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MANAGEMENT OF ZAMBIA'S CHONGWE RIVER
CATCHMENT THROUGH ENVIRONMENTAL
EDUCATION.

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Abstract

Introduction: Degradation of river catchment is a major concern world over. Environmental Education is a vital tool to reduce or stop environmental degradation. Several of the environmental problems presently faced by humankind are directly or indirectly caused by misunderstanding of the society about Environmental Education. To address river catchment degradation, this study is in line with priority area 5 of the Global Action Programme (GAP) on Environmental Education and Sustainable Development which emphasises the need for researchers to accelerate sustainable solutions to existing social problems at local level through educational intervention strategies.

Purpose: This study explored the management of river catchment through Environmental Education in Chongwe river catchment. Prior studies on the Chongwe river catchment lacked education approach in addressing the environmental degradation in the catchment. The objective of this study was: to assess the nature of Environmental Education programme taking place if any.

Methodology: This study was guided by critical realism view on research. The study used case study design within the stream of qualitative approach. Targeted population included selected ten (10) local people, ten (10) small scale farmers, two (2) traditional leaders and two (2) experts. Participants were sampled through homogenous purposive sampling while experts were sampled using expert purpose purposive sampling. Data collection instruments included interview schedule, focus group discussion guide and participant observation guide. Data was analyzed through thematic analysis. Data validation was through triangulation method that is through mirror data triangulation techniques.

Findings: From the study findings, the environmental degradation issues in Chongwe river catchment were confirmed and it was found that Environmental Education was being offered in the area but it was not adequate to address the degradation because the Environmental Education offered lacked education approach. This resulted in proposing an Environmental Education programme to address the bad activities in the catchment.

Recommendations: Based on the findings, the study recommended that, there should be formation of an Environmental Forum from the local level incorporating the private sectors, creation of an empowerment scheme like bee-keeping and promotion of best practices in the catchment.

Keywords: *Degradation, Catchment, Environmental Education and Management.*

1.1. Introduction

The exploitation of the environment by humans is visible everywhere. Zambia like many other developing countries has not been spared from the effect of environmental degradation. The need to protect the environment has grown to be a huge issue of concern. UNESCO (1997) argued that everyone is aware of the impact of environmental problems in that, we smell them in air, taste them in the water, see them in more congested living spaces and blemished landscapes. One of the ways to redeem nations from this problem is by way of environmental education.

In support of the role of Environmental Education in protecting the environment, the Environmental Education Bulletin of Southern Africa (EEBSA) (2011) stated that people's attitude towards the environment needs to change because the destruction that has been done to the environment will reach a point of no return where the environment will no longer be able to support agricultural activities. The same document further advised that the best way to do this is through education because education is the key to achieving the changes that we need in order to live in a manner that the planet can be able to replenish itself. Education can be done using different media such as print and electronic media houses and institutions of learning. United Nations Education, Scientific and Cultural Organisation (UNESCO) (1980) acknowledged the role media plays in creating public awareness. However, it stated that this type of information has its limitations. The media mainly places emphasis on the superficial or anecdotal aspects of the questions and mainly inform those who are already informed citizens (UNESCO, 1997). This study subscribes to this view by UNESCO (1980) that Environmental Education being an essential issue and answer to our environmental problems do not just need mere awareness by the people, but full participation of every individual. Mere awareness may not give people chance to ask questions and obtain further clarification on some of the environmental concerns that may not be understood.

Chongwe River basin which is found in Lusaka Province of Chongwe District of the Soli speaking people has been providing water resources for agriculture and domestic use. Apart from charcoal burning, farming is the main economic activity in the area. Farming has been practiced since time immemorial and the basin has been providing the needed water resource for irrigation and drinking (Ngongo and Kruaz, 2016). The demand for water has increased to a point where the basin can no longer meet the demand hence the basin drying up during the dry season (Environmental Council of Zambia (ECZ), 2004).

It is generally acknowledged that some socio-economic activities in the catchment contribute to the degradation of the catchment ecosystem (World Wide Fund -WWF, (2011). The increases in the demand for food and energy for the urban population are some of the key root causes of the indiscriminate destruction of natural resources and environmental degradation. To address the issue of environmental degradation in the catchment area such as Chongwe river catchment, Environmental Education programmes could be instituted. These Environmental Education programmes could integrate the values inherent in sustainable development into all aspects of learning to encourage changes in behavior that allow for a more sustainable and just society. It is hoped that Environmental Education will promote and influence change in attitude and behavior of the catchment communities towards their immediate environment while sustainably using and managing the natural resource. UNESCO (1997) stated that education for sustainable development

will help a person in any situation that he may be in and it will assist in being able to make a decision that is beneficial for the environment. Environmental Education will make people understand the implications of their activities on the environment. Sustainable development begins with education (UNESCO, 2014). Therefore, it is important to empower people with knowledge so that they can make informed decisions.

1.2. Statement of the Problem

Chongwe river catchment area had been experiencing environmental degradation due to lack of catchment management in the area. This situation is due to several factors that had contributed to poor catchment management. There was rampant deforestation in forest reserves and customary lands of the catchment headwaters due to charcoal burning and agriculture (Ngongo and Kuraz, 2016). This had resulted in water scarcity which has affected the majority of the locals in the area. In addition, Chongwe district council (CDC) pointed out that increased water demand for irrigation and domestic use, cultivation along the river banks and sand mining also posed a threat to the flow regime of Chongwe river (CDC, 2006). This situation called for serious measures to address the problem. Environmental Education could be such a panacea to the problem at hand. Therefore, this study argued that Environmental Education could contribute to sustainable solutions involving management of the river catchment in Zambia's Chongwe district. Studies by different scholars (Muchanga 2009; Chomba and Sichingabula 2015,) had all focused on technical dimensions of managing the catchment which the most affected and water-dependent communities of the area arguably did not understand. In view of such a situation, this study focused on using the agency of Environmental Education to address environmental degradation in Chongwe's catchment area.

1.3. Purpose of the Study

The purpose of this study was to employ Environmental Education as a means of addressing mismanagement of the Chongwe river catchment area.

1.4. Objectives

To assess the nature of Environmental Education activities that took place if any

1.5. Theoretical Framework

This study was guided by Expansive learning theory. Environmental Education in this study is seen as the only way of developing an awareness of the environment and it's the most effective vehicle for persuading the human race to adopt a rational attitude towards the natural environment and avoid the deterioration of human life as a result of unwise exploitation and misuse of nature (Otiende, 1997).

1.5.1. Expansive Learning Theory

This study was guided by the theory of Expansive Learning founded by Engestrom (1987). This theory involves the creation of new knowledge and new practices. When existing knowledge is developed in a new activity setting, the knowledge gains a different meaning, motives and perspectives.

The theory is connected to the study because it is the theory that emphasizes on learning through experience and change of old ways of doing things. Environmental Education is likely to create new knowledge which is different from the previous knowledge held by the people of Chongwe river catchment area and this would result in new practices of sustainable human activities in the river catchment areas.

2.0. Literature review

Environmental awareness in Zambia is strengthened by the increase in the number and quality of Environmental Education and awareness campaigns. Environmental activities include environmental articles, the print media and environmental programmes aired on radio and television. These activities have helped to set up awareness in the country. The inclusion of Environmental Education (EE) in training courses for journalists is a good orientation and it will increase environmental awareness among the public in Zambia. Other activities that have been carried out include the formation of clubs in schools such as Chongololo Club although it should be mentioned here that these clubs in schools just exist on paper, and are non-functional (Chipatu, 2011). Also the “Keep Zambia Clean, Green and health” campaign activities play a key role in educating the society on the need to live sustainably.

In Southern Africa, Zambia has partnered with other countries like Botswana, Tanzania, Zimbabwe, and Swaziland to sign an agreement on the action plan for the environmentally sound management of the common Zambezi River system (SADCC, 1998). In 1987, these countries signed this agreement which aimed at developing regional co-operation in the spirit of the Lagos Plan of Action (SADCC, 1998). One of the agreements was to monitor socio-economic development that may adversely affect the environment, including the identification for river basin development in general and the identification of ecosystems that could be endangered by the environmental degradation.

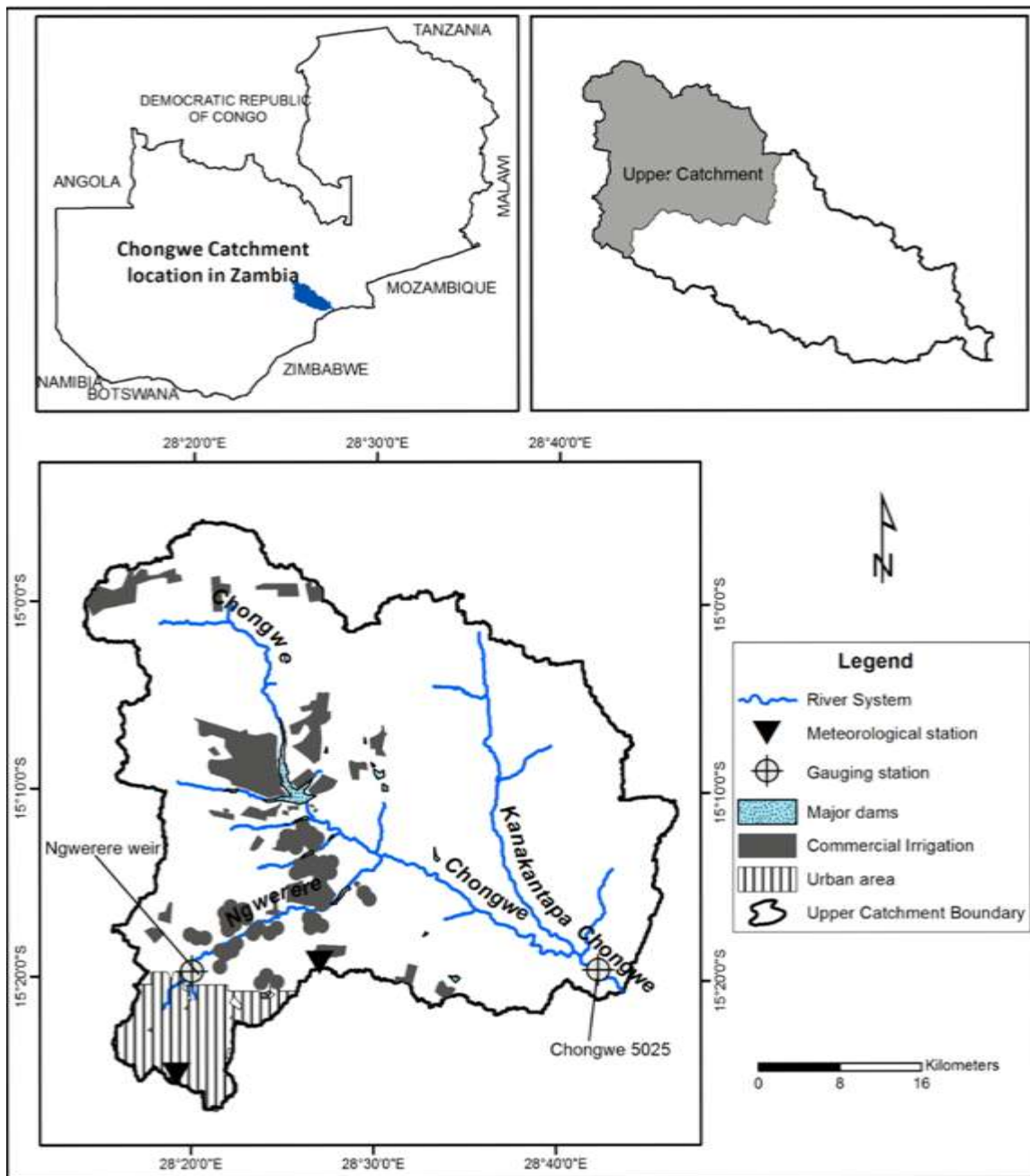
It is, however, not mentioned as to what role Environmental Education could play to reduce environmental degradation and no mention of the communities that are affected as these are cardinal in mitigating the effects. This study adds more knowledge by emphasising the use of Environmental Education and the involvement of all stakeholders especially the ones at the grassroots from the planning stage up to implementation and evaluation. Allowing these to stakeholders to suggest best ways can help to combat environmental problems that affect them as is the case of this research.

3.0. Description of the Study Area

Details of the study area in terms of location, hydrology and land use are presented in the subsequent sections.

3.1. Location

Chongwe River lies in Chongwe District of Lusaka province in Zambia. However, its source is in Chisamba District of Central Province. This study concentrated on the upper part of the basin within the latitude 28 10'E -28 50' and 14 45'S -15 30'S (Ngongo and Kruaz, 2016).



Source: Adapted from Ngongo and Kuraz (2016)

Figure 3.1: The Location of Chongwe River Catchment

3.2. Socio-economic Factors in Chongwe River Catchment

Most of the people within the catchment area depend on crop farming, charcoal burning and pastoral farming (Central Statistics Office, 2010). However, an increase in such activities of crop farming and charcoal burning has increased pressure on the environment and has led to

environmental degradation in the area. The community added pressure on the environment through practicing unsustainable activities like cultivating along the river banks, sand mining, charcoal burning, and brick modeling (CDC,2006). These activities could have contributed a lot to environmental degradation in Chongwe river catchment. If these activities are left an attended to, it would result in the catchment been heavily degraded.

The climate of Chongwe river catchment is described as humid subtropical, with dry winter and hot summers (Chisanga, 2008). Summers are much rainier than the winters. The climate is classified as caw by the Kopper-Geizerssystem (MEWD/JICA, 1995). In Chongwe, the average annual temperature is 20.9⁰c. Although the catchment receives a mean annual rainfall of about 889mm, there have been severe water shortages in the last few years due to the recurrent and continuous drying up of the Chongwe River. This has, in turn, affected the livelihood and socio-economic activities within the surrounding communities (Zambia Water Partnership -ZWP, 2007). The two main woodland types of the study area are Miombo and Munga. The dominant species in Miombo belong to the Genere Brachysteria, Julbernardia, and Isoberlina (Mumbi and Malolwe, 2013). The structure of Miombo woodlands in the study area are dominated by small and medium sizes stems (Zambia Water Partnership, 2007). Munga woodlands are dominated by Acacia species.

Commercial farming is the predominant land use in the catchment whose source of water is the Chongwe River (CDC, 2006). Commercial farming is done in the upper and middle catchment while small scale farming is mainly in the lower catchment (Chuzumba and Baur, 2016). The main crops grown by the commercial farmers are wheat, maize, cotton, and horticultural crops. In the lower catchment river basin, cultivation by the local riparian community is a common agricultural practice which serves as a source of food security and livelihood. Under the small scale farming, the main crops grown are groundnuts, maize, tomatoes, and vegetables.

Chongwe District has a population of 834,359 (Central Statistics Office, 2010). Most of the local people are engaged in charcoal burning as the main source of income (Ngongo and Kuraz, 2016). Some people are involved in small business within Chongwe town. The rapid population growth in Lusaka has placed Chongwe catchment area under great land-use pressure, as most people prefer moving out of town to settle in Chongwe (Mucheleng'anga, et al., 2002). The people depend on the Chongwe River and its tributaries for their domestic water, agriculture, industry, and socio-economic purposes.

4. 0. Methodology

4.1. Research Design

This study employed a case study design. This was done in order to get in-depth information on the degradation in the catchment. Neville (2007) stresses that the case study offers an opportunity to study a particular subject in-depth and usually involve gathering and analysing information that may be both qualitative and quantitative. This case study design was descriptive in nature. This is because current practices would be described in details. Kombo and Tromp (2006) described a case study as a one that seeks to describe a unit in details, in context and holistically. This design fits very well into this study because the researcher was interested in understanding the current

practices in the catchment and get detailed information on the status of the management of the catchment.

4.2. Sampling Procedure and Technique

This study used a non-probability sampling procedure. Under this sampling procedure, the purposive sampling technique was employed to select participants for the study. Purposive sampling technique is a non-probability sampling that is most effective when one needs to study certain cultural practices with knowledgeable experts (Creswell, 2014). It is also used in the identification and selection of information-rich cases related to the phenomenon of interest (Neville, 2007). Purposive sampling was used to select key informants who gave an in-depth analysis of the prevailing situation in the catchment as they are experts in the area of environmental degradation. Expert purposive sampling was used to select key informants. These key informants were forest officers, policymakers, water affairs officer and local chiefs. Table 1 below shows number of participants and sampling technique used.

Table 4: 1, Showing number of participants and sampling technique used.

<i>Participants</i>	Number of Participants	Sample technique used
<i>Department of water affairs(warma)</i>	1	Expert
<i>Commercial and small scale farmers</i>	10	Homogeneous purposive
<i>Local chiefs</i>	2	Expert
<i>Forestry department</i>	1	Expert
<i>Local residents</i>	10	Homogenous
Totals	24	

Source: field data 2018

4.3. Method of Data Collection

This section outlines the methods that were used in data collection. The methods are outlined in the table 2 below.

Table 4: 2 Methods used.

Method	Instruments	Data type
Interviews	Semi-structured interview	Qualitative
Focus group discussion	Focus group discussion	Qualitative
Observation	Observation guide	Qualitative

4.4. Data Analysis

Thematic analysis is one of the most common forms of analysis in qualitative research. Themes are patterns across a database that are important to the description of a phenomenon and are associated with a specific research question. Thematic analysis identified a pattern of meaning across a database that provided answers to the research questions being addressed. Thematic analysis was used where the analysis of data started during data collection exercise by ensuring that all field notes were arranged according to the themes in relation to the objectives that were set. Qualitative data were analyzed thematically.

5.0. Results

5.1. Nature of Environmental Education Programmes Offered

The objective of this study was to assess the nature of the EE provided in Chongwe river catchment area. The findings to this objective are addressed in items. 5.1.1 to 5.1.5.

5.1.1 Understanding of the Phrase Environmental Degradation

The participants during interviews and focus group discussions were asked what they understood by the phrase ‘environmental degradation’.

Twenty-seven (24) participants related the phrase to the damage of the environment or contamination of our living spaces. During the focus group discussions, the discussants explained the phrase as making the environment unfit for any activities such as farming. This is what one participant said:

Ndi kuonongwedwa kwa nthaka kupitila mzinchito tichita pa nthaka, zinchito zoipa zimene etichita pa nthaka, (This is the destruction of land through human activities. Bad activities which we do on land).

The understanding of this phrase was very important in that it gave the researcher an insight on how to come up with the proposed EE since learners acquire skills and values easily when they already have an idea of what is to be learned. From the researcher’s observation, it was clearly evident that the majority of the participants had an idea of what the phrase environmental degradation was all about and cited practical examples.

5.1.2 Knowledge about Environmental Education

During an interview, one participant said:

“Environmental Education is the type of education where people learn about their environment how to protect it and how to care for oneself and all the things found in the environment.

On the other hand, another participant during the interview had this to say:

Ndi chobvuta kwambiri kwaine kumasulira cymene aya maianena cifukwa sindina yamverewpo. Kapene andi cifukwa sindina phunzire kwambiri. Ndi namvere za sukulu osatimauawa. Kodi ndi kambe kutiattanthauza kuphinzira: (It is very difficult for me to explain what that word means because I have not heard of it. Maybe it is because I have not gone far on my education. I have heard of the word education but not this one).

This information on understanding EE was very important in assessing how much should be added to the proposed EE programme in order to fill the gaps related to the conception of EE in the Chongwe area.

5.1.3 Types of Environmental Degradation Experienced in the Chongwe River Catchment

The people of Chongwe explained that some of the environmental degradation experienced in the area are as follows; forest degradation (cutting down of trees), soil erosion, siltation, and water pollution.

The table below shows the types of Environmental degradation in the area.

Table 5.1: Types of Environmental Degradation in the Catchment Area

Types of Environmental degradation	Forest degradation
	Soil erosion
	Water pollution
	Siltation

Source: Field data (2018)

The researcher observed that there was deforestation, soil erosion, sedimentation and siltation occurring making the river shallow. Further, it was noted that gardening and farming along the river banks were very common. This has led to the contamination of the water through the application of fertiliser which is, in turn, washed away into the river. Contamination was also confirmed by the Lusaka Water and Sewerage Company (LWSC) technician whose organisation was involved in the contamination of the water. During an interview, one participant said the following:

Muli iyi nchende ya Chongwe tulasangwa na mafwa ayakumine imikalile yesu, pamo nga ukusendwa kwa mushily, ukonaulawa kwa meshi elyo na ukonaula imiti. Ubonaushi ubwingi bwa mikalile yesu buletwa nemicitele yesu fye bekala mushi. Tulngile ukuleka iyi misango iyakocha amalasha. (In this area of Chongwe, we are faced with several forms of environmental degradation such as soil erosion, water pollution, and deforestation. Most of these forms of degradation taking place in our area are due to some of our activities carried out by ourselves the locals in this catchment area. We need to stop some of these activities like charcoal burning).

Forest degradation was confirmed in the area by physical observation through a number of poles cut by tomato growers. This information was very important to the researcher when coming up with the proposed Environmental Education programme.

5.1.4 Causes of Environmental Degradation

Respondents were asked about the causes of environmental degradation and one respondent said that the causes were largely driven by culture while others said degradation in the area was influenced by poverty. The respondents said that poverty was the major challenge because forest products are a source of wood for charcoal. Demographically, the key factor explained was that environmental degradation had been caused by the continued expansion of settlements along the river banks and the forest. During focus group discussions, one discussant said:

Soli culture has been contaminated; we no longer follow our tradition on the preservation of our resources that is why even the river today is drying up, a thing that has never happened. We never used braziers to cook our food. Today, nearly everyone in our villages is using braziers for cooking. This has resulted in more trees being cut. We never used to cut trees for firewood; we only picked dry ones which fell off.

Therefore, indiscriminate cutting of trees, effluent poured into the river, poor farming methods and charcoal production were said to be the major causes of the catchment area degradation. One participant said:

The issue of catchment degradation should be blamed on the lack of information by the people leaving in the area because they are involved in activities that are unsustainable in nature such as cutting down of trees for charcoal burning.

This information was very cardinal in coming up with an EE that will include all topics concerning causes of catchment degradation

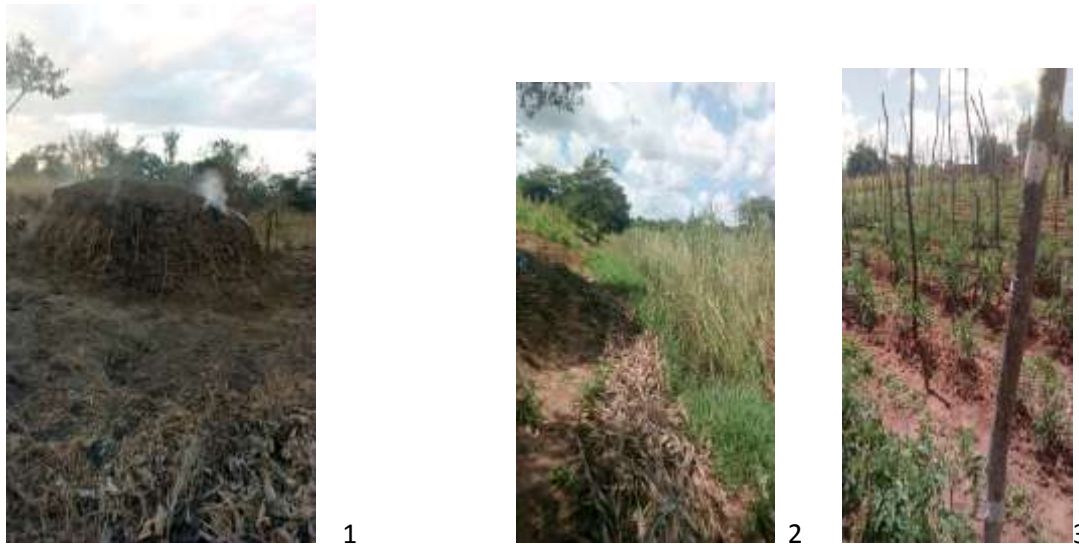
5.1.5 Unsustainable Activities in the Catchment Area

It was discovered that participants through interviews said gardening along the river banks, charcoal burning and construction of houses was detrimental to the effective management of the catchment area as they contributed to its degradation. One participant in an interview said that the effect of river degradation was through poor farming methods which clearly reflected the accumulation of silt along with the water bodies. He went on to say that these bad practices and high dependence on the catchment resources, especially farming by the local communities had adverse effects on the catchment area of Chongwe River. One participant during interviews said:

The problem of the catchment degradation was not new and it started as far back as 1980 when settlers from other parts of the country failed to adhere to the norms and customs of the land.

Deforestation and unsustainable land use in the catchment contributed to increased sedimentation in the water bodies of Chongwe River. The pictures below show some of the unsustainable practices which have had effects on the catchment area.

Figure 5.1 shows charcoal burning in the catchment as one of the activities that contribute to the degradation of the catchment. This information was very cardinal to the researcher so that the proposed EE programme in the area would tackle all these activities which are contributing to the degradation of the catchment.



Source: Field data (2018)

Figure 5.1: Charcoal Burning in the Area **Figure 5.2: Cultivation along the River Banks**

Figure 5.3: Poles Used for Tomato Growing in the Area

As evidenced by the participants' views during focus group discussions, the above pictures were in complementary to what was observed by the researcher.

6.0. Provision of Environmental Education

The objective of this study was to assess the nature of EE provided in the catchment area. This was addressed in items 6.1.1 to 6.4.5.

6.1.1 Understanding of Environmental Degradation

It should be stated here that some of the participants interviewed had no idea about environmental degradation. This could be due to a lack of exposure or accessibility to information as they seemingly were not educated since learners acquire skills and values easily when they already have an idea of what is to be taught. The failure of some participants to have knowledge of environmental degradation could also be attributed to the scarcity of comprehensive EE

programmes in place. This lack of knowledge poses a danger to the environment. Puttan (2011) gives a comprehensive answer by stating that environmental degradation is the degradation of the environment through depletion of resources such as air, water and soil. As a result, the above situation calls for an education that will help the people of Chongwe river catchment understand what their environments are, if they are to avoid degradation in the area.

6.1.2 Knowledge about Environmental Education

The data collected on the knowledge about Environmental Education indicated that there were some participants who did not know that there was Environmental Education in the area. It was also observed that those who had knowledge about Environmental Education were mostly those who had formal education and those who were attending EE programmes in the area. This finding is in line with the National Project for Excellence in Environmental Education (2005), which argued that environmental education is a process that aims at developing an environmentally literate citizenry that can compete in our global economy, has the skills, knowledge and inclinations to make well-informed choices, and exercise the right and responsibilities of members of a community. Hence, critical understanding of the Environmental Education helps citizens to know environmental problems they would face and be in a position to combat or prevent them. UNESCO (1985) agrees with this assertion and outlines a twofold purpose of EE as that of educating citizens capable of being responsible to the environment and makes various populations more conscious of the eco-system and social-cultural environment they lived in and by activities they were engaged in.

6.1.3 Types of Environmental Degradation Experienced in the Chongwe River Catchment

The residents attributed environmental problems they faced in the area to lack of seriousness among EE providers. They contended that Environmental Education providers in the area were not serious in helping the residents to understand the consequences of their activities in the catchment. Every year there were reports of the river drying up but there was no action taken to address the problem. It was also found out that gardening and farming along the river banks were very common. This had led to the contamination of the water through the application of fertiliser which was washed into the river during the rainy season. Contamination was also confirmed by one of the organizations which provide water to the residents. Deforestation was confirmed in the area by physical observation through a number of poles cut by tomato growers.

It was evident from this information that the types of environmental degradation experienced in the area were due to a lack of awareness and lack of knowledge. If these problems were not tackled on time, people in the area would be affected due to these environmental problems. Issues of soil erosion, water pollution, water scarcity and deforestation needed to be addressed as soon as possible before serious problems occurred in the area. Related studies by Chisanga (2008) on Chalimabana Upper Catchment equally showed that local people were affected with environmental problems such as deforestation, soil erosion, and water scarcity.

It should be mentioned here that these environmental problems arising from the lack of understanding of environmental issues could be curtailed by educating residents in the sustainable management of river catchment area through EE as they acquire knowledge that helps reduce or even stop these problems in the area.

6.1.4 Causes of Environmental Degradation

The causes of environmental degradation are largely driven by poverty. A religious factor was supported by participants who said that religious festivals also contribute to environmental degradation in the catchment. Social factors were also one of the actors that had contributed to degradation in the area. Others have argued that there were many factors but the combination of the two causes; socio and economic factors were the most prominent. Poverty was highly ranked as one of the main causes of environmental degradation in Chongwe. The findings in this study conform to literature from the Environmental Council of Zambia (ECZ, 2000) which presented that poverty was the underlying factor in Zambia in as far as environmental degradation was concerned. The Environmental Council of Zambia report revealed that unless poverty levels were reduced drastically in Zambia, the Zambian environment would suffer extreme degradation with a negative impact on both humans and biodiversity. This was very true in the research area because types of environmental degradation common in the study area affected the residents in many ways.

6.1.5 Nature of Environmental Education Provided

The data collected from the participants did not point clearly the type or characteristics of Environmental Education provided in the catchment area. Participants were not able to point out clearly what was being offered in the area. There was no connection between environmental issues faced in the area and its impact on the people. When asked further, the providers said Environmental Education provided was carried out by Agricultural Extension Officers who taught farmers on mitigation measures as a result of climate change. The fact that participants were unable to say the characteristics of EE provided in the area, it points out to one thing. The EE provided was just on paper or never existed at all. This assertion is supported by Chipatu (2011) in a related study where she acknowledged that the implication of failure by participants to identify the characteristics of the EE offered to them was that the EE on offer was either superficial in nature or it was not EE at all. Due to the fact that there was no evaluation, these EE programmes had no impact on the lives of the residents. This has resulted in continued degradation of the catchment area.

Therefore, a responsive EE programme should be able to create awareness, change of attitude and acquire new knowledge by the residents which were not the case with the current EE programme in the area. Chipatu (2011) stresses that it was necessary to promote inclusive EE programme that would offer prospects for learning about sustainability throughout ones' life. In this case, people should acquire skills in managing the catchment area.

It was observed that EE provided in Chongwe education approach on catchment area management and skills. This type of EE provided lacked in many aspects like awareness, skills, change of attitude and management aspects. Therefore, the goal of Environmental Education in this is to develop a world population that is aware of, and concerned about the environment and its associated problems and which has the knowledge, skill and attitude, motivation and commitment to work individually and collectively towards solutions of and problems and the prevention of new ones (UNESCO,1978).

In other words, Environmental Education should be understood not only in the aspects of formal education but also through formal and non-formal or informal education to acquire understanding,

skills, and values that will enable them to participate as active and informed citizens in the development of an ecologically sustained and socially just society. Therefore, it is important to have an inclusive EE programme in the area that will enable the residents to tackle the issue of environmental degradation as one force. To ensure the use of best practices in the catchment area management, EE programmes should guarantee that all stakeholders were involved. This, therefore, entails that there should be more EE activities in the area so that the participants could be educated further on the issues affecting their environment.

Conclusion

River catchment area degradation is a global problem. In Zambia and specifically Chongwe River Catchment Area, it is a serious problem that affects the sustenance of the catchment area and the local people as their livelihood depends mainly on the catchment area. The application of using Environmental Education in river catchment management may not apply to other areas but to Chongwe River Catchment Area. Its significance was seen as it helped raise awareness among the participants on how they contribute to catchment area degradation in the area and how they could be co-providers of the solution to the problems. Therefore, education fosters human change in thinking thereby transcending the learnt ideologies to practical activities.

Several factors were attributed to the degradation of the catchment area such as cultivation along the river banks, cutting down of trees for charcoal, and gardening. Despite several factors having been established as the major contributors of degradation in the catchment area, lack of knowledge on the management of the catchment was the major contributor to the environmental degradation occurring in the catchment area. In order to have a sustained catchment area, there was a need for well organised Environmental Education in the area so that people would learn to appreciate their environment.

Having considered the nature of EE being offered in the area, it was imperative that a proposed EE programme was to be put in place to address and fill up the gaps that had been observed during the period of the study. It should be noted here that for the success of this proposed, Environmental Education programme, the residents should be incorporated in the planning, implementation, and evaluation.

Recommendations

In the context of Zambia, prior studies such as those by Chisanga (2008) and Ngongo and Kruaz, (2016), show that some researchers have conducted studies on the Chongwe River catchment area. However, their studies lacked an Environmental Education component as they used technical approaches in their methodology and could not explore the management dimension as a measure to address environmental degradation in the catchment area.

Kufer (2015) stressed that the Zambian government has acknowledged deforestation, soil and land and water degradation as key environmental problems that Zambia needs to address to ensure sustainability. She went further to say that the main shortfall in the current Environmental and Natural Resource Management is the lack of effective community engagement and participation in conceptualization and implementation of the strategies. None of the scholars seemed to follow up to ensure that the community is made aware through sensitization and education. No scholars

outside Zambia had mentioned as to what role Environmental Education could play to reduce these effects and there is no mention of community involvement. Therefore, the lack of information on how Environmental Education can be used as a tool to manage catchment degradation is the gap that led to this study to be undertaken.

The locals should be involved in all the stages. This would ensure a successful EE programme. In the selection of the topics, materials, and language to be used, the locals would play an important role in suggesting what they feel is best suited for them.

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