CHAPTER 1
INTRODUCTION

1.1 Introduction
This study assesses the perceived impacts of environmental education on land degradation in Arda Transau, Manicaland. As the introductory section, this chapter presents the background to the study, statement of the problem, aim and objectives. The description of the study area is also explored and finally the limitations, definition of terms and the organisation of the study.

1.2 Background to the study
In 2010, the community of Marange faced forced relocation due to diamond mining operations. At first, 136 families were earmarked for relocation but as the mining activities increased, the number of families increased to 500 with 4,321 membership (Makore, 2013). The companies involved in mining projects included Mbada Diamonds, Diamond Mining Corporation, Canadile, Anjin, Jinan, Rera Diamonds and Marange Resources. These companies were considering relocating communities to Arda Transau and the transfer process posed a serious threat to the health and livelihoods of local community members. The mining companies and complicit government officials threatened to relocate the communities to a farm just outside Mutare (Arda Transau) before housing, schools and clinics had been put in places. Some community members were initially settled in tobacco-curing barns because there were no housing facilities at the relocation site. Due to lack of adequate housing, the arbitrary and violent nature of the relocation process also meant human life was at risk (Makore, 2013).

In addition, once relocated, some community members lost livestock when they failed to adjust to the new environment. Other relocated community members also lost livelihoods as they had been primarily engaged in trading and farming on the lands they now could not access (Makore, 2013). As a result, there was pressure on the land and that pressure resulted into serious land degradation. Zimbabwean press, schools and agents like Environmental Management Agency (EMA) and Zimbabwe Environmental Law Association (ZELA) have been active in their participation in natural environment conservation. According to Masuku (2016) the people of Arda Transau received knowledge concerning their environment through the management from EMA and ZELA, taking into account the fact that the settlers in Arda Transau in particular, were responsible
for massive environmental degradation. Assessing the role played by the Zimbabwean press, ZELA and EMA through their active participation in natural environmental management, examining the discourse applied by both the Zimbabwean press and EMA in a bid to strike the hearts and minds of the Zimbabwean society for it to conserve and effectively manage the natural environment using the knowledge gained and the indigenous knowledge within their society (Press and Environmental Management Agency, 2016).

The initiative by the Zimbabwean government to integrate environmental education into the school curriculum is commendable because Zimbabwe’s economy is largely dependent on the country’s environment and natural resources (URT, 2004). However, natural and human-made environmental issues and problems, like drought, floods, poor sanitation, lack of clean and safe water, land degradation due to poor agricultural practices, unsustainable ways of harvesting natural resources like mining, forests and fishing, environmental pollution and loss of biodiversity are threatening the life support system of the environment (MoEVT, 2005; MoEVT, 2007). These problems are a result of various factors like population pressure, poor agricultural practices and high rate of urbanisation (Johnson-Pynn & Johnson, 2005; Sheridan, 2004). Therefore, education for awareness-raising and finding solutions for these issues and problems is considered necessary. Also, to attain quality life we need to live in a healthy and well conserved environment. In improving the quality of life and social well-being of its people, Zimbabwe has, as one of the goals of the country’s national strategy for growth and reduction of poverty to “Increase access to clean water, affordable and safe water, sanitation, decent shelter and a safe and sustainable environment.” (Agenda 21, 2006). Thus, the overall aim of environmental education is to develop an informed citizenry that is environmentally conscious and motivated to actively participate in managing and sustainable use of its environment. This led to the integration of environmental education into the formal curriculum at all levels. The core aim is to enable pupils in schools to develop knowledge about their environment, and an awareness of environmental issues and problems so that they can take an active part in seeking and implementing solutions to the problems facing them in their environment (Sheridan, 2004). As a result, education would develop environmentally responsible citizens, because through environmental education they would develop knowledge skills, concern and positive attitudes towards the environment. However, environmental education is not a new phenomenon in the schools. For example, there were
components of environmental education in schools in the subjects like domestic science, Agriculture, Science and Geography (Kimaryo, 2015). The subjects were considered to be environmentally oriented subjects and therefore it was believed that they could make a significant contribution to environmental education (Bolscho & Hauenschild, 2008; Chi-chung Ko & Chikin Lee, 2003). Therefore, the researcher is going to assess the impact of environmental education on land degradation in Arda Transau.

According to Katere, Hill and Moyo (2001) effective management of natural resources is essential for long term sustainable development in a region. Sustainability of natural resources can only be successful only if the communities have basic knowledge on how to safeguard, conserve, and protect their environment. Greater achievement in environmental sustainability can only be a dream comes true if the communities can manage their own environment using acquired knowledge and the indigenous knowledge within them. Reducing threats and pressure on the environment would lead the environment to be able to regulate itself as a result that improves the living standards and life expectancy of the community. Hence, the researcher aims to identify land degradation management activities, assess the level of knowledge on environmental degradation among the residents and to assess the challenges faced by the community in managing land degradation in Arda Transau.

1.3 The study area
The study would be carried in Arda Transau farm in Odzi, about 24 kilometers west of the city of Mutare town in Manicaland (Mwonzora, 2011) (see figure 1.1). Arda Transau spans 12 000 hectares and runs along the Odzi River. It was a highly productive farming area, under irrigation, and was divided into grazing and farming zones that produced much for Manicaland and the whole country. Arda Transau is a village within the province of Manicaland, Zimbabwe located 24 kilometers west of Mutare just off the main Harare-Mutare road. Over 500 Manicaland families from Chiadzwa diamond fields have been relocated to Arda Transau Relocation Village some 24 kilometers from Mutare. As the mining activities increased, the number of families rose to 500 with 4,321 membership (Makore, 2013).
Figure 1.1: Map of Arda Transau
The upper Odzi River catchment area in the eastern areas of Zimbabwe is one of the most erosion-prone areas in the country (Stocking and Elwell, 1973a). Total catchment area is 2,486 km²; altitude difference is large, 950 to 2,160 m; geology is dominated by granitic bedrock and weathered sandy soils; population density is above 60 persons per km² in large parts of the catchment; land use is a mixture of communal lands, commercial farms and forests; main crops are tobacco and wheat on the commercial farms and maize, rapoko and sorghum on communal lands where the number of livestock is high, (Lidén, et al, 2001). The climate is seasonal with a rainy season from November to March. Average rainfall is 700 to 2,000 milliliters per year and average runoff is 150 to 400 mm·yr⁻¹, the upper mountainous parts receive the highest amounts. The irregular seasonal availability of water has led to the establishment of irrigation systems. River abstractions, canals and small weirs are commonly found in the catchment. The three main reservoirs on the Odzi River are Osborne, Smallbridge and the Odzani. The Odzani and Smallbridge provide the city of Mutare with fresh water, while the Osborne Dam was constructed in 1990 for downstream irrigation purposes. The dam, which is located just downstream of the Nyatanda and Odzi confluence, has a total capacity of 400 mm³ and acts as a sediment trap for a large part of the catchment (Lidén, et al, 2001).

### 1.3.1 Socio-economic

Nyoni et al (2013) concurred with Lidén et al (2001) when they highlighted that, in the communal areas, farming is performed on a much more intensive basis. Small fields are mainly used for maize cultivation; in the drier areas; however, rapoko (a maize-relative) and sorghum (a relative to sugarcane) are cultivated. Cattle and goats are the most common livestock. In the mountainous parts of the catchment, land is mainly covered with forests and in some areas companies carry on forestry. Big plantations of pines and gum trees, which are clear cut when it is time for harvesting, are common.

### 1.3.2 Physiographic

The geology of the area is dominated by granitic bedrock and in-situ weathered sandy soils. The landscape is hilly, especially in the upper parts where the mountains reach heights up to 2,000 m but also the western spur of Chimanimani mountains where some tributaries rise. Granite forms
the foundation of the area. The bedrock is very old; around 3.8 billion years. In fact, it is among the oldest geological formations that can be found on earth since the area is situated in the middle of the continent and therefore not recently exposed to tectonic movements (Nyoni, 2012). This also means that the bedrock is strongly weathered and bare rock is rarely seen except for the mountain peaks. The soils within the river basin are mostly of igneous origin and rather thick. The parent material is the underlying bedrock since most soils have been formed in situ. In some areas, red clay is found. One important factor could be that compared to a clayey soil. The vegetation is sparser on a sandy soil and thereby the soil is more easily eroded.

1.3.3 Hydrology
The climate is seasonal with a rainy season from November to March. The upper catchment area receives up to 1500 mm rainfall per year while the area west of the river is much drier and receives about 450 mm/year and average runoff is 150 to 400 mm/year with a coefficient of variation of 174%. The upper mountainous parts receive the highest amounts. The irregular seasonal availability of water has led to the establishment of irrigation systems. The average potential evapotranspiration is around 4 mm/day in the catchment area (Nyoni et al, 2013).

1.3.4 Demography
The prevalence of poverty in Zimbabwe including Arda Transau, was estimated at 63% with 16% estimated to be in extreme poverty. Poverty is more widespread in rural households (76%) compared to the 38% in the urban areas. A total of 30% of the rural people are extremely poor compared to 6% in urban areas. The proportion of extremely poor rural households was 22.9%, this fell from 50.4% in 1995/6 and 42.3% in 2001 (ZimSTAT, 2013). The prevalence of poverty among female headed and male headed households was almost the same at 62% and 62.9% respectively (ZimSTAT, 2013). A total of 63% of the households reported having inadequate labour from household members for normal agricultural activities. These households may not be able to reach their agricultural potential if they do not get resources (financial and technological) to supplement the available labor (Cunguara and Darnhofer, 2011).
1.4 Statement of the problem
Arda Transau was a vacated area by the white farmers and was left bare for some time and the trees, thorns, grass and twigs have been regenerating since then. The problem came when the Government of Zimbabwe decided to resettle the people from Chiadzwa following the diamond mining projects. Within a space of six months after resettlement, the area was more of a desert. A large number of people in the area are surviving and earning a living on the local environment and land degradation has been and is still a challenge to Arda Transau. This alone shows that there is a problem in managing the environment in the community either due to poverty, population growth or lack of environmental education. However, consultations with the local authorities indicated that the community has been trained and there are awareness campaigns on environmental management. This means that the community has received environmental education in one way or another but no study has been carried out to assess the impact of environment education on land degradation in Arda Transau. Therefore, this study aims to assess the land degradation activities, the level of knowledge on environmental management, and the challenges faced by the community in managing the environment.

1.5 Aim
The study aims to assess the impact of environmental education on land degradation management.

1.6 Objectives
1. To identify land degradation management activities in Arda Transau.
2. To assess the level of knowledge on environmental degradation among the residents in Arda Transau.
3. To assess the challenges faced by the community in managing land degradation in Arda Transau

1.7 Research questions
1. What land degradation management activities are in Arda Transau?
2. What level of knowledge on environment education do the people of Arda possess?
3. What are the challenges faced by community of Arda Transau in managing land degradation?
1.8 Justification of the study
It is hoped that the study will help EMA, ZELA, teachers, local administrators, communities and NGOs working in Arda Transau community, Zimbabwe, and the world at large to curb land degradation which is a threat to food security. This study would help to address residents’ problems and help the environmental organisations to close the gaps. Besides, the study is going to spell out the management activities, the challenges faced in land management and levels of education the residents of Arda Transau. More so, this research study will fill the gap in literature and therefore contributes to the still sparse evidence on the link between Environmental Education and the practices in Arda in order to move towards sustainable land management.

1.9 Limitations of the study
The study is to be carried out in Mutare District of Manicaland province in Zimbabwe in Arda Transau, a relocation area with a population of 500 families. The research had its limited time, which forced the researcher to stick only to three research methods; the interviews, questionnaires and observations. Due to restricted time, the researcher had imprison the researcher to adhere to purposive selection of the residents in Arda Transau, ignoring all other residents. The study is not sponsored, therefore, financial constraints affected coverage of a large sample. Hence the researcher sticks to a limited sample of one hundred participants.

1.10 Definition of terms
Degradation is any change in the condition of the land which reduces its productive potential or is the deterioration in the quality of land, its top soil, vegetation, and/or water resources, caused usually by excessive or inappropriate exploitation.

Land degradation can be viewed as any change or disturbance to the land perceived to be deleterious or undesirable (Eswaran, 2001).

Environmental education as the key concept in this study is defined as education that helps individuals to become more knowledgeable about their environment and to develop responsible environmental behavior and skills so that they can improve the quality of the environment (Nordström, 2008). Knowledge about people’s perception about the environment and how they relate to it has been found to be of importance in the adoption of attitudes and environmental
behavior and also in the teaching and learning of environmental education (Ballantyne and Packer, 2015). **Environmental education** is a process that allows individuals to explore environmental issues, engage in problem solving, and take action to improve the environment. It is a methodology in which people pick up familiarity with their surroundings and secure learning, abilities, values, experiences, and passion, all of which will empower them to act – separately and aggregately – to take care of present and future environmental issues. As a result, individuals develop a deeper understanding of environmental issues and have the skills to make informed and responsible decisions (EPA, 2017).

**Sustainable development** is a concept which came into life when sustainable development (SD) became the agenda for development forums. Sustainable development was initiated as a result of conflicts between social development, economic growth and environmental conservation (Kimaryo, 2015). At intervals, economic growth has been achieved through unfair deals without taking into consideration the environmental consequences and the communities whose survival depends on the environment and the resources therein. Thus, **sustainable development** is defined as a course of action or development which focuses on environmental protection while using the available resources to meet the needs of the people at present without destroying or exhausting resources because they will be needed by future generations to sustain their lives (Breiting, 2000). It is therefore about bringing social, economic and environmental factors together (Gough, 2002) because none of them can be understood in isolation. It can be said that the essence of introducing sustainable development is to dissolve the artificial boundaries between the environment economy and the society (Kimaryo, 2015). As people needed to be educated about the environment through environmental education, it was predicted that some form of education needs to be put in place to address the issue of sustainable development. Therefore, this resulted into the emergence of education for sustainable development from 1992 (Barraza et al., 2003). The origin of education for sustainable development can be traced back to agenda 21 chapter 36, where it was stated that states should be committed to the promotion of education, public awareness and training in order to achieve socio-economic and ecological sustainability. Therefore, it can be said education aims at empowering people to take responsibility for working for a sustainable future (UNESCO, 2002). The purpose of sustainable development, therefore, as its name suggests, is a sustainable future.
**Environmental sustainability** is a state in which the demands placed on the environment can be met without reducing its capacity to allow all people to live well, now and in the future (Lexicon, 2016).

**Community** is self-organised network of people with common agenda, cause, or interest, who collaborate by sharing ideas, information, resources, and background (Oxford, 2017).

**Sustainable Land Management** is the use and management of land resources – soil, water, animals and plants – for the production of goods to meet changing human needs, while ensuring the long-term productive potential of these resources and maintenance of environmental functions (FAO, 2015).

1.11 Structure of the study

The study has been structured in five chapters. The initial chapter of this thesis presents the background to the study. It aims at introducing the reader to the background of the study to make the reader develop interest in the study. In addition, this chapter sets the foundation on which the study is built. In Chapter 2, there is an overview of literature on land degradation management activities, the level of knowledge on environmental degradation of different communities and challenges faced by community in managing land degradation. A clarification of the key concepts and areas is important in helping the reader understand the study and what is being investigated as this chapter sets out the theoretical basis for the study. Chapter 3 presents the methodology of the study including the research questions and the research approaches and methods adopted are presented and discussed. Chapter 3 also answers questions on how the study was done, who is involved in the study and how the data was analysed. At the end of chapter 3, the aspects of validity, reliability and ethical considerations are presented. This is followed by Chapter 4, which concerns analysis of the data collected for the study. Chapter 5 presents a discussion of the results based on the research problem and the research questions.

1.12 Summary

This chapter described the research problem and also highlighted how the research study will fill the gap in literature and therefore contribute to the still sparse evidence on the link between the knowledge of Environmental Education and the behavior of the people in Arda. The delimitation
of the study was made and the major objective of the study that was used to solve the problem was highlighted. The terms were defined in order to put the discussion into context.
CHAPTER 2
LITERATURE REVIEW

2.1 Introduction
The drive of this literature review, as it measures the impacts of environmental education on land degradation, is to explain how and why the objectives were formulated in their present form. It also highlights how the research strategy was chosen by identifying major supporting research findings in literature and identifying the knowledge gaps. Literature relating to the aims of environmental education, principles of public awareness campaigns and of media respectively will be discussed. This chapter provides the conceptual framework through reviewing literature on the influence of environmental education in communities to move towards environmental sustainability by managing land degradation. Therefore, the survey of literature related to this study was considered in three major areas:

1. Land degradation management activities
2. The level of knowledge on environmental degradation of different communities,
3. Challenges faced by community in managing land degradation.

2.2 Land degradation management activities
Land degradation will persist to be an essential global issue for the 21st century because of its adverse effect on agronomic productivity, the environment, and its outcome on food security and the quality of life (Lal, 2009). Land degradation is a process in which the value of the biophysical environment is affected by a blend of human-induced processes acting upon the land, (Lal, 2009). Therefore, land degradation is a process where the topsoil lost its contents due to physical and human activities. According to Lal (2009) continued productivity impacts of land degradation are due to a decline in land quality on site where degradation occurs (for example; erosion) and off site where residues are deposited. However, the on-site impacts of land degradation on productivity are easily screened due to use of additional inputs and adoption of improved technology and have led some to question the negative effects of desertification, (Eswaran et al, 2001). Hence, land management is key to every community.

The United Nations FAO (2017) defines sustainable land management (SLM) as the use of land resources, including soils, water, animals and plants, for the production of goods to meet changing
human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental function. Also, TerrAfrica (2005) in FAO (2017) defines SLM as the adoption of land-use systems that through appropriate management practices enable land users to maximise the economic and social benefits from the land while maintaining or enhancing the ecological support functions of the land resources. The importance of land degradation among global issues is enhanced because of its impact on world food security and quality of the environment (FAO, 2016). Therefore, the productivity and sustainability of a land-use system is determined by the interaction between land resources, climate and human activities. However, Helbron (2017) had a different view that high population density is not necessarily related to land degradation; it is what a population does to the land that determines the extent of degradation besides, storms, hurricanes contribute much more to land degradation.

SLM is based on the following four principles: targeted policy and institutional support, including the development of incentive mechanisms for SLM adoption and income generation at the local level; land-user-driven and participatory approaches; the integrated use of natural resources on farms and at the ecosystem scale; and multi-level, multi-stakeholder involvement and partnerships at all levels – land users, technical experts and policy-makers (FAO, 2017). For example, SLM is addressing trans boundary land degradation issues, including: “Integrated Management of the Fouta Djallon Highlands, Globally Important Agricultural Heritage Systems, Transboundary Agro-ecosystem Management Program for the Kagera Basin, Using Farmer Field School Approaches to Overcome Land Degradation in Agro pastoral Areas of Eastern Kenya, and Integrated Natural Resources Management in Drought-prone and Salt-affected Agricultural Production Landscapes in Central Asia and Turkey” (CACILM2) (in development). The project has 15 participating countries in Africa (Lesotho, Morocco, Nigeria and Tunisia), East and South Asia (Bangladesh, China, the Philippines and Thailand), Europe and Central Asia (Bosnia and Herzegovina, Turkey and Uzbekistan), and South and Central America (Argentina, Colombia, Ecuador and Panama) (FAO, 2017).

Land degradation is a global problem which needs to be addressed by technology through human activities (Weil, Brady, and Weil, 2016) points that agroforestry technology has been seen by many as a potential solution to this continued problem of declining rural agricultural production in the
tropics and for that matter, the Sudan; Agroforestry as an "informal" art based on knowledge is an age-old land use principle that has been practiced for thousands of years by farmers all over the world. The aim of agroforestry practice is to provide rural communities with timber and wood fuel, control water and wind erosion, improve soil fertility, provide livestock fodder, increase yield, provide income to the rural community, thus contributing to rural development (Weil, et al, 2016). Weil et al (2016) continued, the Forests Act 1989 of the Sudan has already stressed the need to practice agroforestry and obliged large-scale mechanised farmers to leave or to plant a percentage not less than 10% of the total area of a rain fed project, and a percentage not less than 5% of the total area of an irrigated project, in the form of wind breaks or shelterbelts for the purpose of protection and production. Major multipurpose trees that can be grown on agricultural lands in the area include Acacia Senegal, Acacia seyal, Eucalyptus and Ziziphus. These trees can protect the soil against erosion. The trees also enhance infiltration of water into the soil. They “mine” nutrients from deep soil and make them available to shallower depths through (mainly) litter fall. Measures of soil fertility have shown increased levels of nitrogen, phosphorus and organic matter under Acacia trees. Increase in crop yields is estimated to be as high as 15%. More research is needed on the critical role windbreaks and shelterbelts play in increasing agricultural production (Weil et al, 2016). Mukwada (2000) added that in order to prevent soil erosion plant species which can easily adapt to the prevailing environmental conditions can be grown in areas that have high rates of soil erosion. Then afforestation of different species of trees is key to defend land degradation adverse impacts.

Vegetation cover is vital to target land degradation as it improves the infiltration capacity of the soil because of the bio-pores and interstices which it creates within the soil. Another effective biological measures of soil conservation involves the management of livestock populations which should be within the carrying capacity of the land; this means that the number of livestock should be kept within the limits that can be sustained by the land (Zembe et al, 2014). According to Barrow (1991) in Zembe et al (2014) strip cropping and contour cropping are other biological methods of soil conservation that have become widely accepted. Strip cropping involves the planting of two or more types of crops in parallel strips and ensuring that these crops mature at different times. This ensures that the land is never left bare at any one time in the year. Contour
cropping requires that crops are planted parallel to the contours. Both strip cropping and contour cropping reduce overland flow and soil erosion.

In the view of Mukwada (2000) in research study carried out in Chivi and Zaka Districts, mechanical measures of soil conservation involve the use of man-made or mechanical devices and structures which are capable of controlling the flow of water within specific areas, for instance arable areas. Storm drains are relatively wide trenches that are constructed upslope of the arable land with the intention of diverting overland flow from it. Storm drains are variable in both width and depth, depending on rainfall erosive power and other environmental conditions which prevail within an area. Contour ridges are embankments which are constructed across the slope, within the fields, in order to capture and divert any rainwater which falls above them. The number and spacing of contour ridges depend on both the size of the land to be protected as well as its morphological properties (Mukwada, 2000).

According to the OECD study (2014) there are different approaches to address the green growth concept. For example, three countries attempted to move towards a greener growth - Ethiopia, Kenya and South Africa. Ethiopia’s Climate-Resilient Green Economy Strategy (CRGE), launched in 2011, provides a vision, high level commitment and constitutes important initiatives to promote resource efficient, low-polluting alternatives to business-as-usual economic growth. It builds on an investment plan of over 60 initiatives that are, or can be, turned into financed projects. While building a climate-resilient green economy, Ethiopia’s vision is to achieve middle-income status by 2025. Thematically the investment plan (of +60 initiatives) covers four different areas of pillars of work: (i) Improving crop and livestock production practices, (ii) protecting ZELA website, FAO website, (AfDB et al, 2015; OECD, 2013).

Another land management activity is The Land Degradation Assessment in Drylands (LADA). LADA defines land degradation as a reduction in the capacity of land to perform ecosystem functions and services that support society and development - LADA works with six partner countries: Argentina, China, Cuba, Senegal, South Africa and Tunisia that cover a large share of the world’s drylands. LADA provides tools and products that help countries and regions improve their knowledge and understanding of status, trends, causes and drivers of land degradation; local
assessments, including in-depth case studies of the situations faced by local communities, inform decision-makers of the effects of national policies and actions and help identify bottlenecks, constraints and opportunities to reverse degradation (Kapalanga, 2008).

Green growth will help to achieve sustainable development, but is narrower in scope, and provides a policy agenda that can help achieve concrete, measurable progress at the interface of the economy and the environment. Federal Republic of Ethiopia Report (2011) and re-establishing forests, expanding electric power generation from renewable sources and leapfrogging to modern and energy-efficient technologies. The CRGE strategy is seen as an opportunity for Ethiopia as it focuses on certain critical natural resource endowments, and addresses (socio-economically and environmentally) linked risks facing the country with a comprehensive approach. It identifies low-cost measures, and relies (to a large extent) on attracting international and private finance. One of the crucial factors to reach the target of the CRGE is a sustainable (economically, socially and environmentally) private sector development (Chigumira, 2015). Ethiopia is now moving towards a more diverse economy with investments in commercial agriculture and at the same time the country is also attempting to move beyond agriculture encouraging other industrial investments with large focus on the manufacturing sector. However, in this regard the country is also facing many challenges in terms of low awareness, lack of capacity, policy gaps, and lack of new technology and technological innovation (Chigumira, 2015).

In trying to move towards sustainable energy, the Government of Zimbabwe has proposed supplying 4.5m compact fluorescent light bulbs and introducing a prepaid metering system as ways to improve energy efficiency and reduce peak demand (UNFCCC) in 2015, (OECD and UNDP, 2015). The National Energy Policy notes the importance of improving energy efficiency in the household, transport and agriculture sectors, though this is primarily motivated by cost and supply rather than climate change concerns. The Policy calls for the promotion of energy efficiency across all sectors, for investment in energy efficiency and conservation programmes, for energy efficiency standards and best practices, to promote demand-side management technology production and transfer, and for encouraging farmer-training programmes to include energy efficiency and planning training Zimbabwe’s Intended Nationally Determined Contribution. Zimbabwe’s Intended Nationally Determined Contribution (INDC) was submitted to the United
Msangi (2015) further described that, other than agriculture, approximately 17% of land is formally protected as forest/game reserves and/or national parks where animals are protected for tourists viewing or periodic trophy hunting, a form of land management. While reserves provide for preservation and management of areas with special values or features. Also creating Green Areas Designation that will give local people an opportunity to protect green spaces that have significant importance to their local communities and providing better urban green spaces for the benefit of cities and towns. Support for parks, gardens, and tree planting will benefit people and nature alike. Conservation areas, land that is held or set aside for conservation purposes, and are managed through conservation management strategies and plans that implement general policies and establish detailed objectives for management; no activity can occur in a conservation area without a concession granted by the Department (INTOSAI, 2013).

EAG concept enables communities to take action to manage their resources, through activities such as tree planting, beekeeping and establishment of community woodlots among others. In applying the EAG concept, the community members are trained to engage their local leaders, as well as other relevant stakeholders. It creates a platform for exchange of information between government, stakeholders and local people (Matose 2008). Communities do not work in a vacuum, but with support from the local leaders and other stakeholders. In some instances, for example, in Zvimba, the kraal heads are also members of EAGs. In such cases, they become key and strengthen the work of the EAGs (Matsvange, et al, 2016).

Siegel (2017) asserts that the intrusion of salt water into Senegal’s Groundnut Basin combined with recurrent droughts have led to impoverishment, food insecurity and the subsequent migration of land users but with support from the Global Environment Facility (GEF), the government of Senegal improved the soil through crops that involved use of the peanut shell (which is rich in calcium ions and enhances infiltration capacity), and the integration of adaptive species into salt-affected areas. Through a participatory process, the project tested peanut shells with two staple food crops — millet and maize production — and showed significantly high yields. Hamdy, and
Aly (2015) contended that appropriate technology is only a partial answer but the main solution lies in the behavior of the farmer who is subject to economic and social pressures of the community or country in which they live.

2.3 The level of knowledge on environmental degradation of different communities.

About 1.6 billion people rely on benefits forests offer, including food, fresh water, clothing, traditional medicine and shelter (worldwildlife, 2017). Nevertheless, forests around the world are under threat from deforestation, jeopardising these benefits. Deforestation comes in many forms, including fires, clear-cutting for agriculture, ranching and development, unsustainable logging for timber, and degradation due to climate change. This impacts people’s livelihoods and threatens a wide range of plant and animal species. Some 46-58 thousand square miles of forest are lost each year which is equivalent to 48 football fields every minute (world wildlife, 2017). Wood is still a popular fuel choice for cooking and heating around the world, and about half of the illegal removal of timber from forests is thought to be for use as fuel wood. The cutting down of trees for survival at Arda Transau and other areas where people were resettled following mining related displacements have caused havoc to the environment. Environmental Management Agency (EMA) remain mum on this matter as they find it difficult to pounce on these communities that were relocated in an area with little or no livelihoods options. The government Agency, EMA which has limited budgets and capacity is even failing to curtail bigger environmental catastrophes caused by commercial mining operations (Fisher et al, 2011).

Local and order to accelerate land conservation in Ovamboland, local communities (especially women) must be empowered to participate fully in making and implementing decisions on the sustainable management of land resources, national initiatives have been put in place to halt and reverse the environmental changes (Otto et al, 2013). Moreover, environment and natural resources preservation is vital to the economic growth of any country or a region in many ways but also susceptible to the extent that their utilisation, management and sustainability can be affected by performance and deeds of various factions within the society. As a result, if the communities lack the managerial skills of their environments, land degradation can be a serious cause of poverty in the world at large. According to PEAP (2017), natural resources and
environmental issues matters and apprehensions are cross-sectorial but also renders input in every sector in terms of reducing poverty and destitute conditions of people and therefore need to be accorded highest precedence within the overall framework of the Poverty Eradication Action Plan (PEAP) which intends to reduce the fraction of people living in unconditional poverty to a level below 10% by 2017. PEAP added that, in view of the cross-cutting nature of environment and normal assets issues, actions to address them require involvement of all relevant sectors. It is from this background that during the PEAP revision in the year 2003, the environment and natural resources, PEAP revision sub-committee under the auspices of the then Ministry of Water, Lands and Environment prepared principles for conventional environment and natural resources issues in the PEAP, and other government sectors and programs (PEAP, 2017).

The thin layer of soil that covers the surface of the earth is the key to the well-being and survival of individuals, without proper environmental conditions there would be absence of crops, food, plants, animals, forests and even human beings; about 40% of the surface of the earth and more than one billion people are affected by land degradation; degraded lands are homes to the most poverty stricken sections of the rural people. For instance, in India, in rural areas, most of the individuals are living in the conditions of poverty due to; climatic factors, demographic factors, personal causes, economic causes and social causes are the main factors that lead to the conditions of poverty (UNEP, 2010). Unless degradation is addressed directly, the sustainability of rural development schemes will be destabilised and endeavors to lessen rural poverty will be endangered, hence, the communities need to have the knowledge on how to mitigate land degradation in order to safeguard the little that is left for the communities.

The reduction of the capacity of the environment to meet social and ecological objectives and needs is described as environmental degradation (UNISDR, 2009a). This degradation and the associated decline of ecosystems and their invaluable services (the benefits we obtain) are driving disaster risk. Changes to the environment can influence the frequency and intensity of hazards, as well as our exposure and vulnerability to these hazards. For instance, deforestation of slopes often leads to an increase in landslide hazards and removal of mangroves can increase the damage caused by storm surges (UNISDR, 2009b), and in Negril, Jamaica, degradation of the coastal environment has reduced the natural protection, causing increased risk from storm surges (UNISDR, 2011).
Equally, the communities need education on the effects and adverse impacts of land degradation around them to reduce vulnerability.

The direct effects of land degradation in communities include losses in soil organic content, nutrients and water storage and regulation, which in turn lead to a loss of productive capacity and wildlife habitat. In the low input-low output agricultural systems common to poor rural areas, such as sub-Saharan Africa, nutrient inputs to the soil are almost always less than the outputs (UNISDR, 2009b). Land degradation, therefore, particularly drives drought risk (UNISDR, 2013a), Djalante, et al., 2013). Erian et al., 2012 in UNISDR, 2015a), but can also drive climate change, leading to increases in average (mean) temperatures and decreases in mean precipitation at the local level (UNISDR, 2011). Most ecosystems have been intentionally or unintentionally modified to increase the supply of certain services. However, an increase in the supply of services can frequently lead to declines in other services, because ecosystems produce many services simultaneously. For example, increased food production changes the absorption capacity of the land and can lead to reduced flood protection (UNISDR, 2009b). Therefore, with that knowledge at hand the communities can be able to manage and control land degradation in their respective areas and the environmentalists have a great task to educate the communities on the effects and adverse impacts of land degradation.

However, there are still only few examples of integrated community-level approaches that have been scaled up with success. One exception is the grassroots approach to water management at the border between Guatemala and Mexico, where local initiative has turned into national strategy (IUCN 2012 in UNISDR, 2015a); for instance, innovative schemes including ‘green infrastructure’ projects that maximise ecosystem services, including the reduction of flood risks, was successfully implemented (UNISDR, 2015a). When educating the communities, the key contest on land degradation and knowledge should start from the grassroots.

2.4 Challenges faced by community in managing land degradation

lack funding and the drive to implement them which in the end reduces the progress made on environmental conservation (Zembe et al., 2014). Relevant and interesting technology development has been addressed over time by donors, NGOs and individual country governments focusing mainly on the small-scale farmers. Despite the various initiatives and the availability of these technologies, there has been low rate of adoption by the majority of the small-scale farmers due to poverty and inability to afford the required inputs or due to low literacy which inhibits understanding and appreciation of these technologies (Msangi, 2015).

Other reasons include non-involvement of the rural farmers (who are the custodians of the land) during project formulation or non-consideration of their land management practice. Moreover, some of the technologies are reported to be too general so that they do not address the problems facing a specific area thus lacking in relevance and applicability to different micro-environments (Locke, 2015). As such, coming up with appropriate land management packages remain a great challenge for the situation pertaining in the management of land degradation in Southern Africa.

A number of policies and management programs and projects have been put in place including farmers’ training on relevant activities such as grass seeding for marginal and degraded lands, construction of grade stabilisation structures and stone lines on the rangelands, check dams and progressive soil survey and mapping. In most of the countries, inadequate budgetary allocations and lack of or poorly articulated regulations on implementation of the policies and coordination remains the greatest challenges facing these policies. Other challenges include inadequate capacity to enforce these policies as well as lack of commitment and political will in most of the countries, inadequate budgetary allocations and lack of or poorly articulated regulations on implementation of the policies and coordination remain the greatest challenges facing these policies (Åkesson et al., 2016).

Others include inadequate capacity to enforce these policies as well as lack of commitment and political will. Networking is also a major challenge as there is failure to share vision; there is increased duplication of efforts leading to increased inefficiency and failure to create a critical mass of expertise around land degradation management issues (Baldassarri, 2016). Land degradation and restoration issues take time to yield results; investors and beneficiaries have
displayed impatience and expressed disappointment when expected results were not forthcoming within the plan periods (Hansson, 2005).

According to Gwimbi and Dirwai (2003), the policy frameworks and the institutional setup for managing environmental challenges in Zimbabwe, with a few exceptions, seem quite robust. The main problem relates to implementation and enforcement of existing legislation and policies, further hampered by a lack of good governance, including lack of transparency and accountability, and weak coordination and cross-sectoral cooperation. The problem of enforcement is a key question in tackling the environmental challenges in Zimbabwe, due to the lack of human and financial resources and the difference in interpretation of the statues across government institutions. More so, Gwimbi and Dirwai, (2003) added that low levels of awareness amongst the judiciary and the police are other factors leading to challenges of implementation and enforcement. Lack of transparency, accountability and political will to enforce the laws are all challenges to environmental sustainability in Zimbabwe. This is a particular concern in relation to environmental and social impacts from mining as the consequences are so grave on human and environmental health.

The lack of empowerment of local communities in decisions over forest resources as one of the key natural resource management issues has contributed to deforestation in Zimbabwe (Marufu 2012). In addition, some of the existing legal frameworks do not clearly give local communities control over their natural resources, but rather they specify how communities should exploit their natural resources (Matsvange, 2016). With time, as the population densities increased, permit-based system was introduced, which undermined customary management systems. The failure of such approaches prompted the introduction of co-management in which the role of communities began to be appreciated (Matiku et al. 2013).

The EIA regulation, 74 GoZ INDC (2015), indicated that the policy frameworks and the institutional set-up for managing environmental challenges in Zimbabwe, with a few exceptions, seem quite robust. The main problem relates to implementation and enforcement of existing legislation and policies, further hampered by a lack of good governance, including lack of transparency and accountability, and weak coordination and cross-sectoral cooperation. The
problem of enforcement is a key question in tackling the environmental challenges in Zimbabwe, due to the lack of human and financial resources and the difference in interpretation of the statues across government institutions (Amin, 2015). Low levels of awareness amongst the judiciary and the police are other factors leading to challenges of implementation and enforcement. Integration of environmental concerns in plans and strategies, poor capacity and coordination among law enforcement agencies, highly sectoral and compartmentalised understanding of development issues and a lack of transparency, accountability and political will to enforce the laws etc. are all challenges to environmental sustainability in Zimbabwe (Gwimbi and Dirwai, 2003).

In particular, in relation to environmental and social impacts from relocation as the consequences are so grave on human and environmental health. The EIA regulation is poorly implemented; the EIA reports lack detailed assessment of the impacts from the relocation on ecology, livelihoods and cultural rights of communities. According to the Zimbabwe Environmental Law Association, “the government has abdicated its duty to protect, promote and uphold the rights of the people and has become complicity in repressing rural and poor communities”. ZELA warns for the “natural resource curse scenario”. It is unclear which Government agency that has the mandate to coordinate environmental information systems in Zimbabwe. The Institute of Environmental Studies at the University of Zimbabwe has taken a lead in establishing a SADC regional network for training in environmental issues. The environmental technical community is small, and well networked through personal contacts. Regarding the executive branch of government, a number of external accountability institutions and mechanisms exist. Nevertheless, their operations are hampered by an inadequate allocation of resources. Overall, policy uncertainty has increased the risk premium attached to investing in Zimbabwe (Gwimbi and Dirwai, 2003).

ZELA is currently primarily working on the extractive sector in Zimbabwe. To assess the challenges faced by the community in managing land degradation in Arda Transau. The organisation is working with communities in Manicaland and those along the Great Dyke (Matsa and Masimbiti, 2014). The Manicaland communities are impacted upon by diamond mining operations while those along the Great Dyke are affected by gold, chrome, granite, platinum and diamond mining operations. In working with these local communities, ZELA conducts research, conducts rights awareness training meetings, assists the communities to self-organise, creates
platforms for engagement between local communities and duty bearers (legislators, councilors, Rural District Councils and government representatives) (Chatiza, 2015).

2.5 Summary
The purpose of this literature review was to explain how and why the research objectives were framed in their present form by discussing the findings of prior researches. It also highlighted how the research strategy was chosen by identifying main supporting research findings in literature and identifying the knowledge gaps.
3.1 Introduction

The purpose of this chapter is to describe how the study was carried out. The chapter presents the research design, the sample population, and the research instruments, which includes questionnaires, interviews, and observations which were used to collect data. Measures to ensure the validity and reliability of the data were described and a description of data presentation and analysis procedures was made. Lastly, ethical considerations were discussed to ensure that the rights of the participants are protected.

3.2 Research design

The research study used both qualitative and quantitative research designs as qualitative research design tends to follow the explanatory model of scientific method. Therefore, qualitative and quantitative designs were the best approach in this research since the two approaches verbally describes what is done or what has been done. The qualitative data was gathered from focus group discussions, participant observation, and interviews.

Musingafí and Hlatywayo (2013) postulated that the term quantitative data is used to describe a type of information that can be counted or expressed numerically. Best and Khan (1993) coined that quantitative research design involves collection of numerical and statistical data. They maintained that it employs mathematical models designated to indicate systematic patterns of relations. Thus discipline survey research was used as a sub-element of quantitative research design. This involved mathematical manipulation of data obtained using questionnaires. Quantitative research design has the advantages that, it allows generalisability, reliability and validity of research finding (Best and Khan, 1993). They maintained that it is used to count a representative sample when it is not possible to count the whole population. In this research, mixed approach was used because the data used was converted to numbers.

3.3 Population
With reference to Silverman (2002:20) a population denotes all those who fall into the category of concern. Duller, Korom, Rafael and Schögler (2015) also defined population as all members who fall into the category of concern. These can be people, events or objects to which we wish to make generalisation. A population is therefore the universe of units from which the sample is to be selected and the target population is the population of interest to the researcher. In this study, the target population was 500 families in Arda Transau 24 kilometers west of Mutare town in Manicaland, Meki, (2014). The population of this study involved the relocated residents in Arda Transau area in Manicaland province, Zimbabwe. Systematic sampling was used to select a representative sample from which results were generalised to the entire group. Chimedza (2003) defined a sample as a limit from total units of elements. The information drawn from the Mutare Rural District Council (MRDC) reveals that there are about 500+ registered families in Arda Transau. 10% of the population of 500 was selected as a representative sample. Therefore, 10% of 500 people is 50, therefore, 50 participants were used in this research.

3.4 The Sample

Silverman (2002) defines a sample as a representative of the population under study. Systematic sampling was used to select a representative sample of the residents in Arda resettlement. Systematic sampling is the basic sampling technique where a group of subject (sample) is selected for study from a larger group (a population). Leedy and Ormrod (2005) opined that when using systematic sampling, only 10% of the total population is selected as a representative population, therefore, in this study, the researcher was given the register from the Village Chairperson. The researcher numbered the names from 1 to 500 and every tenth name was selected to be used as the sample of the study. The (n) population constituted 500 registered families from which (n) sample of 50 participants were selected. Each member of (n) size was selected independently of the other members of the population.

3.5 Research Instruments
Research instruments are tools that are used to collect data that is needed in order to find solutions to the problem (Gwimbi & Dirwai, 2003). The research instruments include questionnaires, interviews, observations, and reading. In this research questionnaires, interview guide, observation were employed in collecting the data.

3.5.1 Questionnaire,

A questionnaire is a document containing a list of pertinent questions for a statistical enquiry (Chimedza, 2003). The questionnaires were distributed to 50 families in Arda Transau. They consisted of closed and open ended questions. This was done to give respondents an opportunity to express their knowledge and views prior to the research study. Close ended question were used in the questionnaire with respondents having an option to choose the answer from a provided list. Open ended questions gave the respondents an opportunity to give ideas and their understanding of the subject under study. This had an advantage that respondents express their views without limit, but in the scope of the questions.

The questionnaires were delivered to the 50 selected respondents by the researcher. Each family took 30 minutes on each questionnaire and an average of 15 families were attended to each day. The researcher waited for the respondents to complete the questionnaires and collected them instantly. This helped the researcher to ensure that the questionnaires were completed and also explain to the respondents where they had difficulties. Waiting enable the researcher to explain the purpose of the study to the participants and confidentiality of information the participants provided. The researcher used cover letter from Bindura University of Science Education, Geography department as evidence to the respondents.

3.5.2 Interview Guide

Interview guides were incorporated in this research study. The interviews consisted of key informant method in which the Irrigation Services personnel, AGRITEX personnel and EMA officials were interviewed since they are the organisations which were involved in the whole
process of the resettlement programme in Arda Transau. The interviews aimed at establishing the current environmental related knowledge and challenges in the area, as well as response strategies so far constructed to safeguard the environment which is, the center of the study. Interviews helped the researcher to probe the authorities and redirect questions to seek more clarity in order to widen the slope of the information. In this case, five officers were interviewed, two from EMA, two from AGRITEX, and one from Irrigation Services respectively. The researcher had official appointments with the AGRITEX personnel, irrigation services and EMA officials. The interviews were conducted in offices as per appointment, three conducted in the morning and the other two in the afternoon. The research took two weeks to complete the interviews. These officials were selected for interviews because they were the key organisations responsible for environmental activities in Arda Transau. The interviews were a success as the organisations co-operated. The researcher used an interview guide with crafted questions. The interviews were tape recorded for data analysis.

3.5.3 Observation Guide

Observation guide was also employed in this study. Gorman and Clayton (2005) define observation as the systematic recording of observable behavior or phenomena in a natural setting. Observation as an instrument for collecting firsthand information is considered to be one of the core research methods for data collection (Kimayo, 2011). The observation involved the researcher getting into the field observing non-linguistic aspects in the study area that are related to environment which is the subject of concern. The researcher managed to visit the areas referred to and produced a list of items needed by the study. The researcher also made participant field observation after the questionnaires and interviews were done. An observation guide was used and it helped the researcher on the features that were to be observed. A list of items were also made to complement observations made in the field.

3.6 Data analysis
The researcher used mixed methods to overcome the limitations of a single design. By mixing both quantitative and qualitative research and data, the researcher gained in breadth and depth of understanding and corroboration, while offsetting the weaknesses inherent to using each approach by itself. One of the most advantageous characteristics of conducting mixed methods research is the possibility of triangulation that is the use of several means (methods, data sources and researchers) to examine the same phenomenon. Triangulation allowed the researcher to identify aspects of a phenomenon more accurately by approaching it from different vantage points using different methods and techniques.

The questionnaires were counted to check if all the questionnaires distributed were returned. The questionnaires were scrutinised to check if all the questions were completed. This was followed by giving a code to each answer on the questionnaire, for example a YES was represented by 1 and a NO was represented by 2. Each questionnaire was numbered from 1 to 50. Each question was given a heading and the table was made to record the entries. The data was captured and analysed using the SPSS version 20. The software helped to produce tables which were used to produce pie-charts and graphs for presentation. Data obtained from interviews and observations was analysed using descriptions within statements. The data was coded and categorised, so that it did not overlap, hence context analysis.

3.7 Ethical Considerations

This research study followed research ethics, the researcher produced the research letter from the university and explained to the leaders in Arda Transau that the purpose of the study was educational only. The researcher also observed and explained privacy, secrecy and confidentiality of the information given by participants. The consent process ensured that all participants voluntarily took part in this study with the full knowledge of risks and benefits, for example, the participants has the right to withdraw. The research also respected participants who declined to take part in the study possibly because of fear of the unknown. The researcher also used coding instead of participants real names to ensure anonymity.
3.8 Validity and reliability

According to Walliman (2005) whatever procedure for collecting data is selected it should always be examined critically to assess to what extent it is likely to be reliable and valid. Bell (1993:64) define reliability as, “the extent to which a test or procedure produces similar results under constant conditions on all occasions.” He further asserts that validity tells us whether an item measures or describes what it is supposed to measure. Thus, if an item is unreliable, then it must also lack validity, but a reliable item is not necessarily valid. It can produce the same or similar responses on all occasions, but not measuring what it is supposed to measure.

With the above in mind, the researcher sought advice from colleagues, fellow students and experts to find out whether the questions or items devised were likely to gather the information that they were designed to gather.

The researcher also dealt with the issues of validity and reliability by using a multi – method approach known as triangulation. Bell (1993:64) describes triangulation as, “cross–checking the existence of certain phenomena and the veracity of individual accounts by gathering data from a number of informants and a number of sources and subsequently comparing and contrasting one account with another in order to produce as full and balanced a study as possible.” Data was gathered using different research instruments namely questionnaires, interviews and observations. The account of each of these or the data gathered from each of the informants using the different instruments was then compared and contrasted in order to ensure reliability of conclusions.

The researcher made sure that the respondents were from the families in Arda Transau. The respondents were given same time (30 minutes per family), similar opportunities and atmosphere as they were answering the questionnaires. Everyone with environmental knowledge was accepted regardless of the level of education. Five people from the different organisations were interviewed, and each interview session took 15 minutes. The same questionnaire was given to each participant.
3.9 Summary

This chapter looked at the research design that was used in this study. The researcher described how quantitative and qualitative research designs were used in this study. Target population, sample and sampling techniques that were used in this study were also looked at. The research instruments which include questionnaires, interview guide, and observation guide were used to collect data were discussed. Data collection procedures, data presentation and analysis, ethical consideration and validity of the study were also discussed in this chapter.
4.1 Introduction

The aim of this study is to assess land degradation management activities and challenges faced by the community of Arda Transau in managing land degradation. In this chapter, the findings of the study are presented according to the three research questions as they are stated in Chapter 3. For the first research question, the researcher used the phenomenographic data analysis method, while for the second and third research questions the phenomenological data analysis approach was used. The data collected from the research instruments was represented using tables, graphs and pie charts, and the data was analysed and then discussed. This chapter will present results on the background of the respondents and the findings.

4.2 Socio-Demographic data

Socio-demographic data for Arda Transau

The majority of the responses were from the 16-20 years category, which recorded 36%, implying that most people in Arda Transau are of school going age (16-20 years) and there is also a sizeable number of adults of retiring age (41 years and above). Therefore, the age groups in Arda are the right age groups to deter environment degradation in their area. The school going age is expected to feed the elderly with the requisite knowledge they are getting from schools, while the elders take advantage of that knowledge to maintain their environment for a lifetime. The male dominated gender imbalance worsens land degradation in Arda Transau because it is a known fact that culturally men are less receptive to advice than women, men don’t want to be told what to do. Hence, Arda Transau is suffering from land degradation mismanagement. Most informants in Arda Transau are holders of Advanced level certificate (38%), followed by college graduates (30%), the overall picture shows that most of the residents in Arda Transau are highly educated. Therefore, Arda Transau has the capacity to reduce land degradation in their community. Both males and females show a higher level of education. Arda Transau predominantly has a sizeable number of married people and very few single parents. Married people are responsible people. This is supported by Table 4.1 below.
Table 4.1 socio-demographic of Arda Transau (n=50)

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 - 20 years</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>21 - 25 years</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>31 - 35 years</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>36 - 40 years</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>41 and above</td>
<td>14</td>
<td>28</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>20</td>
<td>40.0</td>
</tr>
<tr>
<td>Male</td>
<td>30</td>
<td>60.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>50</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Educational levels</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No education</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Primary education</td>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td>&quot;O&quot; level</td>
<td>7</td>
<td>14.0</td>
</tr>
<tr>
<td>&quot;A&quot; level</td>
<td>17</td>
<td>34.0</td>
</tr>
<tr>
<td>College Graduate</td>
<td>15</td>
<td>30.0</td>
</tr>
<tr>
<td>University Graduate</td>
<td>4</td>
<td>8.0</td>
</tr>
<tr>
<td>Other specialties</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Non formal education</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>50</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>22</td>
<td>44.0</td>
</tr>
<tr>
<td>Single</td>
<td>20</td>
<td>40.0</td>
</tr>
<tr>
<td>Single parent</td>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td>Widow</td>
<td>5</td>
<td>10.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>50</td>
<td>100.0</td>
</tr>
</tbody>
</table>
4.3 Land degradation management activities in Arda Transau

Objective 1 of this study focused on the land degradation management activities in Arda Transau. The land degradation activities identified by the respondents include cattle grazing, cutting down of trees and farming. (Presented in Figure 4.1)

![Land Degradation activities](image)

**Figure 4.1 Activities in Arda Transau (n=50)**

Serious land degradation in Arda was as a result of cutting down trees for firewood and fencing (28%), followed by farming in general. Degradation from cattle grazing was minimal (10%). This reveals that, deforestation is due to the lack of empowerment of local communities in decisions over forest resources as one of the key natural resource management issues has contributed to deforestation in Zimbabwe. Since some of the existing legal frameworks do not clearly give local
communities control over the natural resources, but rather specify how communities should exploit the natural resources, deforestation has become a severe problem the whole world. Mining activities are also disturbing management to some extent, although, ZELA conducts research, conducts rights awareness training meetings, assists the communities to self-organise, creates platforms for engagement between local communities and duty bearers (legislators, councilors, Rural District Councils and government representatives), (Chatiza, 2015). Illegal mining is rampant in the area. Most of the mining activities are being done along the mountain range. Land for agriculture is very much required in Arda Transau. Families are growing bigger and one hectare to each household is becoming smaller and smaller every day. Some are extending the fields into the reserved areas and as a result more land is being cleared causing soil erosion the area.

During interviews participants highlighted the organisations that were helping the community to implement the land degradation management activities. These included EMA, ZELA, AGRITEX and Irrigation Services shown in Figure 4.2
Figure 4.2 Partners and organisations facilitating land rehabilitation in Arda. (n=50)

Four partners were active in Arda Transau for giving awareness on SLM, bringing in projects and empowering the communities with new knowledge, encouraging the community to safeguard the environment jealously. Zimbabwean press, schools and agents like EMA, ZELA have been active partners in natural environment conservation. According to Masuku (2016) the people of Arda Transau received knowledge concerning environment through EMA, taking into account the fact that the settlers in Arda Transau are responsible for massive environmental degradation and assess the role played by the Zimbabwean press, ZELA (Zimbabwe Environmental Law Association) and EMA (Environmental Management Agency). Through ZELA and EMA’s active participation in natural environmental management, in a bid to strike the hearts and minds of the Zimbabwean society for it to conserve and effectively manage the natural environment using the knowledge gained and the indigenous knowledge within their society (Press and Environmental Management Agency (EMA), 2016).

Most residents are not happy with the work being done by the partners. Some of the technologies are general so that they do not address the problems facing a specific area thus lacking in relevance and applicability to different micro-environments. As a result, the residents failed to figure out the relevance of the projects brought in by these partners in the respective areas.
There are very few projects taking place in Arda at the moment. There is 14% investment in apiculture and 4% in orchards. A lot has to be done to come up with new projects. According to Åkesson, Gunilla, Göran and César, (2016), a number of policies and management programs and projects have been put in place including farmers’ training on relevant activities such as grass seeding for marginal and degraded lands, construction of grade stabilisation structures and stone lines on the rangelands, check dams and progressive soil survey and mapping. Inadequate budgetary allocations and lack of or poorly articulated regulations on implementation of the policies and coordination remains the greatest challenge facing these policies. Other challenges include inadequate capacity to enforce these policies as well as lack of commitment and political will in most of the countries, inadequate budgetary allocations and lack of or poorly articulated regulations on implementation of the policies and coordination remains the greatest challenges facing these policies, this could be the case with Arda Transau.

4.4 Level of knowledge on environment education in Arda Transau

This section presents results which address the second objective focusing on the level of knowledge on environment education in Arda Transau. Respondents were asked whether they had the knowledge about the environment in the area. The majority (58%) of the respondents were aware of the environmental education programmes that were being carried out in the area. The rest (42%) were not sure about the environmental education.

Participants were then asked the source of environmental information. They highlighted that most of the information was received through schools, media, organisations and gatherings. Schools were the main source of EE information, tracked by the media. Churches are the least providers of EE information. Further analysis revealed that environmental science is taught in schools and media is doing well to provide necessary information to the public. Kimaryo, (2015), argued that, education would develop environmentally responsible citizens. Through environmental education they would develop knowledge skills, concern and positive attitudes towards the environment.
However, environmental education is not a new phenomenon in the schools, for example, there were components of environmental education in schools in subjects like domestic science, agriculture and science and geography. These subjects were considered to be environmentally oriented and therefore it was believed that they could make a significant contribution to environmental education (Bolscho & Hauenschild, 2008; Chi-chung Ko & Chikin Lee, 2003). Therefore, Arda Transau community has the capacity to mitigate land degradation in the community so as to cater for developmental projects.

Residents of Arda Transau showed that they received knowledge about SLM. Maybe the lack of empowerment of local communities in decisions over forest resources and the existing legal frameworks do not clearly give local communities control over their natural resources, but rather specify how communities should exploit their natural resources. Due to the reasons given above, Arda Transau seemed to be silent with the knowledge invested in them. Of the education offered to the community, respondents were asked about the contents of the training. This is represented in Table 4.2
Table 4.2 Education offered to Arda Transau community (n=50)

<table>
<thead>
<tr>
<th>Training offered</th>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>afforestation</td>
<td>26</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>apiculture</td>
<td>41</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Mixed farming</td>
<td>47</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>paddocking</td>
<td>31</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Land reclamation</td>
<td>18</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Contour ridge</td>
<td>45</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Zero tillage farming</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ploughing across the slope</td>
<td>15</td>
<td>24</td>
<td>11</td>
</tr>
<tr>
<td>Planting vativa grass</td>
<td>29</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Stream bank cultivation</td>
<td>36</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Lawn planting</td>
<td>34</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Change of energy</td>
<td>38</td>
<td>3</td>
<td>9</td>
</tr>
</tbody>
</table>

Furthermore respondents were asked about the usefulness of the knowledge received. The results are presented in Table 4.3.

Table 4.3 Usefulness of knowledge received in Arda Transau (n=50)

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>SA</th>
<th>A</th>
<th>Not sure</th>
<th>DA</th>
<th>SDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>afforestation</td>
<td>26</td>
<td>10</td>
<td>9</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>apiculture</td>
<td>15</td>
<td>12</td>
<td>10</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Mixed farming</td>
<td>39</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>paddocking</td>
<td>14</td>
<td>12</td>
<td>20</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Land reclamation</td>
<td>23</td>
<td>13</td>
<td>10</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Contour ridge</td>
<td>21</td>
<td>12</td>
<td>13</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Zero tillage farming</td>
<td>36</td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ploughing across the slope</td>
<td>1</td>
<td>12</td>
<td>23</td>
<td>9</td>
<td>5</td>
</tr>
</tbody>
</table>
The majority of the respondent indicated that the knowledge that they received was effective as they managed to address challenges such as soil erosion, run off and improved water retention in their fields. However, some said the knowledge was not effective in managing the environment due to lack of materials to use, shortage of manpower, financial crisis, ignorance, lack of commitment and teamwork among the residents in Arda Transau.

### 4.5 Challenges faced by community of Arda Transau in managing land degradation

This section presents results that address objective 3 which focuses on the challenges faced by the respondents in managing land degradation. The challenges faced in Arda are presented in Table 4.4.

<table>
<thead>
<tr>
<th>CHALLENGES</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial problems</td>
<td>29</td>
<td>14.9%</td>
</tr>
<tr>
<td>Manpower(Community)</td>
<td>13</td>
<td>6.7%</td>
</tr>
<tr>
<td>Lack of knowledge</td>
<td>31</td>
<td>15.9%</td>
</tr>
<tr>
<td>Lack of knowledgeable personnel</td>
<td>18</td>
<td>9.2%</td>
</tr>
<tr>
<td>Poor planning</td>
<td>10</td>
<td>5.1%</td>
</tr>
<tr>
<td>Poor technology</td>
<td>18</td>
<td>9.2%</td>
</tr>
<tr>
<td>Lack of commitment</td>
<td>23</td>
<td>11.8%</td>
</tr>
<tr>
<td>Inadequate capacity to enforce policies</td>
<td>14</td>
<td>7.2%</td>
</tr>
<tr>
<td>Lack of empowerment</td>
<td>14</td>
<td>7.2%</td>
</tr>
<tr>
<td>Transparency</td>
<td>9</td>
<td>4.6%</td>
</tr>
<tr>
<td>Accountability</td>
<td>16</td>
<td>8.2%</td>
</tr>
<tr>
<td>Total</td>
<td>195</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Arda community has numerous challenges that they are facing in managing land degradation. The biggest challenge is that of lack of knowledge. This speaks more to the need for more education
and awareness campaigns. This community also sighted financial problems as a key challenge to the management of land degradation. Hansson, (2005) noticed that inadequate capacity to enforce these policies, lack of commitment and political will, lack of networking, failure to share vision, increased duplication of efforts leading to increased inefficiency and failure to create a critical mass of expertise around land degradation management issues (Baldassarri, 2016). Land degradation and restoration issues take time to yield results. Investors and beneficiaries have displayed impatience and expressed disappointment when expected results were not forthcoming within the plan periods, by so doing the communities are suffering from challenges which need to be controlled.

Table 4.5 Suggested measures in environmental management in Arda Transau (n=50)

<table>
<thead>
<tr>
<th>SUGGESTED MEASURES</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>advocacy</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>afforestation</td>
<td>5</td>
<td>6.0</td>
</tr>
<tr>
<td>campaigns</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>change energy</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>chief advice</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>contour ploughing</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>education</td>
<td>10</td>
<td>10.0</td>
</tr>
<tr>
<td>lack of knowledge</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>land mgt.</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>land reclamation</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>lawn planting</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Life improving skills</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Limited no. Of cattle per family</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>paddocking</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>penalization</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Planting trees</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>Policy Management</td>
<td>7</td>
<td>14.0</td>
</tr>
<tr>
<td>practicing SLM</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>reforestation</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>stream bank cultivation</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
Further, the community of Arda, AGRITEX personnel, the Irrigation department, and EMA proposed twenty measures to be employed in order to mitigate land degradation in Arda Transau. The measures include advocacy for SLM, educational campaigns, motivational measures, introduction of trained personnel with their community, chiefs and chairpersons’ advice, and change of type of energy for household chores. Arda Transau residents have knowledge on EE. Therefore, the residents need to develop intrinsic motivation to work towards sustainable land management through involvement in different stages of policy developments and project formulation that concern their area. This is represented in Table 4.6

4.6 Summary
In this chapter data was analysed and presented using tables, bar graphs, pie charts and text in order to bring out the main findings of the research. The findings were interpreted and discussed which led the research to the summary, conclusions and recommendations in the next chapter.
CHAPTER 5
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter concludes the entire research report and consists of the summary of the research, the conclusions and the recommendations. The summary describes the research problem, the objectives of the research, the research methodology used, the purpose of the research, limitations of the study and the implications of the findings. The conclusions answers the research questions stated in Chapter One and the recommendations suggest ways to improve land degradation problems and ways to address the challenges described in the previous chapters.

5.2 Summary

The study set out to find the effect of Environmental Education (EE) in resettlement areas in this case, Arda Transau. Land degradation still remains a challenge to communities in Africa including Zimbabwean communities like Arda Transau and still people need to earn a living within the same environment which is being degraded day and night. The major objective of the research was to assess land degradation activities and challenges faced by the people of Arda Transau in managing land degradation. The research sought to whether the people in Arda Transau have knowledge on sustainable land management, to assess the levels of education of the community, find out the problems faced by the community in managing land degradation in Arda Transau as well as to make recommendations on how land management can be improved. The research design used both quantitative and quantitative methods and the instruments used to collect data included interviews, questionnaires and observations. Literature revealed that the use of additional inputs and adoption of improved technology has led some to question the negative effects of desertification in communities (Eswaran, Lal and Reich, 2001). Gwimbi and Dirwai (2003) drew conclusions that integration of environmental concerns in plans and strategies, poor capacity and coordination among law enforcement agencies, highly sectoral and compartmentalised understanding of development issues and lack of transparency, accountability and political will to enforce the law are challenges to environmental sustainability in Zimbabwe.
5.3 Conclusions

Serious land degradation in Arda Transau was as a result of cutting down of trees for firewood and fencing poles followed by farming in general. Degradation from cattle grazing was minimal. This reveals that deforestation is due to the lack of empowerment of local communities in decisions over forest resources as one of the key natural resource management issues.

Four active partners in Arda Transau for giving awareness on SLM, bringing in projects and empowering the communities with new knowledge and encouraging the community to safeguard the environment jealously include EMA, ZELA, AGRITEX and Irrigation Services of Zimbabwe. Most residents are not happy with the work being done by the partners. As a result, the residents failed to figure out the relevance of the projects brought in by these partners in the respective areas as there is no monitoring, supervision and funding.

There are very few projects taking place in Arda Transau at the moment. There is 14% investment in apiculture and 4% in orchards. This revealed that residents in Arda Transau are failing to implement what they have learnt due to lack of supervision and resources such as space (1 hectare is allocated per family regardless of the status of the family).

There is immense EE in Arda Transau and the community has knowledge; what they lack is encouragement, teamwork and resources as mentioned in the interviews. As a community, Arda Transau is facing problems like any other community in Africa. As such, the people involved lose hope and weaken commitment.

Schools are the main sources of EE information, tracked by the media. Churches are the least providers of information. Therefore, Arda Transau community has the capacity to mitigate land degradation in the community as the community is made aware of by these sources of EE information.
The community of Arda Transau, AGRITEX personnel, the Irrigation department, and EMA proposed eleven measures to be employed in order to mitigate land degradation in Arda Transau. Since Arda Transau residents have knowledge on EE the residents need to develop intrinsic motivation to work towards sustainable land management through involvement in different stages of policy development and project formulation that concern their area.

Residents of Arda Transau showed that they receive knowledge about SLM. Maybe the lack of empowerment of local communities in decisions over forest resources and the existing legal frameworks do not clearly give local communities control over their natural resources, but rather they specify how communities should exploit their natural resources (Matsvange, 2016). Due to the reasons given above, Arda Transau seemed to be silent with the knowledge invested in them.

Most of the residents (96 %) in Arda Transau showed that there is education on SLM that match their requirements. This revealed that the partners and organisations in Arda Transau are doing enough justice to SLM as part of land degradation management.

Arda Transau community has numerous challenges that they are facing in managing land degradation. The biggest challenge is lack of knowledge. This speaks more to the need for more education and awareness campaigns. The community also sighted financial problems as a key challenge to the management of land degradation. This revealed that the community is either failing to apply the knowledge received from schools, organisations and the media or the community is refusing to take responsibility.

5.4 Recommendations

In view of the above conclusions, the following recommendations are made:

- Residents in Arda Transau should be self-motivated towards SLM since they have the knowledge required.
Organisations and stakeholders should show a degree of responsibility towards the projects brought to Arda Transau.

Residents should make use of the requisite knowledge from the school going age to maintain their environment for a lifetime.

Arda Transau should be involved in every stage where decisions concern the community are made.

Workshops should involve all stakeholders and participation should be at every stage of development.

The organisations should put more emphasis on prohibition of cutting down of trees and educating people more about SLM.
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Appendix A

Interview guide

Residents of Arda

My name is Nety Lucas. I am from Bindura University of Science Education and conducting a study to assess the impact of Environmental Education on land degradation in Manicaland relocated areas. A case of Arda Transau. The information on this study will be treated for academic purposes only and confidentiality is a priority, your answers will not be released to anyone and they remain anonymous.

1. Are you one of the members who were relocated from Chiyadzwa in 2011?
2. Can you give a brief description of the environment looking at land and the forest when you first come here?
3. Are you happy with the situation on the environment around here today as stand here?
4. If you are happy, what are doing to manage the environment around you
5. If you are not happy, what do you think should be done to improve the situation here in Arda Transau?
6. Have you ever heard about land degradation and the causes together with the results of it before?
7. If yes where did you heard the issues concerning land degradation?
8. What do you think is needed to be done to improve the situation?
9. Are there any activities around the community that are to do with land degradation management?
10. What challenges are you facing in trying to manage the land sustainably?

EMA

11. Were you in Arda Transau when the area was given to people from Chiyadzwa?
12. Can you give a brief description of the environment looking at land and the forest when you first come here?
13. Are you happy with the situation on the environment around Arda today as it stands?
14. If you are happy, what are doing to manage the environment around you
15. If you are not happy, what do you think should be done to improve the situation in Arda Transau?
16. Did you ever proposed projects in Arda Transau? If any who monitored the projects?
17. What do you think should be done to improve the situation in Arda towards land sustainability

**AGRITEX**

18. Do you know the relocated area called Arda Transau and have you been there?
19. Can you give a brief description of the environment looking at land and the forest when you first come here?
20. Are you happy with the situation on the environment around Arda today as stands?
21. If you are happy, what are you doing to improve the management of the environment around Arda?
22. If you are not happy, what do you think should be done to improve the situation in Arda Transau in terms of sustainable land management?
23. As an organization are you doing something for Arda in terms of projects to manage land degradation?
24. If yes, how is the response from the community?

**IRRIGATION SERVICES**

25. Did you ever heard about Arda Transau and have you been there before?
26. What plans are in store for Arda in terms of projects, and programmes towards sustainable land management?
27. What do you expect from the community so that they can be able to fight land degradation in Arda?
Appendix B

Questionnaire

My name is Lucas Nety. I am from Bindura University of Science Education and doing a degree: Master of Science in Natural Resources Management and Environmental Sustainability conducting a study to assess the impact of Environmental Education on land degradation in Manicaland relocated areas. A case of Arda Transau. The information on this study will be treated for academic purposes only and confidentiality is a priority, your answers will not be released to anyone and they remain anonymous.

Instructions

1. Do not write your name.
2. Put a tick where it is indicated to do so.
3. Complete with a statement where spaces are provided.

Socio-Demographic data

1. AGE
   16-20 years □ 21-25 years □
   31-35 years □ 36-40 years □
   41 and above □

2. SEX
   Female □ Male □

3. EDUCATIONAL LEVEL
   No education □ Primary education □
   Ordinary level ‘O’ level □ Advanced level ‘A’ level □
   College Graduate □ University Graduate □
   Other specialties □ Non formal education □

4 MARITAL STATUS
Married □ Single □

Single Parent □ Widow □

5. Land degradation activities in Arda? Put a tick for an answer.
   - Deforestation through cutting down of trees for firewood and fencing poles □
   - Farming and gardening □
   - Mining □
   - Cattle grazing □
   - Tobacco farming □
   - Land clearance for agriculture □

6. Did you ever heard anything about sustainable land management?
   - Yes □
   - No □

7. Where did you get the information from?
   - School □
   - Church □
   - Organizations □
   - Media □
   - Gatherings □
   - Others □

8. List down what you were taught or what you heard about sustainable land management:

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

9. Are there any partners or organizations facilitating land rehabilitation in Arda?
Level of knowledge on environment education of the people in Arda possess

10. Is there an awareness in Arda? YES  NO
11. Is there any organizations educating residence about sustainable land management in Arda?
12. What did you understand through the teachings by the organizations in terms of land management?

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

13. Which measures do you think can be taken to reduce land degradation?
........................................................................................................................................
........................................................................................................................................

14. Why did you suggest that measures?
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................

Challenges faced by Arda Transau community in managing land degradation

15. Are you doing any project towards managing land degradation?
16. Yes □  No □
17. Name the projects that you are doing here in Arda for the moment.
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
18. What are the challenges faced in managing land degradation? Put a tick on the answers or add more options.

   a. Financial problems
   b. Manpower (community)
   c. Lack of knowledge
   d. Lack of knowledgeable personal
   e. Poor planning
   f. Poor technology
   g. Lack of commitment
   h. Inadequate capacity to enforce policies
   i. Transparency
   j. Accountability
   k. Lack of empowerment of local communities in decisions making

Thank you very much for the time, the effort and above all the much needed information. God bless you.

THE END
Appendix C

Observation Guide

1. Activities that are going on in Arda Transau that has to do with land management
2. Activities done in the past and their maintenance
3. Conditions in which the people are working towards sustainable land management
4. Creativity and innovations which are towards land management in Arda Transau
Appendix D Bindura University cover letter for the researcher

DEPARTMENT OF GEOGRAPHY
P Bag 1020
BINDURA, Zimbabwe
Tel: 071 – 7531-6, 7621-4
Fax: 263 – 71 – 7534/6316

BINDURA UNIVERSITY OF SCIENCE EDUCATION

........................................2017

To Whom It May Concern:

ASSISTANCE TO THE STUDENTS WHO ARE SEEKING INFORMATION FOR THEIR RESEARCH PROJECTS

This is to confirm that .................................................., Registration Number .................................................., is a Geography student doing Masters Degree in Natural Resources Management And Environmental Sustainability at Bindura University of Science Education and is required to do a dissertation as part of his Masters programme. The student is expected to gather data for his project from various sources including your institution.

This letter therefore serves to kindly ask you to assist the above-mentioned student with information relating to his project entitled:..................................................

Thank you.

[Signature]
DR. A. MAKUMETI
CHAIRMAN

[Stamp: GEOGRAPHY DEPARTMENT OFFICE]