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Methods used by Zambia environmental management agency in disseminating information on environmental pollution in Lusaka District: A case study of Chilenje Township

Hildah Kalulu

School of Humanities, Information and Communications University, Zambia Research and Development Centre: (ZRDC), P.O BOX 30266, 16th Floor FINDECO house, Cairo Road, Lusaka, Zambia

Abstract
Environmental pollution has risen to prominence as a cross-cutting issue in development theory and practice in recent years, and its immense significance in contributing to the ongoing global warming and poverty has been recognized. The findings of this research were that Air pollution was the major form of pollution residents experienced and this was largely due to burning. Quite a number of people did not know the media which ZEMA used to disseminate information and that local people were not involved in Environmental pollution awareness. ZEMA should embark on sensitizing people on the dangers of pollution and deploy more field workers. The report concludes that there is an urgent need for people to be informed on the benefits of preserving their environment and have a better society.

Keywords: environmental, pollution, information, dissemination and media

1. Introduction

1.1 Background Information

While modern societies face growing concern about global environmental pollution, developing countries like Zambia are experiencing complex, serious and fast-growing pollution problems of their own. The potent combination of industrialization, urban development and mass consumption trends is exacerbated by foreign companies operating with little regard for the impact on the local environment. Environmental pollution is more than just a health issue. Pollution has the potential to destroy homes and communities. Pollution problems are also closely tied to the mode of development in developing countries. Despite this, many developing countries either have not developed environmental pollution control measures, or have not provided adequate implementation structures to ensure that policies are effective.

Environmental pollution has risen to prominence as a cross-cutting issue in development theory and practice in recent years. The basic understanding of citizens about the environmental pollution issues, the quality and quantity of their knowledge and, over and above, their awareness on environmental related matters would constitute an important benchmark for such approaches.

Public participation in project formulation and implementation is also a legislative requirement under the Zambian Environmental Protection and Pollution Control Act (EPPCA) of 1990. The Agency is mandated to regulate and coordinate environmental management, promote awareness and ensure environmental protection through enforcement of regulations and the prevention and control of pollution. Given the socio-economic implications of most investment projects in this contemporary society, it has become an established practice to inform and involve potentially affected people during the implementation of the environmental assessment process. In providing comprehensive environmental information, it is important to target the right population and channel sufficient quality and quantity of information. The provision of right environmental information allows citizens to make right choices on consumption and sanction those who do not follow the rules. The role of authorities, in this context, would be to regulate the quality and quantity of information to be disseminated and to provide information on existing regulations and market incentives to the public. In establishing such mechanisms, it will be crucial to understand the current status of information received by citizens. The basic understanding of citizens about the environmental pollution issues, the quality and quantity of their knowledge and, over and above, their awareness on environmental related matters would constitute an important benchmark for such approaches. Public participation in project formulation and implementation is also a legislative requirement under the Zambian Environmental Protection and Pollution Control Act (EPPCA) of 1990. Participation of the public is important to ensure that projects are not only economically viable and environmentally sustainable but also that they are socially acceptable. The public brings local knowledge relevant to the project and can assist in designing mitigation measures that prevent Environmental pollution (Section 86 of EPPCA).

Zambia is a landlocked country which shares its boundaries with nine countries named Angola, Botswana, Democratic Republic of Congo, Malawi, Mozambique, Namibia, Tanzania and Zimbabwe. Since the time the country obtained independence in 1964, the pollution has continued to grow. Lusaka is a capital city of Zambia situated on a plateau and has estimated population of over 2,191,225 people mostly living in uncontrolled settlements without primary services such as water and electricity supply, sewage systems and waste collection. About 34% of the population lived in modern conventional housing structures and only 50% of all households had access to a source of clean drinking water,

18% had electricity for lighting and over 50% of all households used pit latrines (CSO, 2010).

Increasing economic activities in Lusaka resulted in more energy and consumption demand, which generally lead to environmental degradation. According to De Waele, J. and Follesa R. (2003) [3], "The rapid demographic growth has caused an increasing negative impact on karstic environment and on this aquifer, with uncontrolled human activities (settlement, quarrying), scattered waste and sewage disposal, groundwater quality and quantity depletion.

Until recently, people's awareness was never considered as a possible tool to promote environmental policy. However, this tool is actually important and has potential to be a powerful tool in environmental sphere. Before the creation of the ZEMA, there was improper waste disposal from industries, trading places and homes in Lusaka district. A lot of garbage that was generated in households, as well as at places of work, in form of metal, glass, and plastic, cloth, wood or even paper was dumped on the grounds and gave rise to landfills. Some of the garbage, such as plastic, is non-biodegradable. Food refuse generated from homes and the restaurants, fertilizers along with large quantities of pesticides, insecticides and fungicides which were used in large quantities by farmers, accounted for a large chunk of land pollution. Piles of litter were found all over the streets. Automobile emissions and burning of rubbish was a common practice in the district.

Air pollution was a common feature which affected crops and other plants extensively; people also were not spared from this polluted air which resulted in breathing difficulties and lung related diseases. Cases of typhoid and other water borne diseases, due to sewer leakages and other water contaminants were also on the increase. However, the government of the Republic of Zambia came up with Agency called the Zambia Environmental Management Agency (ZEMA) to control pollution in the country. This is a statutory body created under an Act of Parliament "the Environmental Protection and Pollution Control Act (EPPCA) of 1990", Cap 204 of the Laws of Zambia. The Agency, formerly Environmental Council of Zambia was established in 1992 and was mandated to protect the environment and control pollution. The role of Zambia Environmental Management Agency is to advise on policy formulation and make recommendations for the sustainable management of the environment; ensure the integration of environmental concerns in overall national planning through co-ordination with appropriate authorities; review environmental impact assessment (EIA) and strategic environmental assessment (SEA) report; monitor trends of natural resources, their use and impact on the environment and make necessary recommendations to the appropriate authority; and most importantly publicize information on any aspects of the environment and facilitate access to information on the environment (ZEMA, 2015) [41] Annual Report.

The Agency is mandated to regulate and coordinate environmental management, promote awareness and ensure environmental protection through enforcement of regulations and the prevention and control of pollution. Some of the core functions of the Agency include drawing up and enforcing regulations related to water, air and noise pollution, pesticides and toxic substances, waste management and natural resources management; advising the Government on the formulation of policies related to good management of natural resources and environment; advising on all matters relating to Environmental conservation, protection and pollution control, including necessary policies, research investigations and training. Furthermore, Zambia Environmental Management Agency Inspectors have wide-ranging powers of inspection, including sample collection and seizure, at any business premises where they reasonably believe that pollution may be occurring. The inspectors may also arrest persons who have been caught committing an offence, or who are suspected of committing an offence relating to environmental degradation (EPPCA 1990). Today, the sources of pollution include both production and consumption processes. The Human Development Report of 1998 (UNDP) affirms this trend and states that growth in consumption and unbalanced consumption patterns are placing unprecedented pressure on the environment.

In this light, the acceptance of pro-environmental behaviour by the general public, that is, to adopt sustainable life style, is an urgent issue in protecting the environment. The increase of participation of citizens means that legal frameworks would be more respected and economic mechanisms would be more accepted thus increase their effectiveness.

1.2 Statement of the Problem

The high level of environmental pollution in Lusaka is alarming and one wonders whether the local community was being sensitized on the dangers of environmental pollution. It was however not clear whether ZEMA, whose mandate was to disseminate information to the public pertaining to pollution and its effects, was providing enough information to combat this trend and using what methods.

1.3 Purpose of the Study

The purpose of the study was to assess the methods used by ZEMA in disseminating information on environmental pollution, a case study of Chilenje Township in Lusaka District.

1.4 Research objectives

1. To examine methods used by ZEMA to disseminate information on environmental pollution.
2. To establish whether ZEMA faced any challenges in its dissemination of information on environmental pollution to the public.
3. To examine whether ZEMA involved local people in environmental pollution awareness

1.5 Research questions

1. What were the methods used by ZEMA in disseminating information on environmental pollution to local people?
2. What were the challenges faced by ZEMA in disseminating information on environmental pollution to the public?
3. Did ZEMA involve local people in environmental pollution awareness?

2. Methodology

2.1 Study Area

The research was conducted in Chilenje Township of Lusaka District. This was due to the high rise of pollution in the area.

2.2 Research Design
The study adopted the mixed method research strategy, which was a combination of both the qualitative and quantitative strategies. The qualitative strategy involved obtaining in-depth responses to in-depth questions. As such, perceptions, feelings, values and attitudes of people under consideration were obtained. Such data would not be quantified, thus the quantitative strategy were used to obtain statistical, figurative and percentile data. The quantitative strategy made it easier to quantify and analyse collected data. Since the two strategies complemented each other and the limitations of one were covered by the other, resulting in balanced representative information, the mixed method strategy was selected. The research design used was the case study. This was detailed account of the development of a situation that had been studied over a period of time.

2.3 Target Population
The study focused on the methods which were used by ZEMA in disseminating information on environmental pollution in Lusaka district. This was because the district experiences a high level of pollution due to economic activities taking place. The research was conducted in Lusaka district because the area had many cases of environmental pollution due to its high population. A case study of Chilenje Township was undertaken

2.4 Sample Size
The total sample of people considered for the research was 50, 2 key informants and 48 respondents from Chilenje township. The key informants comprised of 2 officials from Zambia Environmental Management Agency and Lusaka City Council under the department of Waste Management. The central limit theorem stated that a random sample equal to or greater than 30 is able to provide a normal distribution of the characteristics of the population under consideration. As such, this sample size was adequate enough to provide unbiased information.

2.5 Sampling Techniques
The non-probability sampling technique was used to select the key informants. Specifically the purposeful sampling technique was employed. Newbold G, (2007) [23] asserts that "when the desired population for the study was rare or very difficult to locate and recruit for a study, purposive sampling might be the only option. For the respondents, probability sampling technique using cluster method and simple random sampling were employed from each selected unit in Chilenje Township.

2.6 Research Instruments
In consonance with the mixed method design interview schedule, interview guide and questionnaires were developed to collect the primary data from the field. These instruments were chosen because they are the most appropriate. Data collected from key informants was qualitative.

2.7 Procedure for data collection
The researcher sought permission from Information and Communication University Authorities before data collection. The Introductory letters for two organizations namely: ZEMA and Lusaka City Council were given. The researcher introduced herself to the key informants and the purpose of study and the nature of interviews were made known. A guided interview for key informants was conducted as questionnaires were formulated. As for the respondents questionnaires were distributed to the various geographical locations within Chilenje Township for data collection.

2.8 Data Analysis Technique
The analysis techniques used narrative form for key informants and excel for respondents. The method grouped data and was presented in form of graphs and charts.

3. Results and Discussion
Environmental pollution is a problem both in developed and developing countries. Factors such as population growth and urbanization invariably place greater demands on the planet and stretched the use of natural resources to the maximum. It had been argued that the carrying capacity of Earth is significantly smaller than the demands placed on it by large numbers of human populations. And overuse of natural resources often results in nature's degradation. (Puk T, Behm D. 2003 [20].

3.1 Global Perspective
Environmental pollution in Japan had accompanied industrialization since the Meiji period (1868-1912). In the 1960s diseases caused by factory emitted water and air pollution were found in areas throughout Japan. The strict environmental protection measures that were subsequently implemented had reduced pollution caused by such emissions. Important problems remain to be solved, however, with action being necessary to, for example, reduce greenhouse-gas and particulate-matter emissions and increase recycling of industrial and household waste. Global environmental issues like the destruction of the ozone layer and global warming could not be resolved by a single country, so it was clear that the cooperation of all countries was increasingly necessary to protect the environment. Japan played an active role in this global effort (Van Matre S, 1990) [28]. Japan had overcome environmental pollution problems by the efforts made by the National and local governments, private sector and citizens. The decision making processes mechanism in which stakeholders participated in playing an important role in environment policy. Japan was moving forward with a wide range of initiatives in an effort to create "low-carbon society" with both a healthy environment and a healthy economy. (Wang J and Liu Y (2014) [38].
Every industrial revolution in history had produced toxic effects. China's industrial revolution was the most recent and the most significant case. Not only was it the biggest and fastest industrial revolution in history, with pollution on an unprecedented scale, but we also now understand how close they were too dangerous and unstoppable climate change, to which China was now the largest contributor by volume. (Wang J and Liu Y (2014) [38].
According to January 16, 2014, https://www.chinadialogue.net/blog/6657-179-Chinese-cities-agree-to-real-time-disclosure-of-air-quality/en. China's air pollution is a horror story that has captivated readers and viewers around the world.

Chinese Academy of Social Sciences pointed out that the problem of haze and fog in China had hit a record level, and China was currently suffering the worst air pollution problem since 1961. The problem of air pollution was first observed in the 1970s, with industrial emissions of sulphur dioxide (SO2) and total suspended particulates (TSP). In the 1980s, acid rain was detected in major cities in the northern part of the country, and this was mainly caused by SO2 from coal combustion, which accounted for more than 70% of the fuel consumption in China. In the 1990s, the number of vehicles on roads increased very rapidly, especially in medium-sized and large cities. In Beijing alone, the number of vehicles increased by a factor of 10, from 0.5 million in 1990 to 5 million in 2012. (Wang and Liu, 2014) [38].

In addition, the emission factor (the amount of pollution emitted by one car) in China was much higher than in developed countries because China had much lower emission standards for automobiles. Thus, the drastic rise in the number of vehicles and rapid development of industries in cities had led to worsening air quality, and concentrations of nitrogen oxides (NOx) and particulates were especially high. High levels of ozone concentration were frequently observed in summer and fell in several big cities.

Many observers had pointed out that it was a major contributor to pollution in Japan and Korea, and even blows across the Pacific to affect air quality up and down the coast of North America. A recent study estimated that on the worst days, Chinese emissions accounted for 12%– 24% of the sulfate, 2%–5% of the ozone, 4%–6% of the carbon monoxide, and up to 11% of the black carbon particulate over the West Coast of United States. (B. Singh, 2014) [25].

For India, Environmental Pollution remained a major challenge. All forms of pollution were prominently found in India for example Floods and River pollution. Floods were a significant environmental issue for India. It caused soil erosion, destruction of wetlands and wide migration of solid wastes. (B. Singh, 2014) [25].

India was recognized as having major issue with water pollution predominately due to untreated sewage. Rivers such as the Ganges, the Yamuna and Mithi all flowing through highly populated areas, were all heavily polluted (B. Singh, 2014) [25].

It was essential to make the public aware of the formidable consequences of the Environmental Degradation, if not retorted and reformative measures undertaken would result in the extinction of life. A population of over thousands of millions was growing at 2.11 per cent every year in India. It puts considerable pressure on its natural resources and reduced the gains of development. Hence, the greatest challenge was to limit the population growth. Although population control automatically led to development, yet the development leads to a decrease in population growth rates. (Wong Bing Kwan *et al*, 2003) [39].

The majority of industrial plants in India were using outdated and population technologies and makeshift facilities devoid of any provision of treating their wastes. A great number of cities and industrial areas that had been identified as the worst in terms of air and water pollution.

Acts were enforced in the country, but their implement was not so easy. The reason was their implementation needed great resources, technical expertise, political and social will. Again the people were to be made aware of those rules. Their support was indispensable to implement those rules.

3.2 Regional Perspective

For South Africa, the recent urbanization and industrialization had really taken a toll on its environment. The mining sector, which was a major part of the country's economy, was responsible for most of those environmental issues. Other factors that contributed to destruction of the ecosystem in South Africa included overgrazing, intensive pesticide use and soil erosion. Water and air pollution problems had also plagued the country. Industrial waste was one environmental hazard associated with the mining sector in South Africa. Solid wastes created after gold was separated from its ore were usually placed in huge dumpsites, while liquid waste was collected in a pit. These wastes contained radioactive uranium in small amounts, which when inhaled contributed to ailments like lung cancer (UNEP and SADC 2014) [40].

The mainstays of the South African economy had long included mining and agriculture. While these sources of national income had created wealth for a minority, they had also imposed a legacy of environmental contamination and degradation on some of the poorest sectors of the population. Some notable examples illustrate broader concerns. A study at the lead mining town of Aggeneys in the Northern Cape Province showed that lead poisoning in children was more widespread in that town than in a nearby non-mining town.

In 1990, concerns were raised over contamination and worker deaths at a mercury waste processing plant in the province of KwaZulu Natal. Recent studies continued to point to environmental contamination around the site, and elevated hair mercury levels in poor communities living around a dam downstream from the same plant. Researchers had also drawn attention to poor pesticide management practices on farms and the risk of long-term health consequences, suicide, and unintentional poisoning in agricultural settings in South Africa. More recently there had been growing alarm, and increased media attention devoted to large-scale acid mine drainage in several parts of the country (especially in and around Johannesburg), and the potential implications for water quality and human exposure to toxic metals. Strong criticism by environmental groups pointed to the apparent lack of political will to address the problem and government's delay in mounting an effective response. (UNEP and SADC 2014) [40].

3.3 Zambian Perspective

Simon Gardner (2007) [28] argued that those who generated pollution must recycle it or at least should meet the costs of its recycling. This variation of the "polluter pays principle" can apply to individuals, businesses and institutions alike and spurs each, to find the most efficient way to re-use material and possibly to reduce its flow. Community educational programs could equip residents to take responsibility for their environment. Like in the study, ZEMA should urge the government to stiffen the law on punishing perpetrators of environmental pollution. Whoever brings about pollution should either be fined or jailed for it. Moreover, industries which pollute the environment should be fined heavily or have their license revoked.

The Environment Directorate General of the European Commission organised stakeholder meetings in September and

November 2011 to explore common solutions to the problem of marine litter. The meeting with interested parties followed a speech of Environment Commissioner Janez Potočnik on the protection of the Mediterranean, in which he called for partnerships with all stakeholders, starting with industry, to further investigate what could be done at European level to encourage voluntary agreements with and within industry to reduce marine litter. Participants were invited to brainstorm on stakeholder involvement in the coordination of initiatives already under development and to propose new ideas. Emphasis was put on a non-legislative approach. ZEMA should, from time to time, organise meetings with the various industries in Lusaka. This is a way of creating a platform for such industries to be made to come up with ways of minimizing pollution in the district, unlike the way they just release chemicals anyhow.

Public awareness programs should enlighten public opinion on environment and promote community action in environmental management (ECZ, 2007) Annual Report. The document further revealed that human actions that led to environmental pollution resulted from lack of knowledge. For example the absence of information about the nature and extent of pollution which was caused by emissions from industrial activities. These may result in communities being unaware of potential hazards and what could be done to reduce the risks. It is made clear that information and dissemination could therefore be effective tools for environmental pollution awareness to affected communities, expanding knowledge about the environment and control of pollution, and supporting environmental management decisions. This was as contained in a study by (ECZ, 2007) Annual Report.

According to Environmental Council of Zambia (2010 Annual Report) ZEMA recognized the need to increase environmental awareness and public participation in the environmental strategy. The aim of the strategy was to enhance coordination to the environment and natural resources sector through improved environmental awareness.

3.4 Previous studies

The Air pollution Information Network for Africa (APINA) was formed to address issues related to Air pollution in Southern Africa. It was a network of scientists, policy makers, Industry and Non-Governmental Organisations (NGOs). The APINA network aimed to form a strong link between the air pollution scientific community and policy makers at national and regional levels.

Previously, APINA linked different networks and programs on air pollution in Southern Africa and in the future aimed to cover the whole of Africa. AFRICA CLEAN was also a network of African experts in urban air pollution which had concentrated on information collection on transport based pollution.

The National Association for Clean Air (NACA) of South Africa also brought together a broad spectrum of experts on Air pollution from South Africa. All these organisations played a major role in collecting and collating information that was useful for decision making. Quality Act 39 of 2004.

Lack of information and understanding of gasoline engine performance were the challenges they faced. Also the other challenge was that the localized air pollution sometimes transferred the pollution from one site to another. This was the case in congested residential urban areas where chimneys were used to eject smoke from the house only to create outdoor air pollution due to poor airflow rates and low heights of the chimneys. As such an integrated approach was to be adopted when addressing air pollution.

3.5 Comparative Study

The comparative study on information dissemination on environmental pollution protection started by generating awareness among the societies so that it grew into part of their lifestyle. The objective of environment on pollution included awareness, knowledge, attitudes, skills and participation of people in protecting the environment (Sharma, 2013). The study also showed that over recent decades, global problems relating to pollution had increased

According to the World educators and environmental specialists have repeatedly pointed out that any solution to the environmental crisis would require environmental knowledge and deeply rooted understanding in the environmental pollution (Deka, 2013).

3.6 Personal Critique Summary

This chapter dealt with environmental awareness and forms of pollution. Then methods used to disseminate information on environment pollution had also been reviewed. Some methods were not effective in that they dealt with a small elite group such as government officials being educated on environmental pollution and ended there. These methods of awareness did not further discussed ways of enlightening the public as they were a major factor. Other governments had not put environmental pollution as priority while for other states; it was first on the agenda. Japan for instance had taken strict measures to ensure that pollution was combated including participation and contribution on the international scene. Some countries lacked political will while others had educated personnel or staff but were failing to come up with effective strategies on how to enlighten the public. (Eckersley, R. 1992) [9]. some of the relevant research works which had been discussed were on Nigeria. The Nigerian government, through the Federal Ministry of Environment (FMENV) formerly known as Federal Environment Protection Agency (FEPA) made efforts to disseminate information on environmental issues, which was highly recommendable as a reflection of political will.

3.7 Establishment of the gap

The results in the study showed that some gaps existed which needed to be filled. With regard to environmental awareness on Environmental Pollution in Zambia, there was a dearth of literature. One of the examples of the gaps identified included insufficient information to the local people on environmental pollution. ZEMA should, at all cost, make people aware of the importance of preserving their environment by not polluting it through various forms of pollution.

The other one was lack of information on the mechanisms that had been put in place to combat pollution. ZEMA should from time to time, organize meetings with the various local people in disseminating information on environmental issues especially pollution. The researcher strongly felt that these gaps needed to be filled in one way or another so as to ascertain whether there were Environmental education

activities on Environmental pollution taught to residents of Chilenje Township to fully understand the effects of polluting their areas.

4. Environmental Issues

4.1 What are some of the challenges faced in the process of sensitizing local communities on the dangers of pollution?

- Changing certain traditional ways of doing things that is people still believing in digging pits to throw waste instead of paying a waste collection
- Un-willingness of some of the community members to participate because of poor attitude
- Persistent poor environment practices
- Low levels of Literacy or education.

4.2 What measures would you recommend to be put in place to combat pollution in Lusaka district?

- Collaborating more with Agencies and relevant stakeholders in issues of environmental pollution protection
- Promote Environment programs aimed at encouraging the community to desist from those poor practices
- Proper enforcement of by-laws in the City

4.3 Briefly explain methods used by ZEMA in disseminating information on Environmental pollution.

- Radio Programs
- Information on ZEMA Website
- Advisory role from inspectorate
- Brochures, Newspapers and Television

4.4 What are some of the mechanisms put in place to ensure that local communities are sensitized on environmental protection?

- Training and Complaint Follow-ups
- They had put in place Ward Development Committee offices to be link between the Community and the Local Authorities.
- Door to door sensitization in the pre-urban

4.5 What are some of the measures taken to ensure that local communities are protected from pollution?

- Issuance of licences to facilities
- Compliance monitoring
- Audits by ZEMA
- Random checks
- Issuance of Orders

4.6 Contextualising the findings

Gbehe (2004) [11] pointed out that the causes of most environmental challenges take their origins in the developmental process or in its failure and inadequacies. As human societies continue to change from traditionalism to modernism with rapid technological advancement and increasing industrial production to satisfy growing human needs and comforts to improve civilization, new life styles and increased production activities have created unexpected environmental pollution. The present study discovered that domestic activities and lack of dumping sites were major sources of pollution in Lusaka district. The environment is highly polluted especially in the markets.

Much of the prior literature has pointed to the importance of disseminating information on pollution to people and engaging them in programs to combat pollution. The survey therefore asked respondents to state whether ZEMA sensitizes them on pollution issues and if at all it engaged them in the program.

On the effectiveness of information dissemination to the local people, pollution awareness programs by other organisations, other than ZEMA, were confirmed by only a small number of people.

4.7 Limitations and strengths of this study

- The limitation had to do with data collection. It was difficult to interview key informants on time because of their busy schedules.
- This study is broad enough to be generalized to other districts.

5. Demographic and Environmental Pollution Awareness

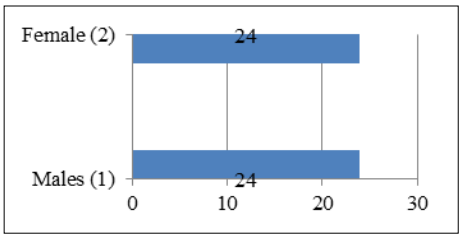
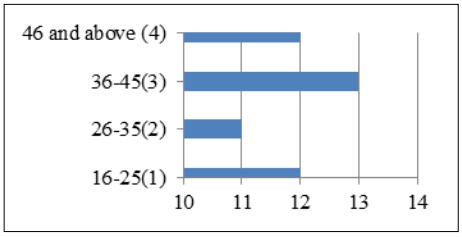
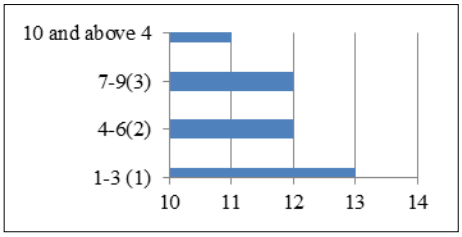


Fig 1: Gender range



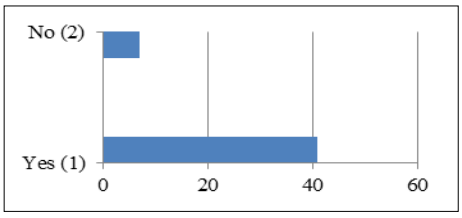
Majority being in the age range of 36-45.

Fig 2: Age range



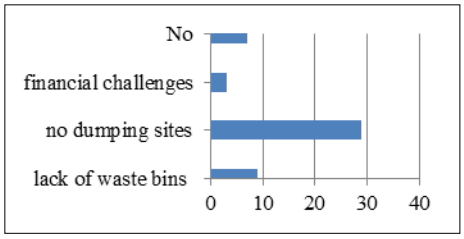
Residents between 4-2 and 7-9 had lived in Chilenje Township for Twelve years

Fig 3: Residence range in Chilenje Township



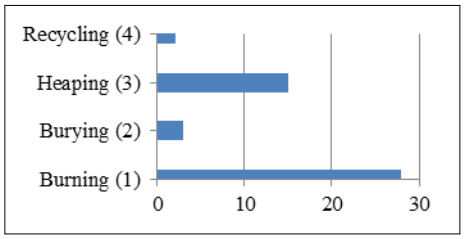
41 people had encountered difficulties in waste disposal while 7 did not.

Fig 4: Pollution Awareness



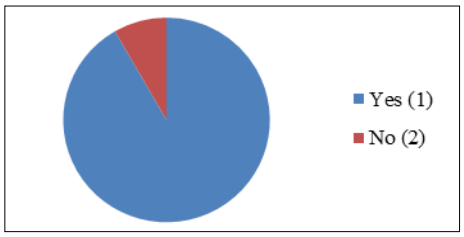
Lack of dumping site – 29, Lack of waste bins - 09
Financial challenges - 03

Fig 5: Problems of Waste Disposal



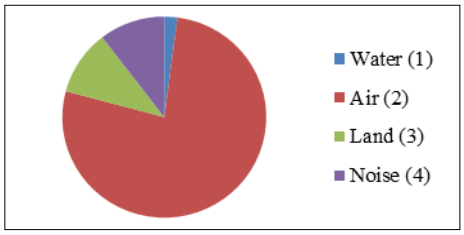
Recycling – 02, Heaping - 15
Burying – 03, Burning - 28

Fig 6: Methods of Waste of disposal



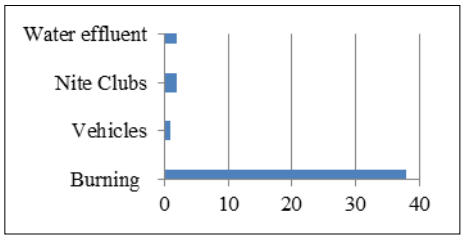
Yes – 44, No - 04

Fig 7: Experience Pollution



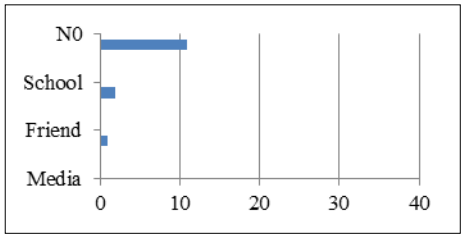
Water – 01, Air – 37, Land – 05, Noise -05

Fig 8: Forms of Pollution



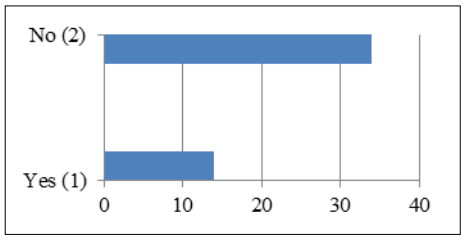
Burning – 38, Night clubs – 05
Vehicles – 04, Water effluent - 01

Fig 9: Source of Pollution



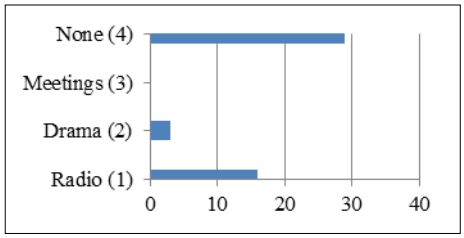
No – 11, Media – 34, School - 02

Fig 10: Heard of ZEMA



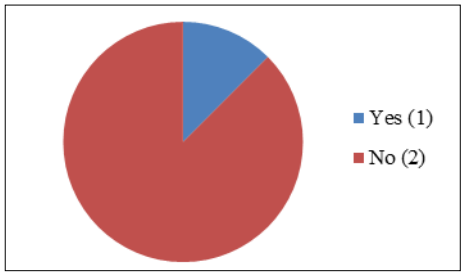
Yes – 14, No - 34

Fig 11: Pollution Awareness



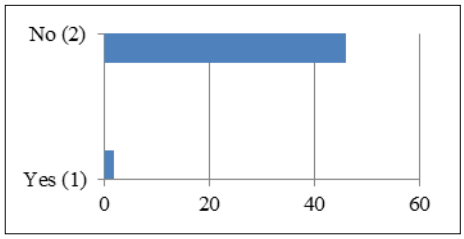
Radio – 16, Drama – 03, Meetings – 0, None - 29

Fig 12: Media used by ZEMA



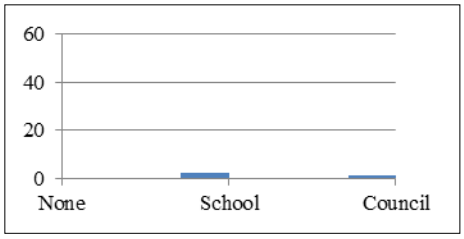
Yes – 06, No - 42

Fig 13: Local people in pollution Awareness



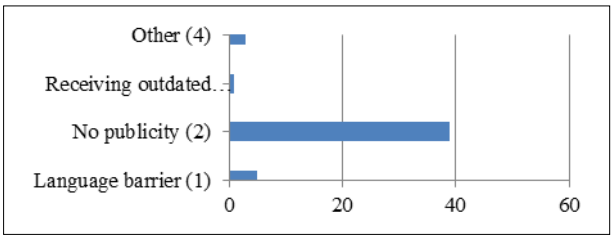
No – 46, Yes - 02

Fig 14: Sensitization programs done by ZEMA



None – 45, School – 02, Council - 01

Fig 15: Whether other organization conduct pollution awareness



Other – 03, No publicity – 39, Language barrier - 05
Receiving outdated information – 01

Fig 16: Challenges faced in accessing information on pollution

6. Conclusion

The research was conducted on Chilenje residents, Lusaka District to find out the methods used by Zambia Environmental Management Agency (ZEMA) in disseminating information on Environmental pollution awareness and the study revealed that Air pollution was the major form of pollution residents experienced.

The findings also revealed that quite a number of people did not know the media which ZEMA used to disseminate information and that local people were not involved in Environmental pollution awareness. Neither do any other organisations hold pollution awareness.

The findings further revealed that residents had difficulties in disposing off their waste and the problem was due to lack of dumping site and financial challenges in engaging garbage collection companies. This prompted residents to dispose of their garbage through various methods such as heaping, burying and burning which again brought form of pollution to the residents such as water, land, air as the sources of pollution. In conclusion, from the findings it could be said that air pollution was the major pollutant that residents experienced in most areas. With information access on Environmental pollution awareness, these residents would have known how to combat pollution in Lusaka District.

7. Recommendations

With regard to the findings of this study, the researcher recommends the following to the management of Zambia Environmental Management Agency (ZEMA).

1. ZEMA should embark on sensitizing people on the dangers of pollution
2. ZEMA should deploy more field workers so as to reach even remote areas when disseminating information on pollution.
3. Organisations involved in pollution awareness programs should be using local languages when disseminating information
4. Improved collaboration between ZEMA and community groups involved in disseminating information on pollution
5. Government should put up measures to penalise all culprits of environmental pollution.

It is hoped that if at all the above recommendations are considered by authorities concerned, and then more lives of people will be protected as pollution issues will be tremendously reduced.

Creation of environmental awareness to local people is the best option to curbing problems of environmental pollution. This will be achieved by monitoring and organising workshops, conferences, and seminars to educate the public on how to manage, and improve on the relationship between human society and the environment in an integrated and sustainable manner.

All in all, there is an urgent need for people to be informed on the benefits of preserving their environment and have a better society.

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