environment and Sustainability, 1*(1). https://doi.org/10.11113/ijbes.v1.n1.4.

Sidik., M., S. (2005) How to write a Research Proposal. *University of Putra, 13*(3), p. 30-32. Retrieved from: https://www.academia.edu/41822116.

Tichapondwa, S, M. (2013). Preparing Your Dissertation at a Distance: A Research Guide. *Vancouver: Virtual University for Small States of the Commonwealth*, (5), 101-112.

UNDP (2012). *Assessment Report on Awareness and Knowledge Level on Climate Change and Adaptation Practices*. Cambodia: UNDP.

UNESCO. (2010). *Climate Change Education for Sustainable Development*. United Nations Decade for Sustainable Development. Retrieved from: https://unesdoc.unesco.org/ark:/48223/pf0000190101.

UNESCO (2016). *Climate Change Education and COP22*. Retrieved from: https://unesdoc.unesco.org/ark:/48223/pf0000246479.

Walliman, N. (2011). *Research Methods: The Basics*. London: Routledge.

Wolf, J., & Moser, S. C. (2011c). Individual understandings, perceptions, and engagement with climate change: insights from in-depth studies across the world. *Wiley Interdisciplinary Reviews: Climate Change, 2*(4), 547–569. https://doi.org/10.1002/wcc.120.