

**ADDRESSING SELECTED SUSTAINABLE DEVELOPMENT GOALS  
THROUGH EDUCATION FOR SUSTAINABLE DEVELOPMENT IN ITEZHI-  
TEZHI DISTRICT OF CENTRAL ZAMBIA**

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**A dissertation submitted to the University of Zambia in partial fulfillment for the  
award of Master of Education in Environmental Education.**

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## DECLARATION

I, **Michael Ndila**, declare that this research report submitted to School of Education at the University of Zambia is my own work and has not previously been submitted for any degree, diploma or other qualification at the University of Zambia or any other higher learning institution.

Signed: .....

Date: .....

**CERTIFICATE OF APPROVAL**

This research report by Michael Ndila is approved as a requirement in partial fulfillment of the award of the Master of Education (Environmental Education) Degree of the University of Zambia.

Name of Examiner 1 .....signature.....date.....

Name of Examiner 2 .....signature.....date.....

Name of Examiner 3 .....signature.....date.....

## ABSTRACT

Among the 17 Sustainable Development Goals (SDGs) adopted by the United Nations Sustainable Development Summit held on 25<sup>th</sup> September 2015 are the following goals; no poverty, zero hunger, achieve quality and inclusive education, addressing climate change, and so on. As a matter of global urgency, the SDGs are stressed in Education for Sustainable Development (ESD) which is inextricably linked to Environmental Education (EE). This study located within UNESCO's (2014) Global Action Program (GAP) section 12 under the 5<sup>th</sup> priority action area which stresses the need to accelerate the search for Sustainable Development solution at local level using educational approaches. The study strove to find sustainable solutions to salient issues such as hunger and poverty using ESD in the context of Itezhi-tezhi Community. The aim of the study was to examine how ESD could be used as a channel to achieve selected SDGs in Itezhi-tezhi District of Central Zambia. The study explored resident's awareness about SDGs, interpretation and practices that related to selected SDGs, as well as fortified how ESD elements can be blended with local knowledge practices to enhance selected SDGs. The study was informed by Socio-Cultural Constructivist Theory (SCCT) as ideologies, lived experiences and activities sought could best be understood in the cultural context.

The study was comprehended through constructivism in which, single case design sited under qualitative umbrella was used for an in-depth understanding of lived experiences of the respondents. The respondents in the study were; Chief Kangu's representative, 3 headmen, 40 household heads (Quota and purposively sampled), and 3 ministerial experts (purposively sampled). Primary data was collected using semi-structured interviews, focus group discussions, and participant observation.

The results show that 77% of residents were not aware about SDGs. It also established that the concept of hunger meant inadequacy in food stuffs, money and domestic animals. Ending hunger by 2030 was generally perceived as up scaling food production via hard work and government support in supplying farming implements and inputs. The study also established that local residents engaged in field crop production to address the challenge of hunger. Education for Sustainable Development was perceived to be instrumental in improving methods of manipulating locally existing resources. The concept poverty was perceived as inadequacy in socially valued material things such as cattle, goats, pigs, and chickens. Ending poverty by 2030 meant enhancing locally existing socio-economic enterprises through government intervention. In order to address the issue of poverty, residents engaged in field crop production where cash crops (maize inclusive) were grown among other enterprises. Local respondents perceived ESD to be instrumental in addressing the challenge of poverty by improving productivity and sustaining local resource utilization via blending sustainable development principles and ideologies with locally existing knowledge practices. Thus, the study proposed a model that stipulated how ESD can be used to achieve SDGs in the local context. The study recommends that the Zambian government, civil societies, and United Nations agencies charged with the responsibility of ensuring that SDGs are known and implemented in all States and communities may harness the vigor of ESD as an approach to address these ambitious global goals.

## **DEDICATION**

This study is dedicated to my daughter and son, Dell Mitchell Ndila and Roland Mitchell Ndila. The hope is it provides an inspiration in their educational endeavors.

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## ACRONYMS AND ABBREVIATIONS

<b>ADC</b>	Area Development Committee
<b>ADPs</b>	Area Development Projects
<b>AFOLU</b>	Agriculture, forestry and Land-Use
<b>CAP</b>	Conservation Agriculture Program
<b>CARE</b>	Cooperative for Assistance and Relief Everywhere
<b>CARERE</b>	Cambodia Resettlement and Reintegration Program
<b>CASIPP</b>	Conservation Agriculture Scaling up for Increased Productivity and Production
<b>CBNRM</b>	Community Based Natural Resource Management
<b>CDA</b>	Critical Discourse Analysis
<b>CFU</b>	Conservation Farming Unit
<b>CIFOR</b>	Centre for International Forestry Research
<b>CRB</b>	Community Resources Board
<b>CSO</b>	Central Statistical Office
<b>DDC</b>	District Development Committee
<b>EE</b>	Environmental Education
<b>EPA</b>	Environmental Protection Agency
<b>ESD</b>	Education for Sustainable Development
<b>EU</b>	European Union
<b>FISRI</b>	Farmer Input Support Response Initiative
<b>FTF</b>	Feed the Future
<b>GAP</b>	Global Action Program
<b>GEM</b>	Global Education for All Meeting
<b>MDGs</b>	Millennium Development Goals
<b>NEEP</b>	Neotropical Environmental Education Program
<b>NGO</b>	Non-Governmental Organization
<b>OWG</b>	Open Working Group
<b>PwC</b>	Network of firms
<b>QDA</b>	Qualitative Data Analysis
<b>RDZ</b>	Restless Development Zambia

<b>SADC</b>	Southern African Development Community
<b>SARPN</b>	Southern African Regional Poverty Network
<b>SCCT</b>	Socio-Cultural Constructivist Theory
<b>SDGs</b>	Sustainable Development Goals
<b>SCRIKA</b>	Strengthening Climate Resilience in Kafue Basin
<b>TPF</b>	The Peregrine Fund
<b>UN</b>	United Nations
<b>UNDG</b>	United Nations Development Group
<b>UNDP</b>	United Nations Development Program
<b>UNECA</b>	United Nations Economic Commission for Africa
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>UNFPA</b>	United Nations Population Fund
<b>UNICEF</b>	United Nations International Children’s Emergency Fund
<b>UNZA</b>	University of Zambia
<b>USAID</b>	United States Agency for International Development
<b>WWF</b>	Worldwide Wildlife Funds
<b>ZAWA</b>	Zambia Wildlife Authority
<b>ZNFU</b>	Zambia National Farmers Union
<b>ZTB</b>	Zambia Tourism Board



# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 Background**

The United Nations Sustainable Development Summit held on 25<sup>th</sup> September 2015 adopted the 2030 Agenda for Sustainable Development in order to address among many other issues, the 17 Sustainable Development Goals (SDGs). This occasion closed the chapter for Millennium Development Goals (MDGs) and opened the new chapter of ambitious and complementary SDGs (United Nations Economic Commission for Africa (UNECA), 2015). The SDGs encompass social, economic and environmental facets; while encouraging all nations to end poverty and embrace socio-economic endeavors sustainably. They include: ending poverty; ending hunger; health and population dynamics; education; gender equality and women empowerment; water and sanitation; energy; economic growth; industrialization; infrastructure; employment and decent work for all; promote equality; sustainable cities and human settlements; promote sustainable consumption and production; climate; conservation and sustainable use of marine resources, oceans and seas; and ecosystems and biodiversity (United Nations (UN), 2015). The United Nations broadly views the 17 SDGs as aiming at eliminating poverty, hunger, discrimination of all form, abuse and deaths as well as addressing environmental degradation and promoting sustainable development for all people everywhere (UN, 2015).

Most of the States in Africa are signatories to the 17 SDGs, including Zambia which played a leading role in the development of these goals. Basically, Zambia co-chaired the Southern African Development Community (SADC) region in the Open Working Group (OWG) of governments negotiating the SDGs (GRZ and UN-Zambia) (2015). As such, it is well placed to adopt and localize the SDGs to reflect its own context and priorities.

It is worth noting that during the period 2006-2010, Zambia made significant progress towards meeting the eight Millennium Development Goals (MDGs) particularly in primary school enrollment, child malnutrition and the fight against malaria (UN-Zambia, 2013). The United Nations in Zambia (2013) notes the need for the country to further

reduce poverty and safeguard sustainable environmental development, among other things. The agency further notes that the overall positive economic growth rates are not reflected in the efforts to reduce poverty or in addressing inequalities, which remain especially high in rural areas. This study aimed at exploring how selected SDGs could be addressed through Education for Sustainable Development (ESD) in Kaingu Chiefdom of Itezhi-tezhi District of Central Zambia, among which ending poverty in all its forms everywhere (SDG 1); ending hunger, achieve food security and improved nutrition and promote sustainable agriculture (SDG 2) were salient, particularly in Kaingu Chiefdom.

## **1.2 Environmental Education Context of the Research**

The study is located within the contextual frames of the Global Action Program (GAP) of 2007 based on Environmental Education (EE). It particularly refers to section 12 under the 5<sup>th</sup> priority action area of the policy document on EE, which emphasizes on accelerating the search for sustainable development solutions at the local level using educational approaches (UNESCO, 2014). The study strove to find sustainable solutions to address issues of hunger and poverty using ESD in the context of Itezhi-tezhi Community. UNESCO (2014) recognizes that effective and innovative solutions to sustainable development challenges are frequently developed at the local level. Similarly, Dervis and Steiner (2006) hold that the poor are protectors of the environment and they are repositories of valuable indigenous knowledge of which environmental education experts may be unaware. It was therefore, imperative that the local community of Itezhi-tezhi District be embraced in finding quick solutions to the major phenomena challenging their sustainable development, among which were persistent poverty and hunger, often exacerbated by climate change.

## **1.3 Statement of the Problem**

Although Zambia is a signatory and participated in the process of developing the 17 Sustainable Development Goals (SDGs) in 2015, little has been done to explore how these global goals can be addressed, particularly in the local context. A joint publication of the Government of Zambia and the United Nations however, notes Zambia's potential to adopt and localize the SDGs to reflect its own context and priorities (GRZ and UN-

Zambia, 2015). Therefore, a study was worth conducting about this issue in order to ascertain how selected SDGs could be addressed through Education for Sustainable Development (ESD) whose vigor to offer a myriad of environmental issues and concerns in the local context should be underscored. Hudson (2001) echoes the need for new knowledge and techniques that address the demands of a constantly evolving social and technological landscape, while ensuring that EE stays relevant to the needs and interests of the community. Apparently, statistics show that Itezhi-tezhi District is predominantly susceptible to food-insecurity and attracts food relief, particularly in the hinterland where need presses the most (Lungu, 2011). Such a condition presses an increased accountability on the health and environmental impacts of agricultural production practices and food system development. Statistics also show that out of 11, 431 people living in Chief Kaingu's area, 9,497 are poor (Murr and Rascon, 2015). This translates into 83% of the residents living in poverty. It was necessary that accelerated solution to end hunger and poverty using an educational approach be found in Kaingu Chiefdom. Inadequate utilization of ESD in solving environmental issues threatened to undermine the achievement of selected SDGs in Zambia, and Itezhi-tezhi District in particular. It was therefore, imperative that the potential and possibility of ESD as an alternative in addressing selected SDGs explored, in the face of new environmental challenges. Hence, the study was conducted.

#### **1.4 Purpose of the Research**

The purpose of this study was to explore how selected Sustainable Development Goals could be addressed through Education for Sustainable Development in Kaingu Chiefdom of Itezhi-tezhi District of Central Zambia.

#### **1.5 Specific Research Objectives**

In this study, four specific research objectives were thought to be necessary and they were:

1. To determine residents' awareness of Sustainable Development Goals in their local context.

2. To examine local residents' interpretation of selected Sustainable Development Goals to their social context.
3. To establish existing practices that local people have been using to address issues related to selected Sustainable Development Goals.
4. To examine how Education for Sustainable Development could be used to fortify local practices in order to meet selected Sustainable Development Goals by 2030.

#### **1.6 General Research Question**

How could Sustainable Development Goals be addressed through Education for Sustainable Development in Kaingu Chiefdom of Itezhi-tezhi District?

#### **1.7 Specific Research Questions**

1. How aware were residents about Sustainable Development Goals in their local context?
2. How did local residents interpret selected Sustainable Development Goals to their social context?
3. What existing practices have local people been using to address issues related to selected Sustainable Development Goals?
4. How could Education for Sustainable Development be used to fortify local practices in order to meet selected Sustainable Development Goals by 2030?

#### **1.8 Rationale**

Notwithstanding the fact that SDGs were newly adopted and posed a positive challenge to the field of EE, the potentiality and possibility of ESD as a channel to achieve them needed to be fully explored. Dearth in scientific knowledge on how ESD can be used to address selected SDGs posed a huge challenge for environmental Educationists. Among environmental challenges related to sustainable development in Zambia and Itezhi-tezhi District in particular, were poor practices in farming, fishing, apiculture, tree harvesting among others. For the rural community of Itezhi-tezhi, particularly Kaingu Chiefdom, this study may enhance locally driven problem-solving and decision making skills,

critical thinking, respect, value and integrity for the environment. It may also promote good governance among local residents. The study may also add to existing literature in the field of Environmental Education, especially on strategies of solving emerging environmental issues. Dervis and Steiner (2006) note that there is insufficient research and lack of environmental information at community level. Namafe (2005) bemoans the absence of sufficient knowledge in Environmental Education in the social domain and recommends the need to urgently develop adequate materials that are user friendly. This knowledge may also be appreciated in the field of Education as a whole.

### **1.9 Operational Definition of terms**

Ecosystems and biodiversity –	embed all organisms of air, aquatic and terrestrial origins, regardless of their cultural, economic and prestigious values and, their supportive environment.
Education for Sustainable Development – sustainable	is an integral part of quality education that plays a crucial role in enhancing development in the local context.
Poverty –	refers to inadequacy in one or more basic needs and material possession.
Hunger –	refers to inadequate supply of food and its nutritional value at a given time.
Sustainable Development Goals –	are unanimously adopted priority areas designed to get rid of poverty, discrimination, abuse and preventable deaths, address environmental destruction while promoting development for all individuals.

### **1.10 Conceptual framework**

Selected SDGs whose meanings and that of their related concepts defined using local residents' lived experiences were more likely to be understood, implemented and appreciated than when technical and standardized definitions were used. Variables such as; ESD elements (i.e. knowledge, skills, value and attitudes), local knowledge of issues, social and cultural factor, all act cooperatively to enhance localization and action for, and selected SDGs implementation. Primarily, local residents who intent to localize the meaning and act for selected SDGs and implement them need to have their local knowledge of selected SDGs blended with the new knowledge of ESD (principles, ideologies and elements) to enhance problem-solving skills, knowledge of action strategies, positive values and attitudes. At the same time, residents were subjected to socio-cultural factors (i.e. custom and norms, locus of control, duties and responsibilities) directly influencing the fashion in which localization of meaning and action for selected SDGs implementation would be landscaped or oriented. Once all the named variables are effectively combined, localization of meaning and intention to act for selected SDGs implementation would take place; thus, residents would live sustainably with the local environment. Meanwhile, situational factors (economic constraints, social pressure, and opportunities to choose different actions) might counteract or strengthen the variables in the model, thus, influencing the manner in which residents would live with their local environment.

ESD was engaged in raising awareness of, interpretation and sharing knowledge about selected SDGs among households in Kaingu's Chiefdom on view to enhance critical thinking, problem-solving skills, decision-making skills, respect, value, integrity, good governance, peace and dignity. This led to localization of meaning and positive action for selected SDGs, while living sustainably with the environment. UNESCO (2005) views ESD as an understanding of the inter-related dynamics of environment, society, culture and economics, and an understanding of the nature and causes of risks and issues that impact on socio-ecological relations, systems and structures at local, national and global levels. Thus, in the context of this study, ESD operated as a mechanism that aided household acquire basic and contextual knowledge about, and meaning of ending poverty and hunger as well as the existing relationships coupled with their dynamics and

reciprocity. Tsai (2013) opines that ESD is founded on the values and principles of sustainability that include respect for others, respect in the present and future generations, respect for differences and diversity, respect for the environment and respect for the planet and the resources it provides. Namafe (2006) also notes the centrality of respect as a kingpin concept, terming it as the energizing principle existing in issues of participation, responsiveness, relevance, flexibility, praxis and other key elements. Thus, through the acquisition of values and principles of sustainability, households gained all dimensions of respect deemed central in their daily problem-solving and decision-making process regarding meeting selected SDGs. This corresponds with Environmental Protection Agency (EPA) (2015) and UNESCO (2014) recognizing ESD as allowing individuals to explore environmental issues, engage in problem-solving, and take action to improve the environment; thus developing a deeper understanding of environmental issues and have the skills to make informed and responsible decisions.

According to Chawla and Cushing (2007), decision-making offers individuals the opportunity to exercise control of their environment, thereby gaining autonomy and sense of self-worth and respect. This idea corresponds with the views of Howe and Warren (1989) who echo on the vitality of individuals' critical thinking, as the process and skills involved in rationally deciding what to do or what to believe. In the context of this study, such ideologies of sustainable development could help household make choices, evaluate and judge information, particularly its usage, plan and actions to take regarding ending poverty and hunger as key environmental challenges within their community. Hungerford and Volk (1989) warn that before individuals intentionally act on particular environmental problems, they must be cognizant of the existence of such issues; thus, ESD was envisaged to offer vital elements of sustainable development in the process of raising awareness, interpretation, and existing knowledge practices related to selected SDGs as a prerequisite to action in the local context of Itezhi-tezhi community. Henceforth, having acquired sustainable elements regarding selected SDGs in their local context, households would live sustainably with their local environment, as viewed by Collins-Figueroa (2012). Figure 1.1 summarizes the conceptual framework of the study.

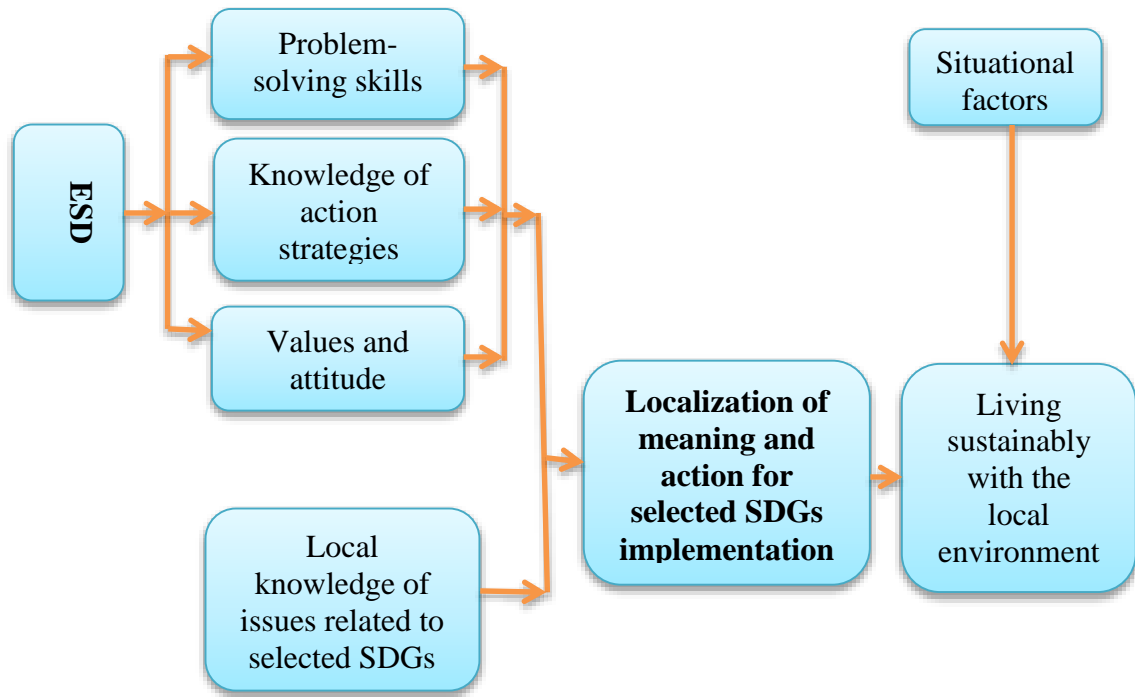


Figure 1.1: *Conceptual framework on addressing SDGs using ESD*  
Adapted from Hines *et al.*, (1987)

### 1.11 Theoretical framework

This study was informed by Socio-Cultural Constructivist Theory (SCCT) which falls in the streams of Constructivist theory of learning. Jerome Bruner is thought to be the father of Constructivism theory and his particular theory is one of many that lay inside of the constructivist framework (Overbaugh, 2004). The SCCT is based on the idea that human activities take place in cultural contexts and mediated by language and other symbolic systems that are best understood when investigated in their context (John-Steiner and Mahn, 1996; Scott and Palincsar, 2013). Overbaugh (2004) observes that each learner generates his or her own rules and mental models used to make sense of experiences. This assumption helped the researcher bracket his academic knowledge and ideologies regarding selected SDGs, while treating individual respondent's views on selected SDGs as unique lived experiences generated within the mental faculties of the respective respondent. Moreover, Kim (2001) observes that social constructivists view



learning as a social process, and meaningful learning occur as individuals engage in social activities. Thus, the researcher further built confidence and appreciated local activities and practices engaged by residents, while acknowledging their awareness and interpretation of selected SDGs in their local and social context.

Bruner's theory of Socio-Cultural Constructivism falls into the cognitive domain and was influenced by the early theoretical research of Lev Vygotsky, and Jean Piaget (Overbaugh, 2004). Moreover, SCCT explains how individual mental functioning is related to cultural, institutional, and historical context; hence, the focus of the socio-cultural perspective is on the roles that participation in social interactions and culturally organized activities play in influencing psychological development (Scott and Palincsar, 2013). This theoretical lens enabled me, as a researcher, to view responses by individual respondents as true reflections of ideologies and lived experiences of the entire community. Consistent with Kim (2001), meaning is created via interactions with people and the objects in the environment.

The study was informed by SCCT as the nature of the topic was directed towards the cultural practices that took various forms of socio-economic activities among community members of Itezhi-tezhi and Chief Kaingu in particular. Local resident's awareness and their interpretation of SDGs would best be understood using socio-cultural approach. In this study, socio-cultural approach accorded the researcher an opportunity to explore human beings dynamically, within their social circumstances and full complexity, thereby gained a much more complete and valid understanding of the residents.

### **1.12 Organization of the Dissertation**

This dissertation comprises seven chapters. Chapter one provided the background of the study, location of the study in Environmental Education practice context the problem statement. Furthermore, the purpose, objectives, research questions, rationale are presented before operational definition of terms which is followed by conceptual and theoretical frameworks of the study.

Chapter two presents existing literature based on global, continental and local perspectives. Chapter three contextually gives the description of the study area focusing on the physical characteristics of the area including the socio-economic factors within the study area. It also provides the selection criteria of the study area.

Chapter four of the dissertation provides the methodology of the study comprising the paradigm orientation of the study, research design, target population, sample size, sampling and data collection tools. It further provides sections of ethical considerations, analytical framework of the study, data trustworthy techniques, anticipated limitations and delimitation of the study.

Chapter five presents research results with reference to residents' awareness of Sustainable Development Goals, residents' interpretation of selected Sustainable Development Goals to their social context, existing knowledge practices that local people have been using to address issues related to selected Sustainable Development Goals and the role of Education for Sustainable Development in fortifying local knowledge and practices in order to meet selected Sustainable Development Goals by 2030.

Chapter six provides the discussion of research results while chapter seven presents conclusion and then recommendations.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter reviews literature related to Sustainable Development Goals (SDGs) as well as establishing how ESD can be used as a channel to achieve selected SDGs. In accordance to a reconnaissance survey conducted end poverty in all its forms; and end hunger, achieve food security and improved nutrition and promote sustainable agriculture are the SDGs selected for study. The global and African perspectives in each of the theme are reviewed preceded by the Zambian view point. Themes are: awareness about Sustainable Development Goals; local residents' interpretation of SDGs; existing SDGs related practices; the role of ESD in addressing SDGs; and different approaches designed to address SDGs respectively. This is followed by a brief outline of gaps addressed by the study and summary text.

#### **2.2 Overview of selected Sustainable Development Goals**

This section presents an overview of selected SDGs namely: end poverty in all its forms everywhere (SDG 1); and end hunger, achieve food security and improved nutrition and promote sustainable agriculture (SDG 2). These are drawn from the 17 SDGs that are relevant, action oriented and ambitious (Weitz, Nilsson, Barron and Mothabi, 2015). Although all the 17 SDGs are of greater concern at global, regional and national levels, there is overwhelming evidence that different regions set priorities in addressing SDGs (UNECA, 2015). Arguably, some SDGs attract much more attention to a given society in time and space. Thus, selected SDGs in this study are much more appealing to the needs and concerns of Itezhi-tezhi community and Chief Kaingu's area in particular. Poverty and hunger are chiefly addressed by sustainable agricultural related practices in the context of Itezhi-tezhi (Lungu, 2011). Above all, the selected SDGs are inextricably linked. Part of Muchanga's (2013) findings on the perceptions of people pertaining to increased temperatures relates to perceptions of increased crop failure, less farming, and increased poverty. Arguably, it may not be possible to end poverty if sustainable agriculture, food security and nutrition are negated. On the other hand, ecosystems and

biodiversity may be stressed in the process of executing innovations meant for poverty and hunger mitigation in society such as Itezhi-tezhi community.

### **2.3 End poverty in all its forms everywhere**

Ending poverty is SDG 1 which aims at ending poverty in all its forms everywhere (Horoszowski, 2015). Poverty is posing a greatest global challenge and is an indispensable requirement for sustainable development, impacting on health and education (UN, 2015). Although the incidence of extreme poverty is on the decline in many countries, progress in poverty eradication remains slow (UNECA, 2015). According to UNECA (2015), poverty remains the major challenge; in which 48% of the Africans live in extreme poverty and 72% of the youth population lives on \$2 a day.

In Zambia, poverty is viewed as deprivation of “long healthy life, educational opportunities, access to resources for a decent standard of living (e.g. income and consumption, housing, health, clean water and sanitation), and lack of freedom to exercise choice and participate in society” (Southern African Regional Poverty Network (SARPN), 2005). Rural poverty rates in Zambia have remained very high, at 80%, over the past 15 years (Chapoto, Banda, Haggblade and Hamukwala, 2011). Murr and Rascon (2015) reveal that Itezhi-tezhi District stands in 51<sup>st</sup> position out of 74 districts with 48,213 people living in poverty. Out of 11,431 people living in Kaingu Chiefdom, 9,497 are poor (Murr and Rascon, 2015; Central Statistical Office (CSO), 2011). The vast majority of the rural people in Itezhi-tezhi lack basic needs. Poor housing, indecent clothing, and questionable health status, inadequate socioeconomic and material possession are some of the many measures of poverty. To that effect, ‘ending poverty in all its forms’ in the context of Itezhi-tezhi means ‘enabling all members of the community access the available basic needs, social services and privileges, socioeconomic and material possession, and other provisions necessary for human survival’.

### **2.4 Ending hunger, achieve food security and improved nutrition and promote sustainable agriculture**

End hunger, achieve food security and improved nutrition and promote sustainable agriculture is SDG 2 (Horoszowski, 2015). UN (2011) views sustainable agriculture as

“a production system that sustains the health of soils, ecosystems and people”. It combines tradition, innovations and science through composting, crop rotations, inter-cropping, agro-forestry, biological pest control measures, green manures, nutrient recycling, integrating livestock into farming systems, preventing erosion, and water harvesting among others (UN, 2011). In case of Nutrition, UN (2015a) observes that most countries suffer from some combination of stunting, anemia, and/or obesity and overweight. This presents a huge challenge with respect to increased risk of food insecurity and poverty, with subsequent insidious implications for nutrition and health (UN, 2015a).

In Zambia, to improve food security and nutrition, small scale farmers adopt conservation farming practices (Baudron, Mwanza, Triomphe and Bwalya, 2007). However, this have not offered a solution to ending hunger in Itezhi-tezhi as Lungu (2011) observes that the District is predominantly susceptible to food-insecurity and attracts food relief, particularly in the hinterland where need presses the most. Arguably, this condition presses an increased accountability on the health and environmental impacts of agricultural production practices and food system development. Thus, the concept of sustainable agriculture, food security and nutrition in the context of Itezhi-tezhi District is understood as ‘all year round availability of staple and other nutritious traditional foods for home consumption’.

## **2.5 Awareness about Sustainable Development Goals in different countries**

A number of countries within and outside Africa have taken keen interest in raising public awareness about the SDGs in their quest to implement and achieve them. This arises due to United Nation’s call for each State to localize the SDGs according to its national priorities and context on a view to achieve them (GRZ and UN-Zambia, 2015). States across the globe are therefore, compelled to devise their own strategies on how to raise awareness about the SDGs.

## **2.6 China**

Of late, China has been using the power of sport in association with journalists and mass media to raise public awareness about the new SDGs (Haverman, 2015). Although such

efforts are of vital importance, there was need to generate informative data on people's awareness on SDGs in order to establish the extent to which they were conceptualized by local residents. Haverman (2015) further reveals that celebrities in China and around the world have been sending in pictures and videos with their favorite SDGs and sharing it on social media and open public shows. It should however, be noted that this study suffers epistemic relevance in terms of people's awareness on SDGs as the scholar paid attention to modes of raising awareness instead of seeking for levels of awareness among local residents.

## **2.7. South Africa**

Just as the case was with China, the media has taken a lead role in raising public awareness about the SDGs in South Africa. According to Nqgulana (2015), organizations of a series of twitter interviews and online discussions around key issues related to SDGs were scheduled to raise public awareness about SDGs in South Africa. The study by Nqgulana (2015) equally suffers epistemic relevance as noted earlier on. A survey conducted by PwC (2015) on public awareness about the SDGs in South Africa revealed that 28% of citizens were aware of the SDGs. PwC (2015) established that the business community were more aware about SDGs than the public. This calls for a more focused study that would bring informative data on SDGs from a rural set up as rural communities are the ones who in most cases suffer the wrath of environmental issues such as hunger and poverty exacerbated by climate change. Notwithstanding the significant contribution the survey results adds to the body of knowledge regarding people's awareness about the new SDGs, the method used and the sample size of 103 people investigated leaves much to desire, especially to mirror the country population. The current study will use a case study for an in depth and representative investigation based on levels of people's awareness among the local population.

## **2.8 Zambia**

Restless Development Zambia (RDZ) (2015) revealed that 76 young people drawn from 10 provinces were sensitized on the SDGs. Complementing to RDZ (2015), Mushota (2015); Mwitwa (2015); and Spooner (2015) opine that the media and public sensitization take a lead role in disseminating information about SDGs in Zambia. Much

as the efforts are valued and appreciated in relation to raising awareness of, and knowledge about SDGs among different stakeholders, the sensitization program targeted the youth only, and so the extent to which the public is aware and know about the SDGs remains unclear. On the other hand, the mode of communication presents huge challenges, particularly to the rural people as they may not afford to acquire gadgets necessary for communication purposes. The current study envisaged to fill this gap by engaging the general public at household level to raise awareness and share knowledge on the SDGs using ESD in their local context.

Despite the existence of literature on awareness related studies on SDGs within and outside Africa, there is little information on the levels of people's awareness about SDGs as many scholars have focused much on modes of raising public awareness on SDGs and not people's awareness. Hence the current study.

## **2.9 Residents' interpretation of Sustainable Development Goals in different countries**

The local residents, within and outside Africa interpret selected SDGs related concepts differently. This is, largely due to variation in their priorities, opportunities, circumstances and contextual needs. Above all, individual States are called upon to re-define the SDGs in accordance to their own circumstances and national priorities (GRZ and UN-Zambia, 2015).

### **2.10 Swaziland**

Some women in Swaziland interpret the concept of hunger in relation to its effects. Fielding-Miller, Mnisi, Adams, Baral and Kennedy (2014) reveal that hunger is a major and consistent theme as women cited their own hunger or that of their children as the impetus to begin sex work in Swaziland. To their local context, hunger is directly associated to sex work. It should however, be noted that the study could not generally focus on what hunger really is, instead, merely reflected as an effect of HIV/AIDS.

## **2.11 South Africa**

In South Africa, it has been realized that understanding how local residents interpret selected SDGs related concepts such as poverty and hunger is the starting point to address them. Tsegay and Rusare (2014) argue that there is need for South Africans to better understand the extent and causes of the scandal of hunger in the quest to eradicate it. Tsegay and Rusare (2014) are of the view that perhaps a start in addressing hunger is to call it by its name and describe what it means for real people, and not disguise or distance it behind technical terms. According to Tsegay and Rusare (2014), local residents interpreted hunger as lack of quality food for consumption. Tsegay and Rusare (2014) maintain that FAO measured the prevalence of food inadequacy based on the percentage of people who have sufficient calories for physical activity to determine hunger.

## **2.12 Zambia**

Equally, in Zambia, CSO sets the calorie requirement per adult equivalent to 2,721, while the World Bank uses the WHO-1985 recommendation of 2,464 calories to estimate the level of poverty (Bigsten and Tengstam, 2008). Such measures may be difficult to use in rural areas where people have various possessions such as herd of cattle and other farm produce, as they could be taking less of the stated calories. The case is the same even in monetary terms, CSO set 78.223 Kwacha Rebased in 2004 as extreme food poverty line and moderate poverty line based on minimum basic non-food items such as health, shelter and education (Bigsten and Tengstam, 2008). However, Nyasulu (2010) view poverty as the condition that makes meeting these needs impossible. What is interesting is that, in some cultures, a home with grass-thatched houses may not entail poverty, and so such measure may not be universal in determining levels of poverty and hunger in rural areas. This is the more reason why Nyasulu (2010) comes to the conclusion that poverty is circumstantial and conditional. People have their own unique ways of interpreting poverty and hunger, depending on their local circumstances and context.

Despite the existence of related literature on interpretation of SDGs, there is little information on how local residents interpret SDGs in their local context, as many



scholars focused on effects and standardized measures to define related concepts. On the other hand, scholars have focused on standardized measures to estimate levels of poverty and hunger which may not reflect a true picture of rural settings. Hence the current study.

### **2.13 Existing Sustainable Development Goals Related Practices in different countries**

Some countries within Africa and beyond use various knowledge practices in order to address the challenge of hunger and poverty. As key environmental issues affecting many communities across the world, hunger and poverty attract great attention in national priorities and sustainable development agendas.

#### **2.14 Panama Canal**

In Panama Canal, the education approach was used to address some environmental issues. For example, in mitigating human-caused raptor mortality through promoting positive attitudes towards Harpy Eagle, Environmental Education was used (*Harpia harpyja*) (Curti and Valdez, 2009). While the engagement of Environmental Education in the protection of the Harpy Eagle is appreciated for the positive results through community education, other endangered species, particularly those hunted for their skin, task or medical, and those of marine origin remain unexplored. There is need to extend protection, conservation and preservation measures beyond endangered species of the air as noted by WWF (2011); Laband and Nieswiadomy (2006); and Zambia Tourism Board (ZTB) (2016). The current study will address these concerns.

#### **2.15 South Africa**

In South Africa, among the practices used to address the challenge of hunger and poverty is modernization of the bee-keeping industry. Cadwallader, Hewey, Isaza and Simsek (2011) conducted a study on supporting urban bee-keeping livelihood strategies in Cape Town. Their findings reveal that there was positive impact in the livelihood of the poor communities pursuing the entrepreneurship due to long-term business skills acquired through training. Not to undermine the contribution of the study to the body of knowledge on sustainable development related practices, the scholar focused on

enhancing business knowledge and skills as opposed to sustainability of the enterprise. There is need to embrace sustainability practices in bee-keeping in order to ensure continuous production while protecting, conserving and preserving ecosystems and biodiversity.

## **2.16 Zambia**

Similarly, Centre for International Forestry Research (CIFOR) (2008) reveals that indigenous knowledge and skills, trade of honey and beeswax provides up to 25% of total annual income for tens of thousands of households in Zambia. Much as the enterprise of bee-keeping is appreciated, particularly in uplifting the living standards of the poor rural, attention to its damaging effects to the environment such as traditional hives is rarely paid. This is noted by SNV-Zambia (2008) which contends that continuous use of traditional bee hives is a threat to the environment in terms of cutting down trees. CIFOR (2008) notes deforestation as the biggest threat to bee-keeping and estimates 900,000 hectares being deforested annually in Zambia. Thus, the current study will infuse the applicability of ESD in bee-keeping enterprise which provides the spirit required for the implementation of sustainable practices of the enterprise. UNESCO (1986: 10) posits that “in a domain such as the environment, in which every action taken impinges on natural, social and cultural cycles, knowledge is essential to foresee possible dangers as well as possible benefits” and so “education must communicate this knowledge”. ESD can be engaged to educate bee-keepers about sustainable practices in their enterprise. It can be argued that once ESD is engaged, bee-keepers will acquire knowledge, skills, values, attitudes and awareness needed in critical application of sustainability practices in bee-keeping enterprise.

Cooperative for Assistance and Relief Everywhere (CARE) (2009) hold that small scale farmers in Zambia use minimum tillage practices such as ripping of planting basins before the rains begin, practice crop rotation such as legumes, living the residues in the field after harvesting, practices weed control and plants early. Baudron, Mwanza, Triomphe and Bwalya (2007) encourage crop production that strives to achieve acceptable profits together with high and sustained production levels while concurrently conserving the environment. Tirado, Englande, Promakasikom and Novotny (2008)

however warn that most agro-chemicals used in farming have effects to ecosystems and biodiversity, an idea that is rarely known and understood among small scale farmers practicing conservational farming methods. The current study, through ESD will be used to enlighten small scale farmers about the environmental harm of using agro-chemicals in their fields, while suggesting sustainable practices in their production system. Tirado *et al.* (2008) contend that the future of farming lies in a modern type of agriculture that works with nature and with people, not against them. Through its vigor and emphasis on sustainability principles, ESD will be used to convey valuable knowledge about sustainable crop production for better livelihood whilst conserving the environment.

Despite the availability of literature on existing Sustainable Development Goals related practices, there is little information that embraces ESD as a channel through which practices aimed at achieving sustainable development could be enhanced. Hence the current study.

### **2.17 Approaches Designed to Address Sustainable Development Goals in different countries**

Some countries across the world use various approaches designed to address SDGs that specifically pose great challenge in their local societies. For instance, in the quest to reduce the rate of hunger and poverty, States come up with various innovations in different forums and sectors of their economy.

### **2.18 Cambodia**

Based on gender responsiveness, the Cambodian Government used the agriculture sectorial approach, particularly agriculture to address the issue of poverty. UN (2015b) reveals that there is massive improvement in socio-economic activities based on agriculture among rural women in Cambodia. Complementing on UN (2015b), Blench, Ralsgard, Gossage, Rahmato, and Scott (2002) contend that Cambodia made steady progress in reducing poverty.

## **2.19 Botswana**

In Botswana, the policy approach has been specially designed to address the challenge of poverty across the country. Ketlhoilwe and Jeremiah (2012) on poverty eradication in Botswana emphasize on positive government policy and diversification as the best means of fighting poverty. Not to undermine the contribution of the study to the body of knowledge on available approaches used to enhance sustainable development, attention lacks on the use of ESD in the implementation of sustainable practices in its innovation. There is need to engage ESD in sustainable development initiatives for recognition of values, knowledge, skills and attitudes to ascertain sustainability of prioritized projects. The current study envisaged engagement of ESD in existing projects aimed at achieving sustainable development such as ending poverty and hunger in order to ascertain sustainability.

## **2.20 Zambia**

Similarly, Zambia uses the policy approach in its quest to address issues of hunger and poverty. According to Saasa and Carlsson (2002), a slight positive impact in poverty reduction with weak poverty-reducing impact of donor aid exist in Zambia for lack of political will and the capacity to develop ‘home grown’ poverty reduction plans. Complementing on Saasa and Carlsson (2002), Blench *et al.* (2002) conclude that it seems fair to say that there is no overall workable poverty reduction policy in Zambia-let alone one backed with political will. In the views of Saasa and Carlsson (2002), capacity and political will for Zambia to develop ‘home grown’ poverty reduction plans and strategies is the only solution to realize a sustainable solution to poverty challenge. This assertion may remain challenging to achieve without an environmentally educated society. Arguably, one of the pending strategies that the country could adopt is incorporating ESD in structuring or designing projects aimed at reducing poverty; which has the potential to raise awareness and knowledge sharing on environmental issues pertinent to current challenges our world is faced with today. Through capacity building, aimed at sustaining the project to caution the short-term benefits deemed vital in the finding and assertion of the case study, ESD can play a crucial role to mobilize and educate a cadre of community members involved in the fight against poverty. Even in an

instance where policy approach is coherent as opposed to fragmentation, ESD could still be used to caution the probable ingredients in the policy formulation process in the frames of environmental management.

USAID (2011) reveals that the goal of Zambia's Feed the Future (FTF) strategy is to sustainably reduce poverty and under-nutrition in target areas. This is closely associated to 'National Food and Nutrition Strategic Plan 2011-2015' whose objective is to achieve sustainable food and nutrition security and to eliminate all forms of malnutrition in order to have a well-nourished and healthy population that can contribute optimally to national economic development (Weitz *et al.*, 2015). While this strategy is appreciated, it does not clearly explain how poverty levels among the rural poor could be eradicated; and the use of ESD lacks consideration.

Despite the availability of literature on approaches designed to address issues related to sustainable development, ESD suffers exploration in enhancing sustainable development, as scholars have focused on bureaucratic efficiencies while paying little attention on methods of implementation thereof. Hence the current study.

### **2.21 The Role of Education for Sustainable Development in Addressing Sustainable Development Goals**

Although ESD could be used to solve numerous environmental challenges, there is little evidence from the case studies reviewed that recognizes the crucial role ESD could play in raising awareness among policy makers, stakeholders, and general public for sustainability of various undertakings. For example, Bucknall, Kraus and Pillai, (2000) hold that ESD must be part of any long-term poverty-focused environmental strategy, particularly in raising awareness about the negative environment externalities or adverse impact of certain development projects on the livelihoods of poor people. Complementing on Bucknall *et al.* (2000), Hungerford and Volk (1989) assert that if environmental issues are to become an integral part of instruction designed to change behavior, instruction must go beyond an "awareness" or "knowledge" of issues. For instance, a study by Collins-Figueroa (2012) reveals that ESD contributes to biodiversity issues in a local context, within and outside the study community. Collins-Figueroa

(2012) recognizes the crucial role ESD plays raising awareness of and action for, the conservation, enhancement and equitable use of biodiversity in the community. Similarly, Chikunda (2012) merits the capacity of ESD to equip people with knowledge, skills, values, and positive attitudes in living harmoniously with the local environment. While these studies are appreciated, they both lack recognition and involvement of the local community in establishing the vigor of ESD to address environmental challenges. Hence, the current study which is envisaged to provide the vigor needed to go beyond awareness of and knowledge about the SDGs in the local community and society at large.

In as much as Collin-Figueroa (2012) established that ESD could play a crucial role in terms of awareness, Bucknall *et al.* (2000) bemoan awareness that does not go beyond the communities that tend to be most severely affected. Whilst the emphasis is stressed on ensuring that ESD be part of poverty focused environmental strategy in raising awareness about environmental implications among the poor rural, it remains unclear on how ESD could be used in raising awareness and subsequently reduce poverty in project cycles. Furthermore, Bucknall *et al.*, (2000) posit that ESD can play an extremely powerful role in the long run by creating demand for effective local institutions and laying the cultural groundwork for effective political action. Notwithstanding the fact the above notion contends, it has to be emphasized that ESD is still in its infancy stage, particularly in the Zambian context for as long as it remains rhetoric. Therefore, there is need to actualize ESD in order to reap the benefits purported thereof; henceforth, using ESD as a tool to achieve SDGs is necessary. There is need to embrace ESD in all stages of developmental projects that aims to involve local communities, equipping policy makers and program developers together with the local community with relevant sustainability practices and principles. Suffice to say, ESD as a dynamic, two-way process that can enable both local communities and development institutions to be more responsive, and accountability (Bucknall *et al.*, 2000), could take a lead role in achieving SDGs taking advantage of its powerful spirit towards sustainable development practices and principles. Henceforth, provide the much needed vigor and spirit in fostering sustainable development in the fight against poverty, hunger, malnutrition, depletion of

natural resources, and preservation and conservation of biodiversity, among others, with regards to SDGs.

## **2.22 Summary of Reviewed Literature**

Firstly, the reviewed literature on awareness of the new SDGs established that scholars have focused on the mode of information dissemination, with less attention to people's awareness about SDGs. For example, they allude that the media and public sensitization play a crucial role in raising awareness about SDGs (Haverman, 2015; Mushota, 2015; Mwitwa, 2015; Nqgulana, 2015; Spooner, 2015; RDZ, 2015). Secondly, the reviewed literature on residents' interpretation of selected SDGs related concepts indicated lack of information on how these related terms are locally interpreted as many scholars have focused on effects thereof. For example, Fielding-Miller *et al.* (2014) established hunger as a lead cause of sex work. Other studies (Tsegay and Rusare, 2014) recommended that the terms 'hunger' and 'poverty' be localized meanings if they are to be addressed effectively. Thirdly, reviewed literature on existing SDGs related practices indicated that scholars paid less attention on how ESD could be used in sustaining practices aimed at achieving sustainable development. For example, studies by Curti and Valdez (2009) focused on conservation of an endangered Harpy Eagle, yet could not show how other endangered species of marine and terrestrial origins could be conserved. Baudron *et al.* (2007) and Tirado *et al.* (2008) encourage conservation farming among smallholder farmers, but could not use ESD to enhance sustainability of the practice. Studies by Cadwallader *et al.* (2011) reveal that there were improved livelihoods among beekeepers, yet could not explore the sustainability of the enterprise. Fourthly, literature revealed indicate little information on the crucial role ESD can play in addressing SDGs. Collins-Figueroa (2012) reveals that ESD plays a crucial role in raising awareness of, and action for biodiversity protection in the community. The study was, however, conducted at institutional level and could not explore on how the larger community could be engaged. Fifthly, scholars have paid much attention the effectiveness of policy based on practices related to SDGs, negating the manner in which practices are sustainably implemented. Studies by Blench *et al.* (2002); Saasa and Carlsson (2002) questioned the vibrancy of the policy based on addressing poverty. The study offers an

opportunity to use ESD to raise awareness of, and action for, the conservation, enhancement and sustainable use of the natural environment in the local community, thus, going beyond environmental awareness regarding SDGs as advocated by Bucknall *et al.* (2000).

### **2.23 Gaps Identified in Reviewed Literature**

Prior studies (Haverman, 2015; Nqgulana, 2015; Spooner, 2015; and RDZ, 2015) were conducted on people's awareness about SDGs and established modes of raising awareness about these global goals. Nevertheless, the current study attempted to establish residents' level of awareness as opposed to modes of awareness about the SDGs.

Studies by (Tsegay and Rusare, 2014; Fielding-Miller *et al.*, 2014; and Bigsten and Tengstam, 2008) on issues that relate to selected SDGs were conducted and used standardized and technical definitions of concepts related to those global goals. The current study, however, attempted to establish local residents' interpretation of selected SDGs to their local context as opposed to standardized and technical definitions of concepts that relate to selected SDGs.

Other studies (Curti and Valdez, 2009; Collins-Figueroa, 2012; Cadwallader *et al.*, 2011; Saasa and Carlsson, 2002; and Blench *et al.*, 2002) on activities people engage to address issues that relate to selected SDGs were conducted and established improved living conditions among residents and the environment. The current study attempted to establish the possibility of engaging Education for Sustainable Development to achieve issues that relate to selected SDGs in the local context.



## CHAPTER THREE

### DESCRIPTION OF THE STUDY AREA

#### 3.1 Introduction

This chapter gives a brief description of Itezhi-tezhi District, in particular Chief Kaingu's area as the study area. It begins with the physical characteristics and a map showing the area. This is followed by the socio-economic activities predominant in the area. The last section looks at the reason for choosing the study area.

#### 3.2 Physical characteristics

Itezhi-tezhi District is located between longitudes 25 degrees and 30 degrees east and latitudes 15 degrees and 30 degrees south. It is found in Southern Province of Zambia, sharing borders with; Mumbwa in the north, Kaoma in the west, Kazungula and Kalomo in the south-west, Choma in the south, Namwala in the south-east and Mazabuka in the east.

Itezhi-tezhi District experiences two distinct seasons that includes rainy and dry seasons. The rainy season begins from November to April, and dry season from May to October (Mfalila, Gbeli, Kiggundu, Bangwe, Jere and Agyei, 2013). However, the dry season is experienced with coldness from May to August and relative hotness from September to October. Mfalila *et al.* (2013) maintain that the annual rainfall ranges between 1,300mm in the north to 800mm in the south with monthly temperature range from 14 Degrees Celsius in June or July to 27.5 Degrees Celsius in October. In terms of hydrology, Itezhi-tezhi Dam and Kafue River are the major water bodies in the district (Mfalila *et al.*, 2013).

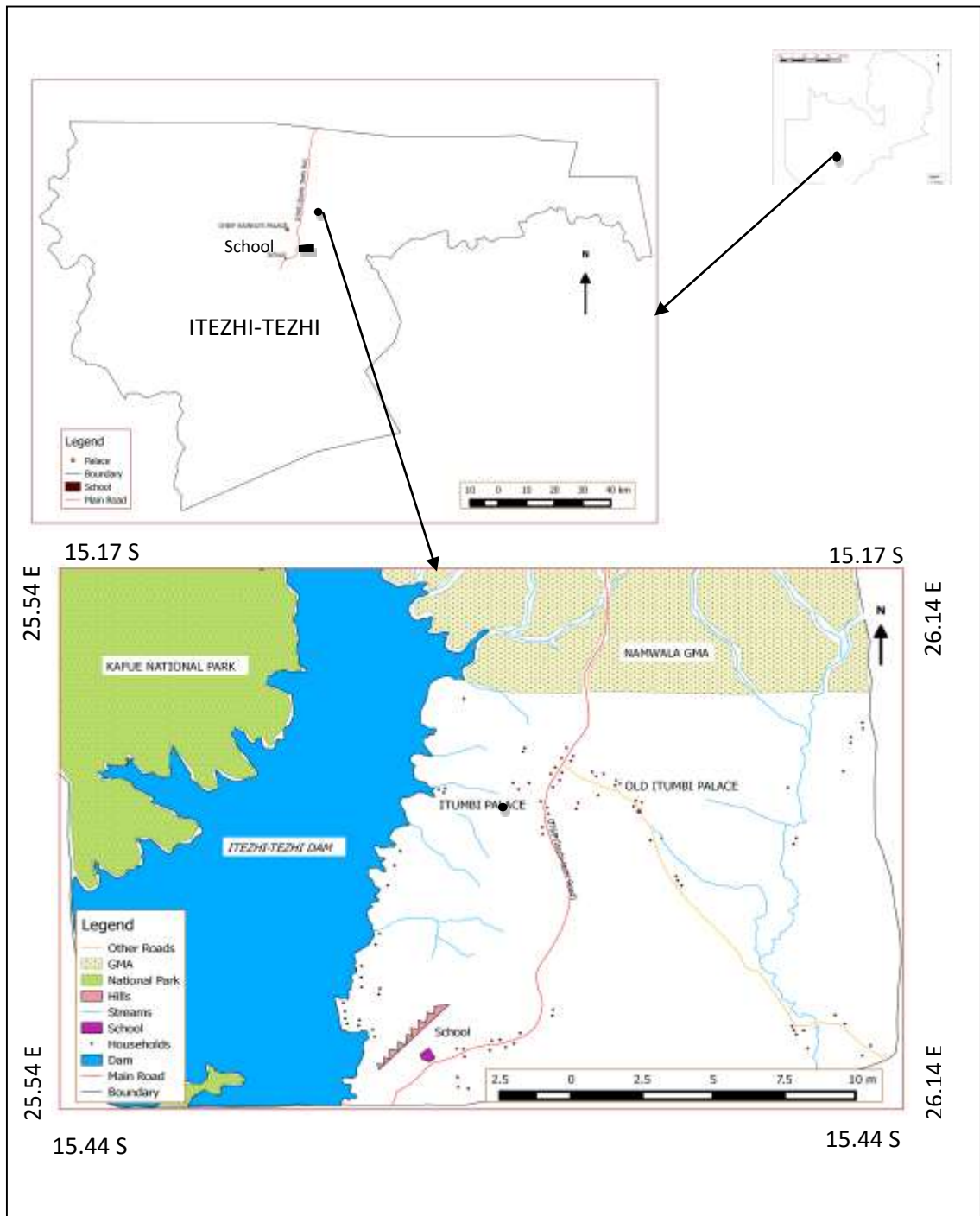


Figure 3.1: Map of Kaingu Chiefdom in Itezhi-tezhi District of Southern Zambia.  
 Source: Digitized from Topo-Raster Model by Ndila (2017)

### **3.3 Socio-economic characteristics**

Itezhi-tezhi District has a surface area of 13, 064 square kilometers with a population of 64,593 people (Ng'andu, 2015). Most of these people, particularly in the Kafue basin, live in “rural infrastructure highly vulnerable to climate change” Mfalila *et al.* (2013); which is the case with those on the upper land. Furthermore, Mfalila *et al.* (2013) hold that they engage in smallholder farming, practicing subsistence farming on an average area of 2 ha. Lungu (2011) observes that crop cultivation is the most vibrant form of agriculture in Itezhi-tezhi District, while fishing remains central to the lives of most people. Lungu (2011) further reveals that livestock production has increased exponentially from 35,000 heads of cattle in 2005 to 68,000 in 2010.

In Itezhi-tezhi, there are 53 primary schools, 24 community schools and 6 high schools. High schools include Itezhi-tezhi Boarding, Uphill Day, Shimbuwa Mboombo, Mbila, and Nansenga (Ng'andu, 2015). In terms of health facilities, there is one general hospital and a modern clinic in the township, and 3 clinics and 10 health posts in the rural area (Ng'andu, 2015).

### **3.5 Reasons for choosing the study area**

The study area was purposively selected, as empirical evidence showed the need for accelerated sustainable development solutions in the local context due to environmental challenges that affected the community. Statistics shows that out of 11, 431 people living in Chief Kaingu's area, 9,497 are poor (Murr and Rascon, 2015). This translated into 83% of the residents living in poverty. It was necessary that accelerated solution to end poverty in Kaingu Chiefdom be found. Moreover, the area was accessible and convenient for this research as the researcher easily accessed participants' residence in the time constraints of the study. The study area chosen was also economical for the researcher, as costs anticipated in the process of conducting the study drastically reduced. O'Leary (2010) complements cases often located that translates into minimized travel, enhanced access, and reduced costs. Hence, the study was conducted in Kaingu Chiefdom's area.

## **CHAPTER FOUR**

### **METHODOLOGY**

#### **4.1 Introduction**

This chapter gives detail of the research methodology used in the study. It covers the following sections; paradigmatic orientation, research design, target population, sample size, sampling technique, primary data and tools of collection, semi-structured interview, focus group discussion, participant observation, ethical considerations, and data analysis.

#### **4.2 Paradigmatic orientation**

The research process used methodology and methods which were consistent with the ontological and epistemological assumptions under the umbrella of Post-positivism. According to Trochim (2006), post-positivists believe that knowledge is valued and biased, and true objective knowledge is difficult to accomplish. To that effect, there was need to use multiple perspective. In the views of Trochim (2006), our best hope for achieving objectivity is to triangulate across multiple fallible perspectives even as we operate within subjective quadrants. Thus, the researcher used interviews, focus group discussion and observation in data collection to counter-check consistence of views. Furthermore, Trochim (2006) indicates that post-positivists view knowledge as generating from many realities rather than one reality. This therefore, compelled the researcher to be eclectic in drawing inferences based on various lived experiences given by the respondents as a pool of facts about awareness and interpretation of selected SDGs as well as knowledge practices used to achieve those SDGs in the local context. Thus, encompassing methods of data collection that are flexible, while increasing the chances of bringing meaningful data to the fore.

The specific post-positivist paradigmatic through which the thoughts of the study were comprehended is constructionism. Constructionism is a meaning-making school of thought that offers an explanation of the nature of knowledge and how human beings learn (Ultanir, 2012). This study was informed by knowledge premised on the belief that, it is constructed through interpretation, based on the knower's perception, value

judgments and lived experiences (Tedds, 2010). Complementing on Tedds (2010), Ultanir (2012) holds that constructivism epistemology maintain that individuals create or construct their own new understandings or knowledge through the interaction of what they already believe and the ideas, events, and activities with which they come into contact. This helped the researcher to appreciate and treat respondents as knowledge holders regarding selected SDGs in the context of awareness, interpretation and their practical experiences. Ultanir (2012) opines that the real understanding is only constructed based on individuals' experience and background knowledge. This influenced the researcher to build confidence and trust in the views of the respondents as experienced and expertise in localized activities aimed at attaining selected SDGs.

In an ontological sense, Orey (2016) and Kukla (2000) observe that among social constructivists, reality is believed to be constructed through human activity and society together invents the properties of the world. Putting it straight, Kim (2001) postulates that, for social constructivist, reality cannot be discovered as it does not exist prior to its social invention. The implication is that, over time and through engagement in socio-economic activities related to selected SDGs, respondents had shaped awareness and interpretation as well as knowledge practices regarding selected SDGs to their local context. In the views of Mackenzie and Knipe (2006), ontologically constructivist approaches to research have the intention of understanding the world of human experience and suggest that reality is socially constructed. This helped the researcher to understand the contextual relevance of selected SDGs as the residents were believed to have gained lived experiences, ideologies and reality about SDGs in the context of their local community. Most importantly, the researcher heavily relied on the respondent's views, particularly on their awareness, interpretation and knowledge practices pertaining to selected SDGs. To a larger extent, practices that depicted socio-economic activities related to SDGs were sought. The study attempted to contextually understand residents' knowledge and responsive knowledge practices that relate to selected SDGs on a view to infuse ESD into the available practices for sustenance of the activities.

### **4.3 Research Design**

The study adopted single case study design. According to Demetriou (2009), a case study is a traditional, systematic approach of looking at events, collecting data, analyzing information and reporting the results, with the end goal of describing the case under investigation as fully and accurately as possible. The study adopted single case study design in order to gain an in-depth knowledge and lived experiences of the people that were involved in the study regarding selected SDGs. Demetriou (2009) asserts that a case study gives the researcher a sharpened understanding of why the instance happened as it did, and what might require greater scrutiny in the future research. Complementing on Demetriou (2009), O’Leary (2010) recognizes a case as allowing for building of holistic understandings through prolonged engagement and the development of rapport and trust within a clearly defined and highly relevant context. In this case, the researcher got an in-depth understanding of resident’s awareness, interpretation and localized meaning, and knowledge practices related to selected SDGs in Itezhi-tezhi District. In the context of this study, case study arguably raised above other strategies available, for its capacity to investigate a phenomenon within its real-life situation and relevant context. Demetriou (2009) notes that case study is gaining popularity in education, particularly education evaluation and instructional use on a view to develop critical thinking, skills and knowledge. This is cardinal as the researcher intended to encourage engagement of ESD as a tool in meeting selected SDGs; envisaged to vigorously foster sustainable development through inculcating awareness, knowledge, skills and critical thinking among residents of Itezhi-tezhi. In Environmental Education, however, case study has been used by a number of scholars in research, some of which are: Sehlola (2010) – A case study of the integration of Environmental Education in the Primary Curriculum; and Reilly (2008) – Environmental Education’s Role in Sustainable Development: Three Case Studies from India, South Africa and the United States, among others.

### **4.4 Target population**

In a research, a population is a total membership of defined class of people, objects, or events which is of particular interest to the researcher (O’Leary, 2010). The target

population for this study was all household heads and their Headmen, Chief Representative and ministerial experts in Chief Kaingu of Itezhi-tezhi District. This target group provided the information the researcher intended.

#### **4.5 Sample size**

Sidhu (2006) asserts that the investigator selects a particular group or category from the population to constitute the sample to mirror the whole population with reference to the characteristic in question. In this case, the sample size of 61 in the category of; 54 household heads, 3 Headmen, Chief's representative, and 3 experts from relevant ministerial institutions (Community Development, Agriculture and Co-operatives, and General Education) in Chief Kaingu's area was used. Van Dalen and Meyer (1966) hold that in a case study, a researcher makes an intensive investigation of a social unit such as a person, family, group, social institution, or community. As such, the researcher elicited respondents from households in Chief Kaingu's area and experts from ministerial institution associated to chosen SDGs in Itezhi-tezhi District and Chief Kaingu in particular.

#### **4.6 Sampling technique**

O'Leary (2010) defines sampling as the process of selecting elements of a population for inclusion in a research study. Basically, the study used proportional quota sampling, homogeneous purposive sampling, and expert purposive sampling techniques, in the streams of non-probability sampling approach. Sidhu (2006) holds that in non-probabilistic sampling cases are selected on such bases as availability and interviewer judgment; and lie largely in the area of convenience. Complementing on Sidhu (2006), Kombo and Tromp (2007) posit that in non-probability sampling, the researcher is interested in the representativeness of the concepts in their varying forms. Non-probability, sometimes called non-random approach helped the researcher elicit representative respondents with vital information about selected SDGs in their varying forms. Henceforth, this study maximized the scope or range of variation within the study population.

Sidhu (2006) views quota sampling as stratifying the population while purposively selecting the cases within each of the strata using the researcher's judgment. As regards proportional quota sampling, Malhotra and Birks (2007) observe that one element is selected based on judgment or convenience within each stratum. In light of this, the researcher stratified the total area of Kaingu Chiefdom in which columns and rows were devised against the strata in order to enhance proportionality. From each column, at least one stratum was sampled and the researcher purposively selected a specific number of household heads for the study. Ultanir (2012) contends that real understanding is only constructed based on individuals' experience and background knowledge. The researcher, thus, selected respondents who were knowledgeable with lived experienced in respective socio-economic activities which related to selected SDGs. Sidhu (2006) explicitly points out that quota sampling permits the researcher to substitute one respondent for another in case of inability or refusal. Thus, in case of resistance, the researcher selected another respondent. This enabled the researcher to easily access available and willing respondents to participate within the stratum in the time constraint of the study.

Within the streams of purposive sampling, the study engaged homogeneous sampling to select household heads. Homogeneous sampling is a purposive sampling technique that aims at achieving a sample whose units share similar characteristics or traits. In this case, the traits of interest, particularly among household heads were background and occupation. Based on the nature of practices and activities engaged in meeting selected SDGs, household heads were selected for study. Kombo and Tromp (2007) hold that the power of purposive sampling lies in selecting information rich cases for in-depth analysis related to the central issues being studied. As such, the researcher selected households that were believed to be living in extreme poverty and hunger whilst engaged in various socio-economic activities relevant to address them.

#### **4.7 Primary data and tools of collection**

Primary data was collected using semi-structured interview, focus group discussion, and participant observation. Kombo and Tromp (2007) view data as the information gathered from respondents. In the context of this study, primary data involved creating new data



set pertaining to selected SDGs that seems to be fragmented among residents of Itezhi-tezhi District. The sections below give details of each of the approaches.

#### **4.8 Semi-Structured Interviews**

O’Leary (2010) refers semi-structured interview as the use of a flexible structure where the researcher starts with defined questions and later shift to follow the natural flow of conversation. Thus, to collect data based on objectives 1 and 2, the researcher generated a series of questions that were answered by respondents (refer to appendix B). O’Leary (2010) observes that in semi-structured interview, interviews may deviate from the plan to pursue interesting tangents. This therefore, means that during the semi-structured interview, the interviewer will take into consideration emerging issues or themes relate to selected SDGs, and expressed in their familiar language. John-Steiner and Mahn (1996); and Scott and Palincsar (2013) argue that SCCT insists on the use of language and other symbol systems in investigating human activities or events within their historical development. In the context of this study, semi-structured interview accorded households an opportunity to use their familiar local language in a conversation fashion to verbally express themselves on how aware they were regarding selected SDGs and what these SDGs meant in their local and social context. Shareef (2010) reveals that, through semi-structured interview, participants discuss their interpretations of the world in which they live, and express how they regard situations from their own point of view. Orey (2016) contends that constructivists beliefs that members of a society together invent the properties of the world. The researcher, therefore, viewed the respondents as rich source and that the information thereof was a true reflection of the entire community. The study adopted semi-structured interview premised on the merit that respondents were met in their respective places of residence, and provided information in their natural context. Semi-structured interview was used as a guide, whereby the interviewer asked probing questions and allowed the interviewee to give a response. Based on the response given, the interviewer made follow-up questions that too, begged response from the interviewee. It is important to mention that the household head was the main respondent and other members of the household who showed interest were allowed to attend.

#### **4.9 Focus Group Discussion**

O’Leary (2012) and Biello (2009) views focus group discussion as a data collection method that relies on group interaction as the source of data in which the researcher is a part of. In handling focus group discussions among respondents, Ngoma and Mwiya (2014) cited Krueger and Casey (2000) who recommend the use of small groups ranging from 6-10 members. Thus, in order to address objectives 3 and 4, 18 household heads who participated in semi-structured interview were allocated to 3 groups, comprising 6 households each, for an in-depth discussion based on existing knowledge and practices relevant to meet selected SDGs, as well as examining how ESD could be integrated therein (refer to appendix C). Kim (2001) opines that constructivists’ belief people create meaning through their interactions with each other. Similarly, John-Steiner and Mahn (1996) observe that constructivists view theory and practice as the collaborative and transformative ways in which knowledge is co-constructed. Henceforth, the researcher selected respondents who earlier participated, i.e. in semi-structured interview with tested ideologies in selected SDGs to participate in focus group discussion for meaningfully reflection and merging their knowledge and practice regarding SDGs, thereby, bringing more valuable data to the fore. Focus group discussion was conducted in a round table fashion where respondents contributed equitably to the discussion while the researcher assumed the role of a moderator. According to O’Leary (2010), the interviewer acts as a facilitator or moderator and there is an express goal of interaction within a nurturing environment during focus group discussion. Note-taking was done by a researcher. Robbins (2005) holds that constructivists recognize mutual involvement, communication, and co-ordination among participants and their partners as they participate in socio-culturally relevant experiences. Thus, such a lens accorded me, as researcher, an opportunity to moderate the focus group discussion in this study. O’Leary (2010) opines that the researcher may consider taking notes in conjunction with audio or video recording. Thus, to preserve raw data, ensuring clarity, and for editing or reporting purposes, focus group discussion was video-recorded with the consent of discussants. This too, enabled me, as researcher, to focus on the interesting tangents following responses given in the process of the discussion. This study adopted focus group discussion as a method of data collection premised on the merit that rich data that cannot

be achieved through direct interview would be achieved. In the views of O’Leary (2010), the goal of focus group discussion is to use rich discussion to draw out depth of opinion within the economy of time.

#### **4.10 Participant Observation**

Pashollari (2016) and O’Leary (2010) are of the view that participant observation requires the researcher to immensely be in the social setting to acquire experiences of the participants. Therefore, in order to address the 3<sup>rd</sup> objective, 10 households drawn from those who participated in focus group discussion were candidly observed in their routine practices meant to achieve selected SDGs. Each household observed for a period of 3 months. The researcher recorded all observations, while suggesting application of sustainability principles in the activities being practiced. John-Steiner and Mahn (1996) note that SCCT views theory and practice as critical ways in which knowledge co-constructed. In the context of this study, participant observation provided a platform for me, as researcher, to work in collaboration with the respondents while fortifying local knowledge and practices in meeting SDGs in the community. In organizing observations, O’Leary (2010) recommends the use of schedules or checklists as well as an attempt to record the unplanned or the unexpected. Using checklists and schedules, the researcher carefully defines observable factors (Sidhu, 2006), particularly those that relate to knowledge and practices engaged in daily activities of the households (refer to appendix D). The researcher also recorded any observations that were relevant to the study. Moreover, O’Leary (2010) views need for an observer to consider the inclusion of photographs and video/audio recordings. Thus, with permission from the household, observed behavior or occurrences depicting relevant scenery were captured through video recording and photographing. According to O’Leary (2012), participant observation helps the researcher to collect data in a natural setting of the phenomena. Thus, the researcher used participant observation to collect data relevant in examining how ESD can be used as a tool to fortify knowledge and practices regarding selected SDGs in the natural setting and cultural context of households.

The researcher all collected data based on objectives 1, 2, 3 and 4 from experts drawn from relevant ministries. O’Leary (2010) holds that key informants can be used to

triangulate or confirm the accuracy of generated data. Thus, an in-depth interview with experts from ministerial institutions associated to the selected SDGs in the study were conducted to ascertain authenticity of data collected through semi-structured interview, focus group discussion and participant observation with households. This data was added to the fore.

#### **4.11 Ethical considerations**

Des Jardins (2001) views ethics as the general beliefs, attitudes, or standards that guide customary behavior. Thus, ethical in the context of this study referred to beliefs and principles regarding what are right and wrong. For consideration of any ethical dilemmas intrinsic in a research project, O’Leary (2010) recommends that a researcher needs appropriate ethical approval. Thus, the researcher initially got clearance with the institution (University of Zambia-UNZA) to undertake a study in Itezhi-tezhi District. O’Leary (2010) regards the letter of introduction from the supervisor as a professional way of avoiding doubts about the researcher. In the context of this research, an introductory letter from the Department of Ethics (UNZA) played a crucial role in seeking permission from ministerial institutions such as agriculture and co-operatives, fisheries and livestock, forestry, health, and also Chief Kaingu and senior Headmen, in Itezhi-tezhi District. O’Leary (2010) insists on ethics and integrity when working with key informants (such as experts). These line ministries provided vital information through selected extension officers who were charged with the supervision of extension services in Chief Kaingu’s area. A courtesy call for permission from local authorities such as Chief Kaingu, senior headmen and headmen overseeing households in the study area were sought. Further permission was asked, particularly from the selected households for inclusion in the study.

O’Leary (2010) regards the consent letter as a cardinal document that assures confidentiality and anonymity in the research project. Therefore, the researcher assured the households at the beginning of the study that the information to be obtained was meant for the study only and either their names or information be divulged in any way. The researcher availed the consent letter to the respondent to read and sign. The researcher emphasized that signing is merely a study routine for evidence that an

interview or discussion between the respondent and researcher was conducted. During semi-structured interviews, focus group discussion, and observation, the researcher displayed high levels of respect, through appropriate personal conduct. The researcher was sensitive of questions, probes and gestures seeking clarity. To a larger extent, the researcher worked everything possible to uphold the cultural norms of people, particularly of the study area. It was incumbent upon the researcher to carefully find out sensitive cultural norms central to the area. Although, it could arguably be viewed as a continuous process, great accomplishment in acquiring cultural norms was made during courtesy, permission seeking and familiarization tour to the area.

#### **4.12 Data analysis**

Data from semi-structured interview, focus group discussion and participant observation was analyzed using thematic analysis and Critical Discourse Analysis (CDA). Astride-Stirling (2001) refers thematic technique as web-like illustrations that summarize the main themes constituting a piece of text. In the context of this study, thematic analysis meant connecting closely related phrases or words in data collected during semi-structured interview, focus group discussion and participant observation. According to Astride-Stirling (2001), thematic networks technique is a robust and highly sensitive tool for the systematization and presentation of qualitative analyses. Thus, thematic analysis is a method for identifying, analyzing, and reporting patterns (themes) within data (Braun and Clarke, 2006).

Braun and Clarke, (2006) observe that an alternative use of thematic analysis is to provide a more detailed and nuanced account of one particular theme, or group of themes, within the data. This study adopted thematic analysis to clearly extract related words or phrases based on the emerging themes captured during semi-structured interview, focus group discussion and participant observation. O’Leary (2010) presses emphasis on engagement with the documents, transcripts, images, and texts that make up the researcher’s raw data through reading and rereading – in the process, mapping and building themes. In this case, using CDA, direct and latent responses was understood. In the first place, data capture through audio was translated into text by the help of the assistant researcher. The researcher then thoroughly read field notes together with the

translated text. In the process of reading, the researcher underlined words and phrases related to the study. Later on, words and phrases were categorized according to similarities, forming emerging themes that will systematically be recorded and packaged. O’Leary (2010) opines that raw data must be drilled systematically in order to come up with categories of understanding. Therefore, various themes identified were coded, taking into consideration the theoretical and epistemological commitments. According to O’Leary (2010), there is need to reflect on how literature and theoretical underpinnings inform data. Packer and Goicoechea (2009) reveal that among constructivists, it is basic that the knower is active and adds a development dimension. The researcher recognized respondents as knowledgeable about selected SDGs in the local context. Figure 4.1 summarizes data analysis of the study.

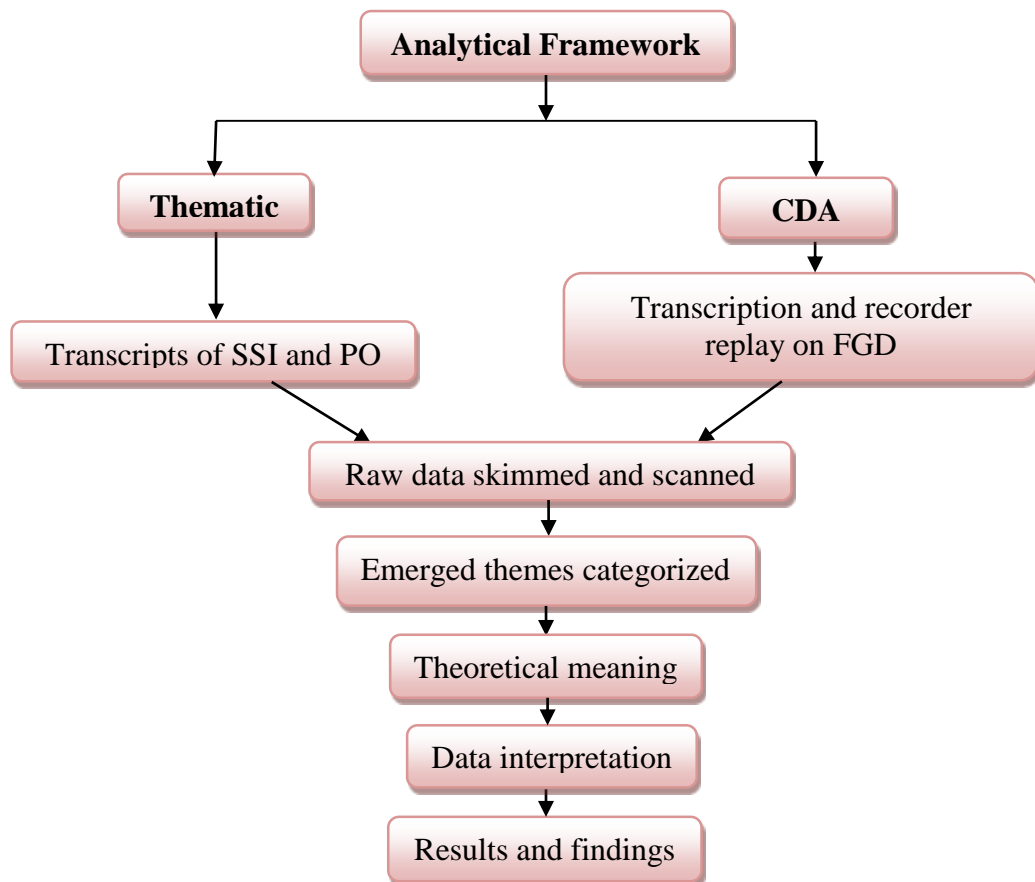


Figure 4.1: *Analytical framework for data based on addressing SDGs using ESD*  
 Source: Field Data, 2017

#### 4.13 Data validation

Egonsdotter and Oberg (2002) define data validation as the continuous checking and questioning investigation while theoretically interpreting the findings. The researcher implored internal validation approach in the streams of methodological triangulation, particularly ‘between-methods’ in epitomizing the research concern such as ‘is the study measuring what it purports to measure. Lee and Wang (1993) argue that internal validation methods, at best, ensure internal validity of data by eliminating inconsistencies. Thus, the researcher created two separate data sets based on ‘semi-structured interview’ and ‘focus group discussion’, while verifying responses corresponding to observed behavior made during participant observation. The researcher then, identified common responses and selected them as quality data; thus, adhering to prevention of bad data into the database (Lee and Wang, 1993).

The study also used recall interview, where the researcher revisited selected respondents and asked some questions to see consistence. Larsen, Flesaker and Stege (2008) observe that in many qualitative research projects, participants are asked to recall, unassisted, their experience across a series of sessions. Packer and Goicoechea (2009) reminds the researcher about the metaphor ‘participation’ being central to SCCT perspective – participation requires forgetting as well as knowing, and often the separation of knower from the known. Thus, the researcher viewed data contributed by respondents as one possible product of the dialectic of person and world with consistence reality about the selected SDGs in the context of the local community. In the views of Larsen *et al.* (2008), the closer the recall is to the original conversation, the more vividly and easily activated the memories are expected to be. Thus, selected respondents were asked to answer selected questions they answered during semi-structured interview and focus group discussion. The answers given were as close as possible or similar to the previous ones. During recall interview, respondents were asked to recall as clearly as they could to their responses as experienced during semi-structured interview and focus group discussion sessions. The recall interview was done 5 weeks after semi-structured interview and focus group discussion sessions.

In case of participant observation, Larsen *et al.* (2008) hold that a system for playback is required for both the interviewee and the interviewer to clearly view the screen, while posing and discussing in the process. Thus, the researcher provided video recorded during participant observation where the respondents, together with the researcher watched and briefly discuss (in-between the video show) their experience in the selected activities. During the discussion, the researcher asked for clarity from respondents for certain actions in the caption, pointing to recorded concerns in the observation or research note book. The corresponding comments and views signifying consistence were noted.

#### **4.14 Limitations of the study**

Hughes, Win and Colton (2015) define limitations as shortcomings that place restrictions on methodology and conclusion in a study. The researcher faced constraints in language fluency during semi-structured interview and focus group discussion as neither majority of households were familiar with English Language nor the researcher is familiar with their local language; an element Hughes *et al.* (2015) recognize as limiting the ability of a researcher to read and interpret the text in the language familiar to the respondents. Meanwhile, John-Steiner and Mahn (1996); and Scott and Palincsar (2013) realize the importance SCCT attach to Language in investigating human activities. Packer and Goicoechea (2009) stress the ontological role of communicative action leading to connecting oneself to others. It was, therefore, necessary that an interpreter used in this study and audio record (with permission) the semi-structured interview and focus group discussion so that further translation could be done after the interview. On the other hand, households may refuse to take part in the study, as noted by Bailey (2008) especially based on personal reasons. This lens enabled me, as researcher to assess the reason for refusal in order to establish the appropriate response and action, particularly suggesting callbacks for those who said they were busy. In other cases, replacements of the respondents with others within the stratum were done. To a larger extent, Dodd-McCue and Tartaglia (2010) bemoan the small sample size and use of convenient samples for limiting generalizability of results. For this reason, the results obtained in this study may not be generalized.



## CHAPTER FIVE

### PRESENTATION OF RESULTS

#### 5.1 Introduction

This chapter gives detail of the research results. It opens with a simple survey that determined two salient SDGs respondents felt necessary to be address by the study. The study, thereafter, covers the following sections: residents' awareness about SDGs; residents' interpretation of selected SDGs; locally existing knowledge, skills, values and attitudes that relate to selected SDGs; and addressing selected SDGs through ESD. In, Tabular information was used alongside verbatim in order to avoid mutilation of data.

#### 5.2 Baseline survey to determine salient SDGs among local residents

This section shows results based on a pilot survey done to elicit the most salient SDGs respondents felt needed to be addressed by the study. The 17 SDGs were introduced to respondents, after which each one was asked to identify at least five SDGs that he/she felt needed urgent attention in their community. Since each respondent gave 5 entries, responses accrued to 72. As shown in Table 5.1, hunger (SDG 2) scored 18% which was the highest. It was followed by poverty (SDG 1) with a score of 16%. Education (SDG 4) emerged third, scoring 15%, and in the fourth position was water (SDG 6) with a score of 13%. In the fifth position was health (SDG 3) scoring 11%, closely followed by ecosystems (SDG 15) with a score of 9% in the sixth position. Habitation (SDG 11) came in the seventh position with a score of 5%, while the eighth was women (SDG 5) with 4%. Climate (SDG 13) and marine-ecosystems (SDG 14) came in the ninth position with each 3%. Energy (SDG 7) and economy (SDG 8) took the tenth position with each 1%. Without a score were; infrastructure (SDG 9), inequality (SDG 10), consumption (SDG 12), institutions (SDG 16), and sustainability (SDG 17).

According to the results in Table 5.1, respondents noticeably preferred hunger related issues which falls in the streams of SDG 2, reading as “end hunger, achieve food security and improved nutrition and promote sustainable agriculture by 2030”. Poverty related issues also emerged as salient under the umbrella of SDG 1, reading as “end

poverty in all its forms everywhere by 2030”. This implied that local respondents perceived SDG 2 and SDG 1 as most urgent global goals that needed immediate attention to their social context. Results also suggested that of moderate concern were SDG 3 and SDG 15. However, the least priority global goals were; SDG 9, SDG10, SDG 16, and SDG 17. The study, therefore, picked SDGs 1 and 2 for further analysis. Table 5.1 shows results on prioritized SDGs based on local residents views.

*Table 5.1: Prioritized Sustainable Development Goals based on residents’ views*

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Poverty related issues (SDG 1)	12	16
Food related issues (SDG 2)	14	18
Health related issues (SDG 3)	8	11
Education related issues (SDG 4)	11	15
Women related issues (5)	3	4
Water related issues (SDG 6)	10	13
Energy related issues (SDG 7)	1	1
Economy related issues (SDG 8)	1	1
Infrastructure related issues (SDG 9)	0	0
Inequality related issues (SDG 10)	0	0
Habitation related issues (SDG 11)	4	5
Consumption related issues (SDG 12)	0	0
Climate related issues (SDG 13)	2	3
Marine-ecosystems related (SDG 14)	2	3
Ecosystems related issues (SDG 15)	7	9
Institutions related issues (SDG 16)	0	0
Sustainability related issues (SDG 17)	0	0
<b>Total</b>	<b>75</b>	<b>100</b>

Source: Field data, 2017

### **5.3 Resident’s awareness about Sustainable Development Goals**

This section presents results based on the first objective of the study which was to determine resident’s awareness about SDGs in their local context. To achieve this, however, semi-structured interview schedule was designed to probe whether the respondents were aware about the SDGs or not. Those who were aware about the SDGs were asked to explain how they came to know about them while giving specific examples of SDGs they knew. In case of those who were not aware about the SDGs, they were asked to give reasons for lack of awareness.

#### 5.4 Awareness about Sustainable Development Goals

The respondents (40 Household heads and 3 headmen) were asked whether they were aware about the SDGs or not. Accrued responses were tabulated for descriptive purposes. As illustrated in Table 5.2, 77% of the respondents were not aware about the SDGs. However, 23% of them were aware about the SDGs.

According to the results, 33(77 %) of the respondents lacked awareness about the SDGs. Only 10(23 %) had an idea about the SDGs. This implied that generally, local residents were not aware about the SDGs at the time of study.

*Table 5.2: Resident's awareness about Sustainable Development Goals*

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
No	33	77
Yes	10	23
<b>Total</b>	43	100

Source: Field data, 2017

Basically, key informants were all aware about the SDGs. For example, a Senior Officer in Planning Unit at Local Government and Housing Offices said, “*Oh! Yes, I am well aware about SDGs and our office is trying to address one of them in conjunction with the SCRKA-Project running in the district...*”

#### 5.5 Reasons for lack of awareness about Sustainable Development Goals

In this study, 33 respondents who lacked awareness about the SDGs were asked why they were not aware about those global goals. The responses were tabulated for descriptive purposes. As demonstrated in Table 5.3, lack of community sensitization scored highest (61%). It was followed by lack of community education which scored 30%. Lack of public announcement scored 6%, and uncertainty about the cause of lack of awareness about the SDGs was the lowest (scored 3%).

According to the results, lack of community sensitization emerged as a noticeable reason for lack of awareness about SDGs. Lack of community education and public announcements was also perceived to be the cause for lack of awareness about the global goals. This implies that, if the community was enlightened of the SDGs at

inception, they would have been aware about them. Table 5.3 shows results on reasons for lack of awareness about the SDGs among local residents.

*Table 5.3: Reasons for lack of awareness about Sustainable Development Goals*

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Lack of community sensitization	20	61
Lack of community education	10	30
Lack of public announcements	2	6
Not sure of the cause for lack of awareness	1	3
<b>Total</b>	<b>33</b>	<b>100</b>

Source: Field data, 2017

## **5.6 How residents became aware about Sustainable Development Goals**

The 10 respondents who happened to be aware about SDGs were asked to explain how they came to know about them. Some respondents came to know about the SDGs through Area Development Committee (ADC) programs that were running in the community. For instance, one respondent was quoted saying, “...*in this community, I am one of the ADC members who is fortunate to attend a number of developmental programs called by either government or donor agencies. Through their innovative programs and meetings, I learnt about SDGs that are currently advocated for world over...*”

Others became aware about SDGs through attending Conservation Farming meetings which is an agriculture initiative that encourages farmers to use farming methods that do not cause much harm to the natural environment, yet sustainable in nature. One respondent registered that,

*“Off course, issues of hunger and poverty have always been the community and country’s major concerns. But then, as new dimensions at the global level, I first heard about them during one of the meetings organized by Ministry of Community Development which was advocating for Conservation Farming in order to address these challenges. Delegates and program presenters kept on referring them as Sustainable Development Goals among others. There was, however, no clear explanation on what these goals really meant apart from the need to*

*getting led of hunger at household level via improved yield in crop production using environmentally friendly methods of farming.”*

Through sensitizations by Community Resource Board (CRB) that ran a number of innovative projects based on natural resources at community level, some respondents became aware about the SDGs. *“...through meetings and sensitization programs, for example; CRB programs and the current climate change project under Strengthening Climate Resilience in Kafue Basin (SCRICA). During one CRB meeting organized by UNDP community representative, the need for care and protection of land resources such as forest trees and wild life was mentioned as a global call....and during SCRICA meeting, climate change was cited as one of the Sustainable Development Goals adopted by United Nations...”,* said one respondent.

Other ways through which respondents became aware about the SDGs included; government department seminars, the media (i.e. radio), and personal interaction. Similarly, ministerial experts came to know about SDGs through the media (i.e. internet surfing). Asked what kind of material the respondent interacted with, he said, *“While I was browsing on the internet, I came across a World Development Report for 2015 document published by UNDP. This document contains the SDGs as global concerns that need urgent attention.”*

According to the results, it was clear that respondents came to know about the SDGs through ADC programs. Some came to know about those global goals through Conservation Farming meetings, CRB sensitization programs, government department seminars, the media and personal interaction.

### **5.7 Sustainable Development Goals residents were aware about**

Ten (10) respondents who were aware about the SDGs were further asked to mention specific SDGs they knew. Respondents were allowed to give as many examples of specific SDGs as they could. Accrued responses thus totaled to 46 and were tabulated for descriptive purposes. As indicated in Table 5.4, End hunger, achieve food security and improved nutrition and promote sustainable agriculture (SDG 2) and take urgent action to combat climate change and its impacts (SDG 13) were the highest (each scored

20%). The two were followed by end poverty in all its forms everywhere (SDG 1) (15%), after which was followed by protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss (SDG 15) (13%). SDG 15 was followed by ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (SDG 4) (11%), and was closely following conserve and sustainably use the oceans, seas, and marine resources for sustainable development (SDG 14) (9%). With the score of each 4% were: achieve gender equality and empower all women and girls (SDG 5); ensure availability and sustainable management of water and sanitation for all ages (SDG 6); and ensure healthy lives and promote well-being for all ages (SDG 3).

According to the results, ending hunger, achieve food security and improved nutrition and promote sustainable agriculture (SDG 2), and take urgent action to combat climate change and its impacts (SDG 13) were commonly known by the respondents. End poverty in all its forms everywhere (SDG 1) was also known. It was closely followed by protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss (SDG 15). Other known SDGs were: ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (SDG 4); conserve and sustainably use oceans, seas, and marine resources for sustainable development (SDG 14). Results show that SDG 14 was moderately known by those who were aware about the global goals. Results also entail that SDGs 4, 1, 15; with SDGs 2 and 13 in the lead, were popularly known among 10 respondents. With less popularity were SDGs 5, 3, and 6. Table 5.4 presents results on SDGs known by 10 respondents.

Table 5.4: Sustainable Development Goals residents were aware about

Response	Frequency	Percentage
End hunger, achieve food security and improved nutrition and promote sustainable agriculture (SDG 2)	9	20
Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (SDG 4)	5	11
Conserve and sustainably use the oceans, seas, and marine resources for sustainable development (SDG 14)	4	9
Take urgent action to combat climate change and its impacts (SDG 13)	9	20
Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss (SDG 15)	6	13
Achieve gender equality and empower all women and girls (SDG 5)	2	4
End poverty in all its forms everywhere (SDG 1)	7	15
Ensure availability and sustainable management of water and sanitation for all (SDG 6)	2	4
Ensure healthy lives and promote well-being for all ages (SDG 3)	2	4
<b>Total</b>	46	100

Source: Field data, 2017

It should be noted that SDGs depicted in Table 5.4 were also popularly known among key informants. For instance, asked to highlight on some specific examples of SDGs related issues affecting the people in their district, particularly Kaingu Chiefdom, one municipality participating in the study registered,

*“...though the fight to end poverty, regardless of its form and nature is a global concern, it is more critical in communities around Itezhi-tezhi District and so activities that relate to poverty alleviation are more appealing to me and the communities I serve. With hardships and unsustainable practices such as charcoal burning and poor fishing methods, the poor residents in Kaingu Chiefdom survive.... our target, therefore, should be based on addressing the issue of ending poverty in our communities if we are to sustain terrestrial and marine resources locally. The other important global concern affecting the poor rural is hunger. Ending hunger in terms of improving food security vital, though, there are other challenges such as climate change influencing productivity. This is the more reason why they are all targeted among the*

*Sustainable Development Goals adopted by the United Nations during the Sustainable Development Summit in 2015.”*

Complementing on the views of the expert from the municipal council, the other ministerial expert participating in this study was quoted saying, “... *as I browsed through the internet, I came across Sustainable Development Goals, among which were issues concerning ecosystems, education, energy, food security, end poverty and so on. Off course they were more specific and categorical with targets set for their achievement.*”

According to the results, among SDGs popularly known among key informants were: end poverty in all its forms everywhere (SDG 1); end hunger, achieve food security and improved nutrition and promote sustainable agriculture (SDG 2); take urgent action to combat climate change and its impacts (SDG 13); protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss (SDG 15); ensure access to affordable, reliable, sustainable and clean energy for all (SDG 7); and ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (SDG 4).

### **5.8 Residents’ preferred way of knowing more about Sustainable Development Goals**

On one hand, respondents who were aware about SDGs were asked to suggest their preferred ways of knowing more about the SDGs. On the other, respondents who were not aware about the SDGs were given a chance to suggest their preferred ways of knowing about the SDGs. Respondents were at liberty to suggest any number of options. As such, responses accrued to 64 and were tabulated for descriptive purposes. As demonstrated in Table 5.5, the educational approach, that is community education or educational crusades scored the highest (55%). It was followed by sensitization which scored 17% and meetings with the score of 11%. The media scored 8%, closely followed by others categorized as door to door campaign, and explanation which scored 5%. The



second last was churches which scored 3%, while brochures and pamphlets scored the least (2%).

According to the results, respondents generally preferred the educational approach, that is community education, and educational crusades as the best way in which they can know more about SDGs. Some respondents above the median preferred sensitization to be the most appropriate approach in which SDGs can be made known in their area. Others perceived meetings as a suitable way in which SDGs can be made known in their local context. In the median, was the media which was perceived as suitable fashion in which respondents can know more about SDGs. This implied that the educational approach targeting the local community can be used to raise awareness about, and knowledge of SDGs in Kaingu Chiefdom of Itezhi-tezhi District. However, it can be integrated with other emerged options in this study, though limiting in nature. In case of the media, local residents may be lacking necessary gadgets of communication such as radios and smart phones. For instance, one respondent noted, “*ITT- Community Radio Station can be used to disseminate the information, though, not all community members have radios.*” Table 5.5 depicts results on residents’ preferred way of knowing more about SDGs.

*Table 5.5: Residents’ preferred way of knowing more about Sustainable Development Goals*

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Education, (i.e. community education, educational crusades or rallies)	35	55
Sensitizations	11	17
Meetings	7	11
Media (Community radio station)	5	8
Churches	2	3
Brochure/pamphlets	1	2
Others, i.e. door to door campaign, and explanation	3	5
<b>Total</b>	64	100

Source: Field data, 2017

Similarly, among key informants, the educational approach emerged as the best fashion in which awareness about, and knowledge of SDGs can be raised in the context of Itezhi-tezhi District and Chief Kaingu in particular. Asked to explain how SDGs could

be made known among local residents in Itezhi-tezhi District, one ministerial expert said,

*“...through community education or educational crusades, awareness concerning the new Sustainable Development Goals can be raised among our local people. Education has no age limit, as such, it can be used as a channel through which communities come to the accurate knowledge about emerging issues, especially those that affect them. For example, education can play a key role in teaching local farmers on the importance of diversification and sustainability in order to address the challenges of poverty and hunger. The two are among the Sustainable Development Goals advocated for globally.”*

Complementing on this view, the other ministerial expert registered, *“Community education is a viable means by which the community can be made aware or knowledgeable about the new Sustainable Development Goals. Other options could be that, people or experts responsible in these goals should go round sensitizing the communities, issuance of brochures and through featuring programs on Itezhi-tezhi Community Radio Station.”* The municipality also expressed similar views. He was quoted saying, *“by using local radio stations, experts ...can feature and teach listener about these goals. Structures such as the District Development Committee, Ward Development Committee, and traditional leaders can specifically be trained in various issues that relate to these Sustainable Development Goals as entry points in their communities.”*

According to the results, key informants were positive that the education which targets the community was crucial in raising awareness about the SDGs. The results suggest a number of options in which education can be a conduit in sharing information about the SDGs at community level.

### **5.9 Local residents’ interpretation of Sustainable Development Goals**

This section presents results based on the second objective of the study which was to examine local residents’ interpretation of selected SDGs to their social context. To

achieve this, a Semi-Structured Interview was designed to inquire for localized definitions of key concepts related to selected SDGs. As such, respondents were asked to state what they considered to be: hunger; ending hunger, achieve food security and improved nutrition and promote sustainable agriculture by 2030; poverty; and ending poverty in all its forms everywhere by 2030, in accordance to their lived experiences. To this course, emerged themes and their descriptive statistics are illustrated in subsections below.

### **5.10 Residents' interpretation of the concept of hunger**

Based on their lived experiences, respondents were asked to state what they considered to be hunger. As depicted in Table 5.6, lack of food and care for the family scored the highest (44%). It was followed by lack of essential things such as cattle, goats, pigs and others in life (21%). The next was a state of being lazy and lacking consultation with others (which scored 14%). With the score of 9% was lack of knowledge on how to effectively use local resources and government support in solving the challenge of food. Both, multiple problems and deprivation of food in terms of quality and quantity at a given time scored each 5%. The least scored (2%) was inability to acquire enough food that can last for the whole year.

According to the results, respondents generally perceived the term, hunger as lack of food and care for the family. One respondent was quoted saying, *“often times our homes are compelled to having a single meal in a day in order to cope with hunger, especially in critical months of November through January when food is limiting.”* This implied that, the provision of food and care for the family would mean ending hunger. Other definitions that emerged above the median were lack of essential things that may include; cattle, goats, pigs and others in life, and a state of being lazy and lack of consulting others. To stress her point, one respondent concluded by saying, *“The concept hunger has diverse meanings, there is hunger for money, and hunger for food, even lack of cattle is deemed hunger.”* The median was lack of knowledge on how to effectively use local resources and government support in solving the challenge of food. This implied that respondents generally understood the concept hunger as inadequacy of food, domestic animals, shelter, education, health and other essentials due to less support

by government. However, definitions below the median were: deprivation of food in terms of quality and quantity at a given time; inability to get enough food; and hunger being a translation of multiple problems. Table 5.6 shows results on residents' interpretation of the concept hunger in accordance to their lived experiences.

*Table 5.6: Residents' interpretation of the concept hunger*

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Lack of food and care for the family.	19	44
A state of being lazy and failing to consult others.	6	14
The term hunger translates into multiple problems.	2	5
Lack of essential things such as cattle, goat, pigs, etc., in life.	9	21
Inability to get enough food that can last for the whole year.	1	2
Lack of knowledge on how to effectively use local resources and government support in solving the challenge of food.	4	9
Deprivation of food in terms of quality and quantity at a given time.	2	5
<b>Total</b>	43	100

Source: Field data, 2017

Complementing on residents' views of hunger, key informants perceived it as inadequacy in supply of food to sustain the family throughout the year. One ministerial expert registered, "...when an individual has not enough food to last him/her from the time of harvest to the next....as such families are compelled to have a single meal in a day as opposed to three or at least two meals in a day." The other ministerial expert mentioned, "...hunger refers to lack of food in terms of quantity and quality. By quantity, there could be some food to eat, but inadequate to carter for the whole year.... quality questions the nutritional value the food set on the table contains." This implied that, by providing enough and nutritionally balanced food for consumption at a given time, hunger can end.

### **5.11 Residents' interpretation of ending hunger, achieve food security and improved nutrition and promote sustainable agriculture by 2030**

Respondents were further asked to state what they considered to be "ending hunger, achieve food security and improved nutrition and promote sustainable agriculture by

2030”. As shown in Table 5.7, working hard to enhance higher field crop yield and other means of food production scored the highest (35%). It was followed by government and NGOs intervention in supplying farming implements and inputs to upscale field crop production which scored 26%. Acquire relevant knowledge, skills and values in field crop and animal production scored 16%. This was followed by end poverty and having adequate food to feed the family which scored 7%. Each of the following scored 5%: having food all year round with at least three meals per day; and end problems and improve living standards among the poor rural. The least scored (each 2%) were: make food available, accessible, affordable, and in rightful nutritional values; end of the world, implying that it would not be possible to end hunger in human nature, let alone God intervene; and faithfulness in returning tithe and offering in all produce.

According to the results, respondents chiefly perceived “end hunger, achieve food security and improved nutrition and promote sustainable agriculture by 2030-SDG 2” as working hard to enhance higher field crop yield and other means of food production. Other respondents viewed SDG 2 as acquiring relevant knowledge, skills and values in field crop and animal production to upscale productivity. End poverty and having adequate food to feed the family also emerged among respondents. This meant that any of the alluded definitions would generally be accepted to their social context. Nonetheless, within the median score line were: having food all year round with at least three meals per day; end problems and improve living standards among the poor rural; and make food available, accessible, affordable, and in rightful nutritional values. However, below the median were: end of the world, implying that it would not be possible to end hunger in human nature, let alone God interne; and faithfulness in returning tithe and offering in all produce. Table 5.7 demonstrates results on residents’ interpretation of ‘ending hunger, achieve food security and improved nutrition and promote sustainable agriculture by 2030”.

*Table 5.7: Residents' interpretation of 'end hunger, achieve food security and improved nutrition and promote sustainable agriculture by 2030'*

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Having food all year round with at least three meals per day.	2	5
Working hard to enhance higher field crop yield and other means of food production.	15	35
Government and NGOs intervention in supplying farming implements and inputs to upscale field crop production.	11	26
Acquire relevant knowledge, skills and values in both field crop and animal production.	7	16
End problems and improve living standards among the poor rural.	2	5
Make food available, accessible, affordable and in rightful nutritional values.	1	2
End poverty and having adequate food to feed the family.	3	7
End of the world, implying that it is not possible to end hunger in human nature, let alone god intervene.	1	2
Faithfulness in returning tithes and offerings in our produce.	1	2
<b>Total</b>	<b>43</b>	<b>100</b>

Source: Field data, 2017

The perception among key informants on the meaning of SDG 2 was similar to the general views of respondents. One ministerial informant said, “...farmers will have learnt new methods of farming to improve production.... farmers receive aid from government or donor community in terms inputs and implements.” Another ministerial expert registered, “ending hunger by 2030 translates into making food accessible and affordable in rightful nutritional values. Those in food production circle should be helped by government to have sure means of production...while those in the consumer circle should have capacity to purchase food.”

### **5.12 Residents' interpretation of the concept of poverty**

Based on their lived experiences, respondents were asked to state what they considered to be poverty. As demonstrated in Table 5.8, lack of material wealth such as cattle, goats, pigs, and chickens and money necessary for human survival scored the highest (60%). The views that inadequate supply of basic things such as cattle, goats, and pigs needs in life; together with lack of hard work (laziness) to earn a living or acquire things followed (each scored 14%). For example, one respondent registered that, “...poverty is a result of not own things like cattle or goats due to lack of hard working spirit. In our

*culture, it is commonly held that; 'bucete nkuyanda, alimwi wakalileka wakawa'- Meaning that one's level of commitment towards work determines whether to be poor or no; through working hard, poverty can be avoided...' With a score of 9% was lack of knowledge and skills needed to sustainably manipulate the environment for personal development. The lowest perception among respondents was lack of capacity to acquire things for basic use in life which scored 2%.*

According to the results, respondents generally viewed poverty as lack of material wealth such as cattle, goats, pigs, chickens and money which were necessary for human survival, particularly in solving life challenges. Some respondents perceived poverty as a concept that refers to inadequate supply of basic needs such as cattle and goat in life; and lack of hard work (laziness) to earn a living or acquire things. Such were among the acceptable definitions of poverty in a general sense of the respondents' social context. Below the median were: lack of knowledge and skills needed to sustainably manipulate the environment for personal development. Results too, reveal that respondents perceived poverty as lack of capacity to acquire things for basic use in life. Table 5.8 illustrates residents' interpretation of the concept poverty to their local context.

*Table 5.8: Residents' interpretation of the concept poverty*

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Lack of material wealth such as cattle, goats, and chickens, and money necessary for human survival.	26	60
Lack of knowledge and skills needed to sustainably manipulate the environment for personal development.	4	9
Lack of hard work (laziness) to learn a living or acquire things.	6	14
Inadequate supply of basic things such as cattle, goats, pigs, chickens and other domestic animals for use in life.	6	14
Lack of capacity to acquire things for basic use in life.	1	2
<b>Total</b>	43	100

Source: Field data, 2017

There was a slight difference in defining the concept of poverty between respondents and key informants. Key informants perceived the term poverty as lack of basic things in terms of food, shelter, health, education and clothes for a segment of the population. For example, one ministerial expert was quoted saying, *“poverty is a condition in which an*

*individual or segment of the population is incapable of meeting basic living standards in terms of food, shelter, health, education and clothing.”*

### **5.13 Residents’ interpretation of ending poverty in all its forms everywhere by 2030**

Respondents were asked to state what they considered to be, “end poverty in all its forms everywhere by 2030”. As illustrated in Table 5.9, government and NGOs’ aid to empower rural farmers with implements and inputs to upscale productivity scored the highest (44%). For example, one respondent registered that, “...to end poverty by 2030, government need to help us with loan facilities so that we manage to upscale our means of production, especially in our agricultural activities that include field crop production, cattle rearing and production of goat, pig, and poultry as well as fish-farming and apiculture...” It was also perceived as embracing educational programs related to up scaling productivity and improving living standards (21%). For instance, one respondent said, “...ending poverty by 2030 meant learning new ways of farming, rearing animals, and working hard to achieve more material things that would help us in life...” To other respondents, it meant working hard to acquire enough material wealth needed to meet every day requirement (scored 19%). With a score of 12%, was the perception that achieving SDG 1 by 2030 meant having adequate food, shelter, education, and essential material things in life. The lowest scored (each 2%) were: remain committed and concentrate on activities meant to raise living standards; and care, conserve and sustainably use existing local resources to improve living standards.

According to the results, the respondents noticeably perceived “ending poverty in all its forms everywhere by 2030 – SDG1” as government and NGOs intervention to empower rural farmers with implements and inputs to upscale productivity in their enterprises. To some respondents, SDG1 implied embracing educational programs related to up scaling productivity and improving living standards. The median perceptions were: working hard to acquire enough material wealth needed to meet every day requirements; and having adequate food, shelter, education and other essential material things in life. Below the median were: remain committed and concentrate on activities meant to raise living standards; and care, conserve and sustainably use existing local resources to improve living standards. All above definitions represent local residents’ general



interpretations of SDG 1 to their social context. Table 5.9 shows results based on their interpretation of “ending poverty in all its forms everywhere by 2030.

*Table 5.9: Residents’ interpretation of ending poverty in all its forms everywhere by 2030*

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Work hard to acquire enough material wealth needed to meet every day requirements.	8	19
Remain committed and concentrate on activities meant to raise living standards.	1	2
Embrace educational programs related to up scaling productivity and improving living standards.	9	21
Having adequate food, shelter, education and essential material things in life.	5	12
Government and NGOs aid to empower rural farmers with implements and inputs to upscale their productivity.	19	44
Care, conserve and sustainably use existing local resources to improve living standards.	1	2
<b>Total</b>	43	100

Source: Field data, 2017

Key informants perceived achieving SDG 1 by 2030 as government prioritizing interventions via its policies and budgetary allocation towards up scaling productivity in agriculture sector. One ministerial expert registered, “...means that government priority in interventions and policies must target the poor rural. Since almost 85% of people target agriculture, the development agenda must be directed towards the agriculture sector.” Closely linked was the idea that government should offer loan facilities for the procurement of valuable things such as cattle, goats, pigs, and poultry while up scaling production in agronomy. The other ministerial expert said, “...government needs to offer loan facilities to farmers in order for them to upscale production. Among things that attract loan facilities are cattle rearing, goat production, pig production, poultry and field crop production. Once these things are made available, poverty can end even before 2030.” So then, empowering and engaging local communities in diverse income generating activities such as field and animal production, gardening, fishing and smallholder businesses among other things meant achieving SDG 1 by 2030.

## **5.14 Locally existing knowledge, skills, values and attitudes that related to selected Sustainable Development Goals**

This section presents results based on the third objective of the study which was to establish existing knowledge practices that local people have been using to address issues related to selected SDGs. To achieve this, Semi-Structured Interview schedule was designed to probe on socio-economic activities or enterprises local residents engaged in order to address hunger and poverty at household level. Additionally, focus Group Discussion guide was designed for an in-depth inquiry on existing knowledge practices that local residents were using to reduce hunger and poverty in their local context. The subsections below give details of the results in tabular form.

### **5.15 Socio-economic activities residents engaged to address hunger and poverty**

Respondents were asked to outline activities or enterprises they engaged in order to acquire food. Since each respondent engaged in at least more than one activity, responses submitted accumulated to 192 and were tabulated for descriptive purposes. As shown in Table 5.10, maize production scored the highest (23%), followed by groundnut growing which scored 18%. Others were; fishing (10%), poultry production (8%), cattle rearing and gardening (each 6%), cassava and sweet potato growing (each 5%), goat rearing (4%), apiculture (3%), others, i.e. fruit and wild food gathering, and cottage industry (3%), sell of labor (2%), pig production, and hunting or poaching (each 1%).

According to the results, respondents generally engaged in field crop production where maize was chiefly grown, followed by groundnuts. Cassava and sweet potatoes were also grown. Noticeably, were fishing enterprise, poultry production, gardening, and cattle rearing above the median. This implied that field crop production, fishing and gardening were commonly engaged to address the issue of hunger by the respondents in their local context. Charcoal burning and trading stood in the median, sharing the same score line with cassava growing and sweet potato growing. Results revealed that those were the alternatives with which local respondents used to caution field crop production, fishing and gardening enterprises. However, below the median were goat rearing, apiculture, fruit and food gathering, sell of labor, pig production, and hunting or

poaching. This meant that those activities were lowly engaged by the residents as avenues to enhance food for home consumption. Table 5.10 demonstrates results on socio-economic activities residents engaged to address the challenge of hunger in their local context.

*Table 5.10: Socio-economic activities residents engaged in to address hunger*

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Maize growing	44	23
Cassava growing	10	5
Groundnut growing	34	18
Fishing	20	10
Cattle rearing	11	6
Goat rearing	8	4
Pig production	2	1
Poultry production	15	8
Apiculture	6	3
Hunting/poaching	2	1
Charcoal burning and trading	10	5
Gardening	12	6
Sweet potato growing	10	5
Sell of labor	3	2
Others, i.e. fruit and wild food gathering, and cottage industry	5	3
<b>Total</b>	<b>192</b>	<b>100</b>

Source: Field data, 2017

Key informants revealed that local residents engaged in conservation farming in which maize and other field crops were grown. According to ministerial experts, some residents engaged in smallholder livestock production where cattle rearing, goat and pig and poultry production were practiced. During an interview, one ministerial expert mentioned, “...some farmers engage Conservation Farming methods in order increase crop production.... others engage in small-scale livestock production where cattle, goats, pigs and chickens are reared. These domestic animals are used as sources of protein, draft-power, sold for money at the time of need.” They also observed that local residents join associations in order to access farming inputs and other forms of aid either from government or the donor communities. To a larger extent, local residents, particularly those who were critically affected by hunger sell their labor in exchange for food or its equivalent.

## 5.16 Socio-economic activities residents engaged to address poverty

Respondents were asked to outline activities or enterprises they engaged in order to address poverty in their local context. Since each respondent engaged in more than one activity, responses summed up to 172. As demonstrated in Table 5.11, cotton and maize scored the highest (each 15%), followed by cattle rearing (12%). Other enterprises were; goat rearing (11%), poultry production (10%), gardening (8%), fishing, and charcoal burning and trading (each 5%), pig production (4%), bricklaying, honey harvesting, and sell of labor (each 1%).

According to the results, majority of the respondents engaged in cotton and maize growing in order to address poverty. Other activities engaged above the median were; cattle rearing, goat rearing, poultry production, and gardening. Sunflower and tobacco growing stood in the median among the enterprises residents engaged. This implied that field crop production, animal rearing and gardening were chiefly engaged by the respondents in addressing the challenge of poverty in their local context. However, below the median were fishing, charcoal burning and trading, pig production, bricklaying, apiculture, and sell of labor. This meant that local residents engaged less of those activities to address the issue of poverty in their local context. Table 5.11 shows results on activities local residents engaged in order to address the challenge of poverty.

*Table 5.11: Activities residents engaged to address poverty*

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Cotton growing	26	15
Tobacco growing	10	6
Maize growing	26	15
Sunflower growing	13	8
Gardening	14	8
Cattle rearing	21	12
Goat rearing	18	11
Pig production	6	4
Poultry production	17	10
Sell of labor	1	1
Fishing	8	5
Bricklaying	2	1
Charcoal burning and trading	8	5
Honey harvesting	2	1
<b>Total</b>	<b>172</b>	<b>100</b>

Source: Field data, 2017

Similarly, key informants revealed that generally residents engaged in field crop production and livestock rearing, i.e. cattle, goats, pigs, and poultry production in order to address the issue of poverty. Other residents engaged in gardening of green and fruit vegetables production. One informant was quoted saying, *“in order to address the issue of poverty, community members engage in field crop and livestock production.... others resort to gardening where green and fruit vegetables are grown. Sell of labor to well-to-do individuals is also common among the poor rural.”* Some were involved in buying and selling of field crop produce such as maize while others sold labor and ventured in charcoal burning.

#### **5.16 Locally existing practices field crop farmers used to address hunger and poverty**

In small groups of six, discussants were asked to identify and explain knowledge practices that were used to enhance field crop production in their local context. During the discussion, a variety of knowledge practices that ranged from soil management to selection of seed emerged. In order to improve soil fertility, discussants used kraal manure, ash and spread anthill soil in fields. For example, one discussant said,

*“...from our fathers and grandfathers, we inherited trends such as the use of cow-dung, spreading anthill soils and ash in fields. These are responsive to non-hybrid seeds and our fore-fathers have been planting them. Their bans were full of produce and we never experienced food shortages. Even today, we are still reaping the same benefits of using them, though, we integrate with modern methods. For example, we apply compound D and urea to fertilize our crops.”*

Discussants also practiced shifting cultivation, full tillage and crop rotation to rejuvenate the soil. The use of inorganic fertilizers such as compound D and urea to fertilize crops was commonly practiced among discussants. In terms of seed selection, discussants used hybrid seed for improved yield. They also used non-hybrid seeds. Discussants too, grew traditional foods such as cassava based on its resistance to diseases and pests, drought

tolerance, conservative nature, medicinal and nutritional values, and adaptability to purportedly poor soils. One discussant registered,

*“...among other traditional foods is growing of cassava that has proven to be important to us. Cassava has numerous advantages over maize production. For example, it does not require fertile land, fertilizer and plenty of rains. Cassava is also disease resistant and gives higher yields within a small piece of land...that is the reason why we still grow it.”*

Discussants further practiced conservation farming, mixed farming and diversification to spread risks in their enterprises. In terms of diversification, one discussant commented, *“... field crops produce, helped us to buy animals via barter system with farmers who keep cattle in Kafue Flats. This is how we can apply the idea of diversification in our enterprises, particularly in fighting poverty at household level...”* They also belonged to associations such as co-operative for knowledge sharing and common goal. Other than co-operative societies were moral tangents where discussants gave tithes and offerings based on produce as entry to other favorable opportunities.

According to the results, knowledge practices generally used by discussants were use of: kraal manure, ash, anthill soil, inorganic fertilizers to improve soil fertility and texture. Similarly, they grew traditional foods such as cassava and non-hybrid seed.

### **5.17 Locally existing practice gardeners used to address hunger and poverty**

In small groups of six, discussants were asked to identify and explain knowledge practices that were used to enhance vegetable and crop yield in the garden. During the discussion, application of kraal manure in vegetable beds and plant stations emerged as one of the knowledge practices discussants used to enhance soil fertility. Asked to highlight on how they have managed their vegetables and crops in gardens, one discussant said, *“...in terms of fertilizing vegetables and crops, we use droppings of cattle, goats and chickens. In some case, we use inorganic fertilizers such as compound D.... What helps us mostly is rotation of vegetable beds or crop-stations as this enhances soil fertility and structure. Some pathogen circles are broken by so doing and this reduces on chemical usage.”* This knowledge practice was accompanied by rotation of

vegetable beds and stations as well as the use of inorganic fertilizers, i.e. compound D and urea. Discussants used bucket-irrigation where winter maize, sweet-potatoes and vegetables such rape, cabbage, okra, onion, tomatoes and so on were grown. They managed their crops and vegetables through the use of herbicides and chemicals. A moral perspective also emerged as vital knowledge practices among discussants. For example, faithfully giving tithes and offering for every product harvested gave them the drive to work hard. One discussant said,

*“...the Bible book of Malachi 3: 8-11 records that we rob Him! ... in tithes and offerings.... God claims all the tithes into His storehouse, that there may be food in the house of the Lord, thus, assures us to try Him now in this and see if He will not open for us the windows of heaven and pour out for us such blessing that there will not be room enough to receive it. God will rebuke the devourer for our sake such that he will not destroy the fruit of our ground, nor shall the vine fail to bear fruits for us in the field...”*

Such knowledge practices were used to address hunger and poverty among discussants.

According to the results, generally knowledge practices used were; the use of kraal manure, crop rotation, application of inorganic fertilizers, bucket-irrigation to water vegetables and crops, use of herbicides and chemicals to control diseases and pests, and faithfully giving tithes and offering.

#### **5.18 Locally existing practices fishermen used to address hunger and poverty**

Using small groups of six, discussants were asked to identify and explain knowledge practices that they used to enhance enough fish-catch. Discussants made use of; canoes, mosquito-nets; all sizes of fishing nets; strong sound to scare fish to the net, fishing baskets, and fishing hooks to catch fish. Asked to explain how they catch fish, one discussant registered, *“...here fishermen and women use various methods to catch fish. For instance, most of them use mosquito-nets to make pulling nets especially during the months of July to January when fish-catch reduces.”* The other discussant bemoaned, *“...other unsustainable methods of catching fish commonly used in this area are the use*

*of non-recommended sizes of fishing nets. Other fishermen are conscious of the regulations set by the government through Fisheries Department, thereby use recommended fishing nets.”* They also belonged to an association.

According to the results, discussants noticeably used different knowledge practices which were somehow unsustainable. Off course, others used recommended fishing nets to catch fish.

### **5.19 Addressing selected Sustainable Development Goals through Education for Sustainable Development**

This section presents results based on the fourth objective which was to examine how ESD could be used to fortify local knowledge and practices in order to meet selected SDGs by 2030. Initially, Semi-Structured Interview was designed for an inquiry on local residents’ perception as to how ESD could be used to enhance ending hunger (SDG 2) and poverty (SDG 1) in their local area by 2030. Secondly, Focus Group Discussion guide was designed for in-depth inquiry on locally existing knowledge practices aimed at enhancing SDG 2 and SDG 1 in the local context of the residents. The inquiry was further sort for consolidated views on the use of ESD elements to enhance SDG 2 and SDG 1 in the local context of the residents. Lastly, respondents were covertly observed in their engaged practices that related to ending hunger and poverty in their natural settings. The subsections below illustrate results based on residents’ perception on how ESD be used as an approach to enhance SDG 2 and SDG 1 in the local context.

### **5.20 Residents’ perception on how Education for Sustainable Development could be used to enhance SDG 2**

During semi-structured interview, respondents were asked to explain how ESD can be used to enhance ending hunger, achieve food security and improved nutrition and promote sustainable agriculture by 2030. As shown in Table 5.12, inculcation of expert knowledge on sustainable ways or methods of producing various socio-economic activities scored the highest (35%). It was followed by knowledge, skills and value sharing based on sustainable use of existing local resources through educational crusades or rallies at local level, which scored 28%. Cautioning existing practices such as



conservation farming (CF) campaign among local farmers, and practices scored 26%. Its capacity to be harnessed to teach local residents such as farmers to diversify their enterprises scored 7%. The lowest score (5%) was emergency of a cadre of educational crusaders to spear-head sustainable practices based on locally existing resources.

According to the results, respondents were of the idea that ESD can be used to inculcate expert knowledge on sustainable ways or methods of producing various socio-economic activities in the local context. Results also show that respondents perceived ESD as necessary in sharing of knowledge, skills and values based on sustainable use of existing local resources via educational approach in the local context. It was further opined that ESD can be used to caution existing practices such as conservation farming campaign among local farmers. Furthermore, results indicate that ESD can be harnessed in teaching local residents such as farmers and other entrepreneurs to diversify their enterprise or socio-economic activities. Lastly, results suggest that ESD can be instrumental in the emergency of a cadre of educational crusaders to spear-head sustainable practices based on locally existing resources. Table 5.12 shows results on the perception of local residents on how ESD could be used to enhance SDG 2.

*Table 5.12: Residents' perception on the use of Education for Sustainable Development to enhance SDG 2*

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Knowledge, skills and value sharing based on sustainable use of existing local resources through educational crusades or rallies at local level.	12	28
Harnessed in teaching local residents such as farmers to and other entrepreneurs to diversify in their socio-economic activities.	3	7
Inculcation of expert knowledge on sustainable ways or methods of producing various socio-economic activities.	15	35
Caution existing practices, i.e. conservation farming (CF) campaigns among the local farmers, and other practices.	11	26
Emergency of a cadre of educational crusaders to spear-head sustainable practices based on locally existing natural resources.	2	5
<b>Total</b>	43	100

Source: Field data, 2017

Among key informants, ESD was perceived to have the vigor which can be harnessed in equipping residents with the capacity to diversify their enterprises such as field crop

production, gardening, and livestock rearing and fish-farming among others. One informant said, “...*the power of ESD can be harnessed to equip farmers with necessary knowledge and skills in their production patterns. Experts in respective specialized fields serving the community can use ESD ideologies and principles to teach farmers on how to diversify in order to maximize production in a sustainable fashion. This is an important objective which can be achieved using ESD.*” Informants perceived ESD to be useful in blending local knowledge with sustainability guidelines to better their knowledge practices in various enterprises. The other informant registered,

*“...majority of the community members go through a lot of hardships due to lack of sustainable education or knowledge that is necessary to carry out certain socio-economic activities.... Local knowledge can be combined with sustainability guidelines to better their ways of conducting their economic endeavors. For example, field crop producers may be cutting down trees unsustainably...through sustainable education, they can understand and appreciate the vitality of vegetation, thus, long term benefits of sustained production can be experienced. Those in the fishing industry can learn the importance of sustainable methods of fishing as opposed to the prevailing ones which are unsustainable.”*

The results show that ESD can be used to communicate ways of caring, protecting and preserving produce in order to sustain them. They perceived ESD to be instrumental in smart agriculture, implementation of Conservation Farming, and food preservation as part of production.

### **5.21 Residents’ perception on how Education for Sustainable Development can be used to enhance ending poverty in all its forms everywhere by 2030**

During semi-structured interview, respondents were asked to explain how ESD could be used to enhance ending poverty in all its forms everywhere by 2030. As illustrated in Table 5.13, improved productivity through engaging sustainable development as a new knowledge to caution locally existing knowledge scored the highest (33%). It was followed by equipping residents with knowledge and practical skills on how to use

locally existing resources with a score of 28%. Acquisition of necessary knowledge practices to prolong production based on socio-economic activities scored 26%. The lowest score (14%) was to provide useful measure to control non-recommended methods of resource use.

According to the results, respondents perceived ESD elements (knowledge, skills, values and attitudes) to be instrumental in improving productivity through engaging sustainable development as a new knowledge to caution locally existing knowledge. Other respondents viewed ESD elements as vital in equipping residents with knowledge and practical skills on how to use locally existing resources. Results show that ESD elements were considered to be important in acquiring necessary knowledge practices to prolong production based on socio-economic activities in the local context. Results further reveal that ESD elements were thought to be a useful measure in controlling methods of locally existing resource use in the local context. Table 5.13 shows results on the perceptions of residents on how ESD could be used to enhance SDG 1 in the local context.

*Table 5.13: Residents' perception of how Education for Sustainable Development can be used to enhance SDG 1*

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Acquisition of necessary knowledge practices to prolong production based on socio-economic activities.	11	26
Equip residents with knowledge and practical skills on how to use local resources.	12	28
A provision of useful measure to control non-recommended methods of resource use.	6	14
Improved productivity through engaging sustainable development as a new knowledge to caution local knowledge.	14	33
<b>Total</b>	43	100

Source: Field data, 2017

Key informants perceived ESD to be helpful in acquiring necessary knowledge, skills, and values needed to care, preserve, protect and sustain locally available resources in order for them to last long. During an interview, one informant submitted, “...ESD, in its campaign can provide the necessary knowledge, skills and values needed to care, preserve, protect and sustain locally available resources for them to last long...” The results show that informants perceived ESD as a measure that can be used to facilitate the change in the thought pattern of local residents through negotiating local knowledge

practices with that of modern and sustainable ideologies vital to sustain productivity. One municipality registered, “...*socio-economic activities can be up scaled through ESD which has the capacity to spread knowledge and skills associated to sustainability. ESD as a measure to enhance sustainable development can facilitate change in thought pattern of local residents through negotiating their ways of manipulating socio-economic activities to that of modern ideologies advocated for the enterprise.*” The results indicate that ESD can be harnessed to equip local residents with knowledge and skills needed to sustainably expand their enterprises.

### **5.22 Using education for Sustainable Development to enhance SDG 2 and SDG 1 in field crop production**

In a small group of six, discussants were asked to discuss how ESD elements can be used to upscale field crop production during which points were noted as mentioned. Discussants perceived ESD to be useful in: sharing lived experiences among co-operative societies members; inculcating a positive behavior in use of organic manure such as cow-dung and anthill soil spread in the fields and reverting to traditional foods; providing means by which farming practices are understood, appreciated and up scaled sustainably; and diversification of farming activities through government and donor aid. During focus group discussion, one discussant was quoted saying, “...*as an educational approach, ESD can be used within our co-operatives to share knowledge and skills that some successful farmers are using to sustain their enterprises.... As we discussed, use of kraal manure, spreading of anthill soils in the field, local seeds and other traditional foods such as cassava are the old ways inherited from our forefathers and have helped in fighting hunger and poverty.*” Discussion also perceived ESD to be useful in addressing hunger and poverty among field crop farmers through: enhancing a practical understanding and appreciation on issues of sustainability via training and sensitization programs; enlightening local farmers on issues of sustainability towards the products, i.e. avoid early sale of product; providing informed decision and practical experiences on prioritizing and use of locally existing resources on a view to maximize and sustain benefit; cultivating cultural benefits of traditional foods and crops such as cassava among local farmers; imploring it as a king-pin in which local residents learn how to

care, protect and preserve locally existing resources; and improving practices such as non-cleaning and burning of trash for moisture re-intention, maintenance of support systems such as nitrogen cycle in the soil, protection against soil erosion, among others. One discussant echoed,

*“...government and the donor community need to ensure that sustainable development is taught among filed crop farmers especially that, often times we lack knowledge, means and ways of diversifying our enterprises. You can see the effects of lacking diversification, farmers in this community are already receiving as low as K15 per 50kg bag of maize. The waste case scenario is that inputs are neither available nor the rains on. I personally see ESD to be vital in teaching farmer ways and benefits of diversification.”* The other one lamented, *“...those who are in a habit of selling fertilizer benefited from programs such as conservation farming and Farming Input Support Program (FISP) on a view to solve immediate challenges like buying a few basic requirements in the home. They may quite okay solve those immediate challenges, but then, what about the needs for tomorrow? They end up harvesting poorly, falling back in the web of hunger and poverty.”*

According to the results, discussants reasoned that ESD elements can be used to enhance ending hunger and poverty in their filed crop production. Discussants considered ESD elements to be useful in so far as up scaled and sustained field crop production is concerned. This can be achieved through: sharing lived experiences in co-operative societies; inculcation of a positive behavior in the use of organic manure; provision of means by which farming practices are understood, appreciated and up scaled; and entrepreneurial diversification via government and donor aid. Results also reveals that ESD can be used for: enhancing practical understanding and appreciating sustainability practices via trainings and sensitizations; enhancing sustenance of crop yields; provision of informed decisions and practical experiences on prioritization and use of existing resources; inculcation of a positive attitude on traditional foods; and most importantly,

provision of knowledge on how to care, conserve and protect existing resources in the local context.

### **5.23 Use of Education for Sustainable Development to enhance SDG 2 and SDG 1 in gardening**

Using a small group of six, discussants were asked to discuss how ESD elements could be used to upscale vegetable and crop production in their gardens in which, points were noted as mentioned. Discussants perceived ESD elements to be useful in: enhancing a practical understanding and appreciation on issues of sustainability through training or seminars; influencing gardeners to use organic manure such as kraal and composite heap in fertilizing vegetables and crops; providing means by which gardening activities and their practices are understood, appreciated and up scaled sustainably; and recognizing it as a king-pin in which gardeners learn how to care, protect and preserve resources such as land, water and trees which happen to be vital in gardening. For instance, one discussant registered, “...through ESD, we can learn on how to make wise decisions regarding the use of land, water and vegetation as vital resources in gardening enterprise. Prioritizing them is key to sustained production and their existence for long service.” Discussants also perceived ESD to be vital in: sharing lived experiences in associations; the process of making informed decision as they prioritize locally existing resources; and providing local solutions via considerable expertise when dealing with relevant and challenging experiences, i.e. new diseases and pests in vegetable and crop production. During focus group discussion, one discussant said, “...through ESD, new challenges such as the current disease attacking our vegetables can locally be researched. We need crop and soil science specialists who are knowledgeable in ESD to come to our aid...in terms of continuous production, we need knowledge and skills that will help us sustain vegetable production....as a proponent of sustainability, ESD can be used to teach us on how to improve and sustain gardening activities as well as combat new challenges.”

According to the results, discussants concluded that ESD elements were instrumental in the process of ending hunger and poverty in gardening activities. Results reveal that, this can be achieved through: enhancing practical understanding and appreciation of issues

of sustainability via trainings or seminars involving good practices in gardening enterprises; cultivation of positive behavior in the use of organic manure such as kraal and composite heaps to fertilize vegetables and crops; understanding, appreciating and up scaling gardening activities; and acquiring knowledge on how to care, protect and preserve useful resources such as land, water and trees. Results also show that discussants reasoned that ESD elements can be harnessed to: share lived experiences where gardeners were in associations; provide informed decisions and practical experiences in prioritization and use of resources such as water, land and trees in the local context; and provide expert knowledge that involve gardeners.

#### **5.24 Using Education for Sustainable Development to enhance SDG 2 and SDG 1 among fishermen**

In a small group of six, discussants were asked to discuss how ESD elements can be used to upscale fishing activities. Discussants were of the view that ESD elements can provide: informed decision and practical experiences on how to prioritize and use locally existing resources; measures by which fishing activities and their practices are understood, appreciated and up scaled in a sustainable fashion. They also viewed ESD as a king-pin in which fishermen learn how to care, protect and preserve marine resources; and provision of community education that supersedes the long arms of the law as means of caring, preserving and protecting fish. One discussant was quoted saying, *“...the kind of education advocated for here is not of the classroom nature no, it is community education where residents stop or avoid using law as the means of caring, protecting and preserving existing local resources such as fish and game animals; but change our ways of viewing things at a personal level.”* Other emerged views point to the fact that ESD elements were essential in: sharing lived experiences via fishing association; enhancing a practical understanding and appreciation in issues of user-friendly and sustained methods of fishing; and linking sustainable development to relevant programs such as Strengthening Climate Resilience in the Kafue Basin (SCRICA-project). One discussant commented,

*“...ESD is a vital tool in ensuring that the methods we use in fishing are environmentally friendly. As fishermen, it is not that we are ignorant*

*about recommended methods of fishing no, but often times we make wrong choices due to lack of care for natural resources at personal level. So then, through ESD we can learn how to take responsibility, particularly in choices we make as individuals in complements to existing laws of fishing.”* In addition, the other discussant registered, “*existing structures such as Constituency or District Development Committee (DDC), Ward Development Committee (WDC), and Village Development Committee (VDC) trained in sustainable development so that they can work alongside the proposed association of fishermen to disseminate relevant knowledge, skills, values and attitudes in sustainable development at the local level...*”

According to the results, discussants concluded that ESD elements can be used to achieve ending hunger and poverty in their fishing activities in many ways, among which were: provision of informed decision and practical experiences on how to prioritize and use marine resources; provision of means by which fishing activities and their practices were understood, appreciated and up scaled sustainably; learning how to care, protect and preserve marine-resources; and provision of community education that supersedes law as means of caring, protecting and preserving marine resources. Results also indicate that some discussants considered ESD elements to be vital in: sharing lived experiences among fishermen in their association; and enhancing practical understanding and appreciation of sustainable practices necessary in their methods of fishing. Discussants further opined that ESD elements were essential in linking relevant programs.

### **5.25 Activities observed among gardeners in pursuit of ending hunger and poverty**

Participants involved in gardening were observed candidly working in their respective gardens. They grew vegetables such as rape, tomato, onion, pumpkin leaves, pumpkins, cabbage, impwa, okra, sweet potatoes, and egg-plants. Maize was also grown in most of the gardens. The source of water for irrigation purposes were shallow wells, though, others used steams and the dam. Bucket irrigation was common among gardeners, though, one used a treadle pump. Gardeners used kraal manure coupled with inorganic fertilizers to fertilize their vegetables. Other tangents observed were; sell of products in



the garden, gardens fenced with poles, crop integration and rotation, water scarcity, sharing irrigation water with domestic animals, and heaps of cleared and diseased plants.

According to the results, participants involved in gardening grew a variety of vegetables and crops such as rape and maize in order to address the challenge of hunger and poverty. Other vegetables were noted and the use of kraal manure and organic fertilizer to fertilize them.

#### **5.26 Observed activities among fishermen in pursuit of ending hunger and poverty**

Participants involved in fishing were candidly observed catching fish on separate incidents. The fishermen and women used mosquito-nets as a pulling net to catch fish. They caught varying sizes of fish and other marine species such as clay fish, jelly fish and toad-pores. Other observations made were; use of fishing baskets (made out of mosquito-nets, and Leeds) for fishing, and sell of fish by the lake side. According to the results, participants used mosquito-nets as pulling nets. During those occasions, varying sizes of fish were caught. Additionally, fishing baskets were used among women and fish-sells were highly observed.

## CHAPTER SIX

### DISCUSSION OF RESULTS

#### 6.1 Introduction

The purpose of the study was to explore how selected SDGs can be addressed through ESD in Kaingu Chiefdom of Itezhi-tezhi District of Central Zambia. To achieve this, the chapter discusses results in four categorical themes as regards to objectives of the study. However, before discussing themes, a brief reflection of the baseline survey is given. The first theme discusses residents' awareness about SDGs in their local context. The second theme discusses residents' interpretation of selected SDGs to their social context. The third theme discusses locally existing knowledge practices that people have been using to address issues that relate to selected SDGs. The fourth theme discusses residents' views on how selected SDGs can be addresses through ESD. In order to avoid mutilation of results and findings, verbatim are used were necessary.

#### 6.2 Selected Sustainable Development Goals

Initially, a pilot study was conducted on a view to establish at least 2 salient Sustainable Development Goals of the 17. The results show that hunger related issues were of great concern among respondents. This indicated how crucial the issue of hunger was in the area of study. The result is consistent with Lungu (2015) who posits that Itezhi-tezhi District is predominantly susceptible to food-insecurity and attracts food relief. The findings suggested that ending hunger, achieve food security and improved nutrition and promote sustainable agriculture by 2030 (SDG 2) was the most salient among the 17 SDGs.

The results also show that poverty related issues were a source of concern among respondents. It showed how serious the issue of poverty was among community members in the area of study. This result is in line with CSO (2011), and Murr and Rascon (2015) who assert that 83.1 per cent of the people in Chief Kaingu are poor. The findings suggested that ending poverty in all its forms everywhere by 2030 (SDG 1) was

also salient among 17 SDGs. This therefore meant that the current study needed to address SDG 2 and SDG 1 as they have proven to be salient goals.

### **6.3 Residents' awareness about Sustainable Development Goals**

This section discusses results based on the first objective of the study which was to determine residents' awareness of Sustainable Development Goals (SDGs) in their local context. The results show that awareness about SDGs was still in its infancy stage among residents in Kaingu Chiefdom of Itezhi-tezhi District. The current study established that awareness about the SDGs was in its infancy stage due to lack of community sensitization concerning the global goals. It can be concluded that local residents were going to be aware about SDGs if sensitization about them was done. Other than sensitization, community education or public announcements on community radio and meetings were going to be helpful as results suggest. Contextually, community education and sensitization were the sure dualities in which social interaction and knowledge sharing took place in the area of study according to residents. This confirms the views of Ketlhoilwe and Jeremiah (2012) who argue that through regular interactions, knowledge and new experiences are shared, an opportunity that these local residents were denied. Clearly, the emerged view is consistent with the socio-cultural perspective which focuses on the roles that participation in social interactions and culturally organized activities play in intellectual wellbeing (Scott and Palincsar, 2013). The findings suggest that local residents would have been aware about the new SDGs if educational opportunities were created, whereby they are enlightened right at inception of the SDGs via participation, especially in their socio-cultural context. Thus, they would be in a position to identify locally existing knowledge, skills, values and attitudes required to achieve the priority SDGs in accordance to their local needs. This result correlates with PwC (2015) whose survey reveals that 72% of citizens lack awareness about SDGs in South Africa.

Nonetheless, not all respondents lacked awareness about the SDGs. The results established that a few who were aware about SDGs attended programs or meetings where issues that related to SDGs were addressed. Other interesting tangents of interaction such as seminars, personal interactions, mass media and internet surfing

played a vital role in raising awareness about the SDGs to the local context of the residents and that of key informants. It is also supported by Constructivists who hold that interaction play a major role in constructing new knowledge (Ultanir, 2012). The findings suggest that social interaction played a crucial role in disseminating awareness about SDGs in the local context of the residents. This result is in line with RDZ (2015), Mushota (2015); Mwitwa (2015); and Spooner (2015) who opines that the media and public sensitization take a lead role in disseminating information about SDGs in Zambia.

Understanding personal preferences on how to know more about the SDGs was equally important in an effort to address them. The results reveal that education can be the best approach to raise public awareness about, and knowledge of the SDGs in Chief Kaingu's area. Community education or educational crusades was perceived to be the most appropriate conduit through which SDGs can be communicated in the local context. It can be concluded that community education has the capacity to raise awareness of, and knowledge about environmental issues as well as paving way for achievement of the goals in the cultural context (Curti and Valdez, 2009). Contextually, it can be concluded that local residents had a common view as regards to suitability of community education or educational crusades in knowing more about the SDGs in their local area. As equitable members of Kaingu Chiefdom with lived experiences, their everyday social and cultural interactions assisted in generating mental models they used to make sense of their experiences. This view is supported by SCCT which assumes that each individual generates his/her own rules and mental models used to make sense of experiences via social learning (Overbaugh, 2004). Their commonality and jurisdiction in response is fortified by Kim (2001) who contends that Constructivists view learning as a social process, and meaningful learning occurs when individuals engaged in social activities. Such lenses offered local residents an opportunity to identify community education as the best approach in raising awareness about, and making SDGs known in their community, and ESD can effectively carry the burner of such communication.

Results also suggest that sensitization, meetings, and the media were perceived to be suitable ways by which SDGs can be made known locally. The results reveal the limiting nature of the media as not all local residents own necessary gadgets of

communication such as radios and smart phones. It may therefore, be necessary that the media as means of information transfer be integrated with other approaches that emerged in this study. This may increase the chances of information sharing with regards to the SDGs on an equal footing even to the disadvantaged populace. Further, results show that churches, brochure or pamphlets, door-to-door campaign, and explanation can be used as means of information transfer concerning SDGs. Zambia has since been declared a Christian nation, and so churches around can be used as platforms to raise awareness about, and making known SDGs locally. With partiality, the result is consistent with prior studies (Haverman, 2015; Nqgulana, 2015; RDZ, 2015; Mushota, 2015; Mwitwa, 2015; and Spooner, 2015) who conclude that social and mass media are key approaches in raising public awareness about SDGs.

#### **6.4 Local residents' interpretation of selected Sustainable Development Goals**

This section discusses results based on the second objective of the study which was to examine local residents' interpretation of selected SDGs to their local context. The results show divergent perspectives of the concepts hunger and poverty. Physiologically, respondents coined hunger to inadequate food, hard work and care for the family. Results have proven that at some point, they were subjected to a single meal in a day in order to cope with hunger. This result is in line with Tsegay and Rusare (2014) who found out that some people skip meals as a coping strategy in addressing the challenge of hunger in South African. Culturally, respondents associated hunger to inadequate essentials such as cattle, goats, pigs, and chickens. Results indicate that respondents seem to value material as play a crucial role to upscale living standards wealth in their cultural and social context. Politically, respondents perceived hunger as inadequate support by government and donor community in addressing food challenges. Socio-economically, respondents perceive lack of knowledge and skills as constitute of hunger. Against this result, the concept of hunger has been accused of destroying residents' mindsets such that they no longer think of their own initiatives, but too dependent on government (Tsegay and Rusare, 2014). However, the findings suggest that provision of food, hard work, adequate supply of domestic animals and government aid means end of hunger in the local context of the respondents.

The results also show multiple perspectives in term of residents' interpretation of ending hunger, achieve food security and improved nutrition and promote sustainable agriculture by 2030 (SDG 2). Socially constructed perceptions of achieving SDG 2 point to personal commitment towards work, of which a political dimension plays an integral role. Results show that government and NGOs play crucial role of making available inputs and implements necessary to upscale crop production. Although this political perspective is discouraged in other studies (Tsegay and Rusare, 2014) for its inhibition capacity, results have proven otherwise. The government and donor community were perceived to have an upper hand in equipping local residents with relevant knowledge, skills and value in both field crop and animal production. Results suggest that local farmers need new knowledge and skills and inputs that adhere to current production patterns in up scaling food production. This result subsists within the confines of UN (2011) who view SDG 2, particularly sustainable agriculture as integration of livestock into farming systems among other things. Respondents from the moral perspective who perceived SDG 2 as faithful in returning tithe and offering in one's produce, as well as end of the world were two folds. On one hand, it can be asserted that it is not possible to end the challenge of hunger in human nature, late alone God intervenes within human race, thus, indirectly achieving SDG 2. On the other, in the process of yearning for more product on a view to give tithe and offering, residents end up having enough food for home consumption, thus, achieving SDG 2. The results also show the contextual dynamism and reciprocity of hunger and poverty among respondents who perceived achieving SDG 2 as ending poverty and accessibility of food. This result matches with Tsegay and Rusare (2014) who described hunger as a personal and communal malaise that crushes the potential of people to get out of poverty and to prosper. Findings suggest that this goal means making food available, accessible, and affordable and in rightful nutritional value. Such dimensions are, however, viewed to mean food security by Tsegay and Rusare (2014). According to Tsegay and Rusare (2014), availability of food, access to food, utilization of food, and stability of food refer to food security.

Just like hunger, establishing the respondents' interpretation of the concept poverty was necessary. Results show that respondents attached social and cultural dimensions in interpreting the concept poverty. Respondents measured poverty in terms of material

wealth such as domestic animals and fowls regarding the role they play in their survival. Results, however, in this study have proven otherwise as respondent's point material wealth such as cattle, goat, chickens, and other domestic animals as king-pin for raising one's standard of living. The results suggest that individuals incapable of owning such wealthy find it difficult to solve life challenges. The results add up to the list of accessible resources established by SARPN (2005) in defining a decent standard of living in the Zambian context. SARPN (2005) elicits income and consumption, housing, health, clean water and sanitation as crucial measures for a decent standard of living. Other social requirements established in the current results were basic things such as food, shelter, good roads, adequate health facilities, education, water and sanitation. Results, however, show that sometimes individuals were inhibited to such needs as education where they may access knowledge and skills needed for personal development. This result is similar to the views of Nyasulu (2010) who opines that poverty is circumstantial and conditional. The process of knowledge and skills acquisition is usually conditional, depending on the circumstances a person is subjected to. Nyasulu (2010) emphasizes on the crippling and dehumanizing circumstances which may surround an individual and prevent him/her from meeting his/her daily needs. Findings suggest that provision or acquisition of culturally valued material wealthy and basic needs meant end of poverty to their social context. Consistent with SARPN (2005), poverty means deprivation of long healthy life, educational opportunities, access to resources such as income and consumption, housing, health, clean water and sanitation among other things in the Zambian context. Although these socially perceived necessities are deemed as a true definition of poverty in accordance with the residents' lived experiences, Nyasulu (2010) maintains that such are manifestation of poverty as opposed to its definition. Poverty is the condition that makes meeting these needs impossible (Nyasulu, 2010).

Establishing localized meaning of ending poverty in all its forms everywhere by 2030 (SDG 1) among respondents was necessary. The results show that respondents with a political perspective called on government and NGOs aid to empower rural farmers with inputs and implements to upscale their productivity. Results suggest that government and the donor community need to create an enabling environment where loan facilities

among farmers and other entrepreneurial ventures are made available on a view to diversify their enterprises. Ketlhoilwe and Jeremiah (2012) opine that loan facilities among local residents are crucial in addressing rural poverty. Complementing to this view, Bigsten and Tengstam (2008) established that government is committed via poverty-reduction policies to support smallholder farmers in improving production. The question is, to what extent? Results show that achieving SDG 1 by 2030 requires much more effort by both government and community members, particularly in up scaling and sustain production in the local context. To a larger extent, embracing educational programs related to up scaling productivity can improve living standards. Similarly, Bigsten and Tengstam (2008) suggested educating a member of a household as a key escape route to ending poverty. In this study, though, result seems to have suggested localized education in which local residents, regardless of their status, gender and age receive relevant knowledge, skills, values and attitudes much needed to improve their socio-economic activities. Consistent with Bigsten and Tengstam (2008) and Nyasulu (2010), observe that poverty eradication and sustainable development can be achieved through creation of a supportive environment in terms of equal access to education and loan facilities that are vital for empowerment and training. Worth noting and most importantly, the definition of poverty as coined by residents to their social context locates within the successfully advocated human rights-based approach to address it (UNCHR, 2005 quoted in Nyasulu, 2010). Findings suggest that achieving SDG 1 by 2030 meant up scaling means of production through government and donor agencies in providing necessary resources and requirements among local farmers and other entrepreneurs in adherence to constantly changing ecological landscape. The results, however, hold more socially perceived necessities, i.e. food, shelter, and essential material things in life. Though Nyasulu (2010) question their credibility and efficiency in poverty alleviation initiatives, they were held with higher esteem. Nyasulu (2010) thus, concludes that meeting poor residents' needs without changing their circumstances does not constitute sustainable poverty alleviation.



## **6.5 Locally existing practices that relate to selected Sustainable Development Goals**

This section discusses results based on the third objective of the study which was to establish existing knowledge practices that local people have been using to address issues that related to selected SDGs. The results show that respondents chiefly engaged in field crop production, small-scale animal production, gardening and fishing in order to address hunger and poverty at household level. Noted were a variety of field crops grown using conservation practices on a view to maximize production. This result is in line with Baudron, Mwanza, Triomphe and Bwalya (2007) who reveal that people implore conservation practices in order to improve food security and nutrition in Zambia. Most important, in this study, were traditional foods grown based on their unique traits such as drought and disease resistance. This result is consistent with the findings of Kethloilwe and Jeremiah (2012) who opine that in order to avoid the adverse impacts of poverty (for example, hunger) farmers resort to drought-resistant local crops, as opposed to hybridized field crops. Traditional foods were not only merited for their resistance, but also valued for medicinal and soil adaptability properties, i.e. cassava.

It follows that respondents who practiced mixed farming used organic manure in form of animal droppings as well as spreading anthill soil in the fields to fertilize their crops. Noticeably, in this study, was the perception that application of organic manure in field crop production is environmentally friendly and much more sustainable as opposed to application of inorganic fertilizers. The results suggest that, other than the provision of dung, domestic animals and fowls were also valued for their nutritional supplementation on the table (milk and meat), farm-power (in case of cattle), liquid cash, and barter-system. Such perceptions and functionalities were generationally transferred via cultural and social events which occurred within the life time of respondent, as believed by Constructivists (Orey, 2016; and Kukla, 2000). Therefore, it can be concluded that such knowledge practices transcended from the old generations, thus, made sense of lived experiences among local residents, a believe centrally held by SCCT (Overbaugh, 2004). Findings suggest that such culturally rooted knowledge practices and lived experiences led to the residents' survival while remain valuable in soil management and sustained crop production.

The results also show that respondents who engaged in vegetable production, too, used organic manure as a scientific knowledge practice which was perceived to be user-friendly and sustainable. Most importantly, in this study, organic manure is valued for its' natural ways of enriching the soil, accessibility, availability as well as enhanced high vegetable production. In this study, it is also interesting to note that respondents perceived vegetables fertilized using organic manure to be highly preferred by consumers compared to those which were inorganically fertilized. This scientific knowledge practice was blended with rotation of vegetable beds and plant stations. CARE (2009) notes the practice of crop rotation, but among field crop farmers. Findings suggest that respondents valued scientific knowledge practices which are environmentally friendly and sustainable either in crop or vegetable production. Baudron *et al.* (2007) promote sustainable and high productivity with environmental consciousness. Other than the alluded scientific knowledge practices among respondents engaged in gardening, results also show moral perspective in the fight against hunger and poverty. It is apparent that, respondents' perceptions based on faith in God through giving tithe and offering per harvest motivated them to work hard. Findings suggest that the desire to give tithe and offering, driven by perceived blessings and windows of opportunities being opened by God in abundance, seemingly motivates an individual to be committed to work, thereby addressing challenges of hunger and poverty in the local context. Such values and ideologies are supported by the views of Constructivists who believe in the knower's perception, value judgment and lived experiences (Tedds, 2010).

Nevertheless, results show that respondents who engaged in fishing largely used unsustainable methods in catching fish, activities which were executed even during the breeding period of fish. The respondents were well aware about the destructive nature of such methods and actions, particularly towards marine resources. However, there was need to go beyond awareness, to a level where their mind-set begun to think and act for the environment (Collins-Figueroa, 2012; and Hungerford and Volk, 1989). Findings suggest that their awareness can be an entry point in equipping them with relevant knowledge, skills, values and attitudes towards sustainability of marine organisms as valuable local resources in addressing issues of hunger and poverty.

The results further, show quite unsustainable knowledge practices among respondents who engaged in charcoal burning and honey harvesting in order to address challenges of hunger and poverty in their local context. Most important, in this study, although it is held that bee-keeping and vices such as charcoal burning are detrimental to terrestrial resources like trees, such existing local resources remain vital in up lifting the respondents' livelihood in the local context. CIFOR (2008) argue that bee-keeping threatens deforestation in Zambia. SNV-Zambia (2008) also views the use of traditional bee-hives to pose a threat to the environment. Findings suggest that respondents' local knowledge and skills can be improved to meet sustainable standards as advocated in modern ways of keeping bees. Consistent with other studies (Cadwallader *et al.*, 2011; CIFOR, 2008), entrepreneurial skills in modern methods of bee-keeping capacitate households to improve their livelihood.

#### **6.6 Residents' perception on how selected SDGs could be addressed through ESD**

This section discusses results based on the fourth objective of the study which was to examine how ESD could be used to fortify local knowledge and practices in order to meet selected SDGs by 2030. The discussion hinges on residents' perceptions on how ESD can be used to enhance ending hunger and poverty in their local context. Results specifically look at perceptions of respondents, discussants and observations as presented and analyzed in the fifth chapter.

#### **6.7 Residents' perceptions on how ESD can be used to enhance ending hunger, achieve food security and improved nutrition and promote sustainable agriculture by 2030**

The study examined respondents' perceptions on how ESD can be used to fortify local knowledge practices in order to enhance SDG 2 by 2030. The results show that ESD was perceived to be a vital tool in inculcating expert-knowledge on sustainable ways of manipulating various socio-economic activities to enhance sustained production in the local context. The study established that it was thought to be a repository of elements such as knowledge, skills and values that were instrumental in sharing ideas based on sustainable use of existing local resources. More important, in this study, ESD elements

were perceived to be influential among respondents in shaping up indigenous knowledge practices in their efforts to sustainably upscale production based on various enterprises. This result matches with the views of Dervis and Steiner (2006) who posit that local residents are the protectors of the environment as well as repositories of valuable indigenous knowledge that may not be known by environmental experts. Adding to Dervis and Steiner (2006), results by CIFOR (2008) reveal the wide availability of traditional technical knowledge in bee-keeping, which can be blended with modern technology advocated for in the study by Cadwallader *et al.*, (2011) whose results show that rural beekeepers were encouraged to use modern bee-keeping procedure for sustainable production. Findings suggest that indigenous knowledge practices are integral part of sustainable development in which ESD plays a transformative role in communicating ideologies and principles of sustainability. According to the results in this study, locally existing structures and resource owners in conjunction with specialists in sustainable development play a critical role in promoting sustainable practices in the use of existing resources. The results correlates with the views of Bucknall *et al.* (2000) who echo on the extremely powerful role of ESD in creating demand for effective local institutions and laying socio-cultural background for effective political action in the local context. It follows that, the encyclopedic nature of ESD has the capacity to be harnessed in teaching local residents how to diversify their enterprises as indicated by respondents. This result corresponds with the findings by Ketlhoilwe and Jeremiah (2012) which encourage diversification of enterprises in the face of ecological challenges in order to spread the risks and reduce poverty-related impacts.

### **6.8 Residents' perception on how ESD can be used to enhance ending poverty in all its forms everywhere by 2030**

The study also examined respondents' perceptions on how ESD can be used to fortify local knowledge practices in order to enhance SDG 1 by 2030. The results show that ESD was perceived to be instrumental in improving productivity through engaging sustainable development as a new knowledge to caution locally existing knowledge practices. The respondents' perception indicated that ESD can help local residents acquire necessary knowledge, skills, and values needed to care, protect, preserve, and

sustain productivity in various enterprises. This result is consistent with findings in a case study on conservation agriculture in Southern Zambia in which, tapping into indigenous knowledge and farmer innovation combined with imported innovative technology was proven to be vital (Baudron *et al.*, 2007). More importantly, in this study, although the human rights-based approach is advocated for in the fight against poverty, the move alone may not be sufficient in ending poverty, unless locally existing knowledge practices are blended with ESD elements such as knowledge, skills, values and attitudes. Moreover, being denied an opportunity to use local knowledge to deal with local challenges constitutes violation of fundamental inherent human trait (Nyasulu, 2010).

The results also show that ESD was perceived to be a powerful tool in equipping residents with knowledge and practical skills on how to use existing resources in the local context. It was thought to be a useful measure in facilitating change in thought patterns among local residents in the process of negotiating traditional methods of resource manipulation with modern ones that sustain productivity in various enterprises. In view of Chikunda (2012), ESD must equip people of all ages with knowledge of, and skills and values for, sustainable development, making them more competent and confident to live a healthy and productive life harmoniously with the local environment. This can be achieved through regular interactions where knowledge about natural resource use and conservation is gained in which, new experiences are shared among involved residents (Ketlhoilwe and Jeremiah, 2012). Moreover, constructivism epistemology recognizes local residents' self-invention or own new understanding achieved through interactions in ideas, events, and activities engaged in social life (Ultanir, 2012). Chikunda (2012) further opines that ESD needs to address the complexity and interconnectedness of social challenges such as poverty, consumption, environmental degradation, and the violation of human rights among other things. ESD has to address the challenge of poverty through providing not only contextually relevant information as emerged in this study, but also the competence and confidence emphasized by Chikunda (2012), particularly needed to comprehend and manipulate the available information. Ultimately, residents would be able to establish the need, coupled with positive attitudes supporting behavior in the social context leading to sustainable

development practices (UNESCO, 2005). The findings suggest that indigenous knowledge practices need to be integrated with ESD elements to address the challenge of poverty in the local context. As an education approach, ESD needs to focus on educating local residents on sustainability ideologies and principles within the confines of their existing indigenous knowledge practices on a view to upscale productivity.

### **6.9 Using Education for Sustainable Development to enhance SDG 2 and SDG 1 in field crop production**

The study examined discussants' perceptions on how ESD can be used to fortify local knowledge practices in order to enhance SDG 2 and 1 by 2030 among field crop producers. The results show that discussants perceived ESD elements to be useful in sharing lived experiences co-operative societies, in which members learn a lot from each other's ways of fighting hunger and poverty. The results suggest that ESD elements were vital in inculcating a positive behavior in the use of organic manure such as kraal and anthill spreading in fields. It can be concluded that positive value and attitude as fundamental elements of ESD can be sort to encourage local residents to revert to traditional and environmentally friendly ways of improving soil fertility in the field. ESD should therefore, provide means by which farming practices are understood, appreciated and up scaled in an effort to fight hunger and poverty of which, in the views of UNESCO (1986), education can communicate this vital knowledge. Embracing such knowledge practices and innovations among local residents can improve their livelihoods. Tsegay and Rusare (2014) encourage local initiatives among residents in finding solutions to issues of hunger and poverty. Additionally, the results suggest that ESD elements were perceived to be helpful in cultivating a positive attitude towards traditional foods such as cassava and non-hybridized seeds that were valued for their nutritional, medicinal, drought tolerance, disease resistance, and high yield for years, among other merits.

Other than that, issues of diversification and sustainability of production is yet another aspect in which ESD can be understood and appreciated among field crop farmers. The results show that ESD elements were perceived to be vital in enhancing practical understanding and appreciation on issues of sustainability through trainings and

sensitization. The findings suggest that inadequacy in both diversification and sustainable practices lead to hunger and poverty due to unsustainable consumption patterns of farm produce. ESD can convey this vital information in which farmers acquire the needed knowledge, skills and value in sustaining their field products.

The results also found that ESD elements were perceived to have the capacity to provide informed decisions and practical experiences on prioritization, use of locally resources as well as cautioning existing practices such as conservation farming. Noticeably, in this study, although conservation farming methods have gained popularity in Zambia, the environmental effects of using some chemical substances such as weed-killer remains a critical concern among local farmers in Kaingu Chiefdom. The results suggest that promoters of conservation farming do not justify the long-term effects of using weed-killer to the soil. This result is consistent with Baudron *et al.* (2007) who bemoan the skepticism of some farmers about the long effects of glyphosate application on the soil. In the view of Tirado *et al.* (2008), most agro-chemicals used in farming either way, negatively impact ecosystems and biodiversity. Otherwise, Baudron *et al.* (2007) advocate for production that strives to achieve acceptable profits coupled with sustainable production levels while conserving resources. To this end, Collins-Figueroa (2012) notes the crucial role ESD plays in raising awareness of and action for, conserving, enhancing equitable use of biodiversity in the local context. Findings suggest that technological advancement and its knowledge in field crop production need to be evenly shared among all stakeholders and end-users so as to ascertain acceptance and sustainability in a quest to improve knowledge practices and up scaling productivity in the local context. Thus, ESD was perceived to be a conduit through which local farmers can learn how to care, protect and preserve locally existing resources such as land, its vegetation and living organisms of ecological importance. These are important local resources in the fight against hunger and poverty, and any decision a resident takes has a bearing.

## **6.10 Using Education for Sustainable Development to enhance SDG 2 and SDG 1 in gardening**

The study also examined discussants' perceptions on how ESD can be used to fortify local knowledge practices in order to enhance SDG 2 and 1 by 2030 among vegetable producers. The results show that discussants perceived ESD elements to be useful in cultivating a positive attitude towards using organic manure such as kraal and composite heaps to fertilize vegetables. Such initiatives can not only replace environmentally unfriendly inorganic fertilizers, but also save in terms of cost of production as use of fertilizer is drastically reduced. It can be concluded that ESD provide means by which gardening activities and their practices are understood, appreciated and up scaled sustainably. The results also show that discussants perceived ESD elements to be instrumental in making informed decisions and practical experiences in prioritizing and using locally existing resources such as land, water, trees and other related vegetation in their enterprise. The results suggest that ESD can help gardeners learn how to care, protect and preserve vital resources such as land, water, trees and other related vegetation in the local environment. As an education approach, ESD need to equip vegetable producers with knowledge of, skills about, value and positive attitudes towards their natural environment as a vital resource in fighting hunger and poverty. The knowledge of locally existing resources can provide gardeners with understanding and appreciation its usefulness coupled with the likely dangers associated to its existence. Skills about existing local resources can provide gardeners with the technical aspects associated to them, to a level where methods of manipulating the resources are sustained. Value and positive attitude can help them to make informed decisions in using existing resources. Hungerford and Volk (1989) argue that before individuals act for the environment, they need to be recognizant of its existence in totality. The findings suggest that ESD should provide an enabling environment for learning and research for the attainment of attribute such as knowledge, skills, values and attitude. The results also show that existing associations provide a platform on such attributes can be shared among gardeners and other stakeholders.



### **6.11 Using Education for Sustainable Development to enhance SDG 2 and SDG 1 in fishing**

The study also examined discussants' perceptions on how ESD can be used to fortify local knowledge practices in order to enhance SDG 2 and 1 by 2030 among fishermen. The results show that discussants perceived ESD elements to be useful in providing informed decision and practical experiences on how to prioritize and use locally existing resources that included; water fish and other living organisms of marine origin. Results in this study have proven that such resources were useful in addressing issues of hunger and poverty among local residents. Since those were valued in addressing hunger and poverty in the local context, discussants felt that ESD elements can provide means by which fishing activities and their practices are understood, appreciated and up scaled in a sustainable fashion to enable the industry stand the test of time. It can be concluded that ESD has the capacity to equip fishermen with knowledge on how to care, protect and preserve marine resources in their local context. The results suggested that, through community education, ESD should be used to assist fishermen acquire knowledge, skills, personal values and attitudes towards marine resources. More important, in this study, ESD has the vigor to provide an education among fishermen that supersedes the long arms of the law as means of caring, protecting and preserving fish and its associated resources. It can therefore, be concluded that fishermen need to be cognizant of ESD ideologies and principles in order to act for marine resources like fish. Consistent with Hungerford and Volk (1989), before individuals act for the environment, they need to be cognizant of its existence in totality. Findings suggest that individual fishermen have the potential to make environmentally responsive and favorable decisions towards marine resources such as fish with less law re-enforcement regarding fishing methods and seasonal closures. This result is similar to the views of Collins-Figueroa (2012) who echoes on the critical role ESD plays in enhancing equitable use of biodiversity in the local context.

Results also show that the existing association among fishermen created an opportunity for a possible platform on which alluded attributes such as knowledge, skills, values and attitudes can be shared. Findings suggest that established associations attract vital

synergies which create great opportunities in up scaling fishing activities, thus, addressing the challenges of hunger and poverty in the local context.

### **6.12 A proposed model of engaging ESD in addressing SDGs in the local context**

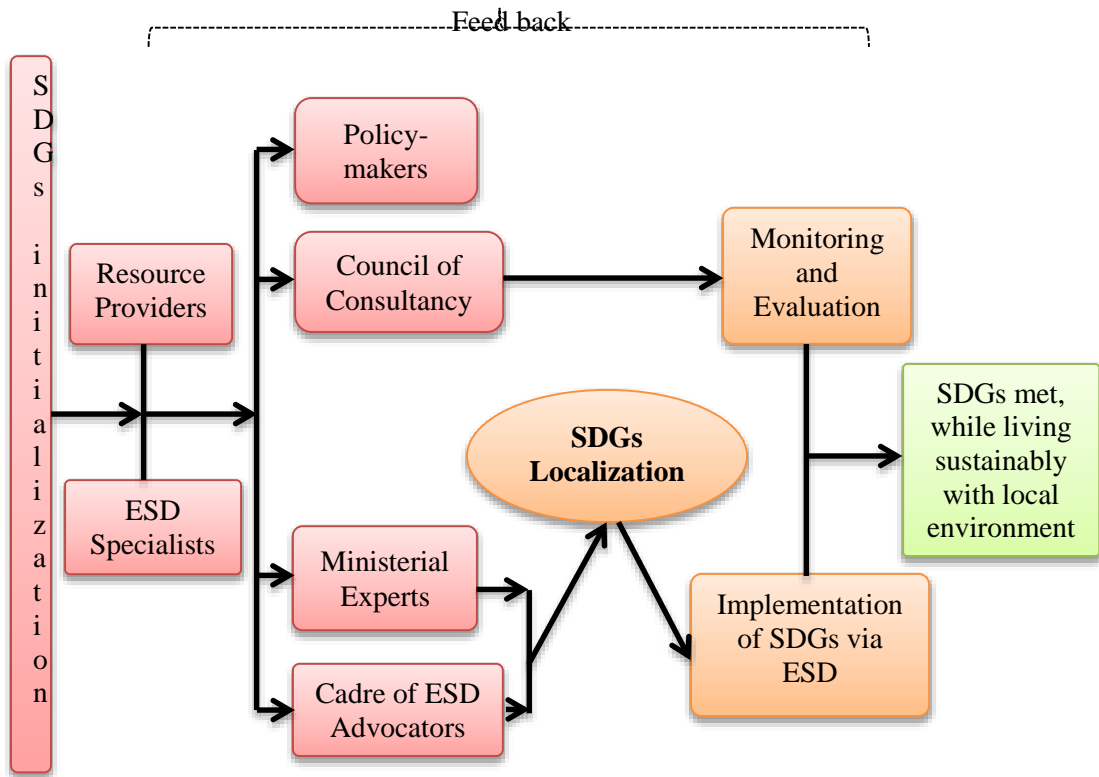
The structural design of the proposed model comprises actors such as; Resource providers, ESD Specialists, ministerial experts, policy-makers, a cadre of ESD advocates, a council of consultancy, and local community. Each of the techno-class forms up a framework that requires some acceptable levels of awareness about, and knowledge of the SDGs so as to build capacity and competencies about the global goals in totality. However, there are specific functionalities within the interlocking frameworks. For example, the Resource providers will ensure that necessary provisions for material and financial resources at all levels are made available. ESD Specialists need to be grounded in ideologies, principles and pedagogy under-pinning ESD through specialized training; who will later train and build capacity and competencies to Ministerial Experts. This will ensure that Ministerial Experts be ready for re-orientation of field operations as they serve communities. Policy-makers too, need full understanding and knowledge of ESD ideologies and principles in order to make sound and informed decisions for SDGs related issues in policies and budgetary allocation. A deliberate established cadre of ESD Advocators will comprise locally existing structures such as DDC, ADC, influential and opinion leaders in the community, government officials, clergymen, and business community. This useful framework of the model will need training in ESD ideologies and principles. The council of consultancy will constitute five members, each one elected among; Resource providers, ESD Specialists, policy-makers, Cadre of ESD Advocators, and local community. The assumption is that they will have already been trained and taught about ESD and SDGs ideals respectively. Nevertheless, there will be need for them to undergo monitoring and evaluation training in order to enhance effectiveness and efficiency in goal attainment before, within, and after the course of action. They will also be charged with the responsibility of technical and logistical provisions. Thus, functional feedback and urgency for modification will be guaranteed. Table 6.1 sums up actors, their actions and indicators thereof.

*Table 6.1. A summary of actors and their actions coupled with indicators*

<b>Actors</b>	<b>Actions</b>	<b>Indicators</b>
Resource Providers	Providing material and financial support at all levels of the project.	Actors at all levels of the project receive valuable support.
ESD Specialists	Providing ESD ideologies, principles and pedagogical applications underpinning it.	Ministerial experts, policy makers, council of consultancy, and cadre of ESD advocates adequately receive training and awareness in ESD and its ideologies, principles and instructional strategies needed.
Policy-makers	Making sound and informed decisions in favor of SDGs related issues.	SDGs related issues prioritized in policy reforms and budgetary allocations at national level.
Cadre of ESD advocates	Undertaking and influencing local residents in issues that relate to SDGs and its engagement in the local context.	Local residents engage sustainability practices in their socio-economic activities.
Council of Consultancy	Providing strategies and logistical support services, i.e. monitoring and evaluation at all levels of the project.	Availability of feedback; re-visiting unaccomplished objectives; recommendations for progression; and other administrative functions.

Source: Researcher, 2017

Schematically, actors and their related functions interlinking as presented below. Figure 6.1 shows the designed model.



2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029/30
SDGs awareness via integration in ESD training			Inclusion of other actors (awareness and strategies)			Engaging local residents	Combined actions by all actors to implement and sustain priority areas				Success

Figure 6.1: A proposed model of ESD engagement to address SDGs. Designed by Researcher, 2017

### 6.13 Theoretical underpinning

In the study, respondents' language of communication and other symbolic systems played a crucial role in the process of data collection. More important, in this study, although it is noted that human activities are culturally related while mediated by language and symbols, there was a realization that such attributes directly relate to individual's lived experiences and called for translation. The central idea of Socio-Cultural Constructivist Theory is that human activities take place in the cultural context and mediated by language and other symbolic systems that are best understood when investigated in their

context (John-Steiner and Mahn, 1996; and Scott and Palincsar, 2013). The researcher realized that respondents gained lived experiences through social interaction, as such, their perceptions reflected historical ideologies and realities of society in which they are a part. Complementing to this realization, Scott and Palincsar (2013) opine that within SCCT, the aspects of individual mental faculties and participation in social interaction is crucial in influencing psychological development. To this end, the researcher's academic knowledge had no influence on the respondents' perception.

#### **6.14 Philosophical and methodological implications**

The selected sample gave the researcher an opportunity to manually use minimal statistical analysis. This helped the researcher to quantitatively summarize some findings on a view to make more mathematical generalizations about the population (O'Leary, 2010). Throughout the study, respondents' and key informants' knowledge was valued, though, seemingly biased and objectively hard to accomplish according to post-positivists (Trochim, 2006). However, objectivity was achieved through methodological triangulation across multiple fallible perspectives of respondents while operating within subjective quadrants in the study. To make it straight, the study employed semi-structured interview, focus group discussion, and participant observation, in which, each tool was at the full disposal of the respondents to derive their perceptions, value judgments, and lived experiences in both cultural and historical contexts. Constructivism epistemology recognizes the knower's perception and judgment based on their lived experiences (Ultanir, 2012 and Tedds, 2010). The three data collection tools used in the study made quite a good combination. Noticeably, semi-structured interview yielded desirable results as much as focus group discussion did, though the study tended to under-estimated it at inception. It can therefore, be concluded that depending on how follow-up questions are phrased, semi-structured interview remains a vital tool supplementing focus group discussion in a tactical sense. This however, does not underestimate the vigor of focus group discussion to bring in-depth information to the fore with interesting and divergent views. Focus group discussion still merit over semi-structured interview in a technical sense and this study valued that fact. Participant observation was seemingly under-utilized as lenses guiding the study limited the

researcher's opportunity to core-produce knowledge in the course of study. It would have done far much better, (though, great results were obtained) in an instance where philosophical under-pinning made provisions for the researcher to equally contribute in sharing lived experiences. All the same, results obtained via participant observation remain great and helpful, particularly in triangulation of data to the fore.

### **6.15 Gaps addressed by the study**

The study bridged the scientific-knowledge gaps, among which were; established the levels of residents' awareness about SDGs in Itezhi-tezhi District and Kaingu Chiefdom in particular. For example, 76 per cent of the residents were not aware about SDGs at the time of study.

It also established multiple perspectives on localized meanings of selected SDGs and their related concepts. For instance, the term hunger was generally understood as inadequacy in provision of food and care for the family. Ending hunger locally implied making provisions for food and care for the family. Achieving SDG 2 by 2030 meant working hard to upscale productivity in the local context. In case of poverty, it was perceived as lack of material wealthy such as cattle, goats, pigs, and chicken vital for human survival. Ending poverty meant making provisions for material wealthy in terms of cattle, goats, pigs, and chickens which are required in one's life. Achieving SDG 1 by 2030 meant government and NGOs' intervention to empower farmers with implements and inputs to upscale productivity in various enterprises. On the whole, against other studies (Fielding-Miller *et al.*, 2014; Tsegay and Rusre, 2014, and Bigsten and Tengstam, 2008) which used technical and standardized definition of the concept hunger, results in this study established localized view point of the meaning of the term in accordance to residents lived experiences.

The study too, established the scientific-knowledge gap on how ESD can be used to achieve selected SDGs in the local context. For example, it was perceived that ESD can be engaged to caution local knowledge practices in an effort to upscale productivity in various enterprises. ESD can also be used to equip local residents with practical knowledge on how to use local resources in a sustainable fashion. It was also perceived

to be vital in the process of acquiring practical experiences or knowledge in sustaining enterprises. Finally, ESD was thought to be a useful measure in controlling methods of resource manipulation. Therefore, ending hunger and poverty among residents will be enhanced, while living sustainably with their local environment.

## CHAPTER SEVEN

### CONCLUSION AND RECOMMENDATIONS

#### 7.1 Introduction

Basically, this chapter concludes and provides recommendations based on key findings of the study. It opens with a brief and precise conclusion based on the key themes which guided the study. The chapter also provides necessary recommendations based on the major findings; emphasizing to whom the recommendations are directed with probable reasons for recommending them. As a major contribution to the body of knowledge and society at large, the study closes with a proposed model that can be used to address SDGs through ESD in the local context.

#### 7.2 Conclusion

Results in this study clearly show that residents' awareness about SDGs in Chief Kaingu's area was still in its infancy stage. Apparently, majority of the residents expressed lack of awareness about the SDGs due to inadequate community sensitization in the area on these global goals by agencies concerned. Contextually, through community education and sensitization, the new SDGs can be made known among residents of Kaingu Chiefdom as they share relevant knowledge in their social interaction.

In terms of local resident's interpretation of the concept hunger to their social context, results indicated divergent perspectives. For instance, the concept hunger was viewed to embracing inadequacy in the following aspects: food stuffs; finance; domestic animals such as cattle, goats, pigs, and chickens; and knowledge coupled with good governance. The causes were also perceived to refer to the concept of hunger, i.e. being lazy and lacking consultation on how to upscale living standards. To their local context, however, ending hunger, achieve food security and improve nutrition and promote sustainable agriculture by 2030 (SDG 2) meant up scaling food production through hard work, government intervention in supplying both inputs and implements as well as offering relevant knowledge, skills and values in their production patterns among local farmers.



In order to address the challenge of hunger in Chief Kaingu, residents used various locally existing knowledge practices. Take for example; smallholder farmers involved in field crop production grew maize, groundnuts, sweet potatoes, cassava, and pumpkins used as sources of various nutrients. Local people also keep cattle, goats, pigs, and chickens which provide with: essential proteins, manure for field/gardening activities; liquid cash for various uses; and source of farm-power in case of cattle. Other activities engaged by the local residents include; gardening, fishing, charcoal burning, cottage industry, honey harvesting, and seasonal wild food gathering.

As regards to local residents' interpretation of the concept poverty to their local context, diverse views were expressed. To their social context, the concept hunger referred to inadequacy in the following: material things such as cattle goats, pigs or chicken; and basic needs like food, shelter, education, health or clean water. One of the causes, though, biblically perceived definition of the concept poverty was given, i.e. lack of hard work to earn a decent living which is a human call since the fall of Adam in the Garden of Eden. Contextually, ending poverty in all its forms everywhere by 2030 (SDG 1) implied up scaling locally existing socio-economic enterprises such as field crop and animal production, fish-farming, and apiculture; through government intervention.

Apparently, local residents in Chief Kaingu used quite a number of locally existing knowledge practices to address the challenge of poverty. Smallholder farmers grew cash crops such as cotton, tobacco, and sunflower; which are either sold for money or exchanged with valuable items needed for up scaling the livelihood. Maize was also grown at a large scale to caution cash crops alluded to above. Other socio-economic activities engaged in fighting poverty in the local context included; gardening, animal husbandry, fishing, charcoal burning, apiculture, and sell of labor among others.

It is, however, clear from the results that ESD, as a new knowledge, can be used as a channel through which ending poverty in all its form everywhere by 2030 (SDG 1) can be enhanced in Kaingu Chiefdom. Among many ways in which ESD could be used to end poverty in Kaingu Chiefdom included: improved productivity and sustained local resource utilization through blending sustainable development ideologies as knowledge with locally existing knowledge practices and skills; and critical measure to control

choices local residents make towards resource manipulation. Basically, ESD has proven to be a vital channel through which ending hunger, achieve food security and improved nutrition and promote sustainable agriculture by 2030 (SDG 2) can be enhanced. Among many ways in which ESD can be used to achieve SDG 2 were: inculcation of expert-knowledge on sustainable methods of manipulating locally existing resources; instrumentality in cautioning locally existing practices such as conservation farming among farmers; and its capacity to be harnessed in teaching issues of diversification among local residents in various enterprises engaged.

### **7.3 Recommendations**

Agencies of the United Nations (UN) charged with the duties and responsibilities of ensuring that new SDGs were implemented in all States and communities around the world needed to co-ordinate with the Government of the Republic of Zambia to sensitize Kaingu community through ministerial specialists at district level. This is due to the fact that findings suggest that government and the donor community need to support local residents in ending hunger and poverty by 2030. As policy formulators, it was imperative that the Zambian government be co-ordinated with UN agencies specialized in SDGs implementation so these global goals were categorically placed in respective policies of government. Ministerial specialists at district level in Itezhi-tezhi of Central Zambia were charged with the responsibility of interpreting and implementing government policies in communities they served; and so it was vital that they were involved in raising awareness about SDGs in Kaingu Chiefdom. Principally, SDGs were meant to serve and protect communities around the globe in aspects of social, political, economic, and environmental endeavors; and so people of Kaingu Chiefdom had the right to full information about these global goals in route to implementation.

As opposed to hiding in technical definitions of terms related to SDGs 2 and 1, which is hunger and poverty respectively, researchers and project implementers needed to accord local residents of Kaingu Chiefdom an opportunity to contextually interpret these concepts. Using their lived experiences, local residents of Kaingu Chiefdom had the capacity to come up with functional definitions of hunger and poverty, unique to their

social and cultural needs. This was crucial to their involvement in finding solutions to end both hunger and poverty at local level in Kaingu Chiefdom.

The Zambian government needed to upscale existing practices local people of Kaingu community have been using to address issues related to hunger and poverty through policy-priorities. Take for example, smallholder farmers engaged in field crop production needed government intervention in supply of both farming inputs and implements in order to enhance sustainable production. Among many interventions that could be initiated by government included: loan facilities through co-operatives; and subsidies in essential re-stocking livestock such as cattle, goats, pigs, and chickens. As findings suggest, cattle were necessary for draft-power, kraal manure to improve soil fertility, and off course milk production. Other shortlisted domestic animals could be essential in diversification of enterprises, thus off-setting miscellaneous expenses at household level. Those engaged with other socio-economic activities such as gardening, fishing and apiculture would too, benefit from loan facilities, i.e. procurement of various materials and equipment deemed necessary for management of their enterprises.

In order to addressing challenges of hunger and poverty among households of Kaingu community, there was need to blend existing local knowledge with ESD elements such as knowledge, skills, values, and attitudes. This would have improved and sustained local residents, methods of production in their socio-economic endeavors. It therefore, meant that ministerial experts serving Kaingu community needed special training based on ideologies, principles and pedagogical aspects underpinning ESD on a view to re-orient their field operations towards helping local residents understand and appreciate sustainable practices. For instance, among important principles underpinning ESD were environmental protection and restoration, natural resource conservation and sustainable use, addressing unsustainable production and consumption patterns, and the creation of just and peaceful societies. Local residents of Kaingu community needed to be vested in these facets if they were to address issues of hunger and poverty while living sustainably with their natural environment. To this end, the researcher proposes a model that stipulates how ESD could be used as a channel through which SDGs could be achieved.

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## APPENDICES

### Appendix A: Consent Letter

Dear respondent

Subject: **Consent to Take Part in the Study**

My name is Michael Ndila, a student at the University of Zambia. I am here to conduct a study on ‘Addressing selected Sustainable Development Goals through Education for Sustainable Development in Itezhi-tezhi District of Southern Zambia’. I am requesting you to participate in this study by providing the information related to the study. The information will be used for academic purpose only and will not be divulged to any other person.

Your views will be treated with respect, confidentiality and anonymity. Please give honest responses. Appending your signature means authorization of your consent. However, you are also at liberty not to append the signature.

Signature: .....

Supervisor’s Name: .....

Signature: .....

Respondent’s signature: .....

Date: .....

Thank you for participating.

**Appendix B: A Semi-Structured Interview Schedule on addressing selected Sustainable Development Goals through Education for Sustainable Development in Itezhi-tezhi District.**

**A. Introduction**

Researcher introduced himself and the colleague to the interviewee. Researcher made a brief topical introduction and the purpose of the study. This was followed by an explanation on the likely benefits of the study to the interviewee and the community at large. Interviewee was ascertained on issues of confidentiality and anonymity as well as use of data sought in the study.

**B. Socio-demographic Background of Household**

Gender: ..... Marital status: ..... Age: .....

Educational level:.....Occupation: .....

Social economic activities:.....Duration of stay in the area .....

**C. Awareness about SDGs**

1. (a) Are you aware about the new Sustainable Development Goals (SDGs)? .....
- (b) If yes, how did you come to know about the new SDGs? .....
- (c) What are some of these SDGs that you know? .....
- (d) If not, what are the reasons for lack of knowledge about the new SDGs?.....
2. In what ways would you like to know more about the new SDGs? .....

**D. Locally Existing knowledge, skills and values that relate to SDGs**

3. In the last 20 years, what activities have you been engaging yourself into in order to address the following;

- (a) Hunger at local community
- (b) Education at local community
- (c) Poverty at local community

**E. Addressing SDGs through ESD**

4. (a) ‘Ending hunger, achieve food security and improved nutrition and promote sustainable agriculture’ is one of SDGs; based on your lived experience, what do you consider to be hunger? .....
- (b) What would be the localized meaning of ‘ending hunger, achieve food security and improved nutrition and promote sustainable agriculture’ by 2030?.....
- (c) How can ESD be used to enhance ending of hunger, achieve food security and improved nutrition and promote sustainable agriculture in your local area by 2030?.....
5. (a) ‘Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all’ is one of SDGs; based on your lived experience, what do you consider to be education? .....
- (b) What would be the localized meaning of ‘ensuring inclusive and equitable education and promote lifelong learning opportunities for all’ by 2030? .....
- (c) How can ESD be used to enhance ensuring inclusive and equitable quality education and promote lifelong learning opportunities for all in your local area by 2030? .....
6. (a) ‘Ending poverty in all its forms everywhere’ is one of SDGs; based on your lived experience, what do you consider to be poverty? .....
- (b) What would be the localized meaning of ‘ending poverty in all its forms everywhere’ by 2030? .....
- (c) How can ESD be used to enhance ending poverty in all its forms everywhere in your local area by 2030? .....

END OF INTERVIEW

## **Appendix C: A Focus Group Discussion Guide on Addressing selected Sustainable Development Goals through Education for Sustainable Development in Itezhi-tezhi District**

### **Introduction**

Researcher introduced himself, topic and purpose of the discussion. Researcher explained the benefits of the study to the discussants and the community at large. Later, researcher allowed discussants to do self-introductions.

### **Time frame**

FGD took 1 hour 30 minutes, as it was realized that discussants were busy with other activities in their homes.

### **Ground rules**

Among ground rules set by participants were the following:

1. Respect each other's views.
2. Speak through the moderator.
3. No mini-discussions.
4. Everyone to freely participate.
5. Minimize movements.

### **Guiding questions**

#### **A. Addressing SDGs through ESD**

1. How can existing indigenous knowledge, skills, values and attitudes be used in practices meant to achieve the new SDGs? .....

(Researcher made follow up questions)

2. How can ESD elements (knowledge, skills, values and attitudes) be used to address the new SDGs? .....
- (Researcher made follow up questions)

### **Conclusion**

Researcher read out key issues of the discussion, and asked participants for any additional information that could not have been discussed during the whole discussion. Researcher thanked participants for their contribution and time.

A volunteer, among discussants gave vote of thanks.

END OF DISCUSSION

## **Appendix D: Participant Observation Checklist on Addressing selected Sustainable Development Goals through Education for Sustainable Development in Itezhi-tezhi District**

### **Entry into community**

Researcher asked permission from the Chief representative to observe selected households in their practices related to selected SDGs, such as: ending hunger, achieve food security and improved nutrition and promote sustainable agriculture; ensure inclusive and equitable quality education and promote lifelong learning opportunities for all; and ending poverty in all its forms everywhere. Permission from the households that were observed in these practices was asked prior to observation. Researcher further asked for permission to video record the existing practices related to SDGs and assured confidentiality and anonymity of the recorded data.

### **Time of observation**

Observations were done in the morning and afternoon for 2 months. This was because most of the households engaged into domestic activities around the stated time. For reflexivity purposes, already existing practices were also observed.

### **Guiding theme**

Existing practices related to SDGs.

The table below depicts what to be observed.

<b>ACTIVITY</b>	<b>MATERIAL</b>	<b>RESULTS</b>
Existing practices that relate to SDGs.	<ol style="list-style-type: none"><li>1. Note book</li><li>2. Pen</li><li>3. Video camera</li><li>4. Camera</li></ol>	

END OF OBSERVATION