

CHAPTER 1

INTRODUCTION

1.1: Background

The role which human beings play in making life better has both negative and positive effects. While the desired result of human intervention in trying to improve the quality of life is usually positive, unintended negative consequences often emerge. Since development, however it is regarded, is generally believed to be the ultimate concern of all human efforts, human beings may justifiably be described as agents of development. And because development is primarily aimed at improving the human welfare, human beings can also be regarded as beneficiaries of such development. Therefore, humans are both agents and beneficiaries of development. It is also worthy noting that most of the *development* oriented human activities have had far reaching negative effects on both human populations and other non-human living organisms and especially the environment.

The pursuit to achieve development by any society tends to be generally characterized by the dual role of human beings as agents and beneficiaries of development on one hand, and as agents of destruction or degradation of the environment, on the other. What is also generally acknowledged is that human societies have since time immemorial adapted to and altered their host environments. It is the alteration of the natural operational systems (or ecological systems) that has been and still is a thorny issue in as far as humans' role in bringing about *development* is concerned.

With widespread realization of the implications of human activities, at global and local levels, in the operations of natural environmental systems, measures have been instituted to remedy the negative impacts created and to minimize the rate at which new impacts are exerted by current activities.

Governments have enshrined environmental issues in their respective legislations and criminalized certain destructive activities that tend to undermine the environment's capacity to function efficiently. Environmental oriented administrative and technical systems have been created and mainstreamed in operations of some government agencies and departments of some

countries which have been legally mandated to police environmental and natural resource utilization. These have been in place for a considerable period of time in some countries. However, their impact does not seem to match up to the inputs injected in their operations. There are no signs to suggest that the battle for the environment will be triumphantly concluded in favour of the environment, not even in the distant future.

Notwithstanding the above observation, it is worthy acknowledging the current efforts by the Zambian government through the Ministry of Tourism, Environment and Natural Resources (MTENR) by launching the Environmental Mainstreaming Programme. Mainstreaming environmental issues, as opposed to integrating them, is a positive indicator of nurturing sustainability principles in the overall environmental protection and management practices. However, if these efforts are made out of the context of a multi-dimensional consideration of other players and systems such as the indigenous ones, their impact may remain insignificant. Another fundamental consideration to take note of is that by implication mainstreaming draws everybody on board and imposes responsibility on all players, public and private, organisations and individuals and therefore should seek insight from everywhere and everybody. This can ably be realized, sustainably, through the medium of education. Hence, environmental education becomes pivotal in ensuring the active participation of all and success of the interventions.

The measures so far provided for by the Zambian government to safeguard the interests of the environment do not adequately appeal to the active involvement of the masses and seem to have put much emphasis on reactive and punitive rather than proactive and educational approaches. Among the efforts the Zambian government made include, but not limited to, the creation of watchdog institutions like the Environmental Council of Zambia (ECZ) and the enactment of enabling legislation such as the:

- (a) Environmental Protection and Pollution Control Act No. 12 of 1990 (EPPCA) and its subsidiary legislations which include the following:
 - (i) the Environmental Impact Assessment Regulations – Statutory Instrument No. 28 of 1997;
 - (ii) Statutory Instrument No. 71 of 1993 – the Waste Management Regulations;
 - (iii) Statutory Instrument No. 72 of 1993 – the Water Pollution Control (Effluent and Waste Water) Regulations;

- (iv) Statutory Instrument No. 141 of 1996 – Air Pollution Control (Licensing and Emissions Standards) Regulations;
- (v) Ozone Depletion Standards Regulations of 2000;
- (vi) Statutory Instrument No. 125 of 2001 – Hazardous Waste Management Regulations.

Other enabling forms of environmental legislation are the following:

- (b) Public Health Act Cap 295;
- (c) Land Act Cap 184 and Land Acquisition Act of 1995;
- (d) Town and Country Planning Act Cap 283;
- (e) Local Government Act Cap 281, including the Statutory Instrument No. 144 of 2007;
- (f) Zambezi River Authority Act;
- (g) National Heritage Conservation Act of 1989;
- (h) Water Act of 1949 (Cap 312);
- (i) Zambia Wildlife Act of 1998;
- (j) Mines and Minerals (Environmental) Regulations of 1997;

In addition, the World Bank Environmental Assessment (OP 4.01) regulations have also been adopted and are enforceable in Zambia particularly for World Bank-financed projects.

The Zambian government had also made efforts to integrate environmental considerations into the planning processes by establishing an Environmental Unit in the now defunct National Commission for Development Planning. The unit was aimed at strengthening environmental input in planning, (Regional Soil Conservation Unit, 1993).

The government further facilitated the formulation of District, Provincial and National Environmental Policies. The government has responded to the current global threat of climate change by devising adaptation strategies as outlined in the *National Adaptation Programme on Action* (GRZ, 2007). Law enforcement and prosecution of some of those that fail to adhere to the regulations has also been on-going. Unfortunately, all these efforts have apparently generated no appreciable positive impacts to warrant the continued reliance on them.

After taking into account various efforts by the Zambian government and other actors in the protection of the environment, what has come out as a missing link is the alienation of indigenous systems in the overall environmental protection mechanisms. Since the environment is a factor as well as a victim of *development*, issues to do with development planning cannot be separated from the environment because it is in the planning processes that decision making, including choosing of development options and resource use, is cardinal.

Since education is generally acknowledged as the currency of development, it is also an important factor in development planning processes and it has always been in existence in all societies. Thus, the necessity to analyse indigenous systems of environmental education in relation to their contribution to development planning systems may be more justifiable now when concerns of sustainability are growing.

1.2: Statement of the Problem

As alluded to above, numerous efforts have been made towards appreciating the need to have quality environment and to ensure poverty reduction through sustainable development interventions. However, these efforts have been of little significance in addressing pressing environmental challenges that appear to be thwarting human aspirations for holistic sustainable development.

The failure of current systems could partially be attributed to the exclusion of indigenous knowledge systems which were more appealing to some people than modern systems which are viewed as being too abstract in certain instances. Such excluded knowledge systems create problems in people's lives and, therefore, it was such a negative situation that constituted the problem for this study. It was, therefore, important to analyse inherent principles and approaches of modern and indigenous systems so that ways could be proposed through which the two systems could inform each other and possibly come up with a harmonized approach. To continue neglecting indigenous knowledge would only serve to incubate a viscous cycle of environmental problems that would eventually make life on earth unbearable for both human beings and other forms of life.

1.3: Orientation of the Study

The study aimed at exploring the potential of blending indigenous systems which worked well in the past, and probably even now, with modern systems which have been in force for so long with arguably negative impacts.

Furthermore, the study envisaged exploring possibilities of taking on board indigenous systems of environmental education in their contribution to development planning, taking cognizance of Zambia's national decentralization policy principles which focused on the devolution of authority and resources to grassroots level.

Ascertaining the extent to which indigenous and modern environmental education systems complimented each other towards attaining common goals in development planning or the manner they posed as a hindrance to each other also constituted part of the study orientation.

1.4: General Aim of the Study

Within the above stated orientation, the study aimed at analysing environmental education from the perspectives of both the indigenous and modern systems vis-à-vis their potential synergetic contribution to addressing development planning in Zambia. The essence of the study was to generate theoretical and pragmatic perspectives from which a synergy of the two systems could be suggested. In addition, key players in the indigenous and modern systems were to be identified as well as the instruments and mechanisms commonly applied in environmental education and development planning processes.

1.5: Specific Objectives of the Study

Arising from the general aim, the following were the specific objectives:

- To establish the interface between indigenous and modern systems of environmental education in confronting development planning in Zambia;
- To devise a harmonized environmental education system comprising principles from both indigenous and modern systems relevant to dealing with development planning in Zambia.

1.6: General Research Questions

The general research questions that guided the study were:

- What types of indigenous systems are used in environmental education within the context of development planning in Zambia?
- What modern systems are used in environmental education when dealing with development planning?

1.7: Specific Research Questions

The following specific research questions were used to guide the study:

- What is the interface between indigenous and modern systems of environmental education when addressing development planning in Zambia?
- What prospects are there for the integration or harmonization of the two systems (i.e. indigenous and modern)?
- What cross-cutting environmental education and development planning principles can be suggested from a blend of indigenous and modern approaches?

1.8: Significance of the Study

The study has the propensity to help in contributing towards bridging the gap between the available systems of environmental education being applied in addressing development planning in Zambia and the indigenous systems that had been in use prior to the advent of the current systems. The development challenges that characterize Third World countries like Zambia have continued unabated due to the restriction of options of addressing them to modern ones which have just created an unending struggle without foreseeable public and environmental benefits. The multifaceted nature of environmental and development challenges we are confronted with today require a multiplicity of strategies and efforts to address them. These efforts should include drawing upon the immense indigenous knowledge that has for so long been relegated to the realms of passive history for ornamental purposes.

In this regard, various stakeholders involved in environment, education and development planning fields at different levels stand to benefit from this study. Among these include

academicians and institutions of learning, government and its relevant agencies, planners and other technocrats involved in planning activities, communities in the study areas and their traditional leadership as well as non-state actors dealing with environmental education and development related issues.

1.9: Limitations of the Study

The following limitations were confronted during the study and field work period:

- Finances – the challenges of self-sponsorship where finances remained too inadequate to accomplish planned activities in time were a reality to cope with. This also impacted negatively on coverage of study areas;
- Time – this was basically a function of the availability of finances. The field work period was relatively longer than anticipated due to periodic stoppages necessitated by financial limitations;
- Bureaucracy – this was a major stumbling block especially in the public sector particularly in the Boka Karska Bay region, Montenegro, where it was not possible to have audience with the Planning personnel in the Kotor Municipality;
- Weather extremes – extremely low temperatures of between negative 12 and 23 degrees Celsius affected mobility in certain areas within the state of Saxony of which Dresden is the capital. This inhibited access to some areas outside the city of Dresden. Thus, bad weather made it difficult to have audience with rural dwellers whose villages could not be reached. In addition, the planned visit to Prague in the Czech Republic on 14th December 2010 also failed due to adverse weather which resulted in the blockage of roads and rail lines between Dresden, Germany and Prague which were covered by snow. Prague is one of the best examples of cities in Europe in terms of spatial integration of environmental aspects in its planning regime;
- Language – This was a challenge in the following areas:
 - Some areas in the eastern part of Siavonga district where the Goba language is used which is relatively different from Tonga;
 - In Montenegro where English is rarely used and the majority do not speak it, especially the elderly population;

- In Dresden, Germany, where the majority of the elderly populations do not speak English and some of those who know it felt they had no obligation to speak it.

However, in all these cases, some interpreters were available to aid effective communication.

1.10: Description of Study Areas

Table 1: Study areas and the justification for choosing them.

S/N	Study Site	Reasons for Choice of Area
1.	Tonga Society (Southern Province – Siavonga District) <i>indigenous system</i>	These Traditional Societies have witnessed environmental changes over the years that have impacted on their livelihoods. Indigenous responses to these changes could have been employed to enable the communities cope with the changing environment. In addition, the system of traditional governance is highly localized and independent of any other traditional leadership in the district or province.
2.	Lozi Society (Western Province– Mongu District) <i>indigenous system</i>	This society has for centuries co-existed with a unique and fragile ecological system comprising of wetland in the Baroste plains and forest in the upland (aquatic and terrestrial ecosystems). In addition, the traditional governance system is highly centralised and hierarchical with more authoritative and cohesive systems;
3.	South-East Europe (particularly Montenegro) <i>modern system</i>	Montenegro is the only modern country in the World which declared itself an Ecological State and explicitly enshrined this in the national constitution (see extract in chapter 4). Antecedents to this declaration as well as its impact could be of interest to explore from an environmental education perspective.
4.	Western Europe (Dresden, Germany)	This is the part of Germany that witnessed deplorable environmental consequences as a result of Hitler's wars. It

	<i>modern system</i>	constituted East Germany before the fall of the Berlin Wall and the re-unification of Germany. How the country's planning system is confronting urban environmental challenges is of interest to this study.
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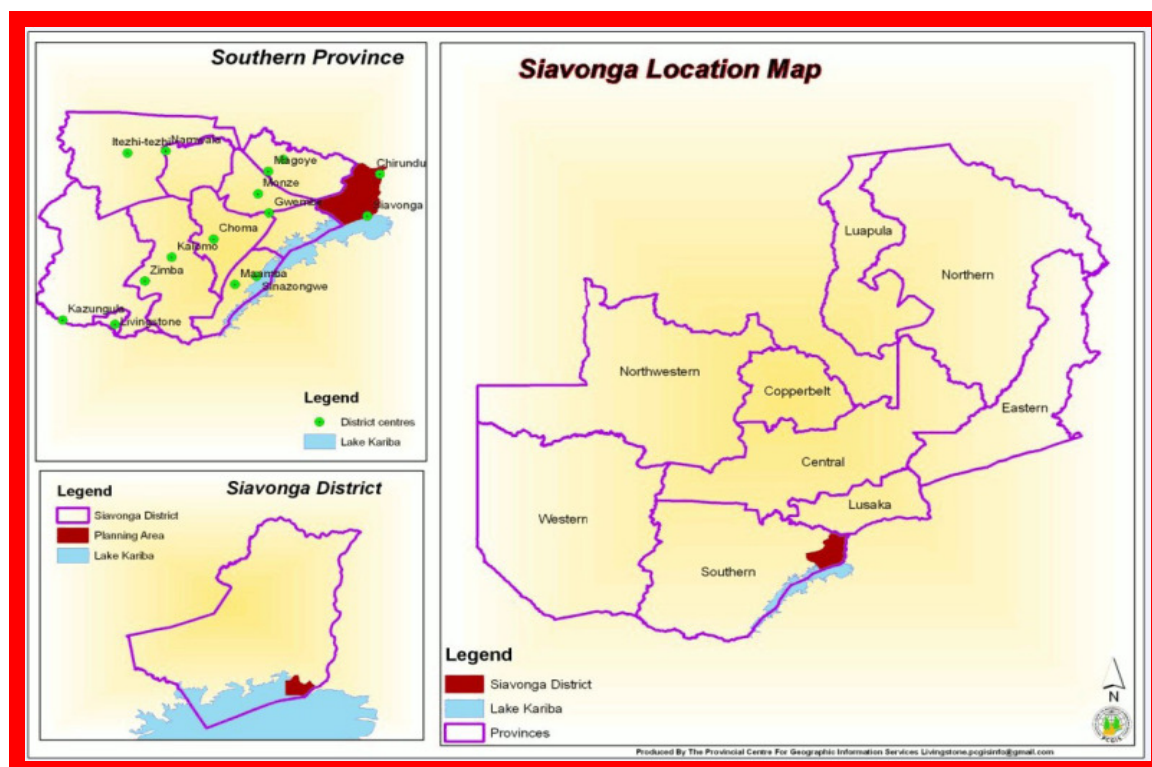
Source: Field Data (2010)

1.10.1: Siavonga District, Zambia

Siavonga is one of the eleven (11) districts of Southern province of Zambia. It is situated in the north-eastern part of the province and is absolutely located between the geographical coordinates 15.50 degrees to 17.35 degrees south of the equator and 28.1 degrees to 29.0 degrees east of the Greenwich meridian. It is inhabited by the valley Tonga. Fishing, tourism, farming, livestock rearing and trading are among the major means of livelihood in the district. Mining is the latest economic activity recently embarked on with the commencement of uranium exploration works around 2006.

The district has visible signatures of environmental degradation where only 15% of the land is arable and 10% of this is heavily degraded. Keeping of goats, which are browsers, also exerts pressure on plant species which are desirable to goats.

Figure 1: Location Map of Siavonga in the National and Regional Context



Source: Siavonga District Council (2010)

1.10.2: Mongu District, Zambia

This is the provincial capital of Western Province (Barotseland). It is the smallest district in the province with respect to area but has the highest population density. Fishing, farming, cattle rearing, crafts and trading constitute part of the main economic activities for the people. The district is also the venue of the magnificent Kuomboka ceremony of the Lozi people which takes place between the two capitals of the Litunga, that is, Lealui and Limulunga around April. The event is also a tourist attraction. The district is inhabited by the Lozi people consisting of a mixture of several dialects spread across Barotseland. The study was mainly conducted at Limulunga Royal Village.

Figure 2: A Welcome Billboard at Limulunga in Mongu District



Source: Field Data (2010)

1.10.3: Boka Kotorska Bay Region, Montenegro

Montenegro is a newly independent state, since 2006, formerly part of Yugoslavia and is located in Southeastern Europe. Its capital and largest city is Podgorica. Montenegro's total area is 13,812 km² with a population of 650,000 inhabitants. The country is divided into 21 Municipalities. The proposed study area is the Boka Kortoska Bay region covering three Municipalities of Kotor, Tivat and Herceg Novi all located on the shores of the Adriatic sea in the south-western part of the country. The region has an area of 87.33 sqr. Km and boasts of a coastline of 105.7 km and is inhabited by 71,500 people who are mainly involved in trade, overseas shipping and tourism as the major economic activities.

Other attributes of the Boka Kortoska bay region include:

- Being the biggest bay in the country;
- It was inscribed on the UNESCO World Heritage list in 1979;

- It is a member of the most beautiful bays in the world club.

Figure 3: Map of Montenegro and the Boka Kotorška Bay Region

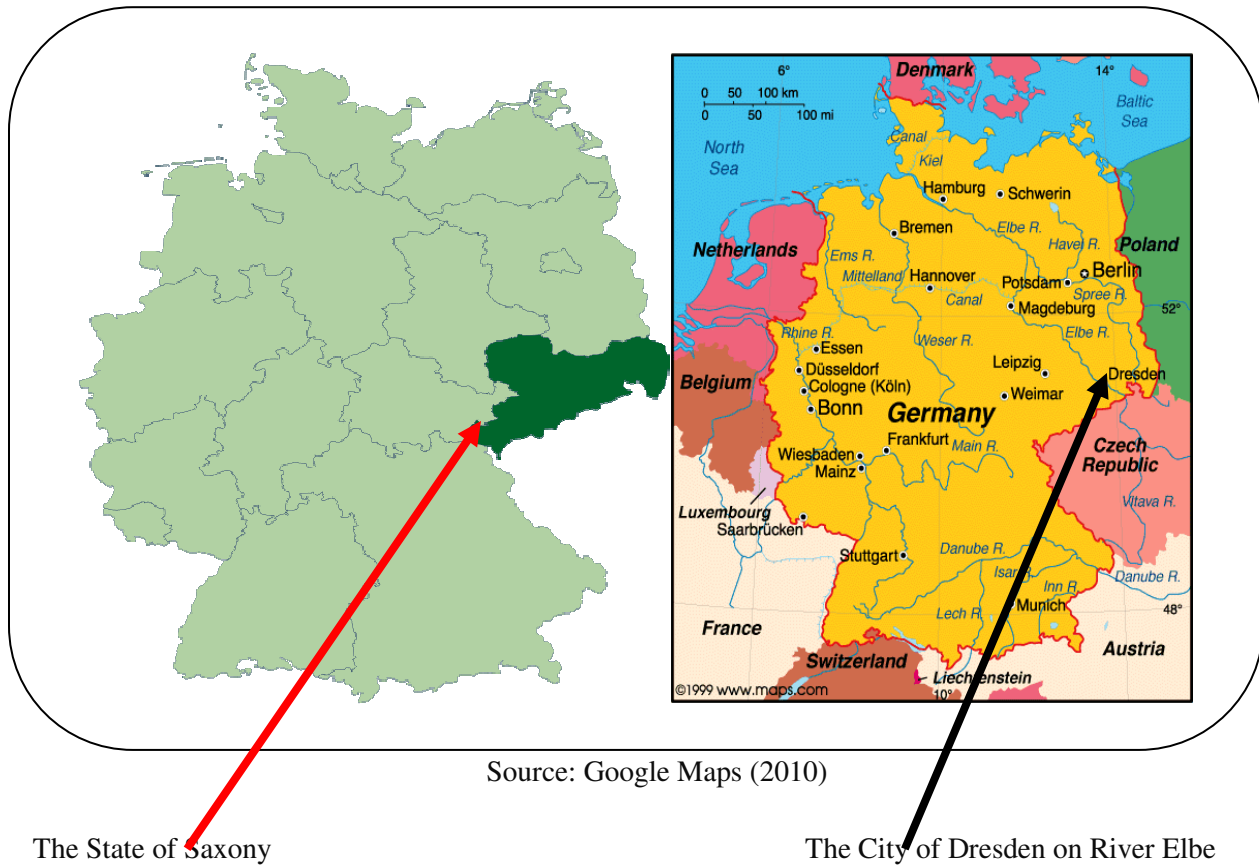


Source: Google Maps (2010)

1.10.4: Dresden (Saxony State) Germany

Dresden, located on the River Elbe, is the capital of the state of Saxony in Germany. It is one of the cities that were bombarded by the allied forces during the world wars. The resulting socio-economic and environmental consequences required drastic measures by both the Federal and State governments. Dresden is today one of the environmentally sensitive cities in the European Union and has a number of programmes dealing with energy efficiency, climate change and environment and sustainable development.

Figure 4: The Federal Republic of Germany Showing Saxony State and the City of Dresden



1.11: Operational Definition of Terms

The following are some of the common concepts and phrases used herein that require to be defined within the context of their application to this study.

Table 2: Concepts and Operational Definitions

Concept / Phrase	Operational Definition
Chiefdom	A geographically defined area inhabited by people of a generally similar way of life all under one recognised traditional

	leader (Chief) who has jurisdiction over traditional or customary matters in that particular area.
Community	A group of people occupying the same environment and sharing similar challenges, aspirations, and in some cases a <i>common history</i>
Education	A system of acquiring and sharing information and knowledge among and between generations
Environment	Natural (biophysical) resources including various spheres, i.e. the biosphere, atmosphere, hydrosphere and the lithosphere.
Environmental Education	A system of acquiring, sharing and passing on of information and knowledge about and for the environment
Development	A general improvement in quality of the state of the environment and life of human beings
Sustainable development	Long lasting, efficient and cost-effective improvement in the quality of the environment and human beings
Planning	A systematic way of doing things oriented towards meeting agreed goals and aspirations
Synergy	An amalgamation of two or more things for the purpose of working together with greater strength than that of individual components working independently.
System	A set of interrelated activities and processes intended to bring about desired outcomes
Indigenous	Locally bred, home grown innovations, ideas, skills, knowledge
Indigenous knowledge	Locally generated knowledge which is relevant to local situations and challenges, normally gained through experience over time.
Indigenous system	Locally generated experience -based activities or processes applied in tackling challenges and puzzles. The emphasis is on its origin and not on who applies or uses it.
Traditional system	An established and accepted pattern or usual way of perceiving or doing things. Such a generally accepted pattern could either have

	been locally initiated or imported irrespective of whether it is being used by the indigenous people or not.
Traditional Leadership	A system of power sharing, management and governance of public affairs involving Chiefs, Indunas (ministers) and village head persons
Traditional Leader	A Chief, Induna, or head of a village recognised as such by the communities. A Chief in this case refers to one gazetted by the President of Zambia as Chief and for a specified Chiefdom (geographically defined area of traditional jurisdiction)

Source: Field Data (2010)

1.12: Theoretical Perspectives of Synergy Formulation

The immediate ultimate essence of this research was to propose some synergies between the indigenous and modern systems of environmental education that could be replicated in the development planning cycle activities in Zambia.

A synergy is a combination of ideas, values, perceptions, attributes or methods of doing things. Synergies are preferred for their enhanced strength arising from a combination of positive attributes which collectively make them much stronger than individual systems from which they have been merged. As Faith Joko in (Mlipha, ed. 2009) pointed out, a synergy has greater power than the total power achieved by each component working separately. The elements of a synergy may have been principally different in terms of application or approach but basically sharing similar aspirations or goals. For instance, development is one aspect that has numerous varying models but all sharing generally the same mission of improving human welfare. The difference is in the effectiveness, reliability, appropriateness, economic viability, ecological sensitivity and social acceptability of a model.

Likewise, the subject of formulating synergies has different models or theories. With reference to the proposed synergy between the indigenous and modern systems, varying propositions abound. Among the arguments in this regard are those from *methodological pluralists*, like Paul Feyerabend, who contend that indigenous knowledge is a science because it functions and

possesses some common features which may be construed as scientific. This implies it can be integrated in the (modern) mainstream system. On the other hand, there are *unified theorists* who believe in the concept of a single science. This group argues that indigenous knowledge is a science in its own right, thus, it is separate from the modern system but equal. By implication this group asserts that indigenous knowledge should not be integrated into the mainstream modern system. This view calls for separate but equal recognition of indigenous knowledge as a scientific discipline (Emeagwali, 2003).

It is apparent that what is described above presents two antagonistic models one arguing for the synergy between modern and indigenous systems while the other wants each system to stand on its own and be regarded as such.

Each dimension has its own implications on the subject matter. Firstly, the argument by unified theorists that indigenous systems or knowledge should receive separate but equal treatment, without integrating it with modern knowledge or system, has two contrasting issues in it and these are:

- (a) **Support for Indigenous knowledge (IK):** The argument could be said to canvass support for IK since it is aimed at seeking its recognition as a body of knowledge and should be respected on its own without being infused into the modern systems.
- (b) **Weakening Indigenous Knowledge:** The proposition of the unified theorists may render indigenous knowledge insignificant as it lacks fully developed mechanisms for storage of information, replication and validation. Furthermore, treating indigenous knowledge as a separate entity would reduce it to a curriculum, which it is not. It is much more than curriculum. It is a way of life, a life long learning process with tested relevance.

The second model is the methodological pluralism which expounds the necessity of making a synergy between systems. The following issues are associated with this approach. Firstly, the synergy approach creates a possibility that one of the systems being combined may be subdued by the other. In this case, it is most likely that the modern system may overshadow its indigenous counterpart. Secondly, another possibility is that the indigenous system may use the experience of the modern system in information storage and sharing to chart its own

spread and recognition. Depending on the circumstances, the merging may either work to the advantage or disadvantage of either of the two systems.

Arising from the above, a mechanism should be devised to ensure that the most neglected systems, the indigenous ones, are taken into account. In this regard, a compromised synergy between the two would be appropriate. This approach takes into account the strengths and weaknesses, opportunities and threats of each system and find a way of using one system's strengths to address the weakness of the other, its opportunities to address the threats facing the other. By so doing, there will be enhanced positive attributes (strengths and opportunities) and reduced negative aspects (weaknesses and threats) in both systems. The consequential synergy of systems is envisaged to be more appropriate, efficient and relevant in addressing development planning through the media of environmental education in Zambia.

For the purpose of this research, methodological pluralism was adopted as the appropriate ideology in justifying the formulation of synergies. Synergies in the context of this research are not aimed at thwarting the growth of any of the subject systems but rather recognize the positive strands of each so as to devise a hybrid of systems endowed with more strengths than weaknesses. Specifically, indigenous systems, or generally indigenous knowledge, are expected to contribute significantly towards enhancing the relevance to and compatibility with local conditions of the approaches to be devised through the proposed synergy.

The adopted ideology (methodological pluralism) has started receiving due attention beyond academic circles. In some governments, for instance, Canada's North-West Territories, incorporating indigenous knowledge into the mainstream has become a policy requirement (Usher, 1999).

1.13: Elements of Development Planning in Zambia

Development planning in Zambia is enshrined in the statutes particularly the Town and Country Planning Act Cap 283 and the Local Government Act Cap 281 of the laws of Zambia. There are many other pieces of legislation that provide for planning in various government ministries and departments. The establishment of planning and information departments and units in nearly all

government ministries and departments is an indication of the increasing recognition by government of the relevance of planning.

Although the Town and Country Planning Act, in its current form, has a deliberate bias towards urban planning which is confined to urban areas which are subject to this Act, the Local Government Act transcends the statutory planning areas and covers the whole district, including Chiefdoms. The biasness of the Town and Country Planning Act Cap 283 is being taken care of through the on-going review of the spatial planning legislation in Zambia. The proposed Urban and Regional Planning Bill will, once enacted, replace the existing Cap 283 and will be applicable to the whole district, rural areas inclusive.

Planning is one of the cardinal functions of Local Authorities worldwide. In most European countries, for instance, especially within the European Union, Local Authorities enjoy a planning monopoly with very insignificant role played by central government which only ensures that the Councils take into account national interests in their planning. In Zambia, the current Local Government Act Cap 281, under section 61, stipulates 63 functions of Local Authorities of which development planning is one.

It is important here to make a distinction between town planning, which is also called urban or spatial planning as it is commonly referred to in most European countries, and regional planning. Town planning deals mainly with the organisation and regulation of the physical growth and development of urban areas (towns and cities) which constitute the planning areas as defined by the Zambian Town and Country Planning Act. This type of planning is concerned with welfare of urban populations directly and rural populations indirectly since urban areas are considered to be the productive hearts of the economy. Issues of urban ecological harmony, local economic development, economies of scale, reduction of geographical transaction costs, public safety and security, transport networks, and general service delivery as defined by land use zoning are critical aspects of urban planning.

Unlike the western world Municipalities which enjoy admirable planning monopoly, Zambian Local Authorities, particularly District Councils, have restricted planning mandate since they are not planning authorities. The large contrast between the Zambian and European planning environment is that in Zambia, the politician (Minister of Local Government and Housing) is the

Chief Planner and has the final say on urban planning matters irrespective of whether the incumbent is a planning technocrat or not. On the other hand, ministers in Europe are confined largely to policy matters and are not expected to directly get involved in technical matters of the Local Authorities. In short, there is insignificant or no interference from central governments in Local Authority planning decisions and activities in most European countries, including the United Kingdom from where Zambia inherited the Planning legislation still in use to date.

Regional planning, also called development planning, on the other hand, caters for the entire population in a multi-sectoral manner. It focuses more on ensuring access by the population to the services and means of production. Thus, delivery of social infrastructure, capacity building of the locals in democratic principles and participatory decision-making, identification and prioritization of communally felt development challenges, aspirations and interventions are integral aspects of regional planning's key business.

This component of planning is very critical in that it has a wide spectrum of public participation in making development choices. The process of producing regional plans is generally, though not adequately, democratic and participatory. However, the locals' involvement is usually defined and this curtails effective participation, mainly on the receiving end of the 'knowledge'.

The gist of planning in this context is to provide a diagnosis of development problems or challenges and prescribe some appropriate and preferably sustainable panacea in a more participatory and democratic manner. The communities, therefore, become equal partners in the planning process and play a cardinal role in problem identification, analysis and choosing of development scenarios.

To what extent the Zambian planning regime addresses public participation in real terms is subject to further investigation. However, there are overwhelming reference points suggesting that the so called participation of the masses could be described as passive, that is, they are just informed or get involved for their information. For instance, accountability in decision-making has not reached a level where communities can effectively influence planning outcomes that address their absolute aspirations. In the same way, there is an apparent restricted opportunity for locals to inform the planning processes with their indigenous knowledge which is technically excluded in the development planning processes.

However, the ideal planning cycle in Zambia recognized the valuable input by the communities. For at least a decade now, the development planning system spearheaded by the Local Authorities took cognizance of community participation and the main elements or stages had been as described below.

1.13.1 District Situation Analysis (DSA)

This was the first planning stage where the technocrats work together with the communities in the identification of key development issues (KDIs) and problems, their spatial distribution and magnitude, historical context and proposed remedies. When dealing with communities, government officers play a role of facilitators aimed at helping (not dictating to) the locals through the problem identification and prioritization. A detailed analysis of inherent strengths and weaknesses as well as opportunities and threats (SWOT Analysis) were also done.

This process was done also at institutional level covering all government departments, Non-governmental organisations (NGOs) parastatals, and any other organisation involved in development work in the district.

The District Situation Analysis (DSA) was a planning document that outlined in general terms the characteristics of the district ranging from geophysical, economic, social, cultural, governance and administrative features, political to any other vital aspects about the particular district. It was, in other terms, a source document about anything concerning the district (GRZ, 2004).

1.13.2 District Development and Poverty Reduction Strategy Paper (DDPRS)

This plan was mainly done by technocrats without the communities. It was a summary of sector strategies informed by the DSA. It contained sector specific mission, strategic objectives or goals, programmes, strategies and activities oriented towards addressing the weaknesses and threats or general problems identified at the first stage with the communities.

1.13.3 Participatory Poverty Assessment and Risk Analysis

This was another plan done with the communities and the contents were almost exclusively from the communities. Public officers were also reduced to mere facilitators in the preparation of this plan. However, since the format was designed by government which also had a bearing on the type of information required from the communities as well as the nature by which it should be provided government still appeared to have had an overriding role in determining what communities could contribute.

1.13.4 Annual Investment Plan

This was a short term plan done exclusively by technocrats drawing upon the information in the preceding plans. This plan was a reflection of prioritized interventions that required immediate action. It also contained time bound funding profiles and indicative planning figures and possible sources of such funding.

1.13.5 District Information Management System

This was a very important plan which provided multi-sectoral information about the district. This formed the basis for subsequent interventions and future planning. It also provided for informed decision-making (data based decisions) by policy makers, particularly Councillors.

1.13.6 Medium Term Expenditure Framework (MTEF)

This was a three-year rolling plan which focused on Activity Based Budgeting (ABB). It provided a good foundation for accountability and fiscal prudence in the public sector. It also provided for easy tracking of funding and linkages with specified activities.

1.13.7 District Strategic (Development) Plan

This was a five-year plan with strategic focus and long term development objectives, summarized into programmes and strategies and reduced into activities which were also costed. The preparation of this plan also created room for the participation of the locals although their involvement was insignificant in terms of their input.

1.13.8 National Development Plans

Finally, a national development plan was made consisting of priority inputs from districts and provinces. For instance, the *Zambian Fifth National Development Plan (FNDP) 2006-2010* was informed by the preceding plans at district level. The FNDP was prepared from 2004 to 2006. The length of the preparation period was necessitated by the resolve to provide for stakeholders' participation in the plan preparation process.

Although most of the plans described above claim to have had involved the communities, there was little evidence to corroborate this claim. As such, concerns of negligible involvement of communities in determining their own destiny have remained valid to date. For instance, the preparation of Zambia's *Sixth National Development Plan (SNDP)* for the period 2011 to 2015 commenced in November 2009 but only government ministries and departments had been involved alongside Planners. The sub district level, mainly communities, had been alienated.

As a response to this concern, a strategy to ensure the active and meaningful participation of the people, especially at grassroots level had to be devised. Decentralisation had been adopted by government as a reliable vehicle by which to attain collective and democratic governance.

Accordingly, the *Zambian government* adopted the *National Decentralisation Policy* in November 2002. The vision of the policy was *to achieve a fully decentralized and democratically elected system of governance characterized by open, predictable and transparent policy-making and implementation processes, effective community participation in decision-making, development and administration of their local affairs while maintaining sufficient linkages between the centre and the periphery.*

The main objectives of this policy were:

- To empower local communities by devolving decision making authority, functions and resources from the centre to the lowest level with matching resources in order to improve efficiency and effectiveness in the delivery of services;

- To design and implement a mechanism to ensure a ‘bottom up’ flow of integrated development planning and budgeting from the District to the Central Government;
- To enhance local political and administrative authority in order to effectively and efficiently deliver services;
- To promote accountability and transparency in the management and utilisation of resources;
- To develop the capacity of Local Authorities and communities in development planning, financing, coordinating and managing the delivery of services in their areas;
- To build capacity for development and maintenance of infrastructure at local level;
- To introduce an integrated budget for district development and management; and
- To provide a legal and institutional framework to promote autonomy in decision making at local level (GRZ, 2002).

The above objectives provided a conducive environment for inclusion of indigenous knowledge in the development planning process. The autonomy being referred to, especially if it was enhanced through legal framework, could be a sure way of integrating local knowledge. The linkages the policy envisaged maintaining between different levels within the governance continuum may help lubricate the obstacles that would have characterized the integration of indigenous and modern systems. This could further be strengthened by government’s inclusion of information services aimed at creating a well informed citizenry that fully participates in national development among the priority strategies in the long term vision 2030 (GRZ, 2006). The possibility of creating local partnerships for sustainable communities was already evidenced through the integrated rural accessibility planning and rural access interventions spearheaded by

the International Labour Organisation (ILO) in different parts of Africa, Zambia inclusive (ILO, 2003).

1.14: Elements of Indigenous and Modern Systems

It is important to highlight some of the elements associated with the two systems under scrutiny and identify those that may be applicable in this research.

1.14.1 The Elements of Development and Conservation

How was development perceived in the modern systems and indigenous systems? The essence here was to identify any similarities and differences with respect to perception of the aspect of development.

Conservation was also a key aspect in both modern and indigenous systems. However, the significance of this among the priorities in each system needed to be ascertained. Specifically, how conservation related to development had a bearing on the philosophical underpinnings of a system. It also molded the relationship between humanity and nature. This relationship played a cardinal role in the discovery, sharing or transmission of knowledge about and for the environment. Thus, environmental education whether from a modern or indigenous perspective could partly be a reflection of the relations between people and nature.

According to the IUCN (1980:18), development is *'the modification of the biosphere and the application of human, financial, living and non-living resources to satisfy human needs and improve the quality of human life'* and defined conservation as *'the management of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations.'*

The above definitions for both development and conservation reflected the exact intent of humanity and further postulated the biasness of human interventions against nature. Thus, the type of relationship between human beings and nature is that of greedy and insignificant consideration of nature by human beings. All the energies appeared to be directed at meeting

human needs, improving human life without necessarily defining the state at which the environment should be kept or let to keep itself. This type of relationship is a common phenomenon within the modern systems both implicitly and explicitly as can be deduced from policies governments make. The worst perception of development was exemplified by Chi-Yuen Wu who defined it as “*a process of societal transformation from a traditional society to a modern society, and such a transformation is also known as modernization*”(Todaro, 1977:5). Although Chi-Yuen Wu conveniently avoided defining modernization, we can use Lerner’s definition to infer the typical inadequacies in the understanding of the concept of development. According to Lerner (1958:10), modernization is “*a ‘systematic’ process involving complimentary changes in the ‘demographic, economic, political, communication, and cultural sectors of a society.’*”

There are numerous versions of development but the majority of them tend to focus on modernity, socio-economic growth, technological and political changes, (Sapru, 1994; Todaro, 1977). This was so despite the fact that there were documented concerns accusing this perception of development of impacting negatively on nature as illustrated by the organisation for economic cooperation and development (OECD) that:

...the higher scale of economic activity has often led to pressures on the local and global environment, interfering with the climate system and leading to biodiversity loss, water scarcity and over-exploitation of marine resources. In all these areas, the risks of approaching critical thresholds in the regeneration capacity of renewable resources, and of overloading the absorption (‘sink’) functions of the environment, are posing real threats to the long-term sustainability of economic growth (OECD, 2001:2).

As for the position of indigenous systems or indigenous knowledge regarding the human-environment relationship, this study sought the fundamental aspects imbedded in the indigenous philosophical outlook. This had to call for a fair understanding of indigenous knowledge pertaining to the locals’ perspectives on both development and conservation. As (Mortimore,

1998) observed in his study of how the smallholders' perspectives on the management of natural resources differ from that of the global discourse, African smallholders' perspective must be understood if technical changes directed towards environmental change were ever to be turned into practical recommendations which they could adopt.

The study considered nature conservation or preservation and natural resource exploitation or utilisation as extreme positions at each of the ends of what this study termed as environmental management continuum. The extent to which a particular system (indigenous or modern) embraced either of the two contrast positions of conservation and utilisation was assessed.

1.14.2 Elements of Discovery, Storage, Validation and Transmission of Knowledge

Another set of vital elements included the business of discovering, management and sharing of knowledge. Both modern and indigenous systems had their patterns of knowledge discovery, validation, storage and transmission or sharing (education). These were assessed and an interface between the systems with respect to these elements was arrived at.

An attempt was made by Emery, et.al. (1997:31) to scrutinize the variations between indigenous and modern (which they referred to as scientific) knowledge as tabulated below:

Table 3: The Interface between Indigenous and Modern Systems

Aspects of Knowledge	Indigenous Knowledge	Scientific Knowledge
1. Scope	Sacred and secular together; includes the supernatural;	Secular only; excludes supernatural
	Holistic, integrated –based on whole systems;	Analytical or reductionist – based on sub sets of the whole
	Stored orally and in cultural practices	Stored in books and computers
2. Truth Status	Assumed to be the truth	Assumed to be a best approximation of truth
	Subjective	Objective

	Truth found in nature	Truth found from human reasoning
	Explanation based on examples, experience and parables	Explanations based on hypotheses, theories and laws
3.Purpose	Long-term wisdom	Short-term prediction
	Practical life and survival	Abstract, to pass examination
	Powerful predictability in local areas (ecological validity)	Powerful predictability in natural principles (rational validity)
	Weaker in predictive principles in distant areas	Weaker in local use of knowledge
5. Methods of Teaching and Learning	Lengthy period of acquisition ('slow knowledge')	Rapid acquisition ('fast knowledge')
	Learning by living, experiencing and doing	Learning by formal education
	Teaching through examples, modeling, rituals and story telling	Teaching is didactic
	Tested in practical life situations	Tested artificially in examinations

Source: Emery, et.al. (1997:31)

The above table demonstrated some of the varying aspects surrounding indigenous and modern (environmental) education systems. However, one aspect the authors could have clarified was the use of the concept of 'formal' education with respect to scientific (modern) knowledge. Formal basically denotes official, prescribed or recognised. Taking into account this conceptual understanding of formal, then Emery, et. al. are not justified in applying the concept exclusively to modern education system because even the methods of learning outlined under indigenous knowledge were recognised (formal) within the realms of indigenous knowledge system. Thus, the distinction of 'formal' made between indigenous and scientific knowledge with respect to learning methods was either inadequate or not appropriate at all.

Whatever the case, however, indigenous education systems still offered practical and reliable measures for the holistic development of human beings. This was because the indigenous systems were more frequently applied, in most cases unconsciously, than the modern 'formal' systems where learners spend very little time. According to Dam-Mieras in (Holmberg and Samuelsson ed. 2006), an individual spent on average only about 5 to 10 percent of the life long learning process in the formal learning environment. This means at least 90% of learning was accounted for by the indigenous and other 'non-formal' systems.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Presented in this section are various secondary sources consulted which were found to be relevant to the focus of the study. Efforts were made to establish some linkages between modern and indigenous knowledge systems and examples where these two systems proved to be complementary were also cited. It must be stated from the outset that the chosen topic for this study had not been widely explored and therefore suffered from limited local literature. However, efforts were made to gather whatever available literature could be accessed both locally and abroad on this subject.

2.2 Perceptions on Modern Education Systems in Relation to African Development

The challenges of tailoring education towards addressing real problems in African society have been there since the advent of modern western education. This has been the case because modern education by and large presupposes the existence of an imaginary society and consequently the proposed remedies to the actual and perceived challenges usually appear to be misplaced efforts by those facing the real challenges in the real society. The above statement could be seen as a blatant assertion that modern education had failed African human society and other communities of life, and their habitat. This failure by western (modern) education could be attributed to, inter alia, the manner in which this kind of education addressed change. It did not have necessary requisites to invoke participation by society in its entirety. It was framed in such a way that even some of the educators in the sense of modern education had been rendered sheer bearers of modern education messages intuitively. This characterized the anatomy of modern education induced change as Kaufman (1972:3) noted ‘*as educators we can deal with change in several ways. We can be spectators to change, or we may be participants in it.*’ Furthermore, the modern education system was fashioned in such a way that it was responsive to western world needs and aspirations which were largely inconsistent with indigenous African needs. Therefore, the modern education that was imposed on Africa had no direct relevance to society.

2.3 Environmental Education – A Possible Alternative

Notwithstanding the above concerns about modern education, opportunities provided by environmental education (EE) whose approach had been seen to be interdisciplinary and practical in nature were identified. The relevance of Environmental Education in addressing critical societal problems was long realized and the quest to have it incorporated into school curriculum was given impetus with the recommendation by the International Conference on Environmental Education held in the Swedish capital, Stockholm, in 1972. The conference argued for the incorporation of EE in schools and this was further echoed by the Belgrade conference of 1975 which went a step ahead by proposing a framework for environmental education. Generally, the following were identified to be vital attributes of environmental education:

- That it should be interdisciplinary in approach and oriented towards problem-solving;
- It should cater for all learners, both in the formal and non formal systems of learning;
- It should be concerned with local realities;
- It should call for strengthened coordination among various stakeholders involved at different levels, (Ramakrishnan, 2005).

These measures were predisposed to draw education, in this case environmental education, closer to the people and their needs. Since the needs were originally local, the solutions were also supposed to have a local appeal and this could only be assured if the media of development encompassed indigenous aspirations and knowledge. The media of development in this context was education. The education that has little or no link at all to societal aspirations is alien and of no good to finding lasting solutions to the problems being experienced.

It was this failure of modern education to uproot societal problems that attracted criticism from some scholars and held accountable for development stagnation in African societies as (Mbikusita-Lewanika, 1990:2) argued:

Africa is abandoning the spirit of ingenious adventurism, which enabled our ancestors to initiate the taming and utilization of nature for human civilization. Africa is failing to ride the tide of national unifying forces, as our forefathers did. Africa is accepting the predominance of elitist alien

institutions over indigenous popularization of organs of government and economic operations. ... they are discarding the best of African heritage.

Although Mbikusita-Lewanika's lamentation over the subjugation of indigenous institutions by the alien (modern) ones was justifiable in so far as it related to the loss of a wealth of indigenous knowledge, his preference for what he called indigenous organs of government and economic operations should have been qualified to avoid the temptation of using interchangeably modern systems run by indigenous Africans and the locally grown systems over which the imported (modern) systems have had no bearing. For the sake of clarity, it is assumed here that the indigenous organs of government and economic operations the author referred to were those that existed prior to the advent of Europeans (both missionaries and their counterparts, the colonialists) in Africa.

It is unquestionably relevant that the indigenous systems ought to be revived to come to the aid of African societies' ailing environmental (political, economic, social, technological) situations that have rendered the pursuit for development a far fetched dream. In this regard, another concern that deserved serious consideration was the extent to which Africans, including the custodians of African heritage, have had their minds, perceptions and morality polluted by the so called modern values inculcated into them during their interaction with modern education. This observation brought in the question of whether the existence of indigenous Africans (Zambians) who were still in full control of their indigenous minds could be assured. This was a very remote possibility. Thus, the only feasible compromise would be the merging of modern and indigenous knowledge systems with a bias towards indigenous. This is where those intellectuals that are privileged to have privy to both systems were critically needed. These intellectuals constituted the productive hearts of society as (Mwaipaya, 1979) observed "*a society without a functioning group of intellectuals is deprived of a certain level of consciousness and insight into vital problems.*"

Like Akashambatwa – Lewanika, Mwaipaya has not shared with us who he considered as intellectuals. Presumably, arising from the context within which the above quotation was said, he considered intellectuals as those who excelled in modern or western education by acquiring higher qualifications through the formal education system. This notion was a characteristic

failure to acknowledge the reservoir of intellectualism that abounds in indigenous African societies. Restricting intellectual capacities to those that were educated (in most cases schooled) in the context of western education was a serious deprivation of courtesy on the part of western educated Africans who opted to underestimate the immense indigenous intellect in African societies.

To avoid what may be termed as intellectual blindness, this study referred to an intellectual as an individual who was endowed with the capacity to think intelligently, logically, broadly and was able to prescribe a variety of appropriate alternatives to an identified issue or problem. Such an individual with foresight was also expected to be humane enough to put forth public interest before self, always seeking for a better future for everybody, especially those to come. The intellectual in this regard was someone who adequately understood his or her environment, cared for it and all that subsisted on it. One did not need to have an overdose of western education to meet these criteria of being an intellectual. This argument, by implication, asserts that there were many intellectuals in African societies who were masters of indigenous knowledge relevant to their environments. Mwaipaya's statement, therefore, was still applicable but should have a widened constituency of intellectuals as argued above.

The question of reverting to indigenous knowledge has been gaining momentum with increasing realization among African intellectuals (who received western education) that it was high time Eurocentric modern education systems were looked at skeptically. It should be appreciated that to continue to religiously embrace modern education and entrust the tackling of all our societal challenges to it would be the greatest disservice to ourselves and to the future generations. It were concerns of this nature that attracted some arguments for the integration of indigenous knowledge systems into the mainstream (modern) education system while others argued that indigenous knowledge was a science on its own which should be separate from but equal to the mainstream, (Emeagwali, 2003). This still referred to the debate between unified theorists and methodological pluralists alluded to earlier on.

Although indigenous knowledge was accused of being relatively less transferable than the conventional education system, it had much better attributes such as its endowment with socio-

cultural and spiritual dimensions which the other system did not have. It was also said to be largely communitarian vis-à-vis discovery and experimentation and put much emphasis more on collective rather than individualistic sharing and transmission of knowledge alongside its flexibility and easy negotiability than its western (modern) counterpart,(Emeagwali, 2003).

The effectiveness of an education system, whether modern or indigenous, is determined primarily by its relevance to the aspirations of the communities it is aimed at serving, that is, the extent to which it addresses societal aspirations. This requires identification of societal needs. Thus, education assumes the properties of a process, not a one off activity, and educators who are managers of such a process ought to be well vested with the needs, problems and possible solutions. Kaufman (1972:10) elaborated this point well as follows:

It would seem useful to conceive of the educators – an administrator, a counselor, a teacher, a planner, a curriculum specialist – as a manager of the learning process. The management of learning involves ascertaining learner needs, identification of problems, and then the application of a process or a number of procedures to fashion an educational system responsive to the identified needs and requirements. The product of this management process, then, is identical to the product of education: the required skills, knowledge, and attitudes of learners.

As Kaufman (1972) observed, the responsiveness of an education system to the needs of the population is cardinal. It may further be added that not only the needs of human communities should be addressed but also for other forms of life. That is, environmental needs in general. And the needs identification process will demand adequate familiarity with the particular geographical area. In this case, indigenous knowledge becomes critical. Therefore, an education system that is deprived of indigenous knowledge lacks necessary competences to tackle local problems.

In this regard, it becomes imperative to appreciate local knowledge which should constitute an integral component of environmental learning processes which also enhance participation. Local

responsive environmental education system lays a foundation for respecting contributions of all people irrespective of sex, age, creed or any other discriminatory criterion, (Emery, et.al 1997; UNESCO, 1997; Grenier, L., 1998).

It was gratifying to note that the significance of indigenous knowledge in shaping local and global discourse was being acknowledged in some places. Emery, et. al. (1997), for instance, noted that the use of traditional (indigenous) knowledge in environmental assessments and development planning meant that the two knowledge bases (scientific or modern and traditional or indigenous) would be in contact with each other as practitioners attempted to weave the two together. Already, these were talking of a synergy. It was this realization of the validity of indigenous knowledge that enticed the government of Canada to make the incorporation of traditional (indigenous) ecological knowledge into environmental assessment and resource management a policy requirement. For example, the government of the North-West Territories adopted a Traditional Knowledge Policy which recognised that “*aboriginal traditional knowledge is a valid and essential source of information about the natural environment and its resources, the use of natural resources, and the relationship of people to the land*”, and undertook to incorporate traditional knowledge into Government decisions and actions where appropriate, (Usher, 1999:184).

The acknowledgement, in 1993, by the Canadian Authorities of the relevance of indigenous knowledge was later reiterated by the Director General of UNESCO, Frederico Mayor, who emphatically espoused indigenous knowledge in a more holistic manner that ‘*the indigenous people of the world possess an immense knowledge of their environments, based on centuries of living close to nature. Living in and from the richness and variety of complex ecosystems, they have an understanding of the properties of plants and animals, the functioning of ecosystems and the techniques of using and managing them that is particular and often detailed*’ (Emery, at.al 1997:34).

Thus, through indigenous knowledge in developing communities, locally occurring plant species are utilised for a variety of benefits, including foods, medicines, fuel, building materials and other products. Furthermore, the knowledge and perceptions of the environment by the local people and their relationships with it are often reflected as some form of cultural identity. This

cultural identity is in practical terms expressed in traditional songs, stories, legends, methods and other practical techniques of transmitting specific elements of indigenous knowledge. There is also a combination of both secular and sacred knowledge in indigenous systems (Emery, et.al. 1997).

Mayor's remarks were a practical treatment of the characteristics of indigenous knowledge and adhering to the salient elements he raised would help inculcate into the minds of many the unavoidable calling to adopt indigenous knowledge in the mainstream systems to make them more responsive and relevant.

Mayor's amplification of the wealth of knowledge that is 'frozen' in the indigenous systems attests the locals' understanding of the laws of minimum and tolerance as put forward by Liebig and Shelford respectively. In his formulation of the 'law' of the minimum, Justus Liebig expressed the idea in 1840 that an organism is no stronger than the weakest link in its ecological chain of requirements. V. E. Shelford, on the other hand, included the limiting factors to be not only the minimum but even maximum of critical requirements, meaning organisms have ecological minimum and maximum limits with a range in between which represents the limits of tolerance, (Odum, 1959). Therefore, for indigenous communities of people to have co-existed with nature so sustainably for centuries demonstrates their valuable knowledge about the ecological systems and their functional elements. This explains the increasing popularity of indigenous knowledge in most sectors. For instance, in the food security sector, indigenous farming methods have been identified to be a viable alternative to conventional ones whose effects on the environment are more disastrous than the former. This development is creating more opportunities for the integration of indigenous and modern knowledge systems especially that the United Nations' interest had been attracted. The recent (2011) example emanated from India concerning the indigenous grain storage technology of using dried neem leaves as practiced by Maharashtra's Korku tribe and the indigenous irrigation system of the Konda Savara tribe of Andhra Pradesh where pipes made of banana trunks were used. These indigenous knowledge systems sustained agriculture for centuries and the UN-Food and Agriculture Organisation (FAO) embarked on a programme to support the improvement of this knowledge (Post Newspaper, 26 January, 2011).

CHAPTER 3

METHODOLOGY

This chapter describes the research design, population, sampling and sampling techniques, data collection procedures and instruments as well as analysis that were applied.

3.1: Research Design

The research embraced descriptive design, taking on a qualitative approach since it was envisaged to deal mainly with people's perceptions, systems, policies and other types of knowledge and information that would not necessarily be quantifiable. However, some quantitative approaches, where necessary, were employed. As (Kombo and Tromp, 2006) noted, the proposed design (descriptive) did not only help in generating the status quo information but also facilitated the formulation of vital principles of knowledge and contributed towards problem solving. As such the design was more appropriate to this study.

It is important to further clarify that research in indigenous knowledge (IK), which this study was concerned with, has some core values and principles which the researcher endeavored to adhere to. The core values were respect, reciprocity, and relationship. In addition, the following principles also guided research in this sphere as elaborated by (Wickham 1993:211):

***Appropriate attitude** — IK researchers need to be self-critical and must recognize their own bias toward formal scientific, urban, high-tech knowledge. It is the responsibility of the IK researcher to remember that IK systems may be just as valid or useful or that a low-tech solution can be highly appropriate;*

***Appropriate methods** — The researcher must ensure that the research methods are tailored to people's cultures, abilities, and requirements and effectively represent local people's points of view;*

***Multiple methods** — IK research requires a mixture of techniques that together facilitate the collection of different types of data and help confirm or reject research findings through a process of crosschecking or triangulation. A good*

combination of methods can access knowledge concealed in cultural norms or political factors;

Broad participation — *Participation means involving women, men, and children of all classes and requires from both the researcher and the informants more than mere attendance or answering questions. One way to elicit the IK of a community is by participating in its work and leisure activities.*

As Wickham pointed out above, this adopted a multiplicity of mainly qualitative techniques while bearing in mind the cultural underpinnings of the local people. Earmarked among these were the traditional ceremonies and other cultural inclined public functions. Although no traditional ceremony was visited during the study period in Zambia, a historical-cultural festival was visited in Perast, Montenegro, and a historical-political-cultural festival in Tivat also in Montenegro.

3.2: Target Population

The target population for this study included government departments, institutions, parastatals and other non state actors (NGOs) whose activities and programmes have a bearing on environment, education, or development planning. This was also extended to similar institutions outside Zambia, particularly in Germany and Montenegro. These were consulted mainly on modern systems. Of paramount importance were also the Traditional Authorities and local communities in Chiefdoms in Zambia (Siavonga and Mongu) especially on indigenous systems.

3.3: Sampling and Sampling Techniques

Respondents were generally purposively sampled from among the target population of government and non-governmental institutions, traditional leadership and communities. A total of 84 subjects were interviewed broken down as follows:

Table 4: Analysis of Respondents by number, category and Location

S/N	Category	No. of respondents	Place / Location
1	District Heads of Government Departments	12	Siavonga, Zambia
2	Education Standards Officers (Provincial level)	2	Mongu, Zambia
3	Provincial Administration	1	Mongu, Zambia
4	Zambian NGO representatives	1	Siavonga, Zambia
5	Foreign NGO representatives	4	Kotor & Herceg Novi, Montenegro
		2	Karlskrona, Sweden
6	Zambian Traditional Leadership	3	Mongu and Siavonga
7	Focus Group – school pupils	10	Kotor, Montenegro
8	Focus Group – women	18	Kotor, Montenegro
9	Focus Group – Hikers	12	Kotor, Montenegro
10	Practicing Planners & other professionals in planning related work environments	19	Dresden, Dessau and Berlin (Germany)
TOTAL RESPONDENTS		84	

Source: Field Data (2010)

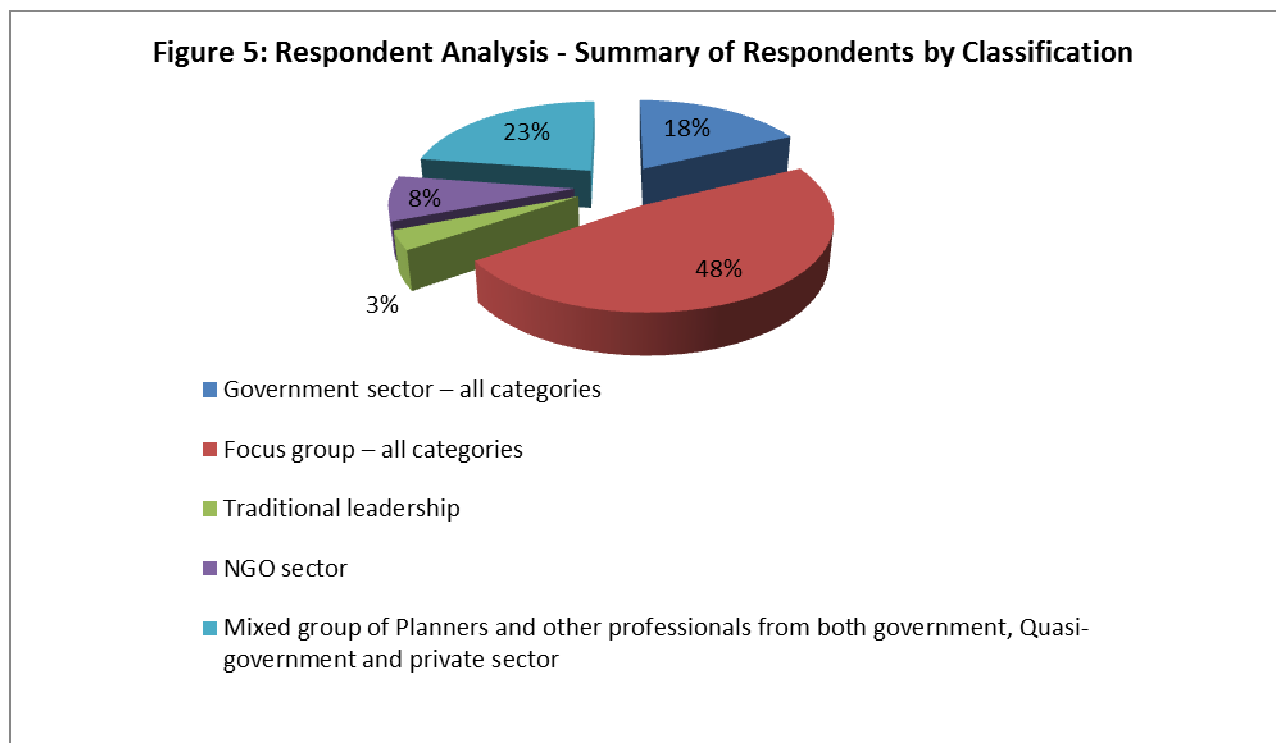
These categories of respondents were further classified into bigger groups to assess which one accounted for more respondents.

Table 5: Summary of Respondents by Classification

S/N	Main Category	No. of Respondents
1	Government sector – all categories	15
2	Focus group – all categories	40
3	Traditional leadership	3
4	NGO sector	7
5	Mixed group of Planners and other professionals from both government, Quasi-government and private sector	19
TOTAL		84

Source: Field Data (2010)

The above table shows that focus group discussions accounted for more respondents (48%) than other methodologies per group although the total for individual interviews was collectively higher than that for focus groups by only four respondents as illustrated in the pie chart below:



Source: Field Data (2010)

3.4: Research Instruments

- **Interviews** – both structured and unstructured interviews were used depending on situations at hand, the respondents and interview setting;
- **Interview Guides** were used to facilitate coherent interviews;
- **Focus Group Discussions** were used targeting selected respondent groups;
- **Observation**, too, was applied wherever appropriate. Both participant and non-participant or passive observation techniques were employed. It should be qualified here that the research duration was not long enough to warrant participant observation especially when dealing with indigenous systems but this was just applied to specific important one-off activities and functions such as festivals.

Figure 6 : Focus Group Discussion with School Pupils held at Kotor Old Town Museum on May 11 , 2010



Source: Field Data (2010)

Figure 7: Women's Focus Group Discussion held at the House of Free Thought, May 21, 2010 Kotor, Montenegro



Source: Field Data (2010)

Figure 8: In the wilderness – the author with Kotor hiking club members in Lovcen, Montenegro, as a participant observer



Source: Field Data (2010)

3.5: Data Collection

Both primary and secondary data sources were consulted. Secondary data are extensively presented under literature review, that is, through existing literature. Interviews, focus group discussions and observations generated the primary data. The interviews and focus group discussions were directly handled by the author with the assistance of some interpreters where necessary.

3.6: Data Analysis

Since the study was biased towards qualitative designs, the analysis drew upon the general emerging thematic areas that were identified. Special interest was directed at ascertaining the extent to which the systems of environmental education (both modern and indigenous) discussed could be harmonized so as to bring forth a strengthened and responsive alternative approach to addressing development planning in Zambia. Issues discussed in chapter one under item 1.11 above were also brought into focus to strengthen the analysis within the context of the gist of the study. Therefore, thematic analysis was applied.

CHAPTER 4

PRESENTATION AND ANALYSIS OF STUDY FINDINGS

4.1 Introduction

The focus of this study was on environmental education and development planning. The study takes cognizance of the existence of two relatively different systems of knowledge, that is, the modern and indigenous systems. Further, the study observed that nearly nothing about indigenous knowledge has been taken into consideration in the dominant modern systems of education and development planning. It was the fundamental idea of the study to salvage the frozen wealth of indigenous knowledge and propose measures of integrating it with modern ones through a synergy that should constitute the basic framework of promoting life-long learning and addressing development planning.

Presented in this chapter are the findings of the study that was premised on the need to establish some harmonized approaches in form of a synergy that incorporated both indigenous and modern systems of environment education in addressing development planning in Zambia. The findings are categorized into thematic areas that address specific issues raised in the study objectives and research questions. It should further be stated that the study took on a global discourse which was later localized to the Zambian situation on a comparative basis. It will be noted that the status of environmental education is gradually being appreciated the world over although in certain cases the phrase ‘environmental education’ is not used but the environmental education (EE) principles can clearly be identified.

The main themes covered in the results discussion are the key environmental education systems or approaches used in modern and indigenous systems, the interface between the two systems, prospects for synergy formulation at both global and local levels, including some cross-cutting principles, and finally a proposed synergy that accounts for positive aspects of the two systems.

4.2 Modern Environmental Education Systems

Some modern environmental education systems were looked at to determine the main approaches applied and how environmental education ideals find their way into the planning processes. Thus, the influence of environmental education (EE) in engendering environmentally sensitive development and spatial plans was also assessed with special interest in ascertaining the extent to which such influence could practically be observed from policies and plans and their implementation.

Modern environmental education approaches of three countries, Germany, Montenegro and Zambia, were studied and what is presented herein is principally from these countries.

4.2.1 Modern Environmental Education Approaches in Zambia

Generally and ideally whatever strategies a nation applies in attaining desired goals do happen within a defined policy framework. The same was expected even in dealing with environmental aspects. Thus, the nature of environmental education approaches do to some extent reflect the overall policy direction which may or may not relate to some identified ultimate vision. Having a glimpse at national policies on environment therefore becomes a necessary pre-requisite to understanding the underlying mechanisms that influence the chosen systems or approaches of environmental education.

To analyse the government policies on environment, it is pertinent to look at the instruments of environmental policy which (Est, 2003) categorized into three, namely:

- Direct regulation;
- Indirect regulation (economic instruments); and
- Self-regulation (voluntary instruments)

Furthermore, an assessment of the factors that influence choices of policy instruments can also be an integral component of the processes involved in trying to understand a country's overall vision, or metaphorical vision as espoused by Namafe (2006).

With respect to Zambia, there was an apparent tendency to generally embrace direct regulation through law enforcement and indirect regulation through economic incentives especially in the

tourism sub sector of the national economy. A general neglect of the third strand of self-regulation was quite evident in Zambia. Self-regulation requires thoughtful and active engagement of the public especially through education and establishment of working linkages. This had been demonstrated through an observed strong correlation between environmental awareness and policy intensity as highlighted by (Est, 2003:151):

...providing environmental information and education and creating cooperation structures between the government, companies, NGOs, and citizens are very important environmental policy tools... by doing this, the indispensable support for environmental policy is created.

The Zambian experience is devoid of this necessary strategy although its importance had apparently been realized. The much emphasis placed on direct regulation in Zambia's modern environmental or general nature conservation system had proved ineffective with regrettably disastrous results. Nearly all aspects of nature (wildlife, water, forests, natural and cultural heritage, among others) were negatively affected by human activities despite direct regulation efforts mainly through law enforcement.

The two common approaches in Zambia currently (2010) were direct regulation as first priority and indirect regulation mainly for economic justification. The former was oriented at conservation while the latter prioritised consumption or utilization for desired economic prosperity. However, a further scrutiny of the inherent motives behind direct regulation revealed that conservation was largely a secondary benefit. Priority was still given to consumption, that is, to realize economic sense out of the conservation efforts. Both approaches were generally undesirable from a sustainability perspective in that they technically alienated the people and eroded the sense of ownership that had been deep rooted in the locals for centuries.

Despite this unfortunate scenario, there was an emerging phenomenon of self-regulation in Zambia that was taking root informally through stakeholder initiatives of engaging the communities without enforcement. This new informal policy instrument was yet to wrestle influence from the traditional direct regulation that was so adored in the government mainstream. Self-regulation, as a policy instrument can also be a catalyst for good governance and facilitate the formulation of integrated policies for decision making (UNECE, 2010). The two posters

shown below are an example of the existence of two complete opposite instruments of direct regulation and self-regulation in Zambia.

Figure 9: An example of Direct Regulation where laws are used as instruments of compliance: Chirundu fossil forest National Monument in Siavonga district of Southern Province, Zambia.



Source: Field Data (2010)

This billboard did not provide any environmental education to the public. It made no effort to justify the protection of fossils. Human beings are principally rational beings and whatever they are asked to do should have a reasonable justification. Threats of imprisonment just serve to instil discontent with the monument itself, it becomes a symbol of enslavement and detaches itself from the lives of the people and therefore renders it irrelevant in their lives.

The local people in this area may not have appropriate reasons for the protection of the fossils. For example, when asked why the fossils had to be protected, the wife of the monument caretaker explained that the people from Livingstone (National Heritage Conservation Commission) often inspected the place and they have to always find everything intact or else her husband would lose his job. When asked further why the people from Livingstone were so interested in the protection of the fossils, she just said it was like they adored the place very much and probably they were also paid for that.

Figure 10: An Educative Billboard at Itezhi-tezhi turn-off along Mongu Road in the Kafue National Park



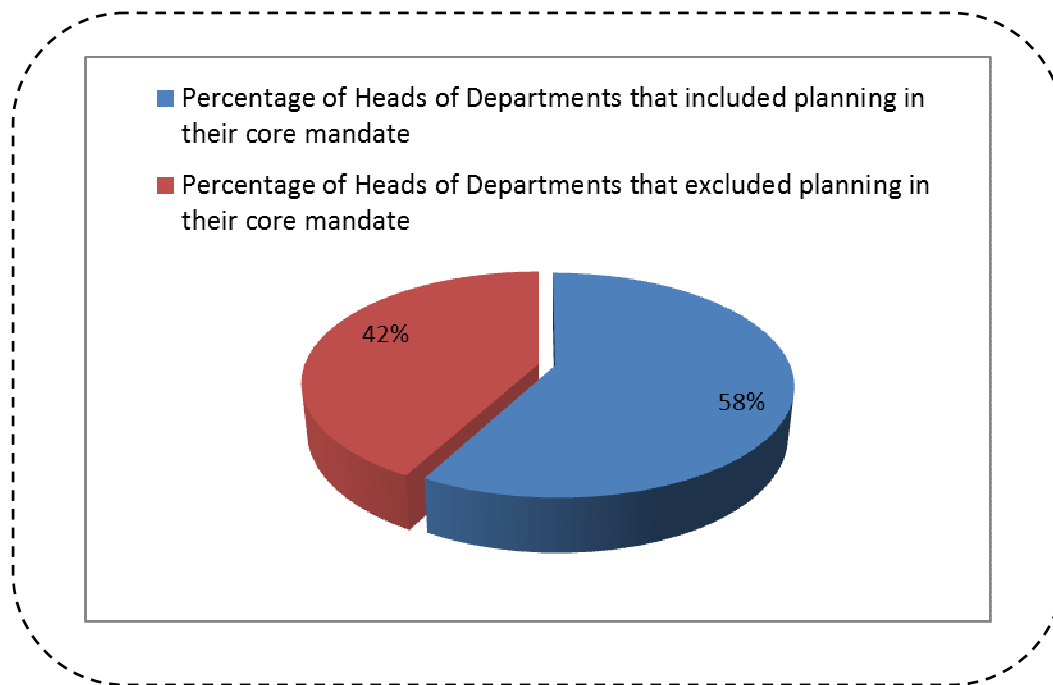
Source: Field Data (2010)

Unlike the first one, this was a people-friendly and educative billboard. It issued no threats of prosecution; rather it provided education about the dangers of litter. Such messages contributed towards self-regulation.

Since the community members were already involved in the co-management of natural resources in their area, environmental education approaches of this nature became easily accepted and improved the general understanding of interrelationships between human activities and the welfare of other living organisms like wildlife in the case of this environmental education billboard. Fortunately, there was an apparent acknowledgement by the Zambian government that public environmental education had the potency to drive attitude change in people's behaviour and bring about self-regulation. For instance, the Ministry of Local Government and Housing prepared and disseminated a 'Make Zambia Clean and Healthy' programme which outlined several generic activities which institutions, the public and individuals were urged to practice in order to improve the state of the environment and personal health in homes, schools, churches, and workplaces. Although this was a government led programme, it was generally a multi-sectoral and multi-disciplinary environmental campaign initiative that involved all government line ministries, Provincial and District Administrations, Local Authorities, Traditional Authorities, Cooperating partners,, Religious organisations, NGOs, and Community Based Organisations, among others (GRZ, 2011).

In terms of planning related modern environmental education systems, it was established, through public officers who were interviewed, that negligible consultations with the locals take place in the discharge of their duties. It was revealed that a number of public officers did not consider planning to be one of their key mandates although their duties were generally planning in nature. For instance, in response to the question on what their main duties were, only 7 (58%) out of the total twelve (12) government district heads of departments interviewed considered planning as one of their core functions as illustrated in the pie chart below.

Figure 11: Proportion of Heads of Government Departments in Siavonga that consider Planning to be one of their core mandates



Source: Field Data (2010)

If some government officers could not even realize that their work largely involved planning how could they be expected to consciously account for planning approaches that were at play? This gap was observed in the general perceptions of some of those heads of government departments that could not identify planning among their core functions.

However, on whether they were involved in some planning activities or not 100% of the respondents indicated that they did take part in these activities. The difference lies in whether these were respondents' departmental activities or were initiated and spearheaded by other departments. A gloomy situation emerged on this aspect where only 4 out of 12 respondents stated that they carried out departmental planning activities. This constituted 33% of the respondents while 8 of them only got involved in other sectors' planning activities due to highly centralized operations in their parent ministries where nearly all planning functions were carried out at national level (ministerial headquarters). Education and health were the most decentralized ministries whose departments at district level vigorously planned, implemented, monitored and

evaluated their activities. The table below gives an impression of the level of planning in various departments on a scale ranging from 4 to 1 where 4 indicates very strong active planning functions and 1 indicates very weak, passive and usually indirect planning functions carried out by a department.

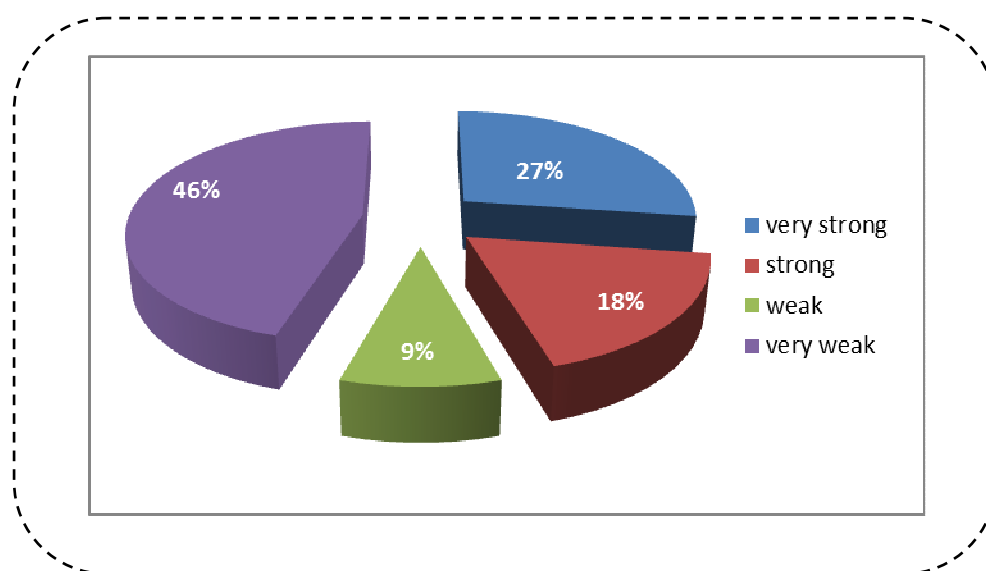
Table 6: Departmental Heads' Perceptions on the Extent of Planning Functions they Carryout

<div>Departments</div> <div>↓</div>	Departmental Ranking of Planning Intensity from very strong (4) strong (3) weak (2)and very weak (1)			
	4	3	2	1
Agriculture				
Buildings				
Community Development				
Education				
Fisheries				
Forestry				
Health				
Information				
Veterinary and Livestock Development				
National Registration				
Social Welfare				
Water Affairs				
Totals	3	2	2	5

Source: Field Data (2010)

From the above table, it is clear that closer to half (41%) of the respondents feel they have insignificant involvement in planning activities and those that are actively involved constitute only 25% of the subject heads of departments (HoDs) as vividly depicted on the pie chart below.

Figure 12: Respondent HoDs' perceptions on the extent of planning functions they carryout



Source: Field Data (2010)

As mentioned above, there is an apparent inverse relationship between the extent to which a ministry is decentralized or centralized and the capacity of district officers in that ministry to diligently perform planning functions. The table below illustrates this relationship.

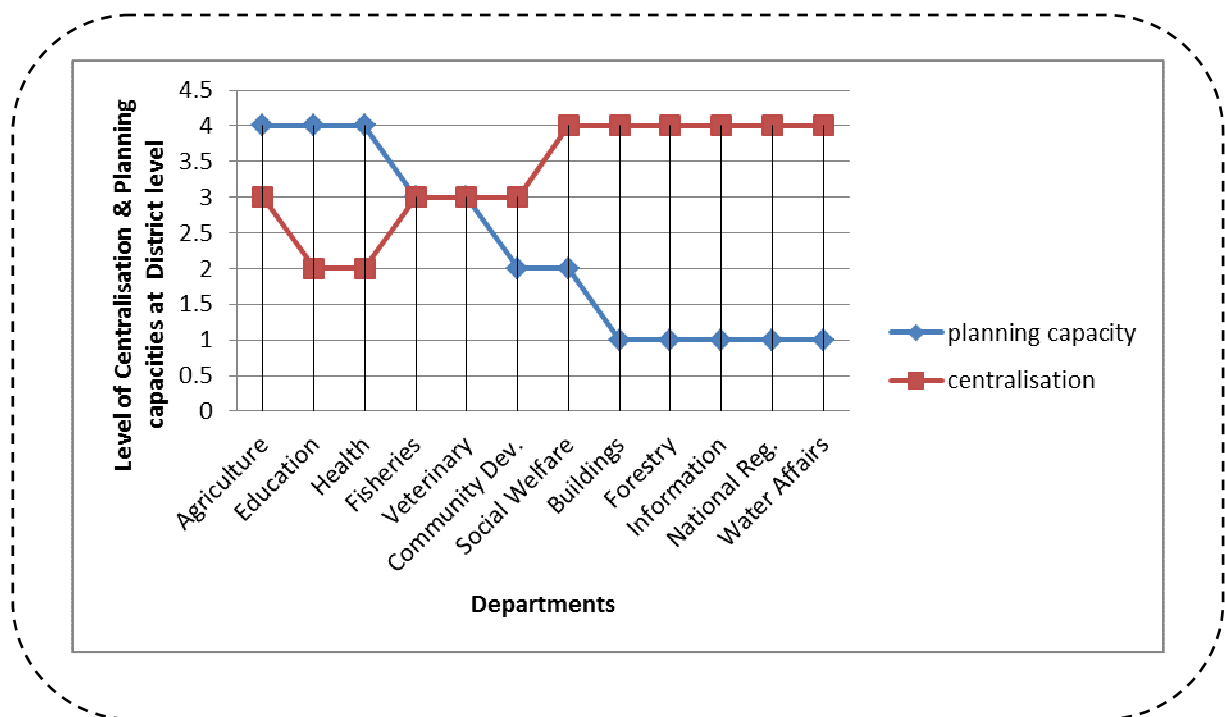
Table 7: Governance Extremes and Planning Capacities of District Officers by Department

<div>Departments</div> <div>↓</div>	Increasing Planning Involvement				<div>← Increasing →</div> <div>Decentralisation Centralisation</div>					
	4	3	2	1	3	2	1	1	2	3
Agriculture										
Buildings										
Community Development										
Education										
Fisheries										
Forestry										
Health										
Information										
Veterinary and livestock Development										
National Registration										
Social Welfare										
Water Affairs										
Totals	3	2	2	5	0	2	1	0	0	9

Source: Field Data (2010)

From the above table and the graph shown below the relationship becomes clearer that the more a ministry was centralized, the less the involvement of district staff in planning activities. All the three departments whose officers were actively involved in planning functions at district level belonged to ministries that were already on the path towards decentralization with education and health on the lead.

Figure 13: Graph showing relationship between governance system and planning capacities in government departments in Siavonga district



Source: Field Data (2010)

Although the perceptions on the level of planning were generally not impressive, all the respondents attested to working with communities in some of the activities they carried out either in their departments or in collaboration with others. The characteristic feature of modern systems became evident in the partnerships with communities. The impression shown that all departments collaborated with communities in some of their activities did not bring out the intricate relationship between government departments and the communities. Not all respondents could clearly account for the specific roles ordinary community members played in different developmental activities they facilitated in the communities. However, all respondents acknowledged the relevance of some community planning and governance structures like the area development committees (ADCs), parents teachers associations (PTAs), neighbourhood health committees (NHCs), community HIV/AIDS Task Forces (CATFs), cooperatives, among others. These were unfortunately usually instructed by public officers, in the name of providing policy guidance and standards, on what to do and how to do it.

This scenario postulates a system that was inspired by direct regulation principles where lower levels are not given appreciable latitude to contribute to their destiny. With regard to environmental education, such a system becomes a liability to local aspirations since most environmental issues were of a local nature and they only become global if they manifest themselves in many different local environments of the world. This system is commonly called top down approach and is characteristic of highly centralized governance environments like the situation in the majority of Zambian central government ministries and departments where lower organs in the system are deemed non-existent when it comes to decision making and choice of development interventions. This confirms the assertion made in chapter one that although the development planning system described presupposes community involvement, reality did not match the ideal situation. The gap that exists between the centre and the periphery in the governance system at the national, regional and district levels is largely replicated between the district and community levels.

Thus, the identified modern approaches that are common are direct regulation, top down, and external expertise oriented. This is where officers at national level claim some monopoly of expertise (both actual and imaginary) which they have to impart into their lower level counterparts who in turn are expected to do the same with their communities. In this situation, little or no attention is given to the antecedent expertise among the locals such that in some cases it becomes difficult to establish the relevance of the modern know-how to local challenges and aspirations.

In the education system, some form of direct regulation could be noticed where the system through the curriculum and subject syllabi dictates what the learners should learn. The levels of academic liberty were unfairly insignificant especially at lower and middle (primary and secondary) levels of the education system, although the tertiary level has also not been spared. Furthermore, the importance and psychological value society attached to examinations as a yardstick of academic success aggravated the inherent academic dictatorship such that even educators were enslaved by the fear of failure of their learners if they departed from the prescribed syllabus even if it had outlived its relevance to societal aspirations.

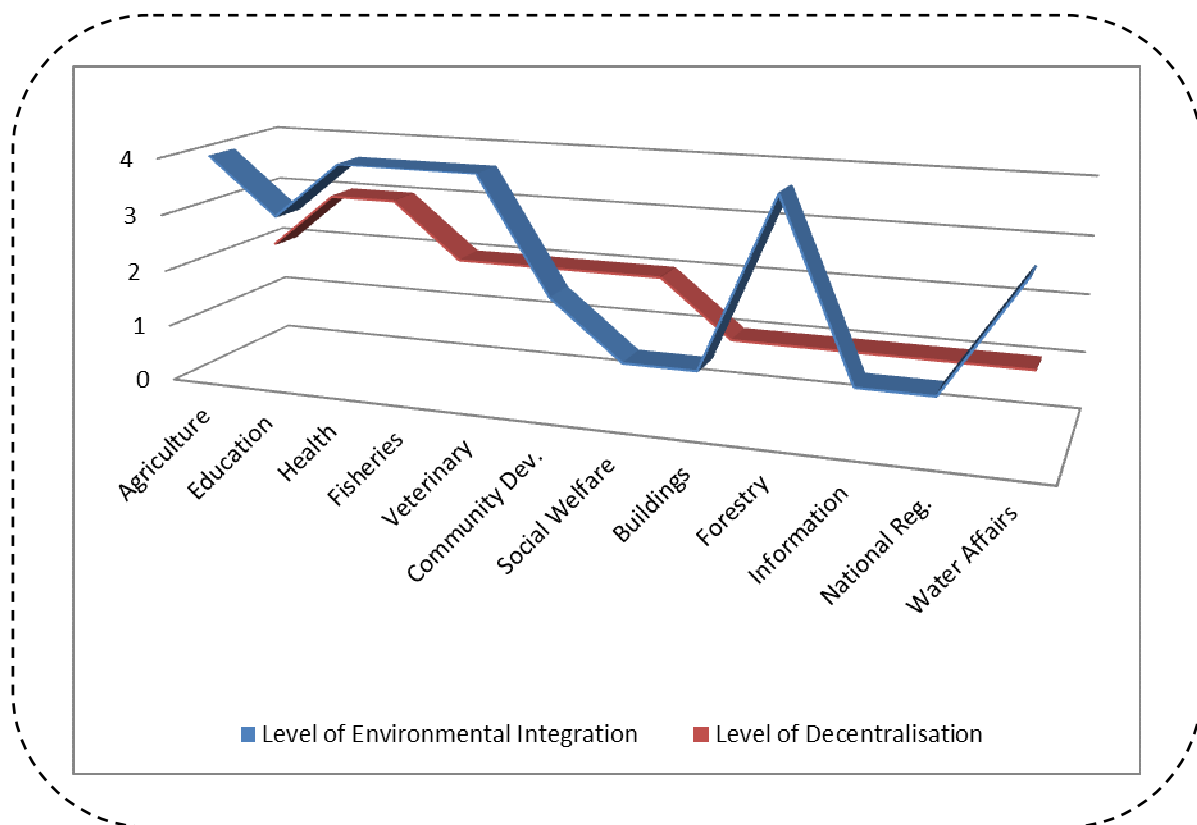
The teaching of environmental education appears to have the same fate in the formal school system. However, it enjoys some levels of independence outside the school system. For instance,

the media, which are another modern environmental education approach in use in Zambia, choose what to share with the public. Environmental reporting in Zambia, although still receives negligible coverage, is another promising strategy that can stimulate freedom of learning which is a common characteristic of indigenous systems.

4.2.1.1 Integration of Environmental Issues in Departmental Programmes

Since the environment is considered to be one of the cross-cutting issues that should be mainstreamed in all development programmes of both the public and private sectors, respondents were asked whether or not they integrate the environment in their usual departmental programmes and activities. Half of the departmental heads confirmed integrating environmental issues in their activities while the other half did not. However, the respondents who reported not integrating the environment did get involved in environmental related activities through the district development coordinating committee (DDCC) and its subcommittees. On this aspect of environmental integration, a characteristic decline on the influence of the governance system was observed. One would normally expect increased integration of environmental issues at local level only in departments whose ministries had advanced in decentralizing. What appeared to matter here was the basic orientation of the department's sphere of operation. Thus, those departments whose activities were closely related to nature or natural resources registered increased integration irrespective of whether they were decentralized or not. This relatively ambiguous relationship was depicted in the graph that follows. In this graph the bigger number (4) denotes the high level of decentralization and also environmental integration and the levels of decentralisation and environmental sensitivity decrease towards 1.

Figure 14: Graph suggesting that environmental integration does not necessarily depend on governance system but on other factors



Source: Field Data (2010)

Although education and health were more decentralized than agriculture, veterinary, fisheries, forestry and water affairs the levels of environmental integration in these two departments were lower than in the five mentioned departments. One explanation for this was the general technical orientation of the departments' mandate. Thus, integration levels were high for those departments whose main mandate was tilted towards the protection or the utilization of natural resources. What this implies is that the environment is quite a diverse sphere that calls for multiple strategies to address all its constituent aspects. This is where the environmental mainstreaming programme the Zambian government through the ministry of Tourism, Environment and Natural Resources mentioned in chapter one is required to inspire the population to assume individual and collective duty to restore credibility to the status of our environment. Environmental education at all levels could be transformed into an all encompassing vehicle to reaching the desired state.

4.2.1.2 The Role of Non-State Actors in Modern Environmental Education and Development Planning

A number of non-government organisations (NGOs) and some sectors of the civil society are actively involved in environment and development work. In Siavonga, the major NGO that has established strong working linkages with both government departments, including the local authority and communities is Harvest Help Zambia (HHZ).

The NGO was involved in several community programmes and activities ranging from relief interventions to long-term programmes. Nearly all of the NGO's activities were inclined to the environment. The NGO had been participating in rural water and sanitation, agriculture and livestock development, health education, woodlot development (tree planting), fishing as well as cultural activities, among others. Unlike many NGOs that have a preference for urban areas, this NGO operates in Siavonga's rural communities. The NGO Director also opted to live in the rural area away from town. Through closer interaction and collaboration with communities, the NGO serves as a conduit for environmental and health education services to the communities. Several advocacy and general information messages have reached communities through the NGO which also feeds central and local government departments with emerging development challenges in rural Siavonga where the latter often fail to reach (*Kasenzi, A., personal communication, April 12, 2010*).

In summary the following modern environmental education approaches were identified in the Zambian context:

- Direct regulation mainly through authoritative intimidation using legal instruments;
- Indirect regulation through planning and environmental standards, and mainly expected economic returns;
- Public awareness through the media;
- Advocacy and Public participation mainly by non-state partners (NGOs).

4.2.2 Modern Environmental Education Approaches in Montenegro

The case of Montenegro as a country and Europe as a continent presents a new lesson for Zambia, the region and the African continent as a whole.

Although Montenegro was one of the European countries that were not fully integrated in the European Union (EU), it had started embracing EU standards firstly for the improvement of the environment and citizens' living conditions and secondly in preparation for EU integration.

Like other European countries, Montenegro followed the self-regulation path in realizing environmental goals. Despite having in place environmental protection legislation that also called for enforcement, the approach adopted by the country was that of education, advocacy and participation. The most active players in this field, alongside the responsible government ministry, were the NGO sector members.

As mentioned earlier in this report, the government created conducive policy and legislation through the reforms that were done a few years ago (1997-2008) and this facilitated the active civil society / NGO sector involvement. The civil society's participation played two cardinal roles, that is, advocacy and public awareness as well as watch dog over government performance on agreed priorities. For instance, some civil society organisations raised concerns about government's failure to adhere to the free environmental information ideals and that the public were allegedly denied adequate information by the state (Calovic, V. and Deletic, M. 2008). The contention by the civil society was that although article one of Montenegro's constitution established that Montenegro was an 'ecological state' there were still some unjustifiable gaps in the area of access to environmental information. The Montenegrin government had also not signed the international treaty, the Aarhus Convention, which was the UN/ECE Convention on access to information, public participation in decision-making and access to justice in environmental matters (Darbishire, 2007).

However, there were working partnerships between the state and NGOs. For instance, the leading NGO in the Boka Kotorska Bay region on environment and sustainable spatial development (Expeditio) jointly created a public environmental awareness television programme sponsored by the ministry of environment (*Rajic, T., personal communication, December 22, 2010*) and the author had a privilege of watching one of the many series of this programme on television.

Furthermore, the NGOs also collaborated with schools and youths on several activities. For example, a quiz youth game on the usage of water. This was a debate between schools that centred on water usage preferences between tap water and bottled water.

On institutionalized environmental education in schools, local efforts were made to train teachers to handle this aspect since it was a relatively new development in the school system.

Generally, the following approaches were identified in Montenegro's environmental sector:

- Cultivation of a visionary national political environmental ideology;
- Self-regulation;
- Participation;
- Education and advocacy

4.2.2.1 National Environmental / Political Ideology

This was a relatively political ideology that put nature conservation at the centre of all the country's priorities. The declaration of Montenegro as an ecological state by parliament in September 1991, as enshrined in article one of the Montenegrin constitution, signaled the seriousness attached to nature by the state. As a constitutional matter, nature preservation became a mandatory duty by authorities, business houses and individuals in their activities. It constitutes a central part of every citizen's life. The extract from the Montenegrin constitution cited below elaborates this vision.

DECLARATION OF ECOLOGICAL STATE OF MONTENEGRO 21 September 1991

.....

We, Deputies of Parliament of the Republic of Montenegro, see that the protection of identity of our people and land on which we live and work, because of destructing the nature, has become our opportune and most important job. By respecting our due to the nature, which gives us the strength of health, freedom and culture, we turn ourselves to the protection of hers, in the name of our survival and the future of our successors. Not feeling any difference between us so strong, as the changes, which our natural environment is exposed to, we subject our national, religious, political and other feelings and trusts to the Plan to turn the Montenegro into an Ecological State. We announce by this Act of the Declaration, that Montenegro begins to make the state relationships with the nature.

This constitutional declaration formed the foundation for all nature oriented policies, programmes and strategies the nation and its partners chose to embrace. It was an elaborate vision that guided all stakeholders towards establishing acceptable and sustainable relationships with nature.

4.2.2.2 Environmental Education in the Montenegrin School System

The Montenegrin government had made necessary reforms in the education sector to incorporate elements related to the environment and sustainable development. Topics that were now considered critical and included in the new curriculum in primary schools were: human rights, civic education, and nature and society, among others. More emphasis has also been placed on natural science subjects particularly geography and biology. The reforms were enriched by the educational needs assessment that was conducted in the late 1990s (Institute for Educational Policy, 2000).

A total of 29 primary school texts and work books were reviewed for grades 1 to 9 except grade 3 for which books were not available at the time. These were mainly for subjects that were nature oriented particularly geography and biology. Lower levels of primary education (grades 1 to 4) have a subject called Nature and Society and another one called Information Technology. These carried interesting topics that instilled environmental values and sense of responsibility for nature at an early age. All the books reviewed were produced between 2008 and 2009, implying it was a new development emanating from the European region's resolve to give prominence to environmental issues through the education system. Thus, national efforts by individual countries, like the ones being made by Montenegro, were within the agreed continental priorities of integrating nature or environmental components in the education system. Environmental education, therefore, has been gaining momentum in Montenegro and other European countries in a variety of ways. For Montenegro, apart from regional priorities on environment, there was an added impetus provided by her declaration as an Ecological State (Regional Environmental Centre for Central and Eastern Europe, 2004; UNDP, 2007).

Figure 15: Some of the Montenegrin Primary School Text Books Reviewed



Source: Field Data (2010)

The fundamental principle embedded within the Montenegrin school system was to nurture responsible relationship with nature.

It was from this perspective that there was strong emphasis on *education in the environment* although this was an old communist approach during the Yugoslavian days. To realize this ideal relationship with nature, government built some educational centres in the wilderness where pupils were expected to spend sometime (about a week or two) in summer to explore the environment and understand it better. They were formally called recreation education centres. During the field stay of pupils, it was expected that teachers would endeavor to help pupils link the theoretical classroom experience to the real world situation in an attempt to create a lasting impression in the pupils' mind and consequently establish sustainable and mutual relationship with nature. Pupils took the lead in all activities during the field stay days and teachers' role was restricted to protection and guidance of pupils. A visit to one of these centres located in Lovce national park revealed that pupils had nearly total independence. They decided what to do, when and how to do it.

Figure 16: Identification Billboard at the Entrance of the Recreation Education Centre in Lovce Wilderness, Montenegro



Source: Field Data (2010)

The strategies adopted by the education system were aimed at promoting self-regulation and participation which were not only cheap measures but sustainable too when it came to environmental policy implementation. The apparent success Montenegro was achieving in environmental education integration was likely to be sustained by local and regional initiatives such as the involvement of the Montenegrin education department in the European Union programme of integrating the environment in the education system and the training of local teachers in engendering environmental issues in their teaching methodologies. Among the regional initiatives that supplemented local efforts in stimulating environmental education and general information included the European Union directive 2003/4/EC of the European parliament and the Council of Europe on 28th January 2003 that the principles of the Aarhus convention on public access to environmental information be incorporated. The Montenegrin government started making necessary preparations to address this directive (Darbishire, 2007).

Although environmental information could be a sweeping phrase, the Aarhus Convention provided an operational clarification in its article three that:

‘Environmental information’ means any information in written, visual, aural, electronic or any other material form on:

- (a) The state of elements of the environment, such as air and atmosphere, water, soil, land, landscape and natural sites, biological diversity and its components, including genetically modified organisms, and the interaction among these elements;
- (b) Factors, such as substances, energy, noise and radiation, and activities or measures, including administrative measures, environmental agreements, policies, legislation, plans and programmes, affecting or likely to affect the elements of the environment within the scope of subparagraph (a) above, and cost-benefit and other economic analyses and assumptions used in environmental decision-making;
- (c) The state of human health and safety, conditions of human life, cultural sites and built structures, inasmuch as they are or may be affected by the state of the elements of the environment or, through these elements, by the factors, activities or measures referred to in subparagraph (b) above (Darbishire, 2007: 18).

4.2.2.3 Environmental Education in the Planning Systems of Montenegro

Although the integration of environmental issues in the education systems was a recent development, planning processes long acknowledged environmental considerations especially in the design of spatial plans. There was also a rich ancient history of planning systems that nurtured well the relationships between humans and nature. There was evidence of centuries old co-existence. In the Boka Kotorska Bay region, humans fitted their settlements (medieval cities) between the terrestrial and aquatic ecosystems in a more respectful manner to nature. There were no observable harmful ecological foot prints of the ancient civilizations in the region. It was, in fact, the modern man's appetite for superficial needs that was threatening the ecological balance of the region. Tourism was the major driving force behind this relatively nature-unfriendly development situation. High levels of environmental awareness, coupled with active NGO sector advocacy, were providing fertile grounds for enhancement of environmentally responsive decisions in both the private and public sectors in line with the great declaration of ecological state.

It had become mandatory now in Montenegro to prepare environmental impact assessments (EIA) to accompany any spatial plans prepared and forms part of the criteria in the approval process of plans. The national spatial planning system acknowledged the necessity to incorporate environmental issues in planning. Efforts had been made by the Montenegrin government to legislate this environmental requirement. With inspiration from the European continent's determination to raise environmental awareness through different strategies and policy reforms, Montenegro revised the spatial planning system to create adequate room for enhancing the integration of environmental issues. At national level, necessary reforms were instituted to reorient the focus of some appropriate ministries towards nature protection. Caution had also been exercised to ensure that tourism did not become a threat to environmental sustainability. In order to realize this, the government reformed the Ministry of Environmental Protection and Physical Planning to Ministry of Tourism and Environmental Protection (Government of the Republic of Montenegro (GRM), 2007; UNDP, 2010).

However, the earlier arrangement where environmental protection was merged with physical planning was the most appropriate one because it paved way for the transition from integration to mainstreaming of environmental issues in the planning system. The recent (2006) change may not facilitate a complete mainstreaming of environmental issues but rather integration.

Integration does not make an issue as important as it should since there are usually no legislative measures to make its incorporation in an organisation's business mandatory. There were, however, regional initiatives within the European Union (EU) and other European countries that were not part of this regional grouping to prioritise environmental issues and efforts to integrate these issues in other sectors were evident. Some NGOs were supplementing these efforts. For instance, Expeditio had, among its various interventions, environmental related programmes and activities. The common activities included cultural and natural landscape, interregional cooperation on environmental issues, promotion of nature conservation, involvement of interest groups such as the youths. Expeditio also played a critical role in the South East European Heritage (SEE Heritage) which was a regional grouping initiative aimed at promoting cultural landscape and the implementation of European conventions on environment focusing on the role of NGOs. The SEE Heritage had called for public involvement and advocated for the ratification of necessary conventions by state governments. This regional grouping (SEE Heritage) posted a public appeal on 13th October 2009 as follows:

We appeal to all institutions and organisations, particularly the ones which are engaged in spatial planning and preservation of natural and cultural heritage, to apply the European Landscape Convention as much as possible in protection, management and planning. We appeal especially to the decision makers and political structures in the South East region of Europe to sign and ratify the European Landscape Convention, and to start with its implementation. Regardless whether the Convention is adopted or not it is necessary to raise awareness about landscape values, role and changes and adequate protection, management and planning as well (Kapetanovic and Karavidic, 2010:3).

4.2.2.4 Integration of Indigenous Systems of Environmental Education in Montenegro

Although the concept of indigenous education was not alien to the Montenegrin society, it was only recently that it was given official acknowledgment in national policies. This was now evident in the modern education system. The Ministry of Education and Science had proposed to devise some mechanism of acknowledging and accepting other forms of knowledge gained outside the normal school system and efforts were underway to have this knowledge officially recognised through certification by public institutions (GRM, 2007). For instance, if it was observed that a person had adequate independently acquired knowledge that was perceived to be useful in some way to society; such a one could be awarded a certificate by a government institution of learning dealing in a related field. For example, a person who happened to have local knowledge about indigenous medicinal plants and was able to apply such knowledge for the betterment of society could have his knowledge recognised by an appropriate institution and award a certificate after some processes of verification. This is a very advanced step in the path towards creating a synergy between modern and indigenous knowledge systems.

Furthermore, there are independent synergy oriented steps by citizens that were nurtured through personal behaviour and health practices. The habits inculcated into the minds of many Kotor residents to be undertaking frequent hiking activities in the mountains have strengthened human-nature relationship to a personal level. Members of the Kotor squirrel hiking club have a complete different perception of nature. It was viewed as a companion and friend in both happy and sad moments as well as supplier of food. Knowledge levels of herbs with medicinal and nutritional properties were generally high among the members of this group.

During participatory observation when the author joined them in hiking activities which took the whole day in Lovcen wilderness, they mobilized some wild herbs which were later cooked in the wilderness as vegetables. They were said to be good for blood boosting, immune strengthening, wound healing, and sight. It was also noticed that a number of the hiking club members did not use conventional beverages such as coffee or tea leaves from shops, rather they collected indigenous herbs from the local mountains which they consumed as green beverage.

4.2.3 Modern Environmental Education Approaches in Germany

The Germany scenario did not differ much compared to that of Montenegro probably owing to shared continental aspirations on environmental issues. Four critical levels at which environmental education aspects were observed in Germany were the federal, state, city and institutional levels. The federal government sets environmentally responsive policies which all the state governments adopt and consequently individual cities and municipalities in respective states incorporated in their planning and general management of their cities. Individual institutions in the city were encouraged to mainstream environmental issues in their operations. Schools, through the curriculum, also incorporated these issues in their programmes. However, environmental education had not been agreed as a teaching subject in Germany but it was a requirement for teachers to incorporate environmental issues in whatever subjects they teach as a cross-cutting theme.

The main approach Germany used in enhancing environmental education was participation and information (environmental education) based self-regulation. Although the Federal Environment Agency was the principal government organ that ensured environmental sustainability and compliance to national and continental standards, the cooperation and activities of all institutions and individuals played a cardinal role in the positive strides recorded countrywide.

For instance by the time of the study visit (November/December 2010) a total of forty (40) companies had already revolutionised their operations to mainstream environment / nature conservation strategies in Germany. As a motivation to entice other companies to join, names and profiles of pioneer companies were displayed at the Federal Environment Agency headquarters public foyer in Dessau as shown below.

Figure 17: A display of some of the companies that have mainstreamed environmental education and conservation strategies in their core business



Source: Source: Field Data (2010)

Through stakeholder engagement and intensified environmental education services, these companies became signatories to the convention on biodiversity and had pledged to support the three objectives of the convention which were:

- Conservation of biological diversity;
- Sustainable use of its components;
- Fair and equitable sharing of the benefits that arise from the utilization of genetic resources.

Among the measures the signatory companies committed themselves to included to:

- Analyse corporate activities with regard to their impacts on biological diversity;
- Include the protection of biological diversity within their environmental management system and develop biodiversity indicators;
- Appoint a responsible individual within the company to steer all activities in the biodiversity sector and report to the management board;

- Publish activities and achievements in the biodiversity sector in the company's annual, environmental, and / or corporate social responsibility report.

Additional advocacy environmental messages were displayed for public education and information such as the examples given below.

Figure 18: A Display of Posters carrying Environmental Education Messages at Public Foyer of the Federal Environmental Agency in Dessau, Germany

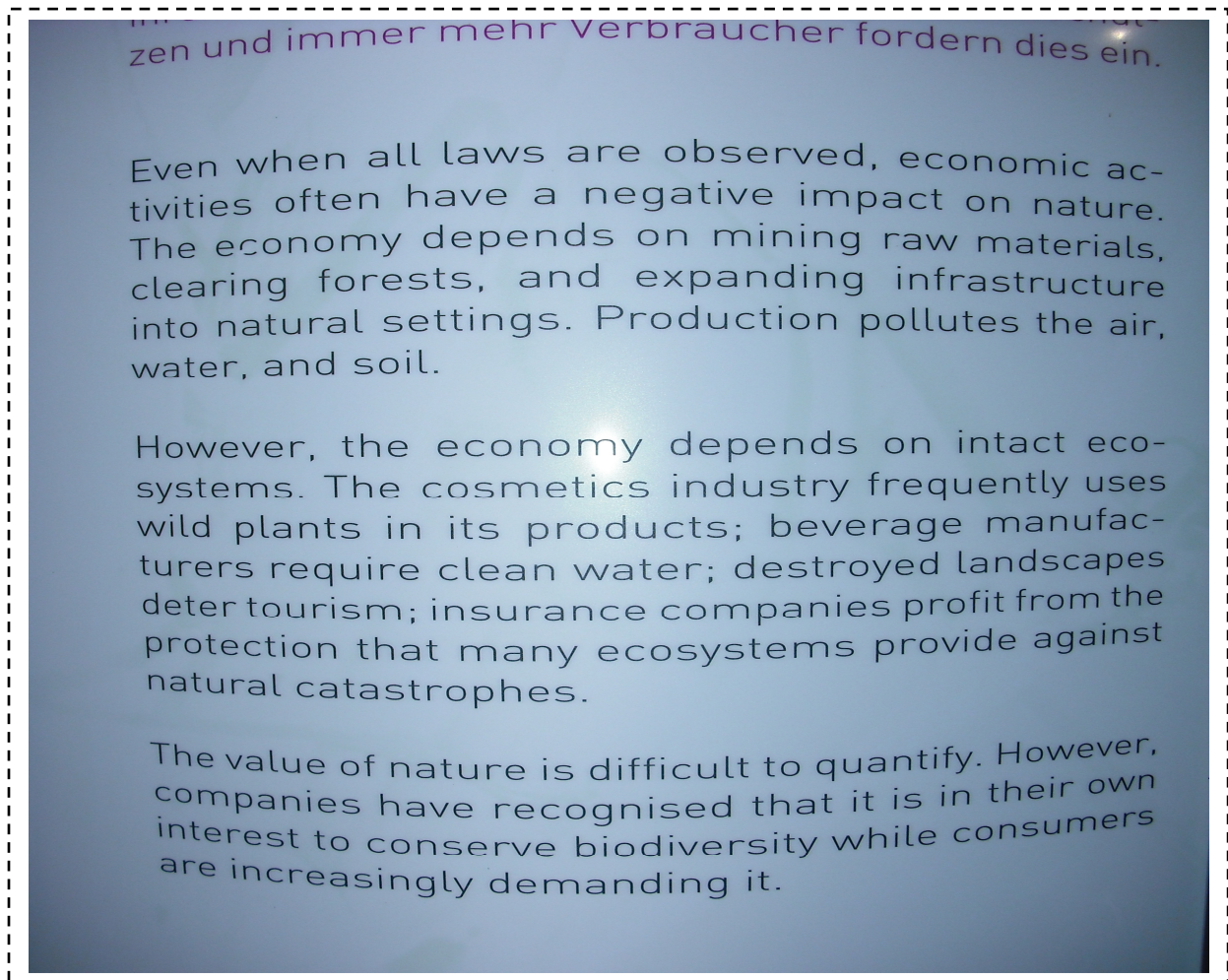


Source: Field data (2010)

The posters depicted above were a common characteristic approach in delivering environmental education that was widely being used by government and private entities, universities and schools inclusive.

The motivation that had driven the Federal Republic of Germany in its entirety to embrace such aggressive but collaborative and inclusive environmental awareness and practical measures could have been explained more vividly by the Federal Environment Agency on the poster shown below by establishing linkages between economic activities and natural / environmental systems.

Figure 19: An Educative Poster at the Federal Environment Agency Public Foyer, Dessau, emphasizing the importance and fragility of nature and the threats posed by human activities.



Source: Field Data (2010)

The message shown above could have provided additional justification for Germany to establish the *Business and Biodiversity Initiative*, an international initiative whose goal was to intensify private sector involvement in activities for the conservation and sustainable use of biodiversity (Benemann and Kaplan, 2010).

All these efforts were being done by the current economically active generation. The aspect of sustainability lies in the involvement of the next generation of economic drivers' age group which was still absorbed in the formal education system. Thus, a glimpse at how environmental education was mainstreamed in the Germany school system became paramount.

4.2.3.1 Mainstreaming of Environmental Education in Germany Schools

As stated earlier, environmental education had not been adopted as a school subject in Germany. The Germany education system, however, had provided special attention to environmental education in a more inclusive manner in all subjects.

It was noted that environmental education was still a relatively elusive concept with no universally agreed meaning. This could have led the Germany education authorities not to settle for a subject but a teaching methodology or approach that gave prominence to and epitomized nature in all school subjects.

In an attempt to unlock the complexity characterising the conceptual understanding of environmental education, Lucas (1980) classified this term into four categories; 'education *about* the environment', education *for* the environment', and 'education *in* the environment', and the mixed category. He defined education *about* the environment as that which is concerned with providing a cognitive understanding of the issues, education *for* the environment as that which is oriented towards environmental preservation for some purposes, while education *in* the environment is aimed at putting emphasis on direct contact of physical and social environments outside the classroom (Lucas, 1980; Dempsey, et. al, 1997).

The Germany approach was an attempt to embrace all the above categories of environmental education as described by Lucas. For example, the 1978 conference on environmental education which was conducted by the Institute for Science Education in Munich localized the Tbilisi conference and another follow-up conference was held in 1980 where all ministries of education were in attendance. The latter conference generated a key resolution that defined the role of schools in environmental education. The resolution was that:

...schools have a special responsibility in conducting environmental education. The responsibility of schools lies in creating an 'environmental consciousness and fostering lasting environmentally sound behaviour' (Dempsey, et.al, 1997:2).

This resolution paved way for an environmental education system that was socially responsive, scientifically relevant and economically appropriate at both local and global levels. The approach was flexible enough to adjust accordingly depending on topical thematic issues that constituted global, national and local priorities. For instance, the central themes of current environmental topics were incorporated in teaching. Therefore, the fundamental philosophy of Germany environmental education was to create environmental consciousness and sound behaviour (Dempsey, et.al, 1997). This was evidently seen even in the lowest level of education, the kindergarten. Germany has a long history of this elementary level of education since the creation of the first kindergarten in the world by a Germany scholar, Friedrich Froebel, in 1837. However, the most revolutionary approach was the one by an ecological kindergarten (*Okologische Kinderhaus In der Neustadt*) in Dresden, Saxony State.

This kindergarten presented a relevant case for sustainable environmental education strategies. The children whose age ranged from 3 to 6 years were introduced and oriented to environmental awareness, good environmental behavior and sensitivity to nature. During the visit to the kindergarten on Wednesday 1st December 2010, no litter or any papers were seen either inside the buildings or outside in the school yard despite the fact that they used a lot of paper for writing and other indoor creative activities. The kids also eat local food prepared by the parents within the school. The most interesting aspect was the absence of plastic toys in the school and the kids were usually let to freely explore their school environment to find natural objects to play with. This created a bond between them and nature at an early age and conformed well to the national environmental education fundamental objective of creating environmental consciousness and environmentally sound behaviour.

Figure 20: *Entrance Poster: The Ecological Kindergarten in Dresden that has put into practice Germany's fundamental philosophy on Environmental Education*



Source: Field Data (2010)

Generally, the Germany environmental education approaches were broad based and oriented towards mass participation by creating an environmentally literate society irrespective of the livelihood means an individual had, that is, all sectors were covered. The Federal Environment Agency (2010:32) exemplified the role of information as a viable tool in instilling environmentally sound approaches in all sectors as illustrated by this example for the construction sector:

Information tools supplement and support the other tools. Special education initiatives on 'Future-oriented construction and housing' in the technical division of schools, in the upper classes of High Schools, in universities and universities of applied sciences – together with an improved training of crafts men, engineers and architects – should provide the knowledge base for environmentally compatible building. It is also helpful when consumers learn to consider their activities on their own. Therefore, generally accessible

information about the state of the art and about solutions in the ‘construction and housing’ area of need should be provided – for instance via a citizen-friendly internet platform. Actions that have already proved successful like energy counseling, information campaigns...can also support environmentally compatible developments in the future.

The above statement has added another approach in use in Germany- the internet. The country had taken advantage of the information technology (IT) age and the availability of IT facilities to diversify the strategies applied in promoting environmental education.

This made even the monitoring of priority sectors of intervention easy for every citizen as well as checking the efforts other countries were making towards meeting regionally agreed targets. For instance, Germany had been monitoring its performance in the energy sector against the European Union targets. The EU targeted to increase the contribution of renewable energy to total electricity consumption by 22% by 2010 and the Germany government targeted to achieve 12.5% of the national electricity production using renewable energy by 2010 (Federal Environment Agency, 2007).

4.3 Indigenous Environmental Education Approaches

As stated earlier, indigenous knowledge systems have been applied in real life situations for centuries and their relevance to contemporary development challenges could still be upheld. Described below are some environmental education approaches that had been employed in indigenous societies, particularly among the Tonga and Lozi societies.

4.3.1 The Tonga Society – Siavonga District

There were no clearly defined systems of environmental education among the Tonga people of Siavonga district. It should be noted that some of these people had lost their ancestral environment through forced displacement to pave way for the construction of the Kariba dam. Thus, their original life styles and inherent relationship to nature were subsequently disrupted.

The areas currently being occupied have had a variety of environmental obstacles to offer thereby bringing about new environmental challenges which the local people were expected to cope with.

The Lusitu and Ng'ombe Illede areas of Siavonga district present interesting examples of human revolt against innocent nature when one group of humans found themselves in a helpless situation at the hands of fellow humans. Following the forced relocation from their good, fertile undulating land in the lower Zambezi river valley to the rugged, impoverished terrain in the north, the people unleashed their frustration on the geo-physical environment which was also a wildlife habitat.

One of the respondents, now a civic leader in the area, who was very young at the time they were resettled in the Lusitu (Ng'ombe Illede) area lamented that the now open area was a forest thicket when they first arrived there. He vividly recalled how dangerous it was to move alone then due to heavy presence of wild animals which had been completely evicted through poaching and destruction of the natural habitat.

What was deduced from the views of some of the older members of the Ng'ombe Illede area was that the people did not recognise or accept the area as theirs. They considered it an alien temporary refuge where they did not expect to live for ever. This undermined the necessary sense of ownership and responsibility required for sustainable management of the area's resources.

Thus, the now highly degraded environment of the Lusitu area was partially a function of uncoordinated resource use practices among the locals. The area suffered unprecedented environmental degradation usually associated with areas around refugee camps.

Therefore, the system observed among the Tonga people of Siavonga was a very flexible one which adjusted easily to the dictates of nature. The learning methodology was very practical. For instance, in the agriculture sector, some locals had resorted to tapping ground water by digging shallow wells on the Lusitu river dry bed for gardening and domestic use. This was a recent practice forced on the people by the harsh dry conditions.

The major environmental education approaches commonly identified in Siavonga indigenous communities were:

- Observation;
- Experimenting; and
- Replication of antecedent knowledge

4.3.1.1 Observation, Experimentation and Replication of Antecedent Knowledge

The local people had been observing environmental change over the years with its consequences that directly affected their livelihood. For example, headman Choonga of Choonga village near Chirundu explained that a few years back they never used to dig deeper wells than they do now in order to find water. He attributed the lowering of the water table to erratic rainfall and the increase in the number of people that had settled in his area. He also said people he gave land to had been cutting down trees for farming purposes. He showed some understanding of factors at play in the changing environmental trends.

The main livelihood strategies the people employed were generally experimental in nature. In Pambazana area of Ng'ombe Illede most villages grew drought tolerant crops like sorghum and this had become a tradition such that even where there was normal rainfall they did not risk planting other crops like maize. They were principally trapped in a historical environmental microcosm.

4.3.2 Characteristics of the Tonga Governance System

Unlike their Barotse counterparts described below, the Tonga society enjoyed some inherent independence devoid of undue influence from other traditional authorities within Tongaland. Thus, every chief was absolutely independent of any other Tonga chief in the land and the traditional jurisdiction of any Chief was confined to the perimeter of his or her chiefdom.

The implication of this system was that management of communally shared resources such as streams that transcended chiefdom boundaries became problematic. If the chiefdom upstream decided, for instance, to dam the river the other chief downstream would have no right to interfere despite the fact that the damming would definitely affect the downstream chiefdom.

However, the most striking advantage with the Tonga system was the levels of local independence and clear communication channels which were devoid of complicated bureaucracy. In this system, a headman or even an ordinary person had direct and unrestricted

access to the Chief. The Chief was much in touch with his subjects at a personal level. This relationship was a necessary strength in change management. This could partially explain why the local people devised individual strategies on how to cope with the new environmental challenges they encountered for the five decades they had been living in their current area since the forced relocation from their previous ancestral homeland.

4.3.3 The Lozi Society – Barotseland

Described below were the general features of the Barotse indigenous system.

4.3.3.1 The Barotse Indigenous System

The information on the Lozi indigenous system had been gathered through personal interviews with Indunas particularly Indunas Imutuko and Imukondo who were both members of Saa Kuta.

The royal Barotseland indigenous governance system provided adequate insight into all the spheres pertaining to relationships among humans and between humans and nature (environment). The Lozi indigenous system was found to be comprehensive and holistic enough to take care of nearly all existing and potential concerns about the well being of both the people and their environment and all that subsisted on it.

4.3.3.2 Characteristics of the Barotse Indigenous System

This was a hierarchically structured administrative governance and judicial system with clearly defined functions and levels of jurisdiction. In this system all Indunas (Traditional Counsellors / Councillors / Ministers) had specific duties to play related to the well being of the people, the environment and other organisms. The following were the special characteristics of the Barotse system:

- ***Holistic:*** The system was holistically structured to cater for all the three key functions of the legislature, the judiciary and the executive equivalent to the modern government organs;
- ***Multiplicity of Roles:*** The Indunas assumed different roles when the court was in session depending on the matter being determined. For example, when litigation matters were

brought before the court, the Indunas performed judicial functions, for other concerns that were generally administrative in nature, the same Indunas became the executive. However, in both cases, reference was always made to rules and regulations constituted by the same courts as legislators;

- ***Representation and Democratic:*** The system attached prime importance to public views on matters of local and regional interest. Thus, no issue could be entertained by the higher courts if it had not been heard at the local (area) courts. Emphasis was on most matters to be determined and resolved at the lower levels.
- ***Transparency and Impartiality:*** The system was an embodiment of objectivity and impartiality within the framework of decision-making accountability. Thus, the status of the person involved in any matter had no bearing on the outcome or verdict;
- ***Class Based:*** The system had upheld the centuries old class notion by having special courts to determine matters involving certain classes of people. Although this may not be desirable from the outset, the traditional authorities claimed it was a necessary measure to ensure that justice was provided to all fairly and that it got rid of possible intimidation and other forms of subjectivity in the system. Through this notion, members of the royal family, for instance, had special courts that could hear their matters.

4.3.3.3 The Courts (Li Kuta)

As stated earlier, the courts from the perspective of the Baroste system performed a multiplicity of functions ranging from judicial, administrative to legislative. Generally, the Barotse jurisprudence consisted of three main levels of court as described below.

4.3.3.4. Kuta Ya Situngu (Situngu Court)

This was the local area (Silalo) court which was headed by the Silalo (area) Induna. The Local Court's geographical jurisdiction was confined to the silalo. In terms of matters to be determined there were several ranging from civil cases, land disputes, public nuisances, natural resource use and management, marriages and family mediation, and many others. Cases could only be referred to a higher court (District court) if one of the parties to the matter had appealed against this court's verdict.

The Local Court (Situngu Court) was very important in that it was the closest court to the people and members of the jury (Indunas) also lived in the same area and had a fair understanding of most, if not all, of the matters pertaining to the subject area.

4.3.3.5. Saa Kuta (Saa Court)

This was the district court of appeal which heard matters referred to it from the Local Courts. It was also called Kuta ya Inete (Inete's court) because Induna Inete was the court administrator. It was, however, commonly known as Kuta ya Mboo (Mboo's court). This court had several Indunas some of whom were:

1. Induna Inete – Head (Court Administrator)
2. Induna Namamba – Inete's deputy responsible for general administration;
3. Induna Inyundwana;
4. Induna Mayunyi
5. Induna Muyumbana
6. ***Induna Ilubonda (responsible for Forestry at District level)***
7. ***Induna Ilutondo (responsible for Fisheries at District level)***
8. ***Induna Imutuko (responsible for Livestock and general agriculture at district level)***
9. Induna Akombelwa
10. Induna Nawasilundu
11. Induna Mubila
12. Induna Mukoti
13. Induna Awami
14. Induna Imukondo
15. Induna Nambayo

The list of portfolios associated with Inete's court as outlined above was not conclusive as the rest were still vacant. Special interest was drawn to the three Indunas whose functions were directly related to some essential components of the environment, namely the terrestrial and aquatic ecosystems (forestry and fisheries) while agriculture was practiced in both

systems. All the above portfolios had their corresponding superior portfolios in the higher court described below.

4.3.3.6 Siikalo Kuta (Kuta Ya Ngambela) – The Prime Minister’s Court

This was the highest (supreme) court of appeal in the whole Barotseland. The Ngambela (Prime Minister) himself was the administrator of this court. Siikalo court received cases appealed to it from Kuta ya Mboo, which was a district court. Siikalo and Mboo courts had similar functions except that the Siikalo had a wider jurisdiction than the latter and its Counsellors or ministers (Indunas) were administratively superior to those in Inete’s court. The following were the existing Indunas in Siikalo court by the time of the study although some of the portfolios were still vacant:

1. Ngambela (Prime Minister) – Court Administrator
2. Natamoyo
3. Mwabange Muimui Namabanda
4. Noyoo
5. Katema
6. Imasikwana
7. Ing’anda
8. Mutwaleti
9. Ingangwana – chief steward in charge of royal assets
- 10. Mubonda (responsible for Fisheries at national level);**
11. Imandi

The Ngambela’s court also received directly all cases from District Chiefs since these could not be determined by the district courts.

4.3.3.7 Other Special Courts

Other than the above mentioned courts, there were some other courts meant for certain classes of people. These are also described below.

4.3.3.8 Kuta Ya Natamoyo (Natamoyo's Court)

This court was specifically for members of the royal family. Any wrangles between members of the royal family over any issue were arbitrated by this court.

4.3.3.9 Kuta Ya Kabeti (Kabeti's Court)

This one was a special court to determine matters involving Indunas and the royalty.

4.3.3.10 Saa-Siikalo Kuta

There were some special circumstances that necessitated the merging of the two courts (Saa and Siikalo courts) over an issue. When this happened where the two courts sat together to determine an issue the name of such a specially constituted court became Saa-Siikalo. Once this happened, it was most likely that a National Council (Mulongwanji) would be convened. By the time of the study, there were already strong feelings that the Barotse National Council could probably be called over the 1964 Barotseland Agreement.

4.3.3.11: Implications of the Barotse System on Environmental Education

The Barotse system as described above had far reaching implications on the management of natural resources and the general administration of environmental knowledge systems. The Barotse indigenous education system, when coming to nature / environment had verifiable 'ecological footprints' dotted across the land. This was more evident in the water sector, particularly for agriculture and transport purposes.

The Barotse indigenous education system had inherent practical underpinnings that translated directly the theoretical hydrological discourse into practical results for survival. During the reign of Litunga Lubosi Litia (popularly known as Lewanika) for instance, several canal construction projects were undertaken that served to drain the farmlands on the plain margins, locally called *matongo* (*plural*) and *litongo* (*singular*) for all year round farming activities to ensure household and national food security as well as water transport to ease mobility and accessibility to as many places as possible. Regular dredging of canals to facilitate water flow to avert unnecessary flooding and to aid water transport was an on-going seasonal activity. This, however, ended with the coming of western oriented government system following the merging of Barotseland and

Northern Rhodesia to form Zambia. The new government's modern systems of managing water courses like canals and rivers failed. Currently, matongo (the transition zone between the aquatic and terrestrial ecosystems) were frequently water logged and drastically affected food production because the people had lost the indigenous ingenuity that sustained early communities in the same environment.

In the wildlife sector, the Indunas stated that wildlife management was an old practice in Barotseland perfected way back during the reign of Litunga Mulambwa Santulu who liked taming and keeping wild animals like Hippopotami, elephants as well as domestic animals, particularly dogs. According to oral history, the now popular Liuwa National Park was created by the Litunga as the royal hunting ground. It was alleged that the Litunga had instructed his royal hunters to capture prey animals from the interior forests and brought them to Liuwa plains and that villages were established surrounding the plains to prevent them from fleeing back into the forests. These animals were later followed by predator animals like lions. This game park was sustainably managed until the modern system of forceful policing with game scouts and wildlife police officers was introduced by the western modern government systems. The result was clear for everybody to see – regrettable depletion of animals in Liuwa and many other game parks in the country. The modern systems of wildlife conservation alienated the locals and eroded the sense of ownership which was a paramount strategy that sustained rational resource use in the indigenous system.

Why were the canals dug and regularly maintained without any problems, and why was the Liuwa park sustained for such a long time? And what went wrong with the modern systems' take over of the management of these natural resources?

The answers to these questions lie in the methodology and philosophy of the concerned systems. According to the Barotse nobility interviewed, credit for the sustainable management of natural resources in the past could be given to the indigenous system's respect for nature and sensitivity to human welfare at a collective, communal level. There were also strong feelings that the nature was man's gift from Nyambe (God) and therefore the duty to use it reasonably rested squarely on our shoulders. This added a religious dimension to the indigenous systems. It was interesting to note that this idea was still very much alive particularly among the modern religious groups such that it was even used in the February 2010 protest by Canadian churches against their

government's decision to expand uranium mining. The Anglican bishops of Saskatchewan had joined their Roman Catholic, Lutheran and Ukrainian catholic counterparts in protesting against the government's uranium mining expansion plans and summarised their message as follows:

Christian churches affirm that God created the earth and that God continues to establish and preserve a just and ordered life for all creation. Human beings are part of the vast ecosystem of the planet. However, choices made by human beings must respect God's creation in its careful interrelationship of earth, water, air and all living things. Exploiting the earth's resources without regard for the consequences is sinful against God and God's creation (Council of Churches in Zambia, 2010).

The above quotation was symptomatic of emerging opportunities for integrating religious dimensions in modern environmental education perspectives. The most remarkable philosophical exposition of the indigenous version of sustainable development was that this land (earth, natural resources,) had just been borrowed from our children and that we had to return it in the same condition as we borrowed it. This vision was later clearly stated by the famous 1987 Brundtland report and constituted a generally agreed definition of the concept of sustainable development within the modern systems domain.

Methodologically, the Barotse system, and many other indigenous systems, did not pay special attention to individual achievement but collective effort. Thus, working on community projects like creating and maintaining canals generated pride in the workers and had a different concept of reward from the modern money economy and paper certification to signify one's accomplishment in a particular field. These were critical values that formed a firm foundation for sustainable communities but were regrettably lacking in the modern systems.

Generally, the Barotse indigenous education and development system consisted of the following approaches:

- Instilling a sense of personal and community pride in having a sound and functioning environment and the belief that there was no any other part on earth that was as beautiful and blessed as Barotseland, a notion that was embedded in the first stanza of the indigenous national anthem for Barotseland;
- A combination of direct regulation (through legislative measures and the courts) and self-regulation (through a sense of ownership and pride);
- Instilling personal responsibility through religious dimension where natural resources or environment in general were believed to have been given to humankind by God (Nyambe) who in turn expected humanity to manage such resources sustainably;
- Direct transfer of skills, knowledge and beliefs through clan and family lineage.

4.4 OPPORTUNITIES FOR SYNERGY FORMULATION BETWEEN MODERN AND INDIGENOUS ENVIRONMENTAL EDUCATION SYSTEMS – A GLOBAL PERSPECTIVE

4.4.1 Introduction

This section articulates the emerging opportunities that may facilitate synergy formulation between the two systems of environmental education from a development planning perspective. Examples from the study countries, among other areas, have been provided to elaborate this possibility.

4.4.2 Global Opportunities and Motivating Factors for Synergy Formulation

The motivating essence for this study was to bridge the knowledge gap attributable to the alienation of indigenous knowledge systems with specific reference to environmental education and development planning.

A number of opportunities were identified that could facilitate the formulation of a synergy between the two forms of education systems.

In the case of Montenegro, for instance, the government made necessary reforms to the education system that were aimed at addressing the concept of sustainability. Through these reforms the Montenegrin government demonstrated the possibility of having a synergy of education systems. The government (GRM 2007:53), through the Ministry of Education and Science, emphasized that:

Apart from the regular education system, considerable attention will be given to the development of the system of informal education to enable life-long learning and recognition of newly acquired knowledge in the system of national vocational qualification.

This view was also stressed by the Swedish NGO, Mango Architects, in its project on liveable cities and public spaces where the emphasis was on creating enough public spaces for cultural

socialisation and other educational purposes which would not normally be offered in modern formal school systems.

In Germany, there were constant reforms in the planning systems to address the missing links between the bodies of knowledge through integration of various systems and multiple stakeholders. A notable one among these measures was the emphasis on drawing upon past experiences in order to shape the future. This drew attention to indigenous knowledge which was generally richer than the modern one when applied at local level. Promotion phrases like ‘*Planning with the Past for the Future*’ were not uncommon in strategic places to invite the public to reflect on the traditional notion of over reliance on modern systems. The scientific relevance of some indigenous knowledge systems was gradually been revealed through modern research efforts. This was a tested integration at this level which could easily lead into a complete synergy.

Figure 21: A poster promoting synergy oriented message in planning



Source: Field Data (2010)

This poster in Dresden at the United Nations Environment Programme (UNEP) offices is an example of some of the measures that were offering conscious reflection by propagating the idea of using the past, mainly indigenous knowledge, to plan for the future. In this poster, the ancient city of Rome was used for reference. This was a product of the Man and Biodiversity (MAB) project.

When exploring opportunities for synergy formulation, a variety of factors were identified which this study classified into three which should collectively lead to sustainability:

- Primary factors
- Secondary factors, and
- Tertiary factors

The study considered the primary factor to be a necessary and unavoidable ingredient in the synergy formulation process without which no genuine synergy could come forth. This factor was culture. The secondary factor was the capacity by society, nations and the world to realize the importance of culture in this business, and the tertiary factor was the willingness by the enlightened society, nations or the world to act accordingly. Thus, the transition from ignorance to enlightenment alone was not enough and would not be relevant if it was not accompanied by the capacity and willingness to transform this enlightenment into practical reality.

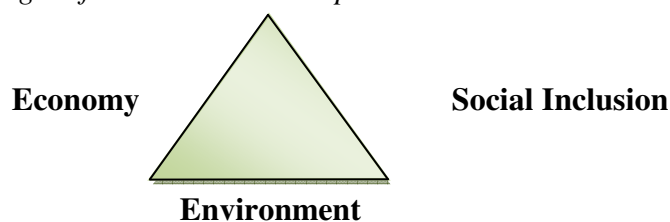
With reference to planning, where culture had been subjected to unjustifiable exclusion for so long, its relevance was gradually being noticed at the international level within the local government system which was the fulcrum of planning. For instance, the United Cities and Local Governments (UCLG) noted that the sustainable development paradigm had included those values which could propel a society's progress, values such as diversity, creativity or critical thinking and that these values constituted part of the inherent cultural processes. It was from this realization that the UCLG questioned the efficacy of the three universally accepted pillars of sustainable development, i.e. economic, social and environment, without culture. The UCLG thus, adopted culture as a fourth pillar of sustainability as expounded by the Australian researcher Jon Hawkes. Hawkes argued for the essential role culture played in public planning. With this inspiration, the UCLG resolved that:

The cultural actors know better than anybody that the circle of development cannot be squared without the fourth pillar, culture... and that... as cultural actors and agents, we, need strong metaphors and images to raise awareness on the cultural dimension of human development, and to secure a solid role for culture in public action. It is difficulty for anyone to advocate for culture without creating bridges with the other spheres of governance. The fourth pillar allows to advocate for culture to be at the same level of significance for the development of a society as the economy, the social, and the environmental (United Cities and Local Governments, 2009:16).

With this dimension, it became convincingly clear that culture was the knowledge storage device for indigenous knowledge systems. It may therefore be argued that it is through the mainstreaming of culture in education and development planning systems, or viewing the education and planning systems from a cultural perspective, that the rich indigenous knowledge concealed in the indigenous systems could be revealed. Thus, the divide between the modern and the indigenous systems could be loosened by a synergy between the two.

The efficacy of culture may be measured by the ineffectiveness of the three pillars of sustainability that had been in the spot light since the 18th century without significant strides in the absence of culture within the triangle of sustainable development. That is, the economic pillar (18th century) concerned with the creation of wealth, the social pillar (19th century) dwelt more on the redistribution of wealth, and the ecological / environmental pillar (second half of 20th century) emphasized responsibility for the environment. These formed the ‘virtuous triangle’ of sustainable development as illustrated below:

The old triangle of sustainable development



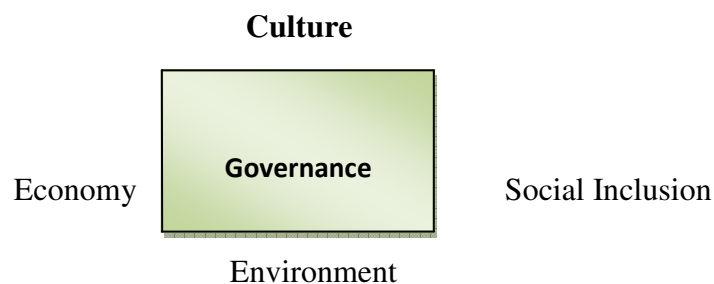
Source: United Cities and Local Governments (2009: 17)

This triangle had not delivered to expectations owing to the neglect of culture in the whole strategy and the UCLG noted that:

In a society with a growing diversity (not only ethnical diversity), that needs to value knowledge and life-long learning, that is connected (at least potentially) to all the societies of the world.. you, he, she, I, we... need to build a cultural pillar that helps us to understand the world, by discovering that our roots, our traditions, our cultures, are not self-evident, by building our own human development through the access to, and practice with, cultural activities (United Cities and Local Governments 2009: 17).

In view of the above, the traditional triangle of sustainable development had been modified into the new square of sustainable development through the inclusion of culture and governance at the centre as per the illustration below:

The new square of sustainable development



Source: United Cities and Local Governments (2009: 17).

In its attempt to actualize this new paradigm of sustainable development the Barcelona City Council launched the Barcelona Intercultural Dialogue project in 2008 within the framework of the European Commission initiative 'European Year of Intercultural Dialogue'. What motivated the City Council to embark on this project was the realization that cultural diversity was an inherent reality of all contemporary cities. Efforts like these were symptomatic of a promising future in terms of devising feasible synergies between cross-cultural modern and indigenous systems.

A lesson drawn from the Barcelona and European example was that there was need for both lateral and vertical synergies in all the systems, economic, social, governance and political systems, in order to attain desirable synergies between any other systems. Therefore, the proposed synergy between the modern and indigenous systems could easily be attained within a general framework of interlinked synergies in the subsystems. Barcelona City Council had the opportunity of the continental resolution, the strength of the willingness of the city leadership and the capacity and willingness of the operatives (staff) to spearhead the vision of enhancing cultural diversity.

These pre-conditions were vividly elaborated by the former Tanzanian President Benjamin Mkapa in response to several cases of indigenous success stories from across Africa brought to light by research efforts. He stated that:

It is in this spirit that I recommend to development experts and planners, researchers and practitioners, politicians and bureaucrats, teachers and students to humbly learn from these cases. They are not blueprints or recipes or shortcuts to development, nor do they seek to romanticize indigenous knowledge or traditions or suggest that global knowledge is irrelevant. Rather, they show that, indigenous and global knowledge working together in a democratic, self-determined way is the best combination to foster sustainable development. It remains for us, the politicians and decision makers, to provide the space for this to happen. Only those who learn will prevail (World Bank, 2004:17).

Mkapa's sentiments had already been brought to life in Barcelona City Council where politicians, administrators and planners added practical relevance to the question of indigenous knowledge and modern knowledge systems working together in a synergy.

It is hoped that the Barcelona case would spread to many other parts of the world because the subject of merging modern and indigenous systems did not receive similar attention everywhere. For instance, a combined group of modern experts from 19 different countries working as planners, engineers, architects, ecological researchers, estates managers, economists, and university and college academicians interviewed generated varying responses with regard to environmental education policy, implementation and public participation as well as indigenous

knowledge policy, its integration in planning processes, awareness and the willingness to incorporate it in planning. Tabulated below is a summary of the responses by country.

Table 8: Showing perceptions of some modern experts from 19 different countries on modern EE , Planning and Indigenous knowledge system

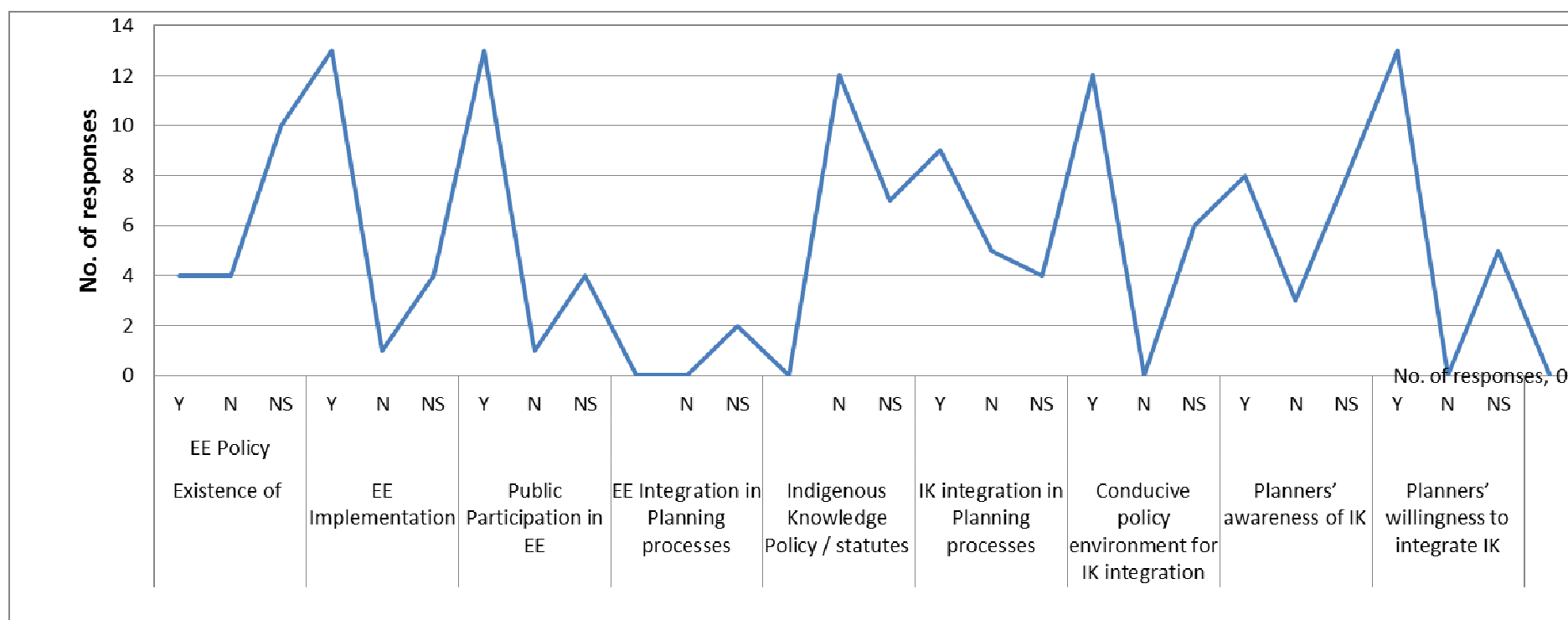
Country of Respondent s' origin	Existence of EE Policy			EE Implement ation			Public Participatio n in EE			EE Integration in Planning processes			Indigenous Knowledg e Policy / statutes			IK integration in Planning processes			Conductive policy environmen t for IK integration			Planners' awareness of IK			Planners' willingness to integrate IK		
	Y	N	NS	Y	N	NS	Y	N	NS	Y	N	NS	Y	N	NS	Y	N	NS	Y	N	NS	Y	N	NS	Y	N	NS
Armenia																											
Germany																											
Syria																											
Bhutan																											
Nepal																											
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Sierra Leon																											
Tanzania																											
Nigeria																											
Costa Rica																											
Peru																											
Argentina																											
Chile																											
Indonesia																											
China																											
Jamaica																											
Thailand																											

Totals	4	4	10	13	1	4	13	1	4	16	0	2	0	12	7	9	5	4	12	0	6	8	3	8	13	0	5
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Source: Field Data (2010)

As per the summary in the graph below and the details on the above table most respondents (52.6% and 36.8%) showed some ignorance about whether their countries had policies on modern environmental education or indigenous education systems respectively.

Figure 22: Graph showing general perceptions of some modern experts on EE & IK from 19 different countries (Key: Y= yes; N= no; NS= not sure)



Source: Field Data (2010)

The above graph portrays some levels of uncertainty on the part of most respondents on nearly every aspect asked ranging from the existence of EE policies in their countries to indigenous knowledge integration in planning. This scenario was symptomatic of how low the levels of the awareness about environmental education were even among the most informed members of modern society like planners. However, the encouraging aspect was that the majority of the respondents, that is 13 (68%) of the 19 favoured the integration of indigenous knowledge system into the modern planning system which in itself was admittance of synergy formulation. Since this group represented countries from all the continents, it may be assumed that the global community was ripe for synergy formulation between modern and indigenous systems of environmental education that could help stimulate inclusive development planning.

For some countries such as Montenegro there were some verifiable consequences of disregarding indigenous knowledge in any field by modern experts. The case of Kotor's old town underground drainage network provided a good example. The ancient indigenous engineers that built the ancient historic city of Kotor did identify some underground canals and preserved their original width as they erected structures on top. Modern engineers modified this and regulated water flow by creating uniform canals in terms of width and orientation. Periodic flooding of the old town had become a common phenomenon since then. Modern engineers did not attempt to theorise why ancient engineers avoided modifying nature's water passages (*personal communication, Vesna 12 May 2010, Kotor old town main square*).

4.5 OPPORTUNITIES FOR SYNERGY FORMULATION BETWEEN MODERN AND INDIGENOUS ENVIRONMENTAL EDUCATION SYSTEMS – A LOCAL PERSPECTIVE

4.5.1 Introduction

The opportunities that present themselves at a global scale had their roots at the local level. Such opportunities did exist in Zambia too. An outline of some of the promising green lights in the synergy formulation process is given in this section.

4.5.2 Local Opportunities and Motivating Factors for Synergy Formulation

The failure by modern systems to maintain their relevance to local environments was evidenced in Mongu over the construction of the Mongu-Kalabo road across the Barotse flood plain. The road project became costly due to frequent failures occasioned by the destruction of bridge structures by the flood waters. The locals' indigenous knowledge about the general behaviour of flood waters was not sought for by the contractors and consultants who were unquestionably qualified and experienced engineers.

One of the residents of Mulamba harbor in Mongu where the road starts from explained that the local elders knew very well why the road structures were destroyed by the flood waters. She explained that flood waters had a double trajectory characterized by both lateral and vertical flows and that modern engineers could have apparently paid more attention to lateral flow. She further explained that the vertical flow is a two-way movement, up-and-down. That is, when it rains, the rain water percolates into the soil (downward flow) and when the soil reaches infiltration capacity, inundation occurs and generates lateral flow on the surface due to differential gradient. Further, the vertical (upward) flow is also initiated from ground water to join the surface flood waters. These movements undermine the foundation of road structures, particularly bridges and culverts. The double action is intensified by vertical flow, which undermines the foundations, and the lateral flow which causes dislocation or removal of foundations and eventually the collapse of superstructures. The locals had witnessed the destructive behaviour of flood waters for centuries, including the exhumation of bodies in cemeteries when they get inundated especially if the area was underlain by a thick layer of sand (*Mwendaendi, personal communication, 9 August, 2010*).

In this scenario, it would be more rewarding for modern engineers to seek the opinion of locals who are well vested in the general dynamics of flood waters and the behaviour of the flood plain sand when it got lubricated by water. Thus, a synergy of expertise of both modern engineers and indigenous ‘geo-hydrologists’ would provide a durable road structure that could withstand natural forces.

In Siavonga district, another miscalculation by modern hydrologists was revealed when the advice by the locals that the ground water in that area was no good was ignored. Under the rural water supply and sanitation programme, the Local Authority engaged some drilling companies to drill boreholes in some identified needy areas. In one of the areas, the people opted to have water from the lake arguing that ground water was not good. However, the modern experts counseled the locals that ground water was safest and went ahead to drill the borehole. The borehole had good yield but the water was brownish and hard. Tests conducted by Environmental Health Technologists in the public health section confirmed the claims by the locals. Money, unfortunately, had already been wasted. The local NGO, Harvest Help Zambia (HHZ) knew too well how valuable indigenous knowledge was in any development programme if success was to be recorded. The NGO Director cautioned development partners and other stakeholders involved in community development initiatives never to move ahead of the locals. He emphasized that consulting the locals even on matters that the modern experts were sure about was very critical and there was always something to learn from them (Kasenzi, A., *personal communication*, April 2010).

In Siavonga district’s Nanyanga area where there had been wildlife-human conflicts, another gap was identified. The conflicts arose partially due to un harmonized land use patterns on both sides of the Zambezi river between Zambia and Zimbabwe. On the Zimbabwean side was a national park while the Zambian side had human settlements. A number of villages have had their crop fields affected by elephants because they were located within the wildlife corridor (AWF, 2010). The major causal factor for these conflicts, however, was the option by human inhabitants of this area to occupy the wildlife corridors. One of the headmen and a former civic leader for Nanyanga ward explained that in the past such conflicts were not there because people respected elephant routes and were usually left free of farming activities. He further explained that elephants could never miss the route they had been using for centuries even if they were obscured by human developments that was why people in the past avoided encroaching into such corridors.

This demonstrated the local people's capacity to understand wildlife behaviour patterns, the knowledge that facilitated genuine co-existence. The direct regulation through wildlife policing and prosecution of poachers had eroded this communal co-existence between wildlife and the local people. The elephants in this area were now referred to as Zambia Wildlife Authority (ZAWA) elephants.

To restore this fractured relationship between humans and wildlife, the African Wildlife Foundation (AWF) adopted a working methodology of combining indigenous knowledge and modern skills in wildlife and general natural resources management. The AWF facilitated the formation of community natural resources management committees which spearheaded the resource profiling exercise. The inventory included wildlife, vegetation and soils pertinent for sustainable community survival as well as for wildlife. This project regained the lost sense of ownership of natural resources in the local people. The draft natural resources management plan had been produced, by the end of field work for this study, with great local input and participation through out the phases. This was a clear case of synergy of systems

4.6 The Proposed Synergy of Systems

4.6.1 Introduction

According to the main theme of this study, a synergy between the indigenous and modern systems of environmental education would be useful in addressing development planning in Zambia. This section presents this proposed synergy.

4.6.2 Characteristics of the Proposed Synergy

After taking into account various opportunities presented above, both local and foreign, the possibility of formulating a synergy between the subject systems became clearer than before. A functioning synergy should have certain features that should sustain it. Described below were the identified desirable features.

Table 9: Modification of Emery et.al (1997)'s Indigenous and Modern Knowledge Systems Interface into a Proposed Synergy of the two systems

Aspects of Knowledge	Indigenous Knowledge System (Strengths, Weaknesses, Opportunities, Threats)					Scientific (Modern) Knowledge System (Strengths, Weaknesses, Opportunities, Threats)					Synergy of Positive Attributes
	Characteristics	S	W	O	T	Characteristics	S	W	O	T	Strengths and Opportunities from both systems
2. Scope	Sacred and secular together; includes the supernatural;					Secular only; excludes supernatural					Sacred and secular together; includes the supernatural;
	Holistic, integrated –based on whole systems;					Analytical or reductionist –based on sub sets of the whole					Holistic, integrated –based on whole systems;
	Stored orally and in cultural practices					Stored in books and computers					Stored in books and computers
2. Truth Status	Assumed to be the truth					Assumed to be a best approximation of truth					Assumed to be a best approximation of truth
	Subjective					Objective					Objective

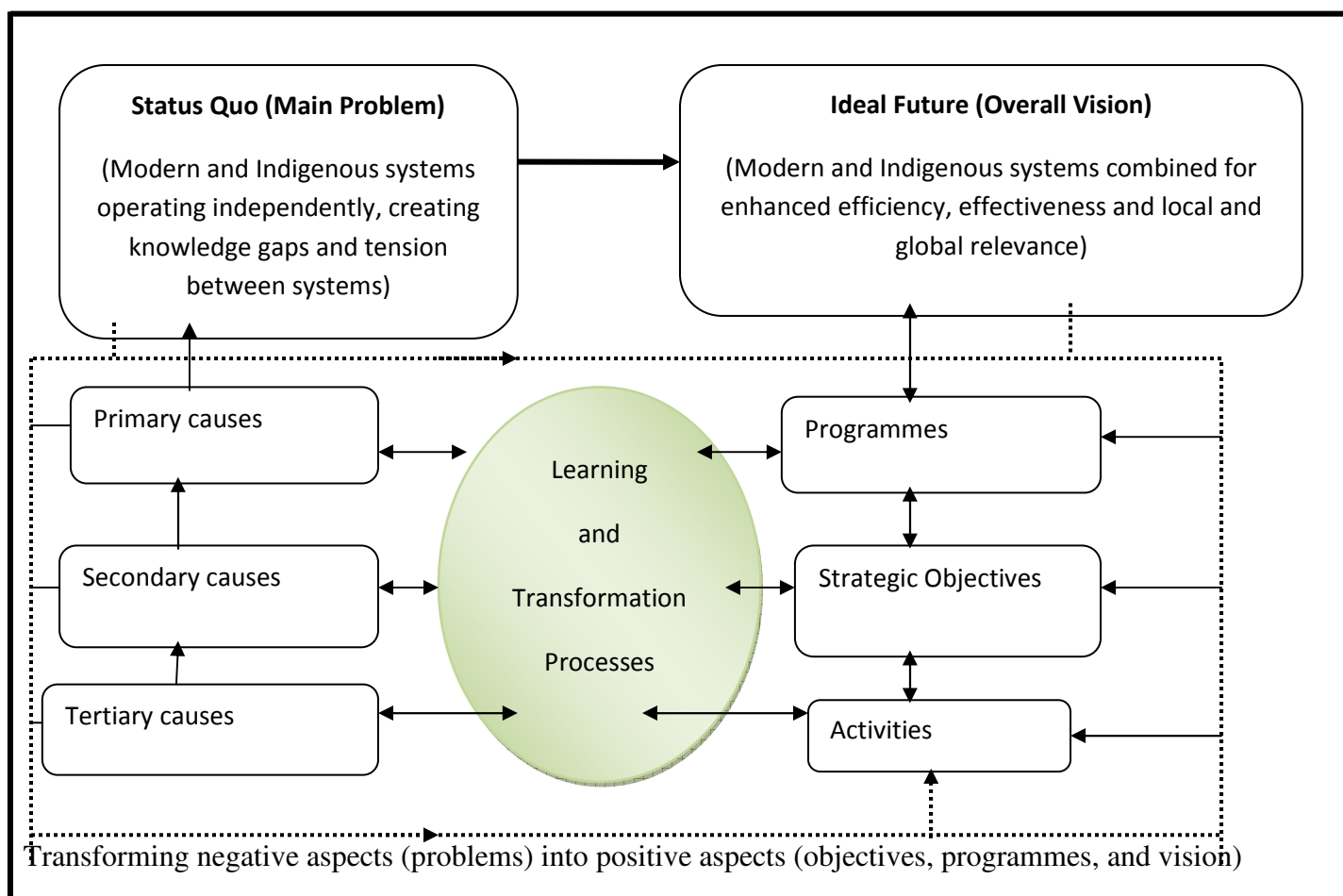
	Truth found in nature					Truth found from human reasoning					-Truth found in nature & from human reasoning
	Explanation based on examples, experience and parables					Explanations based on hypotheses, theories and laws					Explanation based on examples, experience parables, hypotheses, theories and laws
3.Purpose	Long-term wisdom					Short-term prediction					Long-term wisdom
	Practical life and survival					Abstract, to pass examination					Practical life and survival
	Powerful predictability in local areas (ecological validity)					Powerful predictability in natural principles (rational validity)					Powerful predictability in local areas (ecological validity) & natural principles (rational validity)
	Weaker in predictive principles in distant areas					Weaker in local use of knowledge					

6.Methods of Teaching and Learning	Lengthy period of acquisition ('slow knowledge')					Rapid acquisition ('fast knowledge')					
	Learning by living, experiencing and doing					Learning by formal education					Learning by living, experiencing and doing
	Teaching through examples, modeling, rituals and story telling					Teaching is didactic					Teaching through examples, modeling, rituals, story telling and didactic
	Tested in practical life situations					Tested artificially in examinations					Tested in practical life situations
TOTALS		7	5	3	0		3	5	5	2	

Source: Emery et.al (1997: 31); Field Data (2010)

Thus a desirable environmental education system should have less negative aspects and more positive ones. In this case, the strengths and opportunities embedded in a particular system, whether indigenous or modern, should counter the negative aspects (weaknesses and threats) found in the other. As noted in the table above, indigenous systems had more strengths while modern systems had more opportunities. The proposed synergy was simply a combination of positive attributes from both systems in order to create a strengthened, locally relevant and globally appropriate system with strong vertical and horizontal linkages at local, regional and global levels and encompassing all stakeholders.

Figure 23: Proposed Synergy Formulation Strategic Framework



Source: Field Data (2010)

The above framework postulates the transition from the undesirable current situation where the two systems did not operate in a harmonious pattern to benefit each other to a future desirable situation where the systems have formed a complete harmonious synergy with increased positive qualities. The

proposed framework involved identification of key issues which were attributable to the status quo. These constituted the causal factors at different scales ranging from tertiary to primary. The framework further called for a learning and transformation process at the centre so as to initiate the conversion of these negative aspects into positive steps towards a desirable synergy. Thus, a problem (negative) is transformed into a vision (positive outlook). This involved looking at every problem from the other end of the telescope. In this case, primary causes on the negative side became programmes on the positive side, secondary causes to strategic objectives and tertiary causes to activities.

A synergy formulated from this perspective takes into account the grey areas in the respective systems. The identified grey areas in the indigenous systems which would be improved by the modern systems included information (data) or knowledge storage mechanisms. The indigenous systems lacked reliable knowledge storage systems from which such knowledge could easily be retrieved or shared. Furthermore, the natural phenomena long-term prediction capacity was generally weak in indigenous systems. All these could be improved when the two systems' strengths and opportunities were blended together. Modern systems, on the other hand, had relevance inadequacies at local levels. This raised serious questions about their application in trying to address local challenges. They were also narrow in scope and did not include other vital considerations like spiritual dimensions. All these point to a conclusion that change was inevitable and the cost of change could hardly be more than that of maintaining the status quo. Thus, initiating the process of merging indigenous and modern systems may not be an easy and cheap undertaking but the social returns were potentially much higher than the cost of bringing about this change. The question of whether or not to embark on change was clarified by M Pedler's equation of change as outlined in Andersson (2008:8) that:

$D + V + M > P$, where:

D = Level of **D**issatisfaction with current status;

V = Desirability of the **V**ision of the future;

M = Quality of **M**ethodology and process to get there, and

P = The **P**ain and cost of change

4.7 Reflections on Extent to which Research Questions have been Addressed.

Presented below are reflections on the extent to which research questions have been addressed in the study. Linkages between research questions and the sections where they have been addressed are provided.

4.7.1 General Research Questions

The first general research question was *‘what types of indigenous systems are used in environmental education within the context of development planning in Zambia?’* This question has been addressed in items 4.3.1, 4.3.3.2 and 4.3.3.11 above. The second and last general research question was *‘what modern systems are used in environmental education when dealing with development planning?’* This question was also addressed in items 4.2.1, 4.2.2, and 4.2.3.

4.7.2 Specific Research Questions

There were three specific research questions of which the first was *‘what is the interface between indigenous and modern systems of environmental education when addressing development planning in Zambia?’* This question was addressed in item 1.14 particularly in table 3; items 2.3; 4.2.2, and 4.6.2 and especially in table 9. The second specific question was *‘what prospects are there for the integration or harmonization of the two systems (that is, indigenous and modern)?’* Items 4.4.2; 4.5.2, and 4.6.2, including table 9 and figure 21 have addressed this question. As for the third and final specific research question which was *‘what cross-cutting environmental education and development planning principles can be suggested from a blend of indigenous and modern approaches?’*, the following items addressed it: 2.2; 3.1; 4.2.1, 4.2.2, 4.2.3; 4.4.1, 4.4.2.2, and 4.5.2. In addition, the question has also been addressed in item 5.2 below.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

The question of blending the indigenous and modern systems called for finding new justification for old ideas. Although we are in the modern age governed by modern systems, political, economic, social and religious systems, the ideas that sustained communities in the past have not lost their relevance to present human communities.

As noted in this dissertation, there were several issues that demanded the incorporation of indigenous systems. The study established the following:

- The modern systems of environmental education that were currently being used the world over lacked certain aspects that could be found outside the domain of these systems;
- The indigenous systems of environmental education had certain qualities that were not found in modern systems;
- Both indigenous and modern systems had some inherent weaknesses that could be remedied by the strengths in the other;
- The positive traits in both systems could be enhanced when reinforced by additional strengths from the other system;
- Some of the gaps in the dominant modern systems could be bridged by indigenous knowledge;
- Opportunities were available at all levels for creating a synergy between the indigenous and modern systems;
- Modern Planning systems had some inherent measures to alienate local indigenous input into the planning processes;
- Integration of environmental education in the modern school systems was done in a variety of ways some of which were more responsive to synergy of indigenous and modern approaches while others were not;
- Environmental policy instruments which were applied in modern systems were both pro-synergy and anti-synergy. Pro-synergy instruments were those that promoted self-regulation and mass participation;

- The Zambian modern systems tended to be more rigid and legislative oriented than flexible and participatory although involuntary winds of change in environmental policy approaches were taking root through non-state actors' advocacy.

The study further noted that the levels of awareness of environmental integration in planning processes in the government mainstream varied according sector mandates. However, the attention paid to community knowledge contribution was negligible.

5.2 RECOMMENDATIONS

In line with the results discussed and conclusion, the following recommendations are made:

- The modern environmental education systems, like those applied in formal school systems, should embrace a broadened approach which should include direct contact with nature from a multi-dimensional perspective. This calls for curriculum overhaul in order to redefine the role of the education system in the face of numerous local, regional and global environmental challenges. This recommendation is drawn from the finding in item 4.2.2 that it was possible to initiate deliberate curriculum reviews to promote education in the environment so as to enhance direct contact with nature in a more broadened way;
- There is need to promote participatory public policy discourse with a view to redesign national priorities in a more local responsive manner oriented towards a shared vision. This was already demonstrated by the finding in items 4.2.1 and 4.2.2 that the public was always ready to contribute once measures for its inclusion are put in place in the governance system;
- The promotion of culture should be encouraged since it has been noticed in this study to be the storage device for indigenous knowledge. For instance, the efforts by the Barcelona City Council cited in this study provided an example of how culture could contribute to local and global sustainable development;

- Appropriate measures should be put in place to enhance indigenous knowledge property rights so as to encourage the release of this knowledge in the public domain for the benefit of society. This would also call for policy measures to facilitate this possibility like those already made by the Canadian authorities and the Montenegrin government discussed in this study;
- The existing planning processes require a complete overhaul to make them responsive to local knowledge and also promote the ideal of the national decentralisation policy. This recommendation is made in the light of the finding that the existing planning systems in Zambia did not adequately provide for the active involvement of the local people in planning and decision-making processes;
- Strengthened coordination and collaboration among institutions of learning, ministries of education, local government and tourism, environment and natural resources is a necessary pre-requisite to creating a conducive environment for the authorities in both indigenous and modern knowledge systems to work together. The Germany example where there were strong linkages among various entities could serve as a learning point to reposition the perception among Zambian institutions to start recognizing the available opportunities in collaborating with other stakeholders.

5.3 SUGGESTIONS FOR FUTURE RESEARCH

Arising from this study, the following areas of research opportunities have been identified which could be explored further:

5.3.1 National Vision Formulation

Although the Zambian government came up with a national vision, vision 2030, which is '*A Prosperous Middle Income Nation By 2030*' this could just be described as a medium to long term economic objective since it was tilted towards production and consumption. It did not address the concerns of all national interests, for instance, nature conservation and heritage preservation could be threatened by such a 'vision'. Therefore, Zambia still lacked a unifying national vision that should transcend various

specific fields and interests, something where everything could buy in. For instance, Montenegrins chose to establish mutual relationship with nature and this has no time frame within which such relationship should expire. There could be need for future research in the area of national vision formulation in Zambia, that is, to propose a national vision that should be more encompassing.

5.3.2 Indigenous Knowledge Data Base

This study has revealed some examples of how indigenous knowledge could contribute to development in nearly all spheres. However, there is need to document specific and detailed verifiable strides made by indigenous knowledge in various fields preferably covering the whole country, or at least many parts than covered in this study. Further research in indigenous knowledge would also open additional avenues in finding alternative systems and methodologies to contemporary ones. Furthermore, research in this area would still be needed to venture into such indigenous technological skills that were generally considered as evil and ascertain any positive aspects that may be at the good service of humanity. For example, skills of manipulating the laws of nature for the benefit of humankind such as causing rain during off-season period could prove beneficial especially in the face of climate change.

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APPENDICES

Appendix I: Interview Guide administered to selected Government Heads of Departments in Siavonga, Zambia

Section A: Personal Information

1. What is the name of your institution or ministry.....
2. What is the name of your department in the institution/ministry?.....
3. What is your official position in your institution?.....
4. For how long have you worked in the department?.....
5. For how long have you been in this position?.....
6. For how long have you worked in Siavonga?.....

Section B: Departmental Mandate and Specific Duties

7. In summary, what is your department's mandate or delegated functions?
 -
 -
 -
8. In summary, what are your main duties?
 -
 -
 -
9. What type of information do you usually generate?.....
.....
What are the sources of the information mentioned in 11 above?.....
.....
How is the information generally collected?.....
.....
Are you involved in planning activities or functions either for your department or the district?
Yes () No ()
10. If yes,
specify.....
.....
11. Do you mainstream or integrate cross-cutting issues in your department's activities? Yes () No ()
).
12. If yes, which cross-cutting issues are these?.....
13. Do you work with the communities in your activities? Yes () No ()
14. If yes, in which activities are the communities involved?
.....
.....

.....

 15. How do communities get involved? That is, what specific roles do they play?

.....

16. Are there any new contributions in terms of knowledge or skills you have learnt from the communities which you feel deserve to be incorporated into your usual operations? Yes ()
 No (). If yes, specify.....

Section C: Networking and Partnerships

17. Do you have any stakeholders you collaborate with in your operations? If yes, mention not more than three of them and also indicate the areas or activities in which you collaborate.

S/N	Name of Stakeholder	Areas of Collaboration
1		
2		
3		

Section D: Environmental Screening

18. What are the main environmental problems facing the district and the causal factors according to you?

S/N	Environmental Problem	Suggested Causes
1		
2		
3		

19. Why do you think the above mentioned are the main environmental problems?

-

20. How did you come to know about these environmental problems?

S/N	Environmental Problem	Mode of Awareness
-----	-----------------------	-------------------

1		
2		
3		

21. Who are the most affected by these problems:

S/N	Environmental Problem	Most Affected Segments of Society
1		
2		
3		

22. What do you suggest as part of the possible solutions to the problems you identified above?

S/N	Environmental Problem	Suggested Solution
1		
2		
3		

23. What are the main environmental issues in this district and why?

S/N	Environmental Issue	Why it is an Issue
1		
2		
3		

24. Is your organisation involved in any environment related activities? If yes, specify including the partners you work with

S/N	Nature of Environmental Activity <i>e.g. sensitisation, conservation, resource use e.t.c.</i>	Participating Stakeholders
1		
2		
3		

END OF QUESTIONNAIRE

THANK YOU FOR YOUR PARTICIPATION

Appendix II: Interview Guide administered to the NGO in Siavonga, Zambia

Section A: Personal Information

1. What is the name of your organisation?.....
2. What is your official position in this organisation?.....
3. When was your organisation established?.....
4. For how long have you worked in this organisation?.....
5. For how long have you been in this position?.....
6. For how long have you worked in Siavonga?.....

Section B: Organisational Mandate and Specific Duties

7. Where does your organisation draw its authority to exist from?.....
.....
.....
8. In summary, what are your organisation's mandates or delegated functions?
 -
 -
 -
 -
9. In summary, what are your main duties?
 -
 -
 -
10. What type of information do you usually generate?.....
.....
What are the sources of the information mentioned in 12 above?.....
.....
How is the information generally collected?.....
.....
Are you involved in planning activities or functions either for your organisation or the district? Yes () No ()
11. If yes, specify.....
.....
12. Do you mainstream or integrate cross-cutting issues in your department's activities?
Yes () No ()
13. If yes, which cross-cutting issues are these?.....
14. Do you work with the communities in your activities? Yes () No ()
15. If yes, in which activities are the communities involved?

.....

 16. How do communities get involved? That is, what specific roles do they play?

17. Are there any new contributions in terms of knowledge or skills you have learnt from the communities which you feel deserve to be incorporate into your usual operations? Yes () No ().
 If yes, specify.....

Section C:Networking and Partnerships

25. Do you have any stakeholders you collaborate with in your operations? If yes, mention not more than three of them and also indicate the areas or activities in which you collaborate.

S/N	Name of Stakeholder	Areas of Collaboration
1		
2		
3		

Section D: Environmental Screening

26. What are the main environmental problems facing the district and the causal factors according to you?

S/N	Environmental Problem	Suggested Causes
1		
2		
3		

27. Why do you think the above mentioned are the main environmental problems?

•

28. How did you come to know about these environmental problems?

S/N	Environmental Problem	Mode of Awareness
1		
2		
3		

29. Who are the most affected by these problems:

S/N	Environmental Problem	Most Affected Segments of
-----	-----------------------	---------------------------

		Society
1		
2		
3		

30. What do you suggest as part of the possible solutions to the problems you identified above?

S/N	Environmental Problem	Suggested Solution
1		
2		
3		

31. What are the main environmental issues in this district and why?

S/N	Environmental Issue	Why it is an Issue
1		
2		
3		

END OF QUESTIONNAIRE / INTERVIEW

THANK YOU FOR YOUR PARTICIPATION

Appendix III: Interview Guide Administered To the NGO In Boka Kortoska Bay Region, Montenegro

Section A: Organisational Identification

1. Name _____ of _____ Representative:
Prof/Dr./Mr./Mrs/Ms:.....
2. Position _____ (title) _____ of
Representative:.....
3. What is the official name of your organisation?.....
4. When was the organisation established?.....

Section B: Organisational Mandate and Functions

5. What is the source of the organisation's authority?.....
6. What are the main duties (functions) of the organisation?.....
7. Are there any activities or programmes dealing with the environment (nature) among the organisation's functions? If yes, specify.

Section C: Networking

8. Does the organisation collaborate with any other stakeholders in all or some of the functions? If yes, specify as shown below:

S/N	Function / Activity / Programme	Stakeholders / partners involved
1		
2		
3		

9. Are there any communities involved in some of the activities? If yes, specify.

Section D: Environmental Screening and Mainstreaming

10. What are the main environmental problems facing the **Boka Kortoska Region** and the causal factors according to you?

S/N	Environmental Problem	Suggested Causes
1		
2		
3		

11. Why do you think the above mentioned are the main environmental problems?

.....
.....

12. How did you come to know about these environmental problems?

S/N	Environmental Problem	Mode of Awareness
1		
2		
3		

13. Who are the most affected by these problems:

S/N	Environmental Problem	Most Affected Segments of Society
1		
2		
3		

14. What do you suggest as part of the possible solutions to the problems you identified above?

S/N	Environmental Problem	Suggested Solution
1		
2		
3		

15. What are the main environmental issues in this region and why?

S/N	Environmental Issue	Why it is an Issue
1		
2		
3		

16. Is there any legislation or policy dealing with environment in this country?
Specify.....

17. Are there any local by laws or legislation dealing with local environmental issues and problems?
Specify.....

18. Has the national education system incorporated environmental issues? If yes, specify.

19. Are environmental issues mainstreamed or integrated in other sectors, ministries?

20. Are there any indigenous systems or knowledge about environment (nature) that have been identified and integrated in the mainstream sectors by government?

THE END

THANK YOU FOR YOUR PARTICIPATION

Appendix IV: Interview Guide for Traditional Leaders, Zambia

Section A: Personal Details

1. Name of Respondent.....
2. Position:.....
3. Name of Royal / Traditional Authority:.....
4. Name of Area:.....
5. Name of Village:.....

Section B: Familiarity with Study Area by Respondent

6. For how long have you lived in this area? years
7. Have you ever lived elsewhere other than in this area?
8. If yes, where else have you lived?.....
9. For how long?..... years
10. What is your current occupation?.....
11. What was (were) your previous occupation(s), if any?.....
12. Have you ever attended any formal school?.....
13. If yes, what is the highest level of modern education you attained?

Section C: Assessment of Environmental Change and Indigenous Knowledge

14. What challenges do you currently face in your pursuit for livelihood?
15. For how long have you experienced these challenges?
16. What could be the causal factors of these challenges?
17. What have you done to address the challenges?
18. What else should be done to address them?
19. Who should be involved in addressing the challenges?
20. How did you come to know about these challenges?
21. Are the young people in your area aware of these challenges?
22. What major changes have you observed, if any, in your environment when comparing to some years back, e.g. 20 years ago and now? Give examples?

Section D: Governance, Legislative and Conservation Systems Assessment

23. How is the governance structure like in this area?
24. Are there any local regulations that were in force to ensure the protection of nature and natural resources?, If yes, specify
25. Are these regulations still in force today? If no, explain why
26. Are there any new things that this society has learned from modern ideas and systems of protecting nature and bringing about development? If yes, specify

27. How do you compare, in terms of effectiveness and relevance, the current Zambian laws and systems with those that were established by the traditional leadership long before the advent of modern systems?
28. How can the modern systems be improved upon by the indigenous systems referred to in 26?
29. How can the indigenous systems be improved upon by the modern systems?

.....

THE END

THANK YOU FOR YOUR COOPERATION

Appendix V: Interview Guide for Focus Group Discussions for selected Community Groups

1. What are the main environmental challenges facing this community?

.....
.....

2. What are the likely causes of these problems?

.....
.....

3. How did you come to know about these problems?

.....
.....

4. What should be done to address these problems?

.....
.....

5. Who should be involved in solving the problems?

.....
.....

THE END
THANK YOU VERY MUCH FOR YOUR TIME