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Forest/Woodlands Resource Conservation and Environmental Education in Rural Africa: A Comparative Study of Nigeria and South Africa

Ayodeji Peter Ifegbesan

Student No. 0307925R

School of Education
The University of the Witwatersrand, Johannesburg

Supervisors:

Prof Shirley Pendlebury,
The University of the Witwatersrand, Johannesburg
and
Prof Harold Annegarn,
University of Johannesburg

A thesis submitted to the Faculty of Education,
The University of the Witwatersrand, Johannesburg,
in fulfilment of the requirements for the
Degree of *Philosophiæ Doctor*
29 July 2009

Declaration

I, Ayodeji Ifegbesan, Student Number 0307925R, declare that this doctoral thesis is my own unaided work, except to the extent explicitly acknowledged.

This thesis is being submitted for the Degree of *Philosophiæ Doctor*, Faculty of Education, University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination to any other University.

Parts of this work have been published as follows:

Ifegbesan, A.P., S. Pendlebury and H.J. Annegarn (2009) Forest people, two countries and one continent: what empirical connections? *International Research in Geographical and Environmental Education,* Vol. 18, No. 1, 45–56.

_____ _____

Ayodeji Peter Ifegbesan Date

Dedication

This work is dedicated to the loving memory of my late mother,

Omobowale Comfort Ifegbesan,

who slept in the Lord on 13th June 2004.

Abstract

Several recent studies have recognised the importance of forests in sub-Saharan Africa because these forests, with varying levels of degradation, form a significant proportion of global forests. Equally acknowledged and well documented are the levels of dependency on these resources by rural people, who constitute the majority of the continent's population. Various policies and legal responses have been established and implemented at international, regional and national levels but these have failed to reduce the dependence on and degradation of forest resources. However, relatively few studies and environmental education programmes have been directed at understanding the social and cultural dimensions of forest resource use and conservation across African countries. There is a significant gap in the understanding of the socio-economic issues in forest resource conservation and environmental education among rural people, especially from cross-country perspectives. Thus, the purpose of this study has been to undertake a comparative analysis of knowledge, attitudes and practices towards forest resource conservation and environmental education between the rural inhabitants of Ijebu in Ogun State, Nigeria and the rural people of Bushbuckridge in Mpumalanga Province, South Africa. This comparison was done to develop a conceptual framework which could guide policy recommendations and intervention programmes in the study areas. The study explored the differences and commonalities in the socio-economic activities of the targeted rural communities with respect to their knowledge, attitudes and practices toward forest resource conservation. The central question addressed was: How do socio-demographic variables in the two countries (such as gender, education, occupation and livelihood) relate to forest resource conservation relative to the local knowledge, interest, awareness, attitudes and practices of the people? In addition, this study interrogated the attitudes and understanding of rural people regarding government forest policies and environmental education initiatives.

As an inter-disciplinary study, both political ecology and planned behaviour theories were used as the basis of the theoretical framework. Because of the nature of the study and gaps identified in previous studies, a combination of both qualitative and quantitative techniques were employed (such as in-depth interviews, focus group discussions, document analysis, participant observation, informal conversations and questionnaires). Using a questionnaire, 600 randomly selected households (from six rural communities in the two countries) were surveyed. Participants' responses were subjected to analysiss using descriptive and inferential statistics. Content analyses of recorded in-depth-interviews, focus group discussion and documented forest policies were carried out, and related to the survey results.

Notwithstanding regional differences, and contrary to expectation, the study found a greater range of convergence (rather than divergence) between the communities in the two areas. Even though statistical differences were observed in the areas of knowledge, interest, awareness, importance, and practices of forest resource conservation among the people, there were surprising similarities in their attitudes and understanding – and low support for government forest policies. There was an overwhelming dependency on forest resources at household and national economy

levels in both study areas and specifically in the two target groups. It was discovered that socio-demographic variables (gender, education, and age) interacted with knowledge, interest, awareness, importance, attitudes and practices of forest resource conservation. The results indicated that the correlations found between the genders, and their attitudes and practices, are common in both countries.

This research is the first cross-cultural and national environmental survey to be undertaken between these two countries and regions. The study contributes towards a greater understanding of both the potential impacts and limitations of forest conservation policies (as instruments to achieve sustainable development in the forest resource-rich areas of developing countries) and the currently under-utilised role of community based environmental education in promoting forest conservation. This study suggests various policy and environmental educational options to minimise the trade-off between forest conservation and human livelihood by addressing the fundamental socio-economic, cultural and political constraints that affect the design and implementation of forest conservation initiatives. In addition, this research has demonstrated that understanding the ways in which meaning is socially constructed and contested in relation to forest resources is important for effective forest protection, management and conservation.

Acknowledgements

First and foremost, I like to give thanks to the Almighty God for making my dream come true and for granting me strength and good health to complete this study. Without Him, all my efforts would have been fruitless. But, because He is the only one who knows our fate, He is the reason I was able to further my studies at The University of the Witwatersrand, Johannesburg, South Africa.

Two professors to whom I owe a lot of gratitude are my supervisors: Harold Annegarn and Shirley Pendlebury. I enjoyed their support, encouragement, positive feedback and interest in the research. I thank them, not just for the supervision of the thesis, but also for the financial and material support, and, most importantly, for providing me with a laptop in the summer of 2004. It was this most precious and unexpected gift which enabled me to complete this study. Prof. Ray Basson, my first supervisor, also did much to facilitate this work. Thanks to my external examiners for their critical and constructive suggestions on both the research proposal and the thesis. Thanks are also due to Lisanne Frewin for language and grammar proofreading.

I thank my family, especially my darling wife, Wunmi – you, with your love, patience and encouragement – were crucial to my achievement. To my little boy, Timi, my source of happiness, thanks for bearing the pain of separation. I am sorry for not being there for you in your first four years of life. Special thanks to my brothers and sisters. Thank you for your love and understanding, and for sharing the ups and downs with me. It is your love, support and trust in me that helped keep me motivated throughout my studies. **I love you all.** To my Mother and Father, thank you both for your love of education and for sending me to school – which laid the foundation of today's achievement. It grieves my heart that Mama did not live to celebrate this joyous occasion with me. Mama, thanks for everything you did for me when I was growing up. You will never be forgotten and will always be honoured among good mothers. May your soul rest in peace.

Special thanks to the following people: Professors Biodun Ogunyemi, Yemisi Erinosho, L. Abeke Adesanya and Dapo Sotonwa, for constantly reminding me of the significance of this journey. Thanks also to Messrs. Ayoola Ayodele, Wale Salami and all those who can lay claim to have contributed to the success story. My special thanks to my data analyst, Sulaiman Salau, for doing the job promptly and teaching me a few statistical techniques.

This thesis could not have been written without the cooperation and understanding of those who were there and living out the events described in this report. For this reason, I thank the headmen and chiefs and all the villagers of the six communities in Nigeria and South Africa for letting me take part in their village life. Thank you for your patience in answering my questions – many of which perhaps seemed irrelevant and often repetitive. To quote one respondent in one of the study communities in South Africa: "*You are asking too much questions, what do want to gain from all the trouble?*" I am equally grateful to my interpreters and field research assistants, who did an excellent job of explaining my rather abstract and academic questions to the locals and taught me many things about the Shangaan people. I thank Morris Siyabulela, who was my guide and who helped me to establish contact with the people in the study areas in South Africa.

My sincere appreciation and deepest gratitude go to The University of Witwatersrand, Johannesburg, South Africa for the scholarship awards. This work was supported in part by the National Research Foundation, through a Focus Area Grant: FA2005040600018 "Sustainability Studies Using GIS and Remote Sensing" to Prof Harold Annegarn. The fieldwork in South Africa was supported by the Transboundary Protected Areas Research Initiative (TPARI), a programme running under the auspices of the IUCN South Africa, and which is funded through the Centre for Integrated Study of the Human Dimensions of Global Change, by way of a cooperative agreement between the National Science Foundation (SBR-9521914). I thank Dr Wayne Twine, Project Coordinator of the Sustainable Use of Natural Resources in African Environments (SUNRAE) project, based at Wits Rural Facility, for his assistance and support during the pilot and main studies in South Africa.

I thank the authorities of Olabisi Onabanjo University for granting me study leave to pursue this doctoral study and granting extended leave of absence for the study periods in South Africa.

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List of Abbreviations

BWCA	Bénoué Wildlife Conservation Area
CBO	Community Based Organisation
CBD	Convention on Biological Diversity
CCD	Convention on Combat of Desertification
CEEP	Community Environmental Education
CEPRU	Community Education and Public Relations Unit
CIFOR	Centre for International Forestry Research
CITES	Convention on International Trade in Endangered Species of Wildlife Fauna and Flora
DWAF	Department of Water Affairs and Forestry
EE	Environmental Education
EEFCKAPQ	Environmental Education and Forest/Woodlands Conservation Knowledge, Attitude and Practices Questionnaire
ECOWAS	Economics Community of West Africa States
FAO	United Nations Food and Agriculture Organisation
FGD	Focus Group Discussion
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
IDI	In-depth Interviews
IUCN	International Union for the Conservation of Nature and Natural Resources
IIED	International Institute for Economic Development
MDG	Millennium Development Goals
NEPAD	New Economic Partnership for African Development
NEAP	National Economics Advancement Programme
NWFP	Non-Wood Forest Products
NTFP	Non-Timber Forest Products
NCF	Nigerian Conservation Foundation
NGO	Non-Governmental Organisation
NEEDS	National Empowerment and Economics Development Strategy
NEST	Nigerian Environmental Study/Action Team
NFAP	National Forestry Action Programme
OAU	Organisation of Africa Unity
PPMC	Pearson Product Moment Correlation
PA	Place Attachment
RI	Regional Identity
SADC	Southern Africa Development Community
SEAP	State Economics Advancement Programme
TFCA	Transboundary Forest Community Areas
WSSD	World Summit on Sustainable Development
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNDP	United Nations Development Programme
UNCED	United Nation Conference on Environment and Development
WCED	World Commission on Environment and Development
WRI	World Resources Institute
WCMC	World Conservation Monitoring Centre
WCFSD	World Commission on Forests and Sustainable Development

CHAPTER ONE

"*The beauty of this land prompts me to plead for its preservation for future generations. If you love your Homeland, don't let this plea remain unanswered.*" His Holiness John Paul II, Zamose, June 1999.

1 Introduction

For centuries, forests have been part of the economic, socio-cultural and spiritual life of many countries in sub-Saharan Africa. The roles of forests, in the provision of a wide range of timber and non-timber forest products (NTFPs) and related services, have long been recognised by scholars. Forests provide products for different uses (including wood for construction, fuelwood, food and nutrition, medicine, fodder and other related domestic requirements) to both rural and urban populations (Ormsby & Kaplin, 2005; Mengistu, 2006; Appiah, 2009; Katerer *et al.*, 2009). Recently, the importance of forests as carbon sinks in climate change is increasingly being recognised (Heino, 2008; FAO, 2009). The alarming rate at which forest resources were (and are) being over-exploited has caused the emphasis to shift from natural regeneration towards the protection and conservation of the remaining forests and renewed efforts towards increasing tree cover on already degraded land.

Rural people's perceptions and attitudes towards forest resources have been found to influence the kind of interaction they have with the forest – which will invariably influence to what extent and how their local forests will be conserved (Ite, 1996; Mehta & Kellert, 1998; Marcus, 2001; Ormsby & Kaplin, 2005). Understanding people's attitudes and perceptions is crucial. Thus, for any forest resource conservation policies and programmes to be successful, there is a need for programmes aimed at understanding the interactions or relationships that exist between people and forests, the decisions made and the actions taken – most of which will be based on the knowledge, perceptions and alternatives available to the local people.

Conservation of natural resources (in general) and forest resources (in particular) are attitudinal, which requires changes in people's perceptions, the way they think and behave while using forest resources. Therefore, there is a need to assist local people/communities not only to possess – but also to encourage them to display – positive attitudes towards forest resource conservation practices. For conservation to be successful, it should first take into consideration the people who live in or adjacent to the forests. Educating individuals about environmental issues should enable people to develop the knowledge, attitudes, and skills that will increase the chances they will become good environmental citizens (Mabogunje, 2007; Jonathan, 2008; Wangari, 2008; Ogunyemi & Ifegbesan, 2011).

The significance of socio-cultural and demographic elements, including attitudes and behaviour in forest conservation, as well as the participation and policy awareness of rural people,

is attracting recognition in the literature (Appiah, 2009; Katerer *et al.*, 2009; Lepetu & Oladele, 2009). However, little is known about how rural people – in many countries and cultures – perceive the forest. Little research has been focused on community environmental education for forest people. Moreover, little is known about what leads people to the concerns expressed or held about forests and forest conservation. Only a few studies have looked specifically at forest resources conservation across countries (Frost, 2000; Ashley, 2000; Gardner & Stern, 2002; Rauwald & Moore, 2002; Kohler & Schmithusen, 2004; Oskamp & Schultz, 2005; Poffenberger, 2006; Ferrari, 2009; Rasul & Karki, 2009). The present study contributes to expanding research in forest resource conservation attitudes and practices, as well as environmental education, in Nigeria and South Africa.

1.1 The research aim

The aim of this research was to undertake a comparative analysis of the socio-institutional construction of forest resource conservation and environmental education practices among rural inhabitants (of Ijebu division in Ogun State, Nigeria, and the Bushbuckridge district in Mpumalanga Province, South Africa), towards developing a conceptual framework that could guide intervention programmes in community-based environmental education. A secondary aim of this multi-disciplinary research was to examine the relationship between the people's socio-demographic characteristics, knowledge, attitudes and practice towards forest resources conservation.

1.2 Research Objectives

Four major objectives were formulated to help define this research initiative. These are:

- Analyse policy documents to (i) ascertain the official perception of forest resources and environmental education; and (ii) identify the various levels of authorities' involvement in the management of forest resources and (iii) identify the strategies for promoting forest resource use, access, conservation and environmental education, in Nigeria and in South Africa.
- Assess the social construction, knowledge, importance, attitudes and practices of forest resources conservation, and the exposure to environmental education, among the rural inhabitants in rural districts in two countries: Ijebu Division, Ogun State, Nigeria and Bushbuckridge district, Mpumalanga Province, South Africa.
- Compare the socio-institutional construction, knowledge, importance, attitudes and practices of forest resource conservation of rural people in both Ijebu Division, Ogun State, Nigeria and Bushbuckridge district, Mpumalanga Province, South Africa.
- Determine the relationship between, and the contributions of, socio-demographic variables of rural people and their knowledge, importance, attitudes and practices of forest resource conservation in Ijebu Division, Ogun State, Nigeria and Bushbuckridge district, Mpumalanga Province, South Africa, and the potential role of environmental education in shaping future understanding.

1.3 Research Questions

In pursuance of the aim and objectives of this study, the central research question was raised:

> What are the socio-institutional constructions of forest resource conservation and environmental education practices among the rural inhabitants of Ijebu division, Nigeria and Bushbuckridge, South Africa, and how do their socio-demographic characteristics contribute to the local knowledge, attitudes and practices of forest resource conservation?

Arising from this are series of specific research questions relative to each objective. In relation to the first objective, it was asked:

> What similarities and differences exist – between Nigeria and South Africa – in the provisions of the forest policy about (i) perception of forest and forest resources; (ii) aim and objectives; (iii) structure of authority; (iv) strategies for conservation; (v) rural livelihood and poverty; (vi) community participation; and (vii) environmental education and public awareness?

The following questions were raised in relation to the second objective:

> What are the levels of meaning, importance, knowledge and use of forest resource among rural inhabitants in Ijebu Division in Ogun State, Nigeria, and the Bushbuckridge district, Mpumalanga Province, South Africa?
>
> What are the general attitudes and practices of forest resource conservation among rural inhabitants in Ijebu Division in Ogun State, Nigeria and the Bushbuckridge district, Mpumalanga Province, South Africa?
>
> What are the levels of exposure of the rural inhabitants, in Ijebu Division in Ogun State, Nigeria and the Bushbuckridge district in Mpumalanga Province, South Africa, to environmental education?

The following question was raised for objective three:

> Are there significant differences, across their socio-demographic variables – in knowledge, importance, attitudes and practices of forest resource conservation – between the rural inhabitants in Ijebu Division in Ogun State, Nigeria, and those in the Bushbuckridge district in Mpumalanga Province, South Africa?

The following questions were raised for objective four:

> Are there significant relationships between the socio-demographic characteristics and knowledge, importance, attitudes and practices of forest resource conservation in rural inhabitants in Ijebu Division, Ogun State, Nigeria, and Bushbuckridge District, Mpumalanga Province, South Africa?

To what degree do the socio-demographic characteristics of rural inhabitants predict their knowledge, importance, attitudes and practices of forest resource conservation in Ijebu Division in Ogun State, Nigeria, and Bushbuckridge district in Mpumalanga Province, South Africa?

To what extent can community-based environmental education contribute to shaping knowledge and practices towards conservation and sustainable use of forest practices in both study areas?

1.4 Background and Rationale

There exists a broad body of literature which documents the environmental crisis in countries of sub-Saharan Africa, particularly as it relates to forests and forest degradation. How much of the environment is degraded and what impact this has on human livelihood has been a subject of research among scholars. Over the last four decades, there has been increasing concern – expressed by international development agencies – for the conservation of the tropical forest to preserve the abundant biodiversity of these habitats from the threat of extinction. Climate change, loss of biodiversity, ozone layer depletion, and trade in endangered species are only a few of the major environmental threats that have led to these global concerns (Twine *et al.*, 2003; Shackleton, 2004a; FAO, 2007; 2009).

Globally, more than 13 million hectares of natural forest are estimated to be disappearing every year. Of this loss, Africa contributes approximately four million hectares of its natural forest per year (that is 0.62% per year); Africa's losses are equivalent to one-third of the annual global deforestation – and the highest rate in the world (Heino, 2008; FAO, 2009).

Many scholars and international development agencies (Ogbonnaya, 2003; FAO, 2005; 2007; 2009; Asiodu, 2007; Mabogunje, 2002; 2008; Wangari, 2008; Jonathan, 2008; FAO, 2009; Agagu, 2009) agree that, if current trends continue, most tropical forest will soon be completely destroyed. Today's extinction rates are unprecedented and unsustainable; and require urgent attention. The forests support half of the world's five to thirty million species. Concerns about the alarming rates of deforestation caused a shift towards the conservation of the remaining forests, and renewed efforts to increase tree cover on already degraded land.

FAO (1997) identified two separate definitions of 'forest' in relation to two contexts – developed and developing countries. In developed countries, 'forest' refers to land with tree crown cover (stand density) of more than ~20% of the area. The trees must usually grow to more than seven metres in height and must be able to produce wood. In the context of developing countries – a category to which all countries on the African continent belong – 'forest' refers to an ecosystem with a minimum of 10% crown cover of trees and/or bamboo, generally associated with wild flora, fauna and natural soil conditions, and not subject to agricultural practices (FAO, 1997; 2001a; 2005). In this thesis, the term 'forest' refers broadly to all kinds of forests, ranging from relatively untouched 'natural' ones, to those with high levels of intervention and management. 'Natural' forests are the focus of most conservation concern, although highly managed forests can also be an

important source of biodiversity. 'Forest' is used here in its generic sense to cover all classes of natural forests as a natural resource, including both plants and forest wildlife.

Forests are home to 300 million people around the world and directly contribute to the livelihoods of approximately 90% of the 1.2 billion people living in extreme poverty; indirectly forests support the natural environment that nourishes the agriculture and the food supplies of nearly half the population of the developing world; and forests constitute a major source of national wealth. In addition, they provide immensely important environmental services – maintaining soil stability, protecting water flow and quality, regulating global climate through carbon sequestration, and serving as the repository of the bulk of terrestrial biodiversity. Yet, for the large part, forests continue to be poorly managed and indiscriminately felled at unsustainable rates (World Bank, 2002a; FAO, 2007, 2009).

According to FAO (2009), sub-Saharan African forests comprise just 16% (i.e. 635 million hectares) of global forest cover and provide homes and livelihood for the majority (80%) of the rural population of Africa. However, because of the degradation of the forests local rural inhabitants, who depend on their forests for their livelihood, face threats to their survival (FAO, 2007; 2009).

People in rural areas are there to stay. They represent the majority of the world population and make up over 70%, or 840 million, of the world's poor. In 2000, they constituted approximately 53% of the world population and were expected to account for 49% (~34 billion) by 2010. In Africa, the poor rural population constituted 64% (or ~526 000 million) in 2000, and 620 000 million; (60.1%) of the total population of the continent in 2010 (World Population Prospects, 2006, 2007, downloaded on 2/3/2010 from http://esa.un.org/unup).

Rural people often depend heavily upon natural resources for their livelihood. Forest resources are the life support for many rural communities. These communities live in and out of the forests using forest resources for their daily needs, depending on these resources for food, firewood, medicinal plants, materials for construction, home crafts and for many other needs. Forest resources play a vital role in the economic, social and cultural survival of these people. The local forest is home for local people as well as for the numerous species of plants and animals – many of which are facing the threat of extinction because of human activities (Ambrose-Oji, 2003; Scherr *et al.*, 2004; Shackleton & Shackleton, 2004; Belcher *et al.*, 2005; Mengistu, 2006; Shackleton *et al*., 2007).

Over and above tangible benefits, forest/woodlands also have (and serve) cultural and religious purposes (http://www.unep.org/aeo/129.htm, downloaded on 06/5/2003). Rural communities value forests in different ways. The variety of cultural values and symbolic functions ascribed to the forests are as numerous and diverse as the communities and cultures of the continent. Apart from being sources of food, medicine and other utility items, forests have cultural value for those who live within or near them. There are forests which are sacred and are used for religious, judicial and cultural ceremonies. In many communities of West Africa, forests are locations for social, cultural and religious activities. They are seen as homes of the spirits of the ancestors, with mystical powers for healing and protection (IUCN/WWF/UNEP, 1991a).

Rural people value and manage the forests and woodlands. Households, extended families, clans, and tribes manage natural resources by restricting access to certain areas and to specific resources. Harvesting of products from these forests is regulated by the elders and mostly only allowed for the extraction of medicinal plants. This regulated access to the forests helps to conserve a large number of species, thus acting as a reservoir for future use. These practices aim at the conservation and management of resources within sustainable levels. Any research that deals with the conservation, utilisation and development of forest resources has to take into account this range of social practices and understandings.

Nigeria is a country well-endowed in forest resources. Its forest/woodland resources cover ~9.8% of the total land area. A few decades ago, tropical rain forest covered approximately 39% of the southern part of the country; tropical deciduous forest (immediately to the north) covered another 39%; tropical xerophytic woodland covered the northernmost 22% (Federal Republic of Nigeria, 1999; EC-FAO, 2003; Mabogunje, 2008). However, Nigerians, because of their rapacious and inconsiderate exploitation of the environment and its resources, have degraded much of these forested areas, through various activities – urbanisation, bush burning, farming, fuelwood, logging for timber, grazing, hunting and gathering of natural products. The country's natural vegetation has been reduced by 94% in the last century – from 600 000 km^2 in the 1880s to a dwindling 38 620 km^2 in the early 1990s. A recent government study, tagged *Vision 2010* (Federal Republic of Nigeria, 1997), revealed that, between 1976 and 1980, deforestation proceeded at an average rate of 400 000 hectares per annum; in 1981—1990 deforestation was occurring at 3.6% per annum, triggering international agencies to react to the situation in Nigeria. For example, the Food and Agricultural Organisation (FAO) observed that if deforestation continued unabated at this rate, the remaining forest area in the country would have disappeared by the year 2020 (Adeleke, 1995; FAO, 2001a; World Bank, 2001a).

With over 75 million people living in the rural areas, and over 60% considered to be living in poverty, there is no doubt that the majority of the poorest people in Nigeria depend directly on natural resources for their livelihood. In addition, the national economy also depends on services provided by natural resources. Nigerians depends on wild sources of protein supply – including snails, rodents and insects – with little or no regard for perpetuity. These forest resources cater for shelter, food and domesticated livestock for the rural populace (Federal Environmental Protection Agency, 1992; Nigerian Tribune 1997; Oyediji, 1998; The Guardian, 2004).

It has been established that the majority of rural people rely on fuelwood for domestic cooking – because of the increase in the price of kerosene, more rural dwellers and urban poor have abandoned their kerosene stoves in favour of the cheaper fuelwood and alternative energy sources. At present, fuelwood constitutes the main source of fuel for cooking for over 76% of the Nigerian population. The evidence suggests that Nigerians consume 263 000 metric tonnes of fuelwood annually (UNDP, 1993; Ogunyemi & Raheem, 2005; Agagu, 2009). As Jonathan (2008:7) wrote: "*Nigeria's environmental resource base is being undermined by unsustainable practices. Deforestation is high at 3.5% yearly and is being encouraged by use of fuelwood for cooking, a common phenomenon in rural areas."*

When the Nigerian government deregulated the downstream sector of oil, with increases in the prices of petroleum products (such as petrol, diesel and kerosene) by over 50% on 20 June 2003 and with further price hikes (on 1 October 2004 and recently in January 2012), it was obvious that this decision would have far-reaching effects on the environment. The consequence of the increase in prices on forest depletion was predictable. Kerosene has become a luxury item and only a minority of Nigerians can now afford to use it for cooking (Abiodun, 2003). Nnimmo (2003) observed that the new price regimes brought pain, misery and despair to the Nigerian masses and expressed concern that those who could no longer afford gas and kerosene would resort to felling trees to get fuelwood, leading to massive deforestation, biodiversity and habitat loss, including siltation of streams because of extensive land cover clearing.

South Africa, though not as richly endowed in forest resources as Nigeria, derives ~2.8% of the gross domestic product (GDP) and supplies 90% of domestic demand for firewood and 8.7% of agricultural output from forests. An estimated one third of households in South Africa rely on forest products for survival and livelihood (DWAF, 1997; FAO, 2004; Shackleton & Shackleton, 2004). There are two kinds of forest cover – namely, natural forests and woodland, and forest plantation. The natural forest/woodlands cover less than 1% of the total landscape, with the largest natural forests in the Knysna region. However, this forest has been reduced as a result of conversion of land for residential development and agriculture, and through the felling of trees for fuel and medicine (DWAF, 1997). Although most forests are protected, many people from adjacent communities have traditional-use rights to forests. Increasing demand for medicinal materials from forests depletes the tree populations. Rural people constitute 40% (~16 million) of the total population of South Africa; the majority of rural people rely on the natural resources of the environment for livelihood. It is estimated that ~11 million tons of wood is used per year, of which 6.6 million tons is harvested from natural woodlands (www.forestry.co.za/forestry.nsf/link).

Decline of forest cover is a complex socio-economic, cultural and political event. The depletion of forest resources is driven by a variety of socio-economic and environmental factors (such as population growth, illiteracy, corruption, economic and political power, attitudes towards forest, flaws in the market system and structural adjustment policies) (Contreras-Hermosilla, 2000; Ogunyemi & Raheem, 2005; Mabogunje, 2008; Agagu, 2009). The most obvious costs are loss of biodiversity, reduction in woods, soil erosion and landslide, increase in trace gas emission, climatic change and change in the hydrologic process and desertification. In response to these concerns, governments in developing countries, where most of the forests lie, have reacted through various policies measures, most of which have their root in international resolutions and declarations aimed at the protection and conservation of these fragile ecosystems. Empirical evidence from many developing countries shows that – faced with persistent population growth, economic depression, unfavourable government policies, inflation and poverty – rural people have turned their attention and energy to the exploitation of the forest resources for survival (Aina & Salau, 1992; O'Brien & Claridge, 2002). The World Conservation Strategy Report (IUCN/WWF/UNEP, 1991b) reported that "…*hundreds of millions of people in developing countries are compelled to destroy the resources in order to overcome starvation and poverty, but with the consequence that the rural poor have over the years so stripped the land of trees and shrubs for fuel that now many communities do not have enough to cook or keep warm.*" (IUCN/WWF/UNEP, 1991b). In addition,

rural inhabitants harvest fuel-wood, bushmeat and other resources for sale to urban settlers in an attempt to make income. This process, in turn, aggravates the depletion and degradation of forests and woodlands.

In view of the foregoing, those scholars and leaders concerned with natural resource conservation have asserted that efforts to conserve and reverse the detrimental environmental practices have to include an educational approach. According to UNESCO (2006) education at all levels and in all its forms should help people of all ages to understand the environment they live in and inter-relationships between problems – such as mass poverty, unsustainable consumption pattern, environmental degradation, urban decay, population growth, gender inequality, diseases, and conflict – that threaten the future. Chapter 36 of the *Agenda 21* document released by the Earth Summit states:

> *"Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues … it is critical for achieving environmental and ethical awareness, values and attitudes, skills and behavior consistent with sustainable development and for effective public participation in decision-making. Formal education, public awareness and training should be recognised as a process by which human beings and society can reach their full potential." (*World Wildlife Fund for Nature, 1994:3)

Education enables us to understand ourselves and others; it is our link to the wider natural and social environment. As is evident from the above quote, supportive attitudes are an important element towards improving the environmental awareness of citizenry. Understanding public attitudes about the environment is one component of conservation. There is evidence (Badola, 1998; Obiri & Lawes, 2002; Robertson & Lawes, 2005; Silori, 2007) that understanding people's forest attitudes both provides a framework for the future of forest resource conservation and informs future efforts in environmental education.

There is a wide range of literature that addresses the issue of environmental education. (A more thorough review of that literature, as relevant to this research, will be pursued in Chapter Three). For the present, it is sufficient to note that, since the 1972 UN Conference on Human Environment held in Stockholm, environmental education has been very much on the international agenda. 'Recommendation 96' in that conference declaration identified 'environmental education' as one of the most critical elements in seeking a sustainable environment and addressing the world environment crisis (UNESCO-UNEP, 1985). Environmental education is defined as *"…a lifelong, multidisciplinary approach to teaching, mass communication, community participation or some other activity aimed at the development of a world population that is aware of, and concerned about, the environment, and has knowledge, skills, attitudes, motivation, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones…"* (UNESCO, 1978 cited in Moseley, 2000:24) Since Stockholm 1972, several other conferences have taken place including: 1992 UNCED *Earth Summit* held in Rio de Janeiro; 1997 Thessaloniki Conference; 2007 4th International Environmental Education Conference, India; and the 1st World Environmental Education Congress in Portugal, 2003; 4th World Environmental Education Congress in South Africa, 2007. All have agreed that environmental education is the

process through which individuals can get to know the environment, how to live in it and how to modify their behaviour to reasonably support human survival (Mangane, 1992; Sauve, 1996; Nwabueze-Ezeanya, 1999; Lotz-Sisitka, 2005; Sauvé *et al.*, 2007).

Environmental education is linked to development because it is through education (in its broadest sense and not just through formal schooling) that communities can be assisted to raise their awareness of environmentally unfriendly practices (and how to erase them). Education can nurture a new environmental consciousness which will result in a better symbiotic relationship between man and nature. Many environmental educators believe that environmental education is fundamental to effecting changes in environmental attitudes and behaviour (Milbrath, 1989; Wangari, 1992; Maloney, 1996; Palmer, 1995). Environmental education also aims to teach critical thinking skills that involve problem solving, decision-making, occupational skills and attitude development based on socio-economic, political norms, morals and relations in the community (Gayford, 1996; Hart, 2002; Gough, 2004). Thus, community-based environmental education programmes are needed to specifically address the awareness level and environmental concerns of the rural population, including their cultural values and perceptions of nature.

Part of the rationale for this research lies in the fundamental assumption that the causes of forest degradation cannot be addressed through technological innovation alone. An effective long-term solution requires an integrated approach that addresses the social, cultural, economic and ecological issues of human-environment interaction – as articulated in the World Summit on Sustainable Development (WSSD) Report (United Nations, 2002). It is essential that the different ways people understand and relate to the forest/woodlands resources be explored, especially among rural people whose livelihood depends on forest resources. It is important that people be assisted to re-examine and re-define their social construction, attitudes, practices and beliefs towards forest/woodlands resources for sustainable living. Members of rural communities, where large portions of the resources are located, need to be well-informed and educated on the consequences of their actions – and inaction – with respect to the environment and their own future. The research presented in this thesis assumes that environmental educators should first understand people's values, attitudes and practices towards forest resources before teaching them about forest conservation for future generations. In other words, it assumes that an insightful understanding of people's social construction of, and perceptions relating to, forest/woodlands resource conservation is necessary before an effective environmental education programme can be developed and implemented**.**

An overview of the literature shows that research efforts, across the world, in environmental education (over the last three decades) have concentrated on such topics as: environmental awareness and knowledge, attitudes, analysis of school curriculum, teachers' and students' perceptions of environmental education, policy opportunities for environmental education changes in the cognitive and affective attributes of students/people brought about by environmental education intervention, and the pedagogy of environmental education. These researches mostly employed quantitative, quasi-experimental nature, with few using qualitative approaches. For instance, Parlo & Bulter (2007), in a study carried out on Skidaway Island, off the Georgia Coast, investigated the effects of the 'Rivers to Reefs/Coastline' (R2R) – a teachers' workshop – on the

infusion of environmental topic into their curriculum. Shih-Jang (2004) assessed the effects of an environmental education course on responsible environmental behaviour and the associated environmental literacy variables among Taiwanese college students. Mangas *et al.* (1997) analysed environmental education concepts and attitudes among biology degree students. Leeming *et al.* (1997) examined the effects of participation in class activities on children's environmental attitudes and knowledge. Other research conducted in environmental education includes Mlipha & Manyetsi (2005); Jeronen, Jeronen & Raustia (2009).

Researchers – such as Adara (1996b); Mansaray & Ajiboye (1997); Mansaray *et al.* (1998); Ifegbesan (1997; 2002); Olagunju (1997); Pitan (1999); and Ogunsanwo, (1999) from Nigeria – investigated environmental education in schools and other formal education settings. In South Africa, in the last three decades, many studies have been conducted on environmental education covering various themes with varied methodological approaches including: Opie (1990); Schreuder (1991); Shongwe (1992); Bornman (1997); Le Grange & Reddy (1997); and Chacko (1998). Barraza *et al.* (2003), Motshegoa (2006); and Mokhele (2007) were all concerned with policy and practice of environmental education. Together, the authors qualitatively examined several policy documents. Motshegoa (2006) examined what the provisions of the new South African curriculum policy on environmental education are; how teachers should integrate environmental education in the context of the revised new curricula (RNCS); how the policy and practice of environmental education can be understood and explained in schools. However, Tlhagale (2004) was more concerned with impact of the Pilanesburg National Park on people's living environments; the provision of information and environmental education; how communities would be able to put this information into practice for sustainable living. Mokhele (2007) sought to understand the nature and quality of opportunities created by the new national environmental education policy in Mpumalanga Province – that is, how the national policy on environmental education is understood and translated within the province, and what opportunities to learn have been created as a result. Data for these studies were collected mainly through interviews and document analysis.

It has been suggested that an analysis, of the status of the formal and non-formal education sectors and current initiatives taken by governments, needs to be undertaken to determine their relevance to the goals of environmental conservation (Lawal & Noibi, 1991; UNESCO, 2002). While efforts to enhance the quality of environmental education at the formal level are acknowledged, the non-formal sector – which possibly holds the key to a successful campaign of environmental education – has been neglected (Ogunyemi, 1994; Mansaray *et al.*, 1998). The assumption may have been that it is easier to mould the minds of school children than those of out-of-school adults. This assumption is not only questionable but also dangerous in a society largely dominated by rural illiterates, who wield enormous influence on their children's reactions to, and understanding of, the issues affecting their daily lives. Following an in-depth study of the *Nigerian Environmental Profile*, the Nigerian Environmental Study/Action Team concluded that:

> *"There is need to educate people, especially at the grassroots level, to be aware of their responsibility for nurturing and wisely utilizing the environment and taking urgent steps towards restoring balance where such balance has been upset."* (NEST, 1991:2)

Forests are used for different purposes in different parts of the world, sometimes in the hands of local people. As cultures have developed differently, specific attitudes about the natural world may also differ. Identifying the difference between groups will strengthen conservation efforts by providing an information base from which to create site-specific conservation programmes designed to emphasise issues of local concern and are therefore relevant to unique cultural and environmental paradigms. While environmental attitudes have been studied in developed countries and on other continents, studies comparing attitudes between developed and developing countries in Africa have only recently been reported (Schultz & Zelezny, 1998; Frost, 2000; Ashley, 2000; Batterbury, 2005; Ferrari, 2009).

Furthermore, in spite of the climatic, geographic, socio-cultural and economic affinities among the African countries and the similarity of the environmental crises in these countries, there is a dearth of interaction and information exchange between the many scholars and researchers who are interested in environmental conservation, management and education. Intra-national, cross-national and inter-regional research could be pursued with considerably more vigour than is currently the case. The paucity of research and the absence of well-focused and action-oriented initiatives in many of the developing countries has aggravated the problems over time. The dearth of cross-national and community-based research is a gap that this study intends partially to fill. Many of the failed attempts to preserve and promote a healthy environment, it is been argued, resulted from an overemphasis on socio-economic or political factors and inadequate attention was given to the non-economic value of the environment. Only by understanding the relationships between humans and environment, and the factors that influence these relationships, will we be able to comprehend and improve people's attitude towards the environment and thereby strengthen conservation efforts within communities (Ramsey & Hungerford, 1992; Ramsey *et al*., 1998). The resultant environmental disequilibrium requires a complete re-evaluation of environmental attitudes and behaviour towards achieving the re-orientation of their understanding, thus making rural inhabitants realise that the exploitation of the environment can not go on indefinitely without detracting from the quality of life. These are the challenges motivating this research.

1.5 Significance of the Research

There are at least two basic reasons which make saving the forest/woodlands worthwhile. The first is that the continued destruction of forests will negatively affect the people's ability to feed themselves. The second reason is the forests' intrinsic value – beyond the need of humans. The former reason relates to economics and development; the latter rests in an eco-centric philosophical argument. Many educators may believe that the philosophical argument alone demands that action be taken to limit human destruction of forests. Scientists and lawmakers are limited in their ability to change attitudes and values. Therefore, it is necessary for educators in the rural areas (where most of the forest related activities take place) to assist in the process of disseminating information and developing understanding about practices that can help local communities maintain a more symbiotic – and sustainable – relationship with the forest environment.

For many countries, and especially in developing countries, the economic implications of healthy forest eco-systems are far-reaching. There seems to be a consensus among environmental management and social science scholars that the relationship between social structure and

ecological processes is key to understanding the degradation (or otherwise) of forest resources. As discussed in a subsequent chapter, numerous studies have noted that understanding the value and beliefs associated with forest resources is critical to our ability to manage human-environment interaction. This research contributes to the growing understanding about how individuals and communities interpret and perceive forest resource conservation, environmental education in particular, and community based natural resource management (CBNRM) in general.

Most African countries currently direct their energy toward the implementation of *Agenda 21*. In addition, most African countries represented at the World Summit of 2002 signed the WSSD Plan of Implementation. Both summits stressed the importance of Environmental Education and other programmes aimed at achieving a high quality environment (World Bank, 2002b; United Nations, 2002). This current study provides an opportunity for both gaining an understanding of the meaning, attitude and practices of forest/woodlands conservation and environmental education among the rural inhabitants in two African countries, and for developing a needs assessment for community-based environmental education. In addition to revealing the different values and beliefs associated with forests and forest resources and the pervasive influence of several socio-economic variables that lie at the root of unfriendly environment behaviour of people (especially in rural areas), it indirectly helped those rural inhabitants who participated in the study to clarify their values regarding the various forest resources.

It is also hoped that this study will stimulate interest in further comparative research in environmental studies and provide valuable information on the similarities or otherwise between these two communities. More specifically, that the study will reveal the status of environmental education, especially at the community level in developing countries, specifically in Nigeria and South Africa; and will indicate what further development may be needed to improve the local educational systems with respect to environmental issues.

With appropriate forms of dissemination, the findings from this study could help sensitise all stakeholders (such as community leaders, government officials, related Ministries and agencies) to promote: sustainable environments; fill developmental and environmental education needs; and close the gaps in the forest resource conservation policies and practices of the two countries.

In this age of globalisation, people and scholars are interested in working together within and beyond their localities to develop solutions to environmental problems – most of these have consequences that acknowledge no geographical boundaries. Although a number of regional, sub-regional and national organisations are involved in various aspects of environmental management, research capacity in this area is relatively weak, especially at the sub-regional level. Herein, perhaps, lies the greatest significance of this study. It is hoped that the study will help to stimulate interest in comparative research in environmental studies in general and provide valuable information on the similarities or differences between these two countries. The cross-cultural, cross-national and inter-regional insights from the study may well provide illuminating lessons for other countries in Africa, and other stakeholders in developing countries on other continents, where forest and forest resource conservation is a matter of critical concern.

1.6 Delimitations of Scope and Key Assumptions

The spatial focus of this thesis is forest resource conservation in rural Nigeria and South Africa. It is a comparative study that rests on an assumption that it is necessary to understand the levels of rural community environmental knowledge, values, attitudes and practices, across different regions, to promote sustainable environment and development on the continent. In addition, this study assumes that the management and protection of the environment, especially of forest resources in rural areas, requires an investment in local people and in educating them to understand how their activities will affect the quality of their lives and the sustainable use of their natural environment. On the grounds that the improvement of the quality of the environment and human life are intrinsically woven together, the study also assumes that community members should have a common interest in protecting and improving their environment. Empowering communities towards making more environmentally friendly decisions, in the interests of the common good, would seem to require the development and implementation of education programmes to promote the acquisition of the necessary environmental knowledge, skills, attitudes, and values. The involvement of community leaders and members, in both identifying priority areas and resolving environmental problems, are germane to reducing the problems and to the success of the implementation of effective research, development and education projects.

1.7 Outline of the Thesis

This thesis has been organised into ten chapters. The first chapter introduces the research problem, aim, objectives and questions; highlights the need to examine the attitudes and behaviour of rural inhabitants to forest resource conservation on a regional scale; and outlines the background, scope and the main themes to be developed.

Chapter Two establishes the conceptual framework for the study. The first section surveys the theoretical frameworks in the field of environmental studies, with particular emphasis on political ecology. The chapter discusses the theory of reasoned action. The next section addresses the philosophical, eco-centred view of why forest resources are valuable – from an environmental ethics perspective. The dissertation draws on the political and ecological aspects of the anthropological theory and social forestry to argue for rural community participation in, and access to, environmental education and resource management. Since this study is a comparative study, the section also discusses the theories of comparative research to situate its findings.

Chapter Three surveys the literature pertaining to the state of forests globally and nationally; the socio-economic and ecological importance of forests; the history and development of environmental education both internationally and nationally; and the policies related to forest resources.

Chapter Four relates the research methodology to the research questions, detailing the nature of the study and explaining why the research methods adopted were appropriate for this study. It also contrasts the *etic*, or outsider perspective, of the researcher as an observer, to the *emic*, or insider perspective of the participant. The chapter ends with a discussion on how the data were analysed.

Chapters Five through Eight present and analyse the outcomes of the research.

Chapter Nine presents and discusses the main findings and presents a framework towards a community based environmental education system.

Chapter Ten presents a reflective account of the conclusions and implications of the study. Figure 1.1 illustrates the research processes involved in the study.

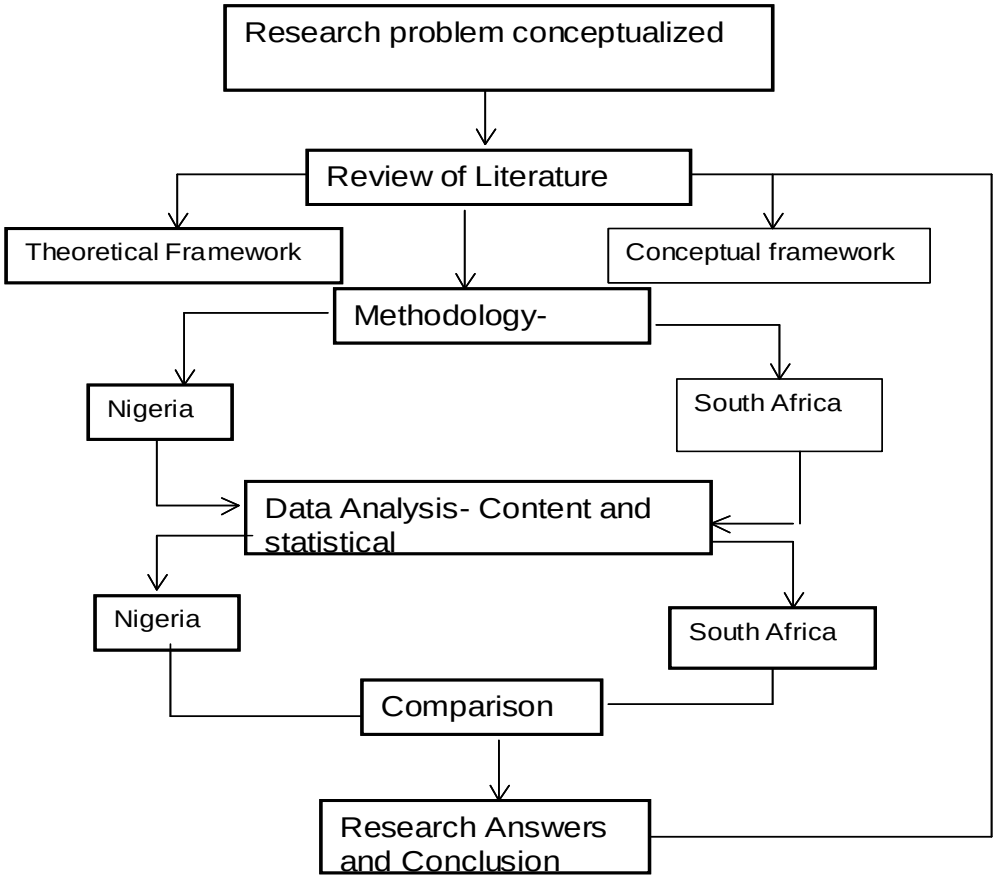

Figure 1.1 Flow chart for the research

1.8 Conclusion

This introductory chapter has set the stage and provided an overview, as well as an outline, of what is hoped to be a piece of pioneering scholarship research between Nigeria and South Africa, in the field of forest resource conservation and environmental education. Now the stage has been set for a review of a range of literature and for explicating theoretical and methodological frameworks that explicitly address the purpose of the study. The next chapter examines and justifies the use of political ecology theory and the social psychology theory of planned behaviour as complementary features of the theoretical framework for the study.

CHAPTER TWO

"Treat the Earth: it was not given to you by your parents'; it was loaned to you by your children. We do not inherit the Earth from our ancestors; we borrow it from our children." (Ancient Native American proverb, cited in National Institute for Environmental Health, 2002)

2 Theoretical Framework

This is the first of two chapters that review literature related to this study. Here the focus is primarily on theoretical literature from which the framework for the study has been constructed. Over the course of the history of research into human-environment interaction, no individual theory has emerged as the dominant explanation for dimensions of the interaction – rather a wide range of theories has been drawn upon. While several of these have relied mainly on such disciplines as psychology, sociology and anthropology, others have attempted to combine various approaches from across the disciplines. Yet others have in fact modified existing models to capture local peculiarities (Walker, 2005). Many scholars, including Bronfenbrenner, (1994); Renzetti, Edleson and Bergen (2001); Hutchison, (2003); Robbins, (2004) and Robbins, Chatterjee and Canda (2005), argued that currently, in environment-human studies, multi-dimensional models and approaches have been gaining the most attention. Any comprehensive research on issues of environmental crises, in general, and forest resource conservation, in particular, demands the adaptation of a multi-dimensional model or approach that draws on a variety of theories.

There are far more theories on human-environment than can possibly be comprehensively covered here. From the domain of ecological anthropology, I consider the political ecology theory; and from the domain of social psychology, I consider those theories of reasoned action and planned behaviour. In addition, this chapter considers philosophical approaches to the problem of forest resource conservation. Specifically the various principles of environmental ethics are discussed. Thus, the theoretical basis of this study is inherent in the notions of the political ecology theory and theory of planned behaviour. Both theories are combined to provide both an explanation and an understanding of forest resource conservation attitudes and practices of people in rural areas of South Africa and Nigeria. This is a largely untested area of research in the forest resource conservation literature.

2.1 Political Ecology

Most environmental research (in recent times) has tended to rely on scientific explanations, without concern for their social and political dimensions. The problem of forest degradation, especially in developing countries, is best explained and conceptualised in socio-economic and political paradigms. People's meanings and uses of forest/woodlands are complex and wide-ranging, and are related to their culture, spiritual belief, ethical values, and day-to-day practices. The meanings,

perceptions and experiences that they derive from forest use and contributions are best explored through multidisciplinary social research. Environmental education itself is a multidisciplinary field. To link it effectively with human understanding, practices and conditions of life that constitute the human-environment interaction, environmental education requires a synthesis of disciplines with holistic approach. Political ecology provides just such a synthesis.

Within the broad field of ecological anthropology, political ecology is a sub-field of geography and anthropology, emerging from the interaction of political economy and cultural ecology (Robbins, 2004; Walker, 2005). This sub-field examines the relationships between nature and society, as mediated by a range of cultural and social practices, systems, and structures. The field is concerned with understanding the relationship between social and environmental change, with political power relations at the core. The discipline evolved through combining cultural anthropology, political economy and social theory, and uses a variety of approaches and scales to explain the causes and consequences of environmental issues and challenges. The central thesis of political ecology is that environmental degradation results from socio-economic and political processes and the structures of capitalist development. Political ecology examines the complex and dynamic relationship between resource use, political economy, and ecological dynamics on a range of spatial and temporal scales (Bryant, 1998; Escobar, 1998; Zimmerer & Bassett, 2003; Paulson *et al*., 2003).

This theory examines the social and cultural factors that shape human responses to the environment, and the intrigue of power play among the political-economic forces or actors at local, regional and global levels. At the local level, political ecology focuses on the environmental challenges that communities are facing. The theory emphasises the need to understand these processes in their historical context because the complex interactions between environment and society are always embedded in history and locally specific ecologies (Escobar, 1998; Zimmerer & Bassett, 2003). Political ecology considers any gender-differentiated uses of and relationships with the environment and how broader social relations affect the women's use of the environment when compared with men's interactions. In addition, political ecology examines how particular groups seek to influence social relations and access to resources – for example in power struggles between peasants and the more powerful groups and political structures (Blaikie, 1985; Blaikie & Brookfield, 1987; Peluso, 1992; Anderson, 1994; Bryant & Bailey, 1997; Adams, 2001; Walker, 1995).

As an interdisciplinary research approach, political ecology offers a more integrated understanding of the realm of nature-society studies. The key element of political ecology is a broad contextualisation of socio-environmental problems towards better understanding of dynamics in human-environment relationships. A relatively new field, political ecology grew primarily out of the traditions of cultural ecology, and the Marxist interpretations of political-economic relations (Walker, 1995).

Bryant and Bailey (1997), in their work on land degradation, identified five analytical approaches in the political ecology of the third world. The first focuses on specific environmental problems – such as soil erosion, tropical deforestation, pollution and land degradation. The second

approach involves research on issues perceived as having links to the political-ecology debate. A third approach examines the inter-link between political and ecological problems within the context of a specific geographical region. This regional political ecology takes into account environment variability as well as spatial variations in resilience and sensitivity. The nature of the problems often varies from region to region, but a shared goal is to evaluate identifiable problems within a given regional context. The fourth approach is to explore political-ecological questions in the light of socio-economic characteristics – such as class, ethnicity or gender – specifically, issues of marginalisation. Fifth is the approach that emphasises the concern, nature and behaviours of different types of actors in understanding political-ecological conflicts. For convenience of reference, I shall refer to the five approaches as (i) *problem-specific;* (ii) *issues-focused*; (iii) *regional political ecology*; (iv) *social stratification and marginalisation*; and (v) *agent-focused.*

Conservation and sustainable development programmes and research in developing countries have a strong presence within the field of political ecology (Bassett, 1988; 1993; Bryant, 1992). A comprehensive account of this field is beyond the bounds of this thesis. Three examples serve to illustrate the conceptual features of political ecology that are most useful for this thesis.

The first example is Montagu's examination, in the 1990s, of forest planning and management in the southwest Pacific nation of Papua New Guinea. Using a political ecology framework, Montagu (2002) argued that the failure of most of the recent reforms could be attributed to the state's repeated failure to address the effect of political-ecological relationships on the entire forest planning and management enterprise. He observed that, although there was an unprecedented reform in the forestry industry, the worst aspects of the country's forest industry persisted. In the second example, Simsik (2002) reported the findings of a research study, conducted on the central highlands of Madagascar, which sought to examine possible reasons for the continued erosion of biodiversity in the country. A political ecology research framework was used to identify different social actor groups struggling for access to natural resources and the extent to which their actions influenced biodiversity. The study revealed three major findings: (i) the existence of tensions between groups of social actors vying for access to and use of natural resources; (ii) the characteristics and role of power differed greatly by actor group, and the mal-distribution of power and its manifestations of use had detrimental effects on regional biodiversity; and (iii) numerous aspects of 'conventional wisdom' permeated the thinking of staff from extra local actor groups and were largely false.

In the third example, Kalipeni and Oppong (1998) examined how the political ecological circumstances underlying the refugee crisis influenced the delivery of health services and the problems of disease and health in refugee camps. The authors argued that Africa's refugee crisis and the underlying political and social forces will have major implications for global health.

These examples illustrate four distinguishing features of the political ecology framework. Analyses of:

- *"resource use patterns and social relations of land users, with an interest in cultural linkages between producers and the land, especially tenure arrangements and the social organisation of labour;*
- *political, economic and ecological dimensions of environmental resource use at different spatial levels, from the community/village, through regional and national to international levels;*
- *the cultural construction of natural resources by social actors at each level of analysis;*
- *historical analysis to understand the process of encapsulation of resource-dependent communities within regional and national political economies".*

Six thematic areas within political ecology research pivotal to this research are: (i) political economy; (ii) gender analyses of resource use and studies of households; (iii) environmental and livelihood movement; (iv) the struggles over social identity and symbolic meaning; (v) discourse and development, and (vi) social analyses of conservation and environmental history (Adams, 1990; Bryant, 1992; Omohundro, 1999).

The elements of political ecology of interest and their relationships to this study are schematically represented in Figure 2.1, a schema adapted from Bryant (1998). In the diagram, forest resource conservation is depicted as being a function and combination of chain of events surrounding environmental problems.

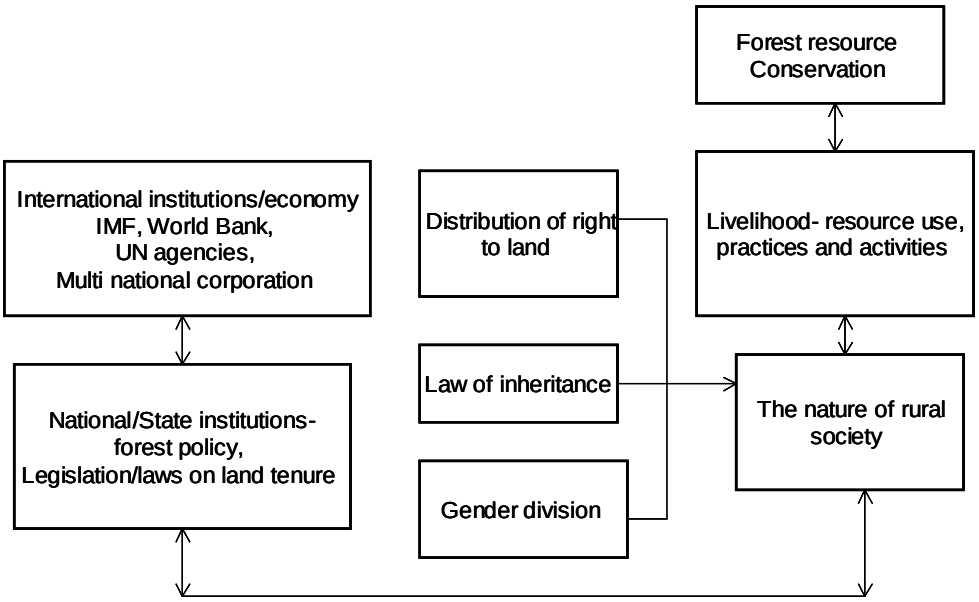

Figure 2.1 The political ecological framework for forest resource conservation.
(Adapted from Bryant, 1998)

The framework, which starts with forest resource conservation, is a function of the livelihood-resource uses, practices and activities, as well as the nature of rural society. National/State institutions (forest policy, legislation/laws on land tenure) and international institutions and economy form the last link of the chain of dynamic relationship.

This research adopts a political ecological framework because it provides both theoretical and methodological insights relevant to the study. In sum, political ecology provides a framework to

explore and understand the issues involved in forest resource conservation in a rural community, and directs attention to the power relations that determine the distribution and access to natural resources. The theory of political ecology also provides a framework for investigating the opportunities and constraints that shape the human-environment interaction in the two study areas, and enables an examination of forest resource conservation practices in ways that illuminate those interactions that were responsible for the transformation of the forests, people, politics and society. Finally, political ecology provides a framework for identifying the factors and dimensions of forest planning and management in rural Africa that need to be addressed to promote greater social, economic and environmental equity in the management of the continent's forest resources.

Political ecology uses a multi-method approach to inquiry, with a commitment to qualitative and interpretative methods to grasp the complexities of the social realities in human-environment interactions. Political ecology requires a holistic, synthetic and pragmatic approach to research. Thus, in this study, qualitative data from in-depth interviews, focus group discussion and observation have been complemented by adding quantitative data from survey questionnaires to construct a comparative account of the social realities of the two study sites.

2.2 Attitudes-Behaviour Framework

Part of the aim of this study is to examine the knowledge, attitudes and practices – and the extent to which environmental education was provided to the rural community – with respect to forest resource conservation. The attitudes-behaviour framework from social psychology provides a perspective from which to examine and illustrate individual reasoning and the formation of particular attitudes and behaviours towards forest resource conservation. Thus, the study combines an approach from social psychology with the political ecology framework to increase the understanding of how preferences concerning forest resource conservation are formed. This section examines the distinctions and connections between knowledge, attitudes and beliefs within the domain of social psychology.

Social psychologists and other social scientists have long been interested in the relationship between attitudes and knowledge, and their influence on people's actions and concerns (Ajzen, 2002; Allen *et al.*, 2005). Numerous studies have been carried out to investigate the variables influencing attitude formation, change and the effect of attitudes on individual behaviour. A number of factors have been identified which interact and thereby affect the levels of concern of individuals (or groups of individuals) about any particular issues. These variables include knowledge, values, ethics, and experiences. Other sources of influence are attitude, the internal control centre, individual responsibility, social norms, gender roles and the intention to act (Hungerford & Volk, 1990; Boershig & De Young, 1993).

For a clearer perspective, it is necessary to clarify several of the concepts central to this study – namely, knowledge, attitudes and values, and their pertinence to environmental education and forest resource conservation.

2.2.1 Knowledge and Belief

Since this thesis examines how knowledge and attitudes are connected to the formation of behaviour towards forest resource conservation, it is important to clarify the concept of 'knowledge'. Knowledge is the capacity to acquire, retain and use information; a mixture of comprehension, experience, discernment and skill. Knowledge can influence an individual person's concern about the environment in more than one way. A general assumption (in majority of the literature) is that an increase in knowledge about local environmental issues can be expected to contribute to the development of an environmental ethic, which is then manifested in proactive environmental behaviour. Such claims about the importance of increasing knowledge assume that because individuals possessed more knowledge on environmental issues, this would lead to greater awareness and in turn the greater awareness would lead to the adoption of more favourable attitudes towards the environment (Hungerford & Volk, 1990). However, while increased knowledge may be necessary, it is not sufficient to guarantee that individuals will adopt environmentally responsible behaviour. This is because other acquired attitudes may exert more influence and because familiar attitudes do not necessarily change in relation to increased knowledge. Kuhlemeier *et al.* (1999:5) argued that *"…knowledge of environmental problems, attitudes toward the environment, willingness to make sacrifices and environmentally responsible behaviour in everyday life should be positively related…"*

In any case, the development of knowledge may be impeded by deeply held systems of belief. Belief is the acceptance of the truth or actuality of anything without certain proof. It is a mental conviction that is believed; an opinion held. Beliefs are *"…psychologically held understandings, premises or propositions about the world that are felt to be true…"* (Richardson, 1996:103).

2.2.2 Attitude

Central to the social psychological studies (since the mid-1970s) is 'attitude'. Indeed, evidence suggests that attitude and attitudinal change or attitude-behaviour connections have received more attention than other topics in social psychology and environmental education (Hines *et al.*, 1987; Kraus, 1995). Yet scholars are still far from establishing a conclusive link between attitude and behaviour. The problem perhaps lies not in conceptualising but in operationalising it. Among the early research into attitude-behaviour are the reports of Bogardu (1925), Thurstone (1928), Likert (1932) and Allport (1935). There are many definitions of attitude presented by different scholars. One of the earliest definitions was given by Allport (1935:810) *"…attitude is a mental and neural state of readiness organised through experience, and exerting a directive influence upon the individual's response to all objects and situation with which it is related."* From this definition, attitudes are perceived as individual attributes that have been formed and organised from experience; implying that attitudes are acquired and they exert some degree of influence on behaviour. Eagly and Chaiken (1993:1) defined attitude as *"…a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour…"*. To Ajzen (1988:4), *"…attitude is a disposition to respond favourably or unfavourably to an object, person or institution or event."* He opined that a distinctive attribute of attitude is that it is "…evaluative in nature, that is of passing judgment of positive or negative." Recent findings, from Upham, Whitmash *et al* (2009:12), suggest that attitudes *"…are hypothetical constructs that refer to an*

individual's evaluation of or orientation towards and attitude object…" (things, idea, person, group, action, self etc.).

On the theory of attitude many scholars (Ajzen 1988; Jaspars, 1989; Dovidio, Kawakami & Beach, 2001; Hale, Householder & Greene, 2003; Schiffman & Kanuk, 2004) have identified three components that guide action. These are: cognitive (knowledge/belief); affective (emotional – the individual's feeling of liking or disliking of the attitude object); and conative (the individual's behavioural tendencies regarding the attitudes object). These three categories of response provide the opportunity to better understand and appreciate the cognitive (knowledge) component or dimension of the human behaviour that influences every decision. However, their impact and effects are mediated by non-cognitive elements – such as socio-economic status and external environment – several will be reflected or revealed as the discussion in this section progresses and also in the discussion of the empirical findings. Cognitive responses are responses that reflect the perception of and knowledge about the attitude object. Relating this to the study, it implies that the knowledge that rural people have about forest resources and forest conservation reflects much of their beliefs. Thus, we can say that the more knowledge an individual, or a group of individuals, possesses on the object of attitude goes a long way towards shaping the attitude of such individual, or group, towards the object. Affective responses, on the other hand, relate to the evaluation of, and feelings towards, the attitude object. For instance, people who think that forest resource conservation increases their livelihood sustainability and that conserving the forest is their responsibility will hold a more favourable attitude towards forest resource conservation than those who think it is the responsibility of other agencies.

Ajzen and Fishbein (1980) distinguished between general attitude, which is global in character, and the specific attitudes that focus on particular aspects of a subject, such as forest resource use and conservation. Understanding public attitudes to, and the related perceptions about, the environment is one component of conservation. Attitude surveys are one effective means of determining how people perceive the natural world and their degree of environmental concern (Parry & Campbell, 1992). It has been argued that attitude is one of the most important factors influencing human behaviour and, in particular, on developing environmentally responsible behaviour (Newhouse, 1990; Hanna, 1995). An individual's attitude is defined as the body of favourable or unfavourable feelings toward specific aspects on one's environment (Newhouse, 1990; Hungerford & Volk, 1990).

2.2.3 Value

'Value' is a polymorphous concept; its meanings are as numerous as those who have attempted to defining it (Brown, 1984; Audi, 1999; Haralambos, Holborn & Heald, 2000). In many definitions, the common elements lie in the recognition of 'values' as an expression of the ultimate ends, goals or purpose of social action. For instance, Haralambos, Holborn and Heald (2000:5) defined value as *"…a belief that something is good and desirable. It defines what is important, worthwhile and worth striving for…"* While Brown (1984:233) defined value as *"…the expressed relative importance or worth of an object to an individual or group in a given context…",* Akinlaye and Ajiboye (1996:57) saw value as "*…a standard, criterion or rule for determining whether something is good or bad and for judging one's behaviour and the behaviour of other people."*

These definitions imply that values are universal standards of judgement against which human society, individuals and groups are assessed or weighed. The values are standards for judging the worth or worthlessness of anything. They are principles which guide human behaviour, actions and social interaction. Values are developed from experiences that individuals have had, from the influence of people, and from the conditions around them (Ogunyemi, 2000; Iheoma, 2000; Eweniyi, 2006). Values not only influence action, but are themselves influenced by the consequences of actions of the values held by individuals and groups. All human actions and inactions are determined by values (Ogunyemi, 2000). Values provide reasons as well as motive for human behaviour. Ogunyemi (1997), in considering values, identified three basic, hierarchically ordered categories of values. First are the core values, which spring from an accepted universal consideration (for example, it is universally accepted that the human environment is worthy of protection). Second are national values, which spring from an ideological viewpoint and are concretised through several socio-economic constructs including, for example, a national philosophy of environment. Third are the values that may be traced to communal needs. An individual becomes an active member of a community at one point or another and is influenced by locally cherished ideas and values. People make decisions about how to use the natural resources in their environment within the context of these values. Each community and culture has its own array of values.

Kellert and Applegate (1984) distinguished between *ascribed values* (values that are important to humans) and *intrinsic values* (values existing regardless of humans). In the same vein Brown (1984) noted the difference between an *assigned value* and a *held value*. Assigned value *"…is the worth of a thing (animal) in relation to other things…"* while held value is *"an underlying personal or societal principle, standard, goal, or ideal that results in the value assigned to something (animal)…"* (Brown, 1984:232).

2.3 Attitude and Behaviour: The Nexus

Understanding individual behaviour is a complex matter; understanding group behaviour is even more complex. Part of the purpose of study is to better understand – relative to the environment and natural resource utilisation and conservation – why people behave and resist change the way they do. This means that an adequate understanding of the factors that influence and determine behaviour in general, and to forest resources in particular, is important. Several researchers in environmental education have argued that the ultimate goal of any research in this field is to bring about an increased consciousness of responsible environmental behaviour (Hungerford & Volk, 1990; Jickling, 1991; Leeming *et al.*, 1993). Earlier studies have shown that variables – such as attitudes, locus of control, knowledge, responsibility, social norms, sexual role, sensitivity and intention to act – are related to the creation of responsible environmental behaviour (Hines *et al.*, 1987; Hungerford & Volk, 1990; Thompson & Barton, 1994; Hwang *et al.*, 2000). Although there are contradictions among the findings of the different studies, they are unanimous in arguing that attitude development is crucial to understanding human behaviour.

The connection between attitude and behaviour was first conceptualised with emergence of the *Theory of Reasoned Action* (TRA) in 1967 by Fishbein and Ajzen (1975). This was later modified in 1988 as the Theory of Planned Behaviour (TPB) as a result of the gaps identified in the

application of the TRA. These theories are among the most frequently cited and used in environmental attitude-behaviour studies (Hungerford & Volk, 1990; Newhouse, 1990; Hwang *et al.*, 2000).

The Theory of Planned Behaviour (TPB) is generally used to predict human behaviour. Although the Theory of Planned Behaviour has only been able to account for approximately one-half of behavioural intentions (Ajzen, 1991), it has successfully been applied and tested in a wide range of studies (Sutton, 1998; Armitage & Conner, 2000; 2001; Brown & Ogden, 2004; Foxall & Yani-de-Sariano, 2005; Elliot & Armitage, 2009). The inconsistencies resulting from prior studies have prompted calls for additional variables to be included in the model. Scholars/researchers have had cause to modify the Theory of Planned Behaviour by including the component of past experience. It is argued that the inclusion of such factors has slightly increased the predictive power of the model (Ajzen, 1991; Bamberg, Ajzen & Schmidt, 2003). The Theory of Planned Behaviour and Theory of Reasoned Action are both extensions of the Expectancy Value Theory. It is important to understand the groundwork underpinning these theories.

2.3.1 Theory of Reasoned Action

The Theory of Reasoned Action (Fishbein & Ajzen, 1975) enhances the predictive and explanatory nature of the basic Expectancy Value Theory by including attitude and normative beliefs which can affect intention. Attitude beliefs relate to how the individual views the behaviour itself and are weighted by perceived importance. In determining whether to engage in a particular behaviour, individuals also weigh up a number of factors – including the beliefs of their family members, friends, and instructors. These beliefs are weighted by the motivation to comply and the need to create a normative belief index. When an individual rationalises a particular behaviour, he/she is considering both the attitude beliefs and normative beliefs.

The Theory of Reasoned Action (TRA) uses three basic concepts – attitudes, intention and behaviour. These variables function as the basic determinants of behaviour: attitudes towards the behaviour (*Aact*); normative beliefs (both personal and social) (*NB*) and motivation to comply with the norms (*Mo*). The normative factor consists of two components: the belief about what the individual personally feels he/she should do and the belief about what society says he/she should do (Jaspars, 1989). The TRA was developed to predict individual volitional behaviour, where actual behaviour is preceded by behavioural intentions. TRA suggests that an individual's behaviour is determined by an intention to perform the behaviour and that this intention is in turn a function of his/her attitude towards the behaviour and the person's subjective norms. The relationship is expressed in a simplified equation as:

$$B \approx BI = (Aact)\, W_o + [(NB\,(Mo)]\, W_1$$

where:

B = overt behaviour; BI = behaviour intention; Aact = attitude toward the act;
NB = normative belief; Mo = motivation to comply with the normative belief
W_o and W_1, are empirically determined weights (Jaspars, 1989: 273)

According to Ajzen and Fishbein (1980), an individual will hold a *"…favourable attitude towards a given behavior…"* if he/she believes that the *"…performance of the behavior will lead to mostly positive outcomes."* In this vein, if the individual believes that mostly negative outcomes result from a particular performance or behaviour, he/she will hold a negative attitude toward the behaviour.

For the purposes of predicting behaviour, the theory includes an additive model in which attitude (*A*) is formed as a summative belief index that is composed of *n* salient beliefs concerning the outcomes of specific behaviour (b_i) and the evaluations of those outcomes (e_i), This relationship can be understood most easily in a simplified equation:

$$A = \sum_{i=1}^{n} b_i e_i \qquad \text{Equation 2.1.}$$

A subjective norm (*SN*) refers to a person's perception of whether the people who are important to him/her think he/she should – or should not – perform the behaviour in question. Thus, *SN* is said to be directly proportional to the sum of products composed of normative beliefs (n_i) and motivation to comply (m_i) with the *k* salient referents important to the individual, as follows:

$$SN = \sum_{i=1}^{k} n_i m_i \qquad \text{Equation 2.2.}$$

"Subjective norms are taken as the individual's perception of the social pressures exerted on the individual to perform or not to perform behaviour by persons, groups, or institutions that s/he cares about." (Ajzen & Fishbein, 1980; Pouta, 2003) An individual's subjective norm to a particular behaviour is a function of the normative beliefs that cause an individual to consider whether he/she should – or should not – perform the behaviour, in addition to the person's motivation to comply with those individuals or groups. Ajzen and Fishbein (1980) suggested that we form beliefs about an object by associating it with various characteristics, qualities and attributes. Through these beliefs, we acquire favourable or unfavourable attitudes toward that object, depending on whether we associate that object with positive or negative characteristics (Ajzen & Fishbein, 1980).

Intention is the cognitive representation of a person's readiness to perform a given behaviour, which is considered to be the immediate antecedent of behaviour. Intention is the likelihood of an individual doing something, like cutting down trees or engaging in bush burning. Thus, an intention is a type of judgment about how an individual will behave toward cutting a particular species of tree. "*Intention is the best predictor of behaviour, and attitude and subjective norms influence the intention.*" (Ajzen & Fishbein, 1980) There are three conditions identified in the TRA under which the intention of an individual can accurately predict the behaviour. First, the intention and behaviour measures must correspond with specific action, target, context and time frame. Second, intention and behaviour should not change in the interval between assessment of intention and assessment of behaviour. Third, the behaviour in question is under *"…the individual's volitional control, that is, s/he can decide at will to perform or not to perform the behavior…"* (Ajzen &

Fishbein, 1980; Pouta, 2003) The TRA model in Figure 2.2 predicts behaviour, with intention as an intervening variable.

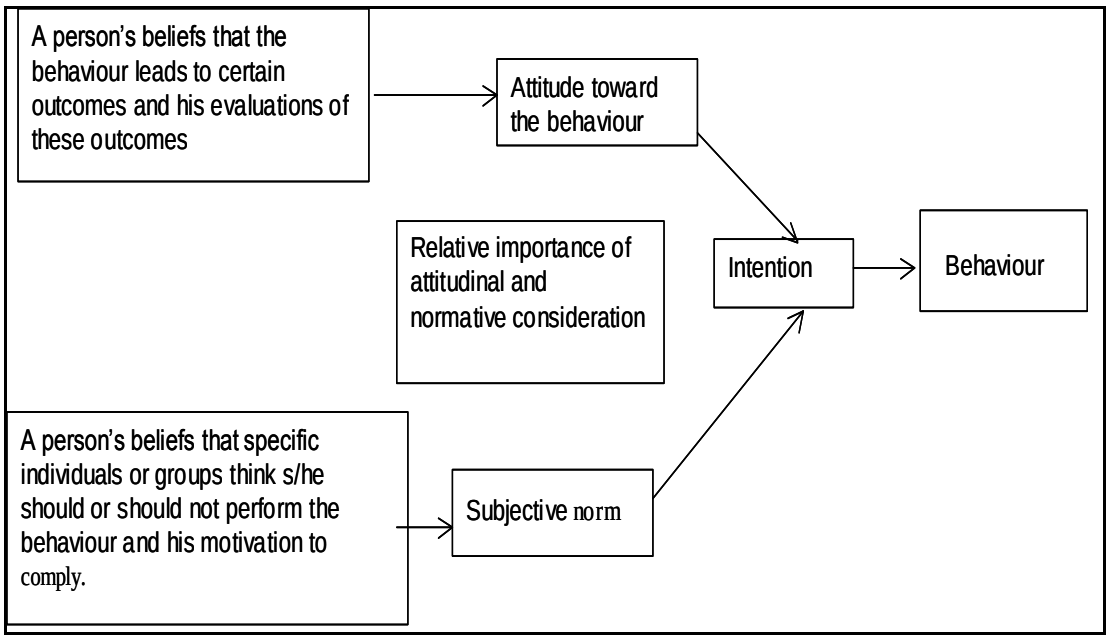

Figure 2.2 Conceptual framework model of *Theory of Reasoned Action*.
(Ajzen & Fishbein, 1980)

In summary, the TRA contains three levels of inquiry/analysis. At the first and most general level, behavioural intentions are the direct determinants of behaviour (Ajzen & Fishbein, 1980). At the second level, behavioural intentions are independently determined by attitudes and subjective norms toward the behavioural object. Finally, at the third level, attitudes are understood by a composition of relevant outcome expectancies; subjective norms are identified through motivations to comply with views of relevant referents.

Two strengths of the TRA are that it is parsimonious, using only a small set of constructs, and originally it was argued to be applicable to any human behaviour (Ajzen & Fishbein, 1980). However, the theory was based on an assumption that has recently brought its usefulness into question. The TRA assumes that behaviour is under the complete volitional control of the individual. Complete volitional control occurs when a person can perform or not perform a specific behaviour at will. If behaviour requires particular opportunities or resources to be available, the behaviour is less likely to be under volitional control. For example, a person may decide that he or she wants to go to another city, but because doing so would require access to transportation, the behaviour is not fully under his or her volitional control. In fact, Ajzen (1991) stated that most behaviour is contingent on factors beyond the individual's own desire.

For nearly three decades, the Theory of Reasoned Action (TRA) proved useful for predicting a wide spectrum of behavioural intention. Studies have focused on a number of regular strategy choices or responses to questions of personal or social significance (including having an abortion, using condoms or voting in elections). TRA is particularly useful in situations where the individual maintains complete volitional control over the behaviour (Ajzen, 1991). Both the attitude and

normative components of this theory have been routinely related to intentions. In recent years, however, several researchers have merged additional indices to increase the predictive power of this theory.

2.3.2 Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) was created in 1985. This theory is a modification of Ajzen and Fishbein's theory of reasoned action (1975). Literature review evidence has shown that, over the last two decades, a large number of researchers have used the TPB to predict and explain an individual's behavioural intentions and behaviours. Among the attitude-behaviour researchers, to whom the TPB is well-known, are: Krau, 1995; Beedell & Rehman, 2000; Beshah, 2003; Brown & Ogden, 2004; Chandon, *et al.*, 2005; Foxall & Yani-de-Sariano, 2005; Thompson *et al.*, 2009. TPB evolved from the modification of TRA with the inclusion of the perceived behaviour control component (Ajzen & Fishbein 1980; Ajzen, 1991). Perceived behavioural control *"…refers to the perceived ease or difficulty of performing the behaviour and it is assumed to reflect past experience as well as anticipated impediments and obstacles…"* (Ajzen, 1988:132). TPB defines relationships between attitudes, norms, and perceived behavioural control as determinants of intentions and behaviour. The theory suggests that the best *"…single predictor of behaviour is the intention to engage in the behaviour…"* (Ajzen, 1988). Behaviour and behavioural intentions are influenced by attitude toward the behaviour and subjective norms. In addition to attitude toward the behaviour and the subjective norm in the theory of planned behaviour, perceived behavioural control can also influence intention. Perceived behavioural control influences the individual's decision through behavioural intention.

An example of the TPB model is presented in Figure 2.3 (Ajzen & Driver, 1991). Extensive literature is available regarding the application of the Theory of Planned Behaviour (TPB) and its use in predicting behaviour. Studies have been conducted using the TPB in such areas as: health (Sparks & Shepperd, 1992; Brown & Ogden, 2004); leisure activities (Ajzen & Driver, 1992); education (Ingram *et al*., 2000); and agriculture (Beedell & Rehman, 2000). Meanwhile environmentally oriented behaviours have been studied – using the TPB theory – by Moisander (1996); Taylor and Todd (1995); Harland and Staats (1999); and Trumbo and O'Keefe (2001).

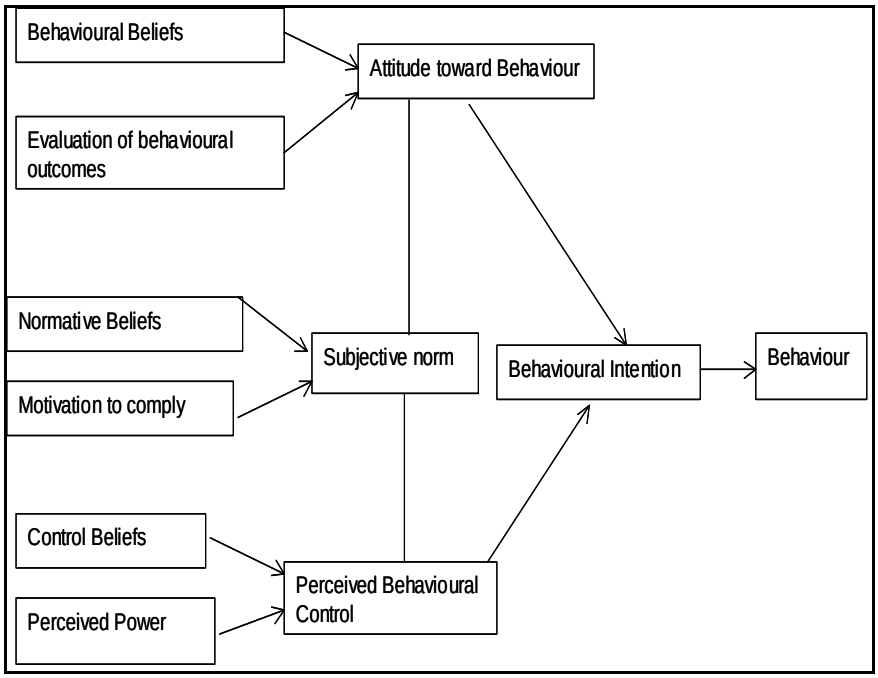

Figure 2.3 Model of the *Theory of Planned Behaviour*.
(Ajzen & Driver, 1991)

The TPB theory assumes that intention is a direct determinant of behaviour, and expands the applicability of TRA to behaviours that cannot be assumed to be dependent only on *volitional control* (Ajzen, 1991). It includes a new control factor in explaining behavioural intention, which is *perceived behavioural control* (*PBC*); in itself PBC is influenced by perceived power (p_i) and control belief (c_i). Expressed as a formula, perceived behavioural control is proportional to the summation of *h* control beliefs (c_i) as well as of the perceived power (p_i) of the control factor under consideration:

$$B = I + PBC \qquad \text{Equation 2.3}$$

where *B* is the behaviour, *I* is intention, and *PBC* is perceived behaviour control.

Apart from contributing to behavioural prediction, perceived behavioural control (*PBC*) is assumed to determine a person's *behavioural intention* (*BI*) (Equation 2.4). People with higher perceived control are more likely to form intentions to perform a particular action than those who believe that they have little or no control. Behavioural intention is formed as a weighted combination of attitudes, subjective norms and perceived behavioural control. The model can be symbolically expressed as:

$$BI = A_B + SN_B + PBC \qquad \text{Equation 2.4}$$

where *BI*, A_B, SN_B and *PBC* have been previously defined.

In the TPB, as well as TRA, attitude is determined as a function of the strength of beliefs (b_i) and the evaluations (e_i) associated with the attributes. Therefore, attitude towards behaviour is a potential user's affective evaluation of the costs and effects of conserving particular resources. There is significant evidence to suggest that the most critical beliefs, underlying the attitudes of

individuals towards their behaviour in using and conserving resources, are their perceptions about the usefulness of the resources (Schahn and Holzer, 1990; Kaiser *et al*., 1999; Rao *et al*., 2003).

Three issues must be paramount and borne in mind when applying this model. First, when inquiring about behaviour it is important to identify the target behaviour. Second, the context needs to be set, and third, the behaviour needs to be limited to a particular time period (Ajzen & Fishbein, 1988). For example, to assess whether individuals intend to conserve resources, it is not sufficient to simply ask if they will get involved in conservation, or if they are likely to conserve. Rather, they should be asked if they intend to become involved in the conservation of resources. This would involve asking if they intend to conserve resources within the next three months. With respect to the element of time, intentions tend to be more accurate when they are assessed close to the time of the potential behaviour (Ajzen & Fishbein, 1980). Therefore, it is best to assess behavioural intentions relative to short term periods.

Generally, the association between intentions and behaviour is useful in making predictions about behaviour; however, it does not add to the understanding of why individuals engage in particular behaviours (Ajzen & Fishbein, 1980; 1988). To improve understanding, the determinants of intentions need to be identified. The theory of planned behaviour is a widely used model for exploring attitudes and allows the researcher to introduce variables to enhance the discernment of constructive and de-constructive attitudes. These are the two primary reasons why this model was selected as the theoretical underpinning for this research.

2.3.3 Critique of the Theories (TRA and TPB)

In spite of the strengths and wide application of the theory of reasoned action (TRA) and theory of planned behaviour (TPB) in attitude-behaviour studies, several scholars have recently criticised the theory of planned behaviour and brought its usefulness into question (Kollimus & Agyeman, 2002; Ogden, 2003).

Meta-analyses of research using the framework shows it only explains, on average, between 40% and 50% of the variance in intention, and between 19% and 38% of the variance in behaviour (Sutton, 1998). Thus, questions are still being raised about the performance of attitude models in predicting and explaining intentions and behaviour (Chandon *et al*., 2005; Foxall & Yani-de-Soriano (2005). Ajzen (2002:666) later conceded that, despite numerous attempts to improve the limitations and predictive ability of their models *"…vexing problems remain."*

Foxall and Yani-de-Soriano (2005) were of the opinion that the problem facing human behavioural studies is the view that prediction can occur from measures of beliefs, attitudes and intentions, regardless of situational factors. Although the Foxall & Yani-de-Soriano criticism is not directed at the Ajzen and Fishbein approach, the former suggested that the latter's approach represented the most sophisticated methodology available to researchers. Whatever the limitations applied to the Foxall and Yani-de-Soriano approach would also affect the less sophisticated methods of investigating or predicting behaviour. Clearly, there is a need to consider alternative approaches for predicting behaviour than those based purely on attitudes.

Others gaps in the theory include the non-inclusion of influential factors – such as personality and demographic variables. The TPB theory is based on the assumption that human beings are rational and make systematic, conscious decisions based on available information. Unconscious motives are not considered.

2.3.4 Previous Empirical Application of the Theories (TRA and TPB)

The previous two sub-sections provided an overview of TRA and TPB models of the attitudes-behaviour relationship. In this section, I have summarised a selection of the literature on applications of these attitude-behaviour theories in forest and natural resource conservation and management. The TPB, in particular, has provided a valuable framework for investigating environment-related behaviours and for developing interventions to change/improve these behaviours. The application of TPB measures has proved useful in understanding and predicting environment-related behaviours with respect to, for example, wildlife reserves, forest fires, water and soil conservation (Lin *et al.*, 1999; Kaiser *et al.*, 1999; Beshah, 2003). Variables within the TPB model have also been shown to predict conservation behaviours. Schahn and Holzer (1990) and Jones and McAvoy (1988) evaluated knowledge, attitude and behavioural changes among programme participants after a workshop on wilderness concepts, wilderness values and practices – both immediately after the workshop and three months later. They found that the knowledge gains were significant immediately after the workshop and even after three months. They also found that favourable attitudes increased significantly and remained high. Similarly, intentions to use appropriate behaviour/practices showed a significant improvement.

Hsu and Roth (1996) conducted a study, using the TRA, to assess the environmental knowledge and attitudes held by community leaders in the Hualien area of Taiwan. A 55-item instrument was administered via a mailed questionnaire to 250 randomly selected leaders. The questionnaire returned with a 70.4% response rate. Significant differences were found in knowledge scores when analysed by age, education level, income level and ethnicity. Similarly differences were also found in the attitude scores when sorted by age, educational level and occupation. The results of stepwise multiple regressions indicated that educational level is the best predictor of environmental knowledge and attitudes. The overall level of environmental knowledge was determined to be moderately high, and the attitudes appeared to be positive.

Arising from their studies of the ideologies of sustainable farmers and conventional farmers by Petrzelka *et al.* (1996), attitude and social influence scales were mailed to the Iowa farmers' membership (via the journal *Practical Farmers of Iowa*, a sustainable agriculture organization). These scales were used to examine the attitude-behaviour relationship of these farmers and the role social influences play in this relationship. The results indicated that, when controlling explanatory factors, the attitude-behaviour relationship is moderate and the social influences examined do not facilitate the attitude-behaviour relationship. Petrzelka *et al.* concluded that the two groups differed in beliefs, values and attitudes on agriculture and rural life. Although awareness of these differing attitudes and values can be an important step in moving toward educational programmes and policies for a more sustainable agriculture, actual behaviour may not be predictable from this awareness.

Other researchers have tried to examine the simple relationships that are believed to exist among a limited number of environmental behaviour-related variables (Cottrell, 1993; Smith-Sebasto & Fortner, 1994; Smith-Sebasto, 1995). Their studies have improved our understanding about relationships among antecedent variables of environmental behaviour. However, there are strong possibilities of changing the relationships among environmental behaviour-related variables by introducing new variables into the model.

Lin *et al.* (1999) applied the modified version of the Theory of Reasoned Action to predict the intentions of forest fire preventive behaviour and constructed a model that showed significant correlation between fire behavioural intentions and attitude, subjective norm, personal importance, and experience concerning fire usage. In a multiple regression analysis, the coefficient was significant ($R^2 = 0.83$). The results suggested that TRA models can be adopted to help construct a 'human-caused' fire predicting system. In a meta-analysis, Hines *et al.* (1987) found that the correlation for general attitude-behaviour relationship in environmental education was 0.35; the correlation between attitudes towards ecology and environment as a whole and environment-related behaviour was 0.34; and the correlation between attitude toward taking environmental actions and environment-related behaviour was 0.38.

Kaiser *et al.* (1999), using TPB as the theoretical framework for a study dealing with environmental attitudes and ecological behaviour, observed that the environmental attitude is a strong predictor of ecological behaviour. These researchers also reported significant relationships among environmental knowledge, environmental values and ecological behaviour intentions.

Pouta and Rekola (2001) tested the TPB model for predicting the *"…willingness to pay [WTP] for abatement of forest regeneration…"* by using survey research methods to gather data for the contingent valuation (CV) study of 600 people in Loppi, Finland. Two rounds of surveys were administered – one concerned forest recreation and respondent background; the other focused on WTP measures and regeneration attitudes. One important aspect of the study was its focus on predicting WTP responses using the attitudes, subjective norms, and perceived behavioural controls of the respondents. Two attitudes were used – the attitude toward forest regeneration and the attitude toward supporting the abatement policy. The results indicated that the use of both attitude variables explained WTP significantly. PBC contributed significantly to the prediction of WTP, suggesting that respondents fully understood their personal limitations. Subjective norms were not significant.

Beedell and Rehman (2000) studied farmers' conservation behaviour by using the TPB model. One hundred and twenty five farmers in Bedfordshire, England participated in the study and were divided into three groups: traditional farmers; Farming and Wildlife Awareness Group (FWAG) farmers; and conservationists. Six behaviours were studied: hedge management; field margin management; tree planting management; hedge removal; hedge planting; and pesticide use. Results of the study showed that the FWAG farmers were more aware of conservation concerns than non-member farmers. FWAG farmers were also more concerned with environment issues rather than the business issues influencing farming behaviour. FWAG farmers felt a stronger moral

obligation, social pressure and internal motivation to conserve. From these results, the authors concluded that the TPB model was an acceptable tool for predicting farmer behaviours.

2.3.5 Relevance and Application of the Theory of Planned Behaviour to this Study

Over the past two decades, the TRA/TPB models have been used to study a wide variety of behavioural intentions and the ultimate behaviours related to environmental issues. As mentioned in the preceding sub-sections, these theories assume that, by predicting intent, one can predict behaviour. Intent is shaped by attitudes toward a specific behaviour (attitude toward an object); the influences of important others (subjective norms); and the perceived level of control over the specific behaviour (perceived behavioural control). Several studies have used this theory to study forests and natural resource management/conservation.

The TPB theory of planned behaviour (Ajzen, 1991) served as a theoretical model for this research. The model allowed the investigation of attitudes and attitude determinants that could influence both the individuals' intentions and, ultimately, the behaviour with respect to forest resource conservation. Literature suggests that general environmental attitudes have fundamental influence on many other variables. Such attitudes are deeply held, are usually formed early in life, and will influence an individual's perceptions of the local environment and reasons for conserving a natural resource (Kaiser *et al.*, 1999; Kaczensky *et al.*, 2004). For this reason, environmental attitudes are likely to have a strong, but indirect influence on people's attitudes toward forest resource conservation. The theory of planned behaviour is a method widely used to explore attitudes and use of this model allowed the researcher to introduce variables that allowed for discernment of attitudes. These are the two primary reasons the TPB model was selected for this research. The model conveys the relationship between behavioural, normative, and control beliefs and their effect on intention and ultimately the forest conservation behaviour.

The theory of planned behaviour can be applied directly in both the domain of forest resource conservation and environmental education in promoting conservation. One can hypothesise that intentions to use socio-economic variables – such as sex, age, educational level, religion, knowledge and the importance attached to forest resources – are likely to predict attitudes, behaviour; and the practice of forest resource conservation. A small number of previous studies have applied the theory of planned behaviour to the environmental attitudes and ecological behaviour *and* forest resource conservation among people in cross-national studies (Frost, 2000; Ostergren, 2001; Bechtel *et al*., 2006; Evans *et al*., 2007). Beyond the inconsistencies in prior results, research has justified the inclusion of other variables to increase predictive usefulness of the TPB model. A number of these facilitating factors include prior experiences and a call for a clear distinction between self-efficacy and perceived behavioural control. While a number of these variables are necessary to predict the outcome, they are far from being sufficient determinants of behaviour. In the development of TPB, Ajzen (1991:199) admitted that:

> *"The theory of planned behavior is, in principle, open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behaviour after the theory's current variables has been taken into account."*

After reviewing the research on the addition of political ecology variables, I can justify political ecology inclusion into the theory and its application in this study. The present research applied the Theory of Planned Behaviour beyond most previous research by combining it with the political ecology theory when researching the behaviours of rural inhabitants in Nigeria and South Africa. In addition, like most previous studies in the field that have used TPB, the current study involved a multiple regression analysis. In the application of TPB to this study – predicting forest resource conservation attitudes and practices – the model in Figure 2.4 was used. This model indicates how important the demographic characteristics of the people; incentive from government; level environment literacy; legislation; policy and law; cultural value/belief, poverty and socio-economic activities can influence and determine an individual's or group's likely forest resource conservation behaviour/practices.

As an interdisciplinary research field, overlapping interests exist between ecological psychology and environmental psychology. Both are concerned with the environment as a subject in the study of human behaviour. While political ecology has been developed and used to explain and enrich the understanding of the relationship between environment and humans, it is concerned also with the need to make fundamental changes in the social and political machinery that structures our interaction with the environment. However, there are several demographic and socio-economic factors that influence people's interactions with all natural resources in their locality and, more specifically, the forest/woodlands. These factors affect values and decisions relating to the sustainable conservation of forest/woodlands. The TPB model has been combined, in this study, with political ecology to aid in identifying and examining the influence exerted by various factors – such as age, importance, interest, knowledge, attitudes and gender.

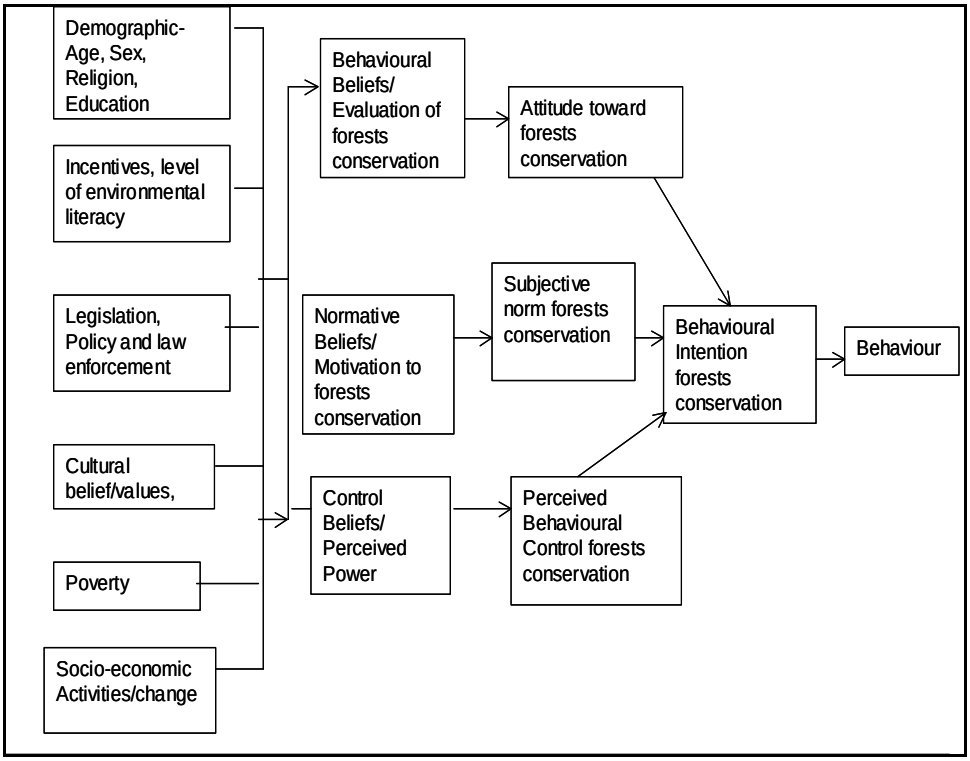

Figure 2.4 Proposed model for predicting behaviour intention towards forest/woodland resource conservation.

2.4 Environmental Ethics: The Philosophical Approaches

In any discourse on environment and natural resource management and conservation, the concept of environmental ethics cannot be ignored. The global concern for the environment has not only brought in its trail the development of modern environmentalism but the emergence of a new field within the discipline of philosophy, *environmental ethics* (Adams, 2001; Light & Rolston III, 2002). Scholars in this emerging field seek to explore the nature of the moral relationships and obligations that can, or should, exist between the human and non-human elements of the environment.

In this section, the ethical problems concerning forest resource use and conservation are addressed. Why should we conserve the environment? Is it wrong to use the forest resources for the purposes of human survival? In addressing these questions, I will examine, briefly, a variety of approaches that have been advocated in the field of environmental ethics, and compare their underlying principles and implications for environmental decision-making. In environmental philosophy, the terms of the discussion have largely been shaped by the anthropocentric versus non-anthropocentric debate (Callicott, 1995; Ehrlich, 2002). It has been argued that anthropocentrism needs to give way to ecocentrism as dominant view of the world on the grounds that, if humans are able to see themselves as part of nature, they will also respect forests as living communities, and not just as resources to be exploited for livelihood.

One of the problems associated with philosophical thinking is the dilemma of making a firm choice between contending positions to organise one's own thinking about an issue. (To avoid this dilemma, I will not attempt to issue a final verdict on any of the approaches, although by the end of the section it should be evident where my own sympathy lies.)

Environmental ethics is a topic of applied ethics, and attempts to provide a systematic account of the moral relationship between humans and their natural environment. For example, according to Brennan and Yeuk-Sze (2002), environmental ethics is the discipline that studies the moral relationship of human beings to, and also the value and moral status of, the environment and its non-human elements. It is the value placed on nature or environment, which invariably determines the extent and various uses to which it is put. Environmental ethics assumes that certain moral norms can and should govern people's behaviour toward the natural world. Thus a theory of environmental ethics must explain the following: what these norms are; to whom – or to what – the people have clear responsibilities; and must also show how these responsibilities are justified. Different theories of environmental ethics offer different answers to these questions. A quite common distinction is the one between anthropocentric ethics – which states that only human beings have moral value – and non-anthropocentric ethics – which grants moral standing to such natural objects as animals and plants. Environmental ethics represents a fundamental shift in ethical thought about the relationship between humans and environment.

2.4.1 Anthropocentrism and Non-anthropocentrism

Among Western scholars, *anthropo-centrism* has roots in both religious and secular philosophies (White, 1967; Murdy, 1975). Armstrong and Botzler (1993:275) defined anthropocentrism as:

"*…the philosophical perspective asserting that ethical principles apply to humans only, and that human needs and interests are of highest, and even exclusive, value and importance. Thus concern for non-human entities is limited to those entities having value to humans.*"

According to Norton (1987:136), anthropocentrism

"*…is the view that the Earth and all its nonhuman contents exist or are available for man's benefit and to serve his interests and, hence, that man is entitled to manipulate the world and its systems as he wants, that is, in his interests.*"

In other words, from an anthropocentric viewpoint, the non-human elements of the world have values only as far as they directly or indirectly serve human interests. A further illustration of this philosophical approach is located in Genesis 1:26-28 of the Holy Bible:

"*Let us make man in our image, after our likeness and let them have dominion over the fish of the sea and over the fowl of the air and over the cattle and over all the earth and every creeping thing that creepeth upon the earth. So God blessed them and said to them, be fruitful and multiply, replenish the earth and subdue it; and have dominion…*" (Holy Bible, King James Version)

Based on this account, many believe that nature was created for human benefit, with a master-servant relationship. The Lord created the earth as a garden for human beings, with no restriction regarding the use of all that it contains. In the anthropocentric view, the focus is primarily on humans. The most common argument for an anthropocentric perspective is that only humans are moral agents therefore only people can owe duty towards other moral agents. All other things have ethical value only as long as they serve human interests. This means that when people have to make decisions about the environment, the moral actors effectively need only to address the question of how these decisions affect other humans.

The primary concern of anthropocentrism is human, with the natural world having a lesser, albeit instrumental, value. From this perspective, humans are usually seen as separate from – and even transcendent to the natural world – with nature merely an object of study and use. Anthropocentrism usually sees nature as having only instrumental value. Something has instrumental value only if it has value as something else. For instance, forests could be considered to have instrumental value as a resource for creating lumber and paper.

Murdy (1993:304) gave a more nuanced account of anthropocentricism:

"*An anthropocentric attitude toward nature does not require that man be the source of all value, nor does it exclude a belief that things of nature have intrinsic value. I may affirm that every species has intrinsic value, but I will behave as though I value my own survival and that of my species more highly than the survival of other animals and plants. I may assert that a lettuce plant has intrinsic value, yet I will eat it before it has reproduced itself because I value my own nutritional well-being above the survival of the lettuce plant. … It is proper for men to be anthropocentric and for spiders to be arachnocentric. This goes for all living species.*" (Murdy, 1993:304)

Non-anthropocentric ethics challenges the perspective that limits moral value to humans. It is an extension of ethics that requires the consideration not only of our duty regarding our human world, but also our duty to objects in the natural world. From a non-anthropocentric perspective, humans are to protect and promote the animals, plants, species, mountains, rivers, and wilderness areas – and even Earth itself – for their own sake. People have a duty to respect the integrity of natural ecosystems or animals, and avoid degrading them, because it is argued that the healthiness of the environment is the healthiness of human beings. There are a myriad of different theories concerning environmental ethics, and this is especially true when it comes to non-anthropocentric ethics. This brief review will consider the two most common and influential theories: namely *biocentrism* and *ecocentrism*.

Biocentrism claims that all living things not only human beings, have an intrinsic value and therefore they should be treated morally correctly. Biocentrism, or life-centred ethics, refers to any theory that views life as the object of respect; life is regarded as possessing inherent value. For example, Taylor and Bogdan (1984), prominent proponents of biocentrism, believe that all living things have and should be given moral concern. In their perception of biocentrism, they identified two moral duties which are tied to two fundamental values. The first is the negative duty not to harm damage or destroy, and the second is the positive duty to conserve and protect all life from being harmed or damaged. Taylor and Bogdan (1984) argued for two fundamental values – one is a single intrinsic value, which is projected onto living things independently of the instrumental value they may possess. The second fundamental value, *inherent worth*, is the value each living thing has by virtue of the fact that it has a good (i.e. a well-being) of its own. According to Taylor and Bogdan, intrinsic value is of an anthropo-genic kind:

> *"An entity is intrinsically valued in this sense only in relation to its being valued in a certain way by some human value. The entity may be a person, animal, plant, a physical object, a place, or even a social practice."* (Taylor & Bogdan, 1984:150)

To understand the inherent worth of anything which is dependent upon its having a good of its own, it is imperative to know (i) what the good of the living entity amounts to, and (ii) what kind of relationship exists between having goodness and having an inherent value. With this perspective, all living entities, simply by the virtue of being alive, should be accorded moral standing.

Ecocentric philosophies offer an alternative way to organise a person's thinking about the environment. For simplicity's sake, an ecocentric philosophy can be defined as a philosophy that reverses the hierarchy in the man-environment relationship and makes nature the predominant actor. The ecocentric point of view is often called holistic because it focuses upon the 'totality' of nature. This approach maintains that the environment deserves direct moral consideration, and not merely consideration that is derived through human and animal interests. Ecocentric philosophies are susceptible to extremism. While the natural world may have an intrinsic value, valuing it above the basic needs of humanity moves proponents of ecocentric philosophies closer to policy actions that may potentially harm many humans for the sake of protecting nature.

It is clear from all the philosophies reviewed here, that they can all be used to support the assumption that it is morally wrong to degrade the natural world. Whatever criticism may be levelled at anthropocentricism, from an anthropocentric angle one could still argue that, since the

natural world is crucial for human well-being and survival, we have a clear duty to protect the environment. This involves ensuring the Earth remains environmentally healthy to support human life, and that its beauty and resources are preserved to ensure a continuous pleasant Earth for human existence – and for the rest of the natural world.

2.5 Forest Resource Conservation and Environmental Education: Interdisciplinary and Cross-national Perspectives

As global environmental degradation continues and interest increases across the world – among both governments and non-government organisations – there is a need for research across cultural and territorial boundaries to illuminate and guide the activities and programmes of concerned groups and organisations associated with natural resource management in general, and forest resource conservation in particular.

According to Cookson (2000), four perspectives exist in comparative research. These are: cross-cultural research; cross-national research; interdisciplinary research and cross-institutional research. This research study falls within the interdisciplinary and cross-national comparative perspective because it draws inspiration from, and overlaps with, disciplines like anthropology, psychology, political science, and geography – and because it involves two countries. Cross-national research (over the past two and half decades) has tended to underpin contemporary comparative research. In cross-national research, the researcher tries either to identify global and universal trends or to emphasise the differences between societies that exist and appear likely to persist. The debate lies between those who focus on similarities-convergence and those who emphasise difference-divergence (O'Reilly, 1996).

Researchers have advanced various reasons for carrying out cross-national and comparative research. One reason is to examine particular issues or phenomena, in two or more countries, with the express intention of comparing their manifestations in different socio-cultural settings, seeking explanations for similarities and differences; another reason may be to generalise or to gain greater awareness and deeper understanding of social reality in different national contexts. Apart from these two, finding out why particular projects or educational programmes work well in some countries and not in others is sufficient motive for cross-national studies. In this research I will not only investigate and try to understand the convergence and divergence perceptions, attitudes and practices of forest resource conservation and environmental education of the people in the selected communities, but also endeavour to find out, where appropriate, what makes things work in the one country and not in the other.

There are many reasons why cross-national comparisons have become popular in the social sciences. Cross-national research helps to unravel one's own hidden cultural preconceptions by showing alternative lines of action and concepts. The quasi-experimental research design of much of the international comparative research ensures a high degree of ecological validity, while also simultaneously allowing a reasonable control of key variables. Finally, in times of so-called 'globalisation', international comparative research is an almost natural match for current theoretical debate. There are a variety of reasons why researchers embark on comparative projects. These can include: simple curiosity; a sense of affinity with a particular foreign culture; a concern for the

competitive success – or failure – of their own country when compared with other nations; or concerns about inequality and possible social policy solutions.

I have four reasons for choosing to do comparative study between South Africa and Nigeria. Of primary importance is the need to achieve an attainable vision for sustainable forest management and development, by recognising each country's particular ecological, economic, social, political and cultural milieu. The UNCED agreements enjoin national actors to cooperate – in many ways – towards the realisation of UNCED's objectives, thus emphasising the need for integration of national and international ideas.

The second reason for my interest in comparative effort is the importance of natural resources to current and planned development strategies for both Nigeria and South Africa. This is because the way nature is interpreted is crucially important. Approximately 80% of sub-Saharan African people live in rural areas and, because forests and woodland are important resources for rural communities, the way they are managed has significant social impact. I have chosen South Africa and Nigeria because both countries are among the most important African countries, whose policies and statements often exert influence and can serve as models across the continent.

The third reason is that forest/woodland resources occur in different parts of the world and have meaning and uses which may not be consistent across differing cultures or peoples. In the same vein, attitudes and practices are likely to differ. Identification of differences between cultures and across cultures will provide information that can be used to strengthen conservation efforts in both countries and across the rest of the African continent.

Finally, although it may appear to be an un-academic a reason (yet I see it as a valid reason), and I have had the urge to study and do research abroad. This exposure to other cultures will allow me to contribute more productively to the advancement of educational conditions for sustainable environment in rural Africa.

2.6 Conclusion

In this chapter, the theoretical framework for the study has been discussed. This will serve as a frame of reference for policy analysis, methodological approaches and the analytical procedure in the subsequent chapters.

CHAPTER THREE

3 Forests, Forest Policies and Environmental Education: An Overview

3.1 Introduction

In the previous chapter, the theoretical framework for this work was discussed. This literature review chapter begins with a brief account of the social construction of forest resources. It then describes: the changing state of the forests, globally and nationally, over the last two decades; highlights the socio-economic and ecological importance of forest resources to people in rural communities; briefly reviews the causes of deforestation and challenges for promoting forest resource conservation; and moves on to matters of environmental education. The chapter describes the origin and development of environmental education, in an international context, over the last three decades and gives a brief historical overview of environmental education and objectives in Nigeria and South Africa. Finally, the chapter reviews several examples of previous research on forest resources and the related environmental education policies and practices. Overall this literature review is intended to illuminate the central problem and significance of the study, and to explore available knowledge, data and research findings which may provide pertinent evidence to support (or negate) the results of this study.

3.2 The Social Construction of Forest Resources

It is widely accepted by scholars, at least in social sciences and humanities, that the meaning of an object is not inherent in the object but ascribed to it by people who interact with it. This meaning is always socially constructed and is articulated on three related levels of conception, perception and practice.

Although there are different accounts of exactly how the construction of meaning occurs, there is broad concurrence on what this entails. Bruner (1990), for example, argued that the construction of meaning rests upon two premises: namely, that a person's experiences are shaped by their intentional states, and that the symbolic systems of a person's culture will shape their intentional states. Epting *et al*. (1996) suggested that the relationship between the personal and social world could be seen as a relationship between a construct and an event or element. There would be no construct with nothing to construe, and there would be no meaning to an event if that event has not been embraced within a personal construct. The person would be empty and incomprehensible without a social surround; the social surround would be barren – and even non-existent – if it were not for the personal action of constructing a meaning.

Working from this general notion of the social construction of meaning, it is clear that the terms *forests*, *woodland* and *forest resources* have many meanings and interpretations beyond the various lexical and spatial definitions (given in dictionaries and by organisations such as the Food and Agricultural Organisation (FAO)). The meaning of *forest resources* varies, depending on how they are perceived and the cultural milieu of the people across. For example, the forest has been

seen as: the abode of the outlaws (as in the Robin Hood story in Old England); the home of outcasts (*osu*) among the Igbo of south-eastern Nigeria; and also as an ancestral home for the spirits of the dead. The varieties of cultural and symbolic functions attributed to forests and woodlands are as numerous as the communities and cultures of the African continent. Rural communities ascribe meanings to forest/woodland different from those held by urban communities. These meanings include both instrumental and utilitarian values and intangible values.

Forest resources and their use are socially constructed in different socio-cultural and political-economic contexts and have complex social consequences. In every society, forests mean different things to different people. Human-environment relationships are determined by social norms, values and beliefs. The functions to which forest resources are put, as well as their importance and ascribed values, are socially constructed and transmitted from generation to generation. Not only does the ascribed meaning depend on the values and benefits derived from forest resources, but the meaning will vary in relation to context or setting. The meaning of a forest is reflected in human perceptions and attitudes, which are culturally moulded (Contreras-Hermosilla, 2001).

3.3 The State of the Forests: Global and National

In 1995, the world's forests, including natural forests and forest plantations, were estimated to cover 3 450 million hectares – that is approximately one quarter of the land area of the Earth. At that time, 55% of the forests were located in developing countries, with the remaining 45% in developed countries (FAO, 1995). Figure 3.1 shows the estimated global forest distribution across continents in 2001.

According to the report on the *State of the World's Forests 2007* (FAO, 2007), between 1990 and 2005 the world's forests decreased by a cumulative 3%, at an annual rate of 0.2% or 13 million hectares per year. This document details the changing trend in forest cover over a 15-year period (1990—2005) and allows for the comparison of forest cover changes in Africa and other continents (Table 3.1).

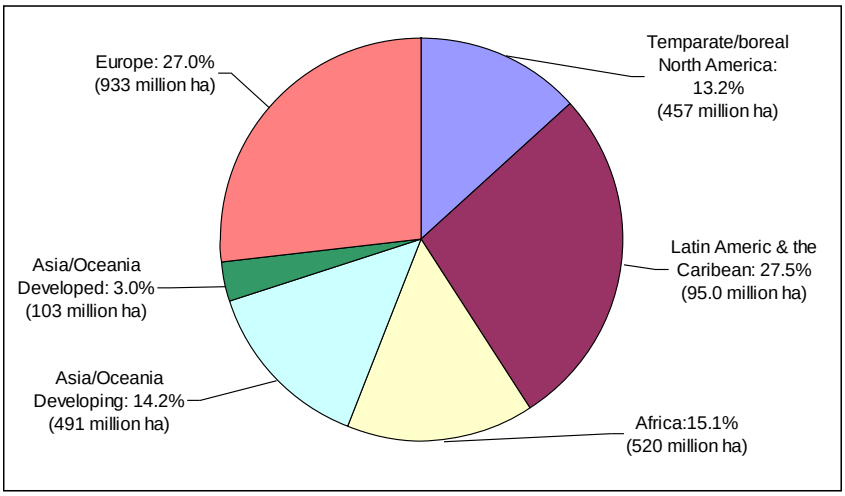

Figure 3.1 Global forested land covers (Total area 1995: 3 454 million ha; developed countries – 1 493 million ha; developing countries – 1 961 million ha).

(Source: State of the World's Forests 2005. FAO, 2005)

Table 3.1 Estimated forest cover and change between 1990 and 2005.

	Forest area 2005			Annual rate of change			
	Total forest	% of land area	Area per capita	1990—2000		2000—2005	
	(1000 ha)	%	(ha)	(1000 ha)	%	(1000 ha)	%
Africa	635 412	21.4	0.7	-4 375	-0.64	-4 040	-0.62
Asia	517 577	18.5	0.1	-792	-0.14	1 003	0.18
Europe	1 001 394	44.3	1.4	877	0.09	661	0.07
Caribbean/Latin America	859 925	47.3	1.9	-4 147	-0.46	-4 483	-0.51
Oceania	206 254	24.3	6.3	-448	-0.21	-356	-0.17
North America	677 464	32.7	1.6	17	ns	-101	-0.01
World	3 952 025	30.3	0.6	-8 868	-0.22	-7 317	-0.18

Extracted from: *State of the World's Forests 2007* (FAO, 2007).

Of this total forest area, 2 000 million hectares are found in developing countries, mostly in the tropical and sub-tropical regions (FAO, 2005). Approximately 8 000 years ago, forests covered ~6 billion hectares of the Earth's land area. However, today only ~3.6 billion hectares remain – or ~60% of the original forested area. The World Commission on Forests and Sustainable Development (WCFSD, 1999) noted that forests have "*…virtually disappeared in 25 countries, 18 have lost more than 95% of their forests and another 11 have lost 90%.*" Asia and the Caribbean have lost approximately 70% of their original forest cover; Europe has lost 60%, and Africa has witnessed a 50% decline (WCFSD, 1999; FAO, 2001a). The trends in forest cover on the Africa continent, over a 15-year period (1990—2005), are illustrated in Table 3.2. It is estimated that the continent lost ~64 million ha (9%) of forest cover between 1990 and 2005. Cameroon, the Democratic Republic of Congo and Nigeria together (all in West Africa) accounted for the highest rate of forest loss (FAO, 2007).

Table 3.2 Estimated forest cover and change between 1990 and 2005 for Africa.

	Area (1000 ha)			Annual change (1000 ha)		Annual rate of change (%)	
	1990	2000	2005	1990 – 2000	2000 – 2005	1990 – 2000	2000 – 2005
Central Africa	248 538	239 433	236 070	-910	-673	-0.37	-0.28
East Africa	88 974	80 965	77 109	-801	-771	-0.94	-0.97
North Africa	84 790	79 526	76 805	-526	-544	-0.64	-0.69
Southern Africa	188 402	176 884	171 116	-1152	-1154	-0.63	-0.66
West Africa	88 656	78 805	74 312	-985	-899	-1.17	-1.17
Africa Total	**699 361**	**655 613**	**635 412**	**-4375**	**-4040**	**-0.64**	**-0.62**

Extracted from: State of the World's Forests 2007 (FAO, 2007).

The FAO (2007) report concluded that forest degradation is continuing in developing countries, especially in sub-Sahara Africa. **Table** 3.3 compares the forest cover change in Nigeria and South

Africa, and shows that the rate of forest degradation is higher in Nigeria than in South Africa. In another FAO report, Nigeria and the Ivory Coast rank among the highest in degradation of forest resource in Africa (FAO, 2003b; 2007).

Table **3.3** **Comparison of estimated forest cover and change between 1990 and 2005**

	Forest area 2005			Annual change rate			
	Total forest	% of land area	Area per capita	1990—2000		2000—2005	
	(1000 ha)	%	(ha)	(1000 ha)	%	(1000 ha)	%
South Africa	9 203	7.6	0.2	0	0.0	0	0.0
Nigeria	11 089	12.2	0.1	-410	-2.7	410	-3.3
Africa	635 412	21.4	1.7	-4 375	-0.64	-4 040	-0.62

Extracted from: *State of the World's Forests* 2007 (FAO, 2007).

3.3.1 Nigeria: Natural Forest and Woodland Resources

Nigeria has a rich and varied assemblage of living organisms. There are over 40 000 plant species in Nigeria of which nearly 2 500 are trees (NEST, 1991). Nigeria's forests consist entirely of tropical forest types. According to statistics from FAO (2000; 2005), Nigeria's forestland covered 13.5 million hectares – or 14.8% of its total land area – with 7.4% designated as forest reserve. Remote sensing images show that '*undisturbed forest*' represented ~1.3% (or 1.21 million hectares) of the country's land area. The vegetation cover can be categorised into two major types: tropical forest in the South and primarily savannah in the North. The forest reserves cover ~10% of the national territory, mostly of the savannah woodland type. The southern rain forest – the source of the country's timber resources – covers only 2% of the total land area of Nigeria (FAO, 2001c; 2003b; 2005).

The forests encompass a range of ecosystems and are home to numerous species of plants and wildlife. Distribution of ecosystem area types across Nigeria are illustrated in Figure 3.2 and Figure 3.3.

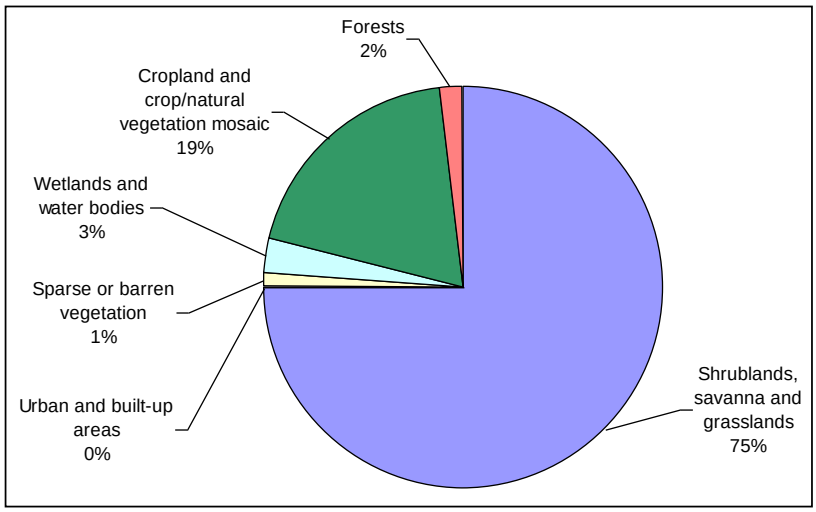

Figure 3.2 **Ecosystems area by type for Nigeria – percentage land cover.**
(Source: http://earthtrends.wri.org/pdf_library/country_profiles/for_cou_566.pdf, 13 March 2006)

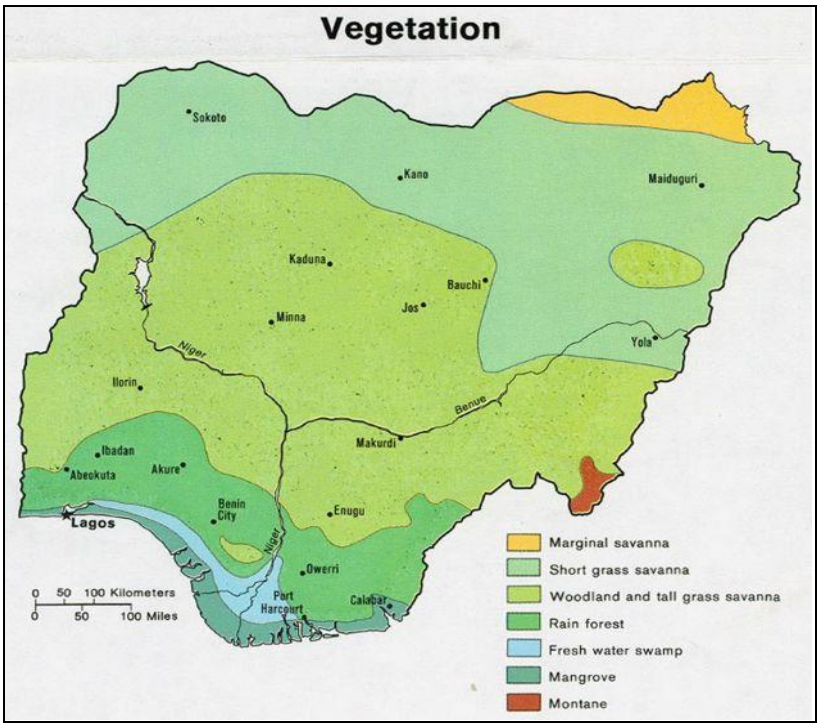

Figure 3.3 Map of Nigeria showing vegetation biome distribution.
(Source: University of Texas at Austin http://www.lib.utexas.edu/maps/africa/nigeria veg 1979.jpg Accessed on 08/04/2005)

The country's vegetation is endowed with numerous non-timber forest products (NTFP). These products include leaves, fruits, barks, nuts, resins, honey, mushrooms, wildlife (including gorillas, leopards, chimpanzees, forest elephants and drill monkeys), cane, chewing sticks and medicinal plants. Both forest product and non-wood forest products (NWFP) are extensively extracted. NWFPs are exploited for domestic consumption and income generation. These NWFPs include edible products, such as wild vegetables (*Afzelia bipindensis, Afzelia Africana, Annona muricata, Daniellia oliveri, Elaeis guineensis*) and wild animals (Grasscutters (the giant cane rat), African giant rat, small antelope, wild pig and duiker), and medicinal plants (*Adansonia digitata, Carica papaya).* Many of the NTFP have social, religious and cultural importance. According to Nigeria's Federal Department of Forestry, the estimated annual income accruing from these products is N178 billion (FAO, 2001b). Most of the collection, processing and marketing of NTFPs is carried out in the informal economy. A high percentage of this luxurious vegetation has been removed through various human activities.

3.3.2 South Africa: Natural Forest and Woodland Resources

In comparison with Nigeria, South Africa is characterised by a sparse assemblage natural forests, of which 68% are tropical and 32% sub-tropical forests. The total forest area of South Africa is 327 600 ha – only 0.2% of the total geographic area (DWAF, 1999; Shackleton 2004). The forests of South Africa belong to the forest biome type of cool temperate deciduous forests. South Africa's natural forests can broadly be grouped into the following: savanna/grasslands – 42 000 000 ha (96.0%), plantations – 1 350 000 ha (3.1%); indigenous forest – 350 000 ha (0.8%); woodland – 51 000 ha (0.1%) (Shackleton 2004). Most of the natural forest occurs in the Eastern Cape (~140 000 ha) and in Kwazulu-Natal (~91 000 ha). In the Western Cape there are ~60 000 ha of

forest, and Limpopo Province and Mpumalanga have ~35 000 ha each. Figure 3.4 shows the distribution of the forest and vegetation land cover types in South Africa.

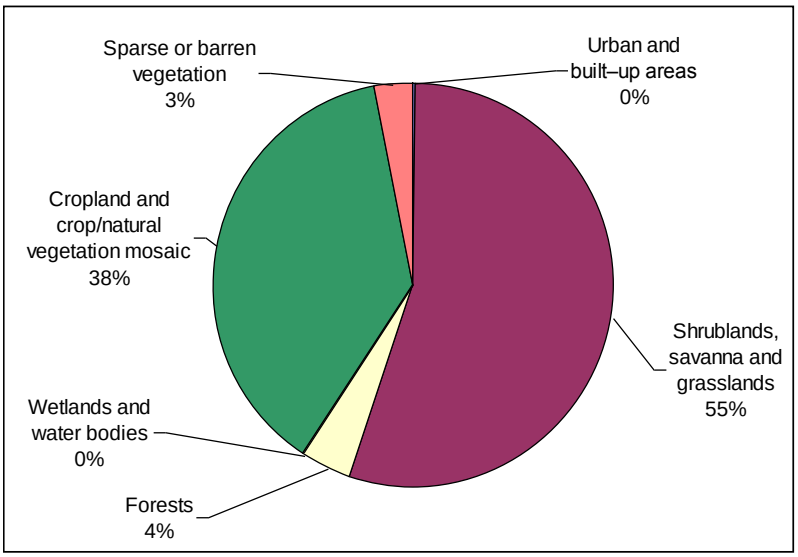

Figure 3.4 Ecosystems area by type for South Africa – percentage land cover.
(Source: http://earthtrends.wri.org/pdf_library/country_profiles/for_cou_710.pdf, 13 March 2006)

South Africa is ranked third in the world in terms of biological diversity. The country encompasses a range of vegetation types, from arid shrub-land and semi desert, through savanna and woodland to coastal forest and alpine forest. The 68 vegetation types are classified into ten biomes (Figure 3.5).

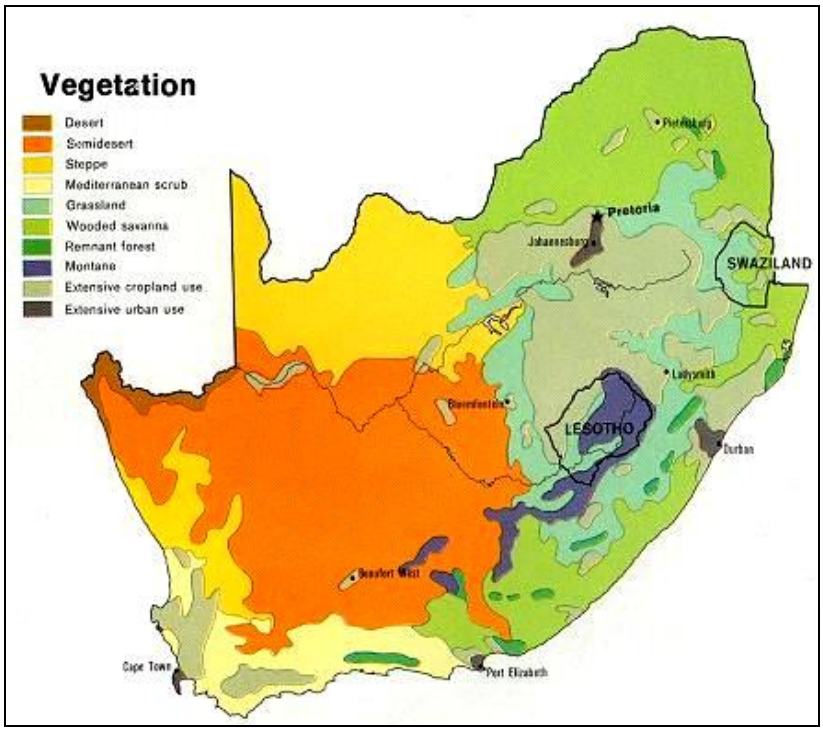

Figure 3.5 Map of South Africa showing vegetation distribution.
(Source: University of Texas at Austin http://www.lib.utexas.edu/maps/africa/south_africa_veg_1979.jpg. Accessed on 08/04/2005)

3.4 Ecological, Economic and Social Importance of Forest/Woodlands Resources

In this section, the importance of forests and natural resources to human survival is discussed – for a better appreciation of the need to preserve and conserve resources.

Globally, forests and woodlands play a critical role in the survival of human populations. Apart from serving as sources of shelter, water, fuel and food for people and their livestock, forests and woodlands regulate climate, protect the land from soil erosion, control the quality and quantity of water, and regulate its release into the rivers and lakes (FAO, 1993; UNEP, 2002). They are sources of much of the world's biodiversity and habitat to numerous species of plants and animals. Forests and woodlands play important roles in sustaining many of the cultural and religious practices of the people, especially in the rural communities, and contribute to the socio-economic development of both developing and industrial countries by creating eco-tourism destinations (Mussanhane *et al.*, 2000).

The United Nation Conference on Environment and Development (UNCED) *Agenda 21* (as well as several other international conventions – including the Convention on International Trade in Endangered Species of Wildlife Fauna and Flora (CITES, 1975), the Convention on Biological Diversity (CBD, 1993), the Convention to Combat Desertification (CCD, 1994) highlights these important roles. Forests and woodlands contain a variety of species of plants and animals that have social, economic, health, and political importance to both urban and rural people. Forests and woodlands provide a number of essential goods and sources of livelihood especially for rural people. These include firewood, construction materials (timber, pole, bark fibres and thatching grass); and non-timber products like food (wild vegetables, fruits, honey, edible insects and bushmeat), medical herbs, grass for grazing, and browsing for livestock (FAO, 1997; Shackleton *et al*., 2002; Mussanhane *et al.*, 2000; O'Brien *et al.*, 2002).

From an economic viewpoint, forests contain many resources from which individuals and countries generate income. It is estimated that in 1998 South Africa earned US$837 million from exports of wood pulp and paper, most of which were produced in plantation forests. In the same year, Zimbabwe earned US$42 million from sawn wood. Commercial timber production is also an extensive and lucrative occupation in Western Africa, contributing significant proportions of income and foreign exchange (FAO, 2001c; Kowero *et al*., 2003; FAO, 2005).

Forests and woodlands are important to local communities, mainly as a source of domestic fuel – either as wood or charcoal. These natural resources are also vital to the livelihood of millions of people – as sources of woodfuel, building materials, and timber. For example, ~80% of Africa's population live in rural areas and depend on wood for cooking, heating water for domestic use, space heating and drying (preserving) foodstuff (Crooke, 2003; Shackleton, 2004; Belcher, Ruiz-Pérez & Achdiawan, 2005; Sunderlin *et al*., 2005; Shackleton & Shackleton, 2006).

Other resources heavily used by local communities are wildlife (bushmeat), medicinal plants, wood and rattan (for construction, furniture and crafts), honey, nuts and fruits, animal fodder, gums, dyes, teas, spices and aromatics. Palms are important resources for the wine and beer making that contributes significantly to the daily income of rural households in West Africa. Forest foods

also feature in many cultural ceremonies: marriages, funerals, initiations, installation of chiefs, and birth celebrations etc. Palm wine and Kola nuts are important symbolic foods throughout humid West Africa. In Nigeria, for example, palm wine is of paramount importance at most social functions. The wine is used in pouring libations, offering prayers, and heralding events. Kola nuts are symbols of welcome, hospitality and of friendship. These nuts are common ingredients in all traditional ceremonies - marriage, naming, coronation or chieftaincy - especially among the Yoruba in the Southwest and the Igbo of south-eastern Nigeria (Okigbo, 1980; Osemeobo, 1994; 1999; FAO, 2001b; Adebisi, 2004).

In addition to the tangible benefits of their products, forests and woodlands have been important paces for cultural, spiritual or religious events and rituals. In many parts of West Africa, forest areas and specific trees are protected and valued both for particular cultural occasions and as historic symbols. Each community has its own traditions associated with sacred areas and, as a result, the sacred species found within them may vary greatly. Sacred groves are the site of ritual and secret society initiations, a locale where social and political values, morals, secrets, and laws are passed on to the younger generation. Sacred groves house important religious and ritual relics.

Because of the enormous economic, social, cultural, and environmental value of forests, the high rates of forest degradation in Africa are cause for concern and require immediate remedial action. Although the local uses and values of forest resources are seldom fully valued or adequately reflected in forest planning and management decisions, they are nevertheless being accorded increasing importance in national and global debates on sustainable environment and development (http://www.unep.org.aeo/126.htm).

3.5 Forest resource and Rural Livelihood: The connection

Lives, and the livelihood of rural people, are often intricately linked to various components of a landscape. The future of the world's forests and the future of millions of the world's poorest people are inextricably linked. Forest resources play an important role in the livelihoods of hundreds of millions of rural people – principally as a subsistence commodity but also as a source of cash income, a capital asset, and a source of employment (Sunderlin, Angelsen, & Wunder, 2003; Vedeld, Abgelsen, Sjaastad & Berg, 2004).

According to The World Bank (2001), it is estimated that roughly a quarter of the world's poor and 90 percent of the poorest depend substantially on forests for their livelihoods (World Bank, 2001). Many of the 'very poor' are found among indigenous hunting and gathering tribes, landless people living around forests, and landless forest workers. More than 1 billion people depend, to varying degrees, on forests for their livelihood. Approximately 60 million indigenous people are almost wholly dependent on forests. Around 350 million people, who live within or adjacent to dense forest, depend on their local forest resources to a high degree – for both subsistence and income (World Bank, 2001:15). From the World Bank figure, there can be no doubt that forest resources play an important role in the livelihoods of vast majority of these individuals.

Mounting empirical evidence demonstrates that forest resource conservation and degradation has consistently pointed to links between the livelihood activities and strategies of forest dwellers. The disappearance of natural forests in developing countries is of concern, because it negatively affects the livelihoods of people dependent on forest products and services. However, before reviewing literature further, it is imperative first to provide the conceptual clarification of livelihood and livelihood activities/strategies. 'Livelihood' is an concept that has been gaining increasing currency in recent years and is now seen as fundamental to poverty reduction approaches around the world. The most widely cited and acceptable definition of livelihood is:

> *"A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base…"* (Carney, 1998: 4)

Livelihood can be thought of as the ways in which people make a living, and this is not just a matter for the poor. Livelihood contributes to human well-being, which includes tangibles such as assets and goods for consumption. Ellis (2000: 10), defined livelihood as *''...the assets (natural, physical, human, financial, and social capital), the activities, and the access to these (mediated by institutional and social relations) that together determine the living gained by the individual or household.''* This definition shows that 'livelihood' is more than an issue of income; it encompasses everything that needs to be done to obtain a living. Livelihood consists of the capabilities, assets (stores, resources, claims, and access) and activities necessary for a means of living (Ellis, 2000). Therefore, 'livelihood' deals with people, all their resources and what they do with these resources. Livelihood essentially revolves around resources (such as land, crops, knowledge, cattle, money, social relationships, and so on), which cannot be disconnected from the issues of access and changing political, economic and socio-cultural circumstances.

Sub-Saharan Africa's forests are a rich, common, property resource that plays a crucial role in rural livelihoods. Forest resources support subsistence and income-generating activities – such as small-scale timber harvesting, fuelwood collection, resin tapping, and collection of wild fruits, vegetables, and medicines. These activities complement agriculture, thus providing households with the means to diversify their livelihood activities. In this manner, the forest resource base serves as an essential 'safety net' for the rural poor in times of hardship. Many rural households view agriculture as their primary employment and the collection of forest resources as a vital secondary, or even tertiary, occupation (CIFOR, 2001; Campbell, 2002).

Numerous studies have documented how rural people living in and within forest areas use forest resources to meet their needs (Horn, 2000; Dovie, 2001; Campbell, *et al*, 2002. Ambrose-Oji, 2003; Kaimowitz, 2003; Crooke, 2003; Shackleton, 2004; Shackleton & Shackleton, 2004; Belcher, Ruiz-Pérez & Achdiawan, 2005; Sunderlin *et al*., 2005; Shackleton & Shackleton, 2006). A survey by Shackleton and Shackleton (2004) provided an indication of the importance of non-timber forest products (NTFPs) in the daily lives of rural people in South Africa. The study reported that the most commonly used products are: wild spinaches, fuelwood, wooden utensils edible fruits, grass hand-brushes, and twig hand-brushes. Approximately 85 percent of the studied

rural households were found to be significantly dependent on forest and/or related activities – processing, selling, reed weaving, or mat-making. More than half the households investigated also made use of edible insects, wood for construction, bushmeat, wild honey and reeds for weaving. Individual households also exploited dozens of animal and plant species.

Cavendish (1999) (in a household economic survey on the role of woodlands in rural livelihoods in communal areas of Zimbabwe conducted among 197 households in 29 villages in southern Zimbabwe in 1993/94 and 1996/97) revealed that at least 100 different resources were used. Most notable were firewood use, consumption of wild foods, livestock browsing and grazing, and cash income from the sale of non-timber forest products (NTFPs) – thatching grass and carpentry products. For the poorest 20 percent of households, these NTFP's provided 24 percent of average total income per person in the two year study period; for the wealthiest 20 percent of households, these resources accounted for only 16 percent of average income – despite the fact that the richer households were the main users of NTFPs by quantity. The economic characteristics of NTFP's are what makes them attractive to poorer households.

In another study, Rahman, *et al* (2007) determined the livelihood strategies of Nyabyumba community in Uganda and the impact of Africare's development activities on the livelihoods of the community. Data were collected using a mixed methodology of a household survey questionnaire (administered to 15 purposefully selected households in Nyabyumba community-Kabale district) and a key informant interview with the chairperson of the community. The researchers found that crop production was the major income source for all samples although there were large differences between the households in the types and quantities of crops grown. Few of the households owned livestock. According to the key informants, those households who did not own livestock were considered 'poor', and the 'poor' people in the area did not take part in community activities. Thus, the participation of the 'real' poor in Africare's activities was found to be very small in Nyabyumba community. Informal discussions with several Nyabyumba residents revealed that there were householders who were reluctant to join in Africare's activities because of the pre-conditions – which required land ownership. All the participants in Africare's development activities were very enthusiastic about their continued participation. They contended that they benefited from Africare projects by acquiring new knowledge and skills which they will always be able to use, with or without Africare.

This literature evidence has indicated that the future of the world's forests and the future of millions of the world's poorest people are inextricably linked. Forests plays an important role in the livelihoods of hundreds of millions of rural people – principally as a subsistence safety net, but also as a source of cash income, a capital asset, and a source of employment (Sunderlin, Angelsen and Wunder, 2003; Ogunyemi & Raheem, 2005). The main contribution of forest resources to rural livelihoods is through providing subsistence products and services, and a *de facto* 'safety net'.

3.6 Links between Poverty and Forest Resource Conservation

Although poverty is not one of the variables of interest in this study, it is important to give a brief review. Firstly, surveys of available literature reveal that poverty cannot be ignored in any discourse on natural resource conservation and will be linked to discussion later in this work. Most

scholars researching forest resources use and conservation reported a clear link between forests and poverty. The links between poverty and forest resources have been the subject of intensive research and discussion. Depending on the discipline and objectives of the study, poverty is often seen as being a component of forest resources use – or vice versa.

Before getting into the debate, it is pertinent to understand the concept of poverty. Poverty has a number of definitions that have different measuring dimensions. The notion of poverty is determined in different ways by various institutions. The indicator of poverty also differs. For ease of reference and coherence in global assessment, development agencies often employ quantitative measures of poverty – such as those setting a threshold of one or two dollars a day. Specific indicators relating to certain economic and social factors (such as infant mortality and literacy rates) are also employed.

The United Nations High Commission for Refugees (UNHCR) defines poverty *"…as a human condition characterised by the sustained or chronic deprivation of resources, capabilities, choices, security and power necessary for an adequate standard of living and other civil, cultural, economic, political as well as social rights…"* (UNHCR, 2004:). Thus poverty can be described as a state of being without the necessities of daily living, often associated with financial need, hardship and lack of resources across a wide range of circumstances. Many people see 'poverty' as a subjective and comparative term; for others it is a moral and evaluative or scientifically established term.

The Copenhagen Declaration of 1995 described absolute poverty as *"…a condition characterised by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information."* The World Bank (2001), on the other hand, identifies 'extreme poverty' as being people who live on less than US$1 per day, and 'poverty' as less than $2 a day. Using that standard, 21% of the world's population was in 'extreme poverty', and more than half the world's population was poor in 2001. Nearly 1.2 billion people worldwide consume less than the 'standard' of a dollar-a-day; they are in dollar poverty. Forty-four percent are in South Asia; approximately 24% each in sub-Saharan Africa and East Asia; and 6.5% in Latin America and the Caribbean. Of the billion poorest people in the world, 75 percent live in rural areas (IFAD, 2001; World Bank, 2003).

The debate about the links between forest resource conservation and poverty is unimportant; it largely depends from which perspective one is viewing the argument. Reading available literature reveals that mainstream literature puts the blame for the environmental degradation (such as deforestation and overexploitation of natural resources) on the rural poor. This literature postulates that the poor – in using and managing forests to maintain flows of material and environmental inputs into their livelihood systems – often transform the resource because the pressure of poverty forces people to deplete and destroy forests (to meet their needs for fuel and other forest products and for land on which to produce food) (Forsyth, Leach & Scoones, 1998; Bebbington, 1999; Scherr, White & Kaimowitz, 2003; McNeely & Scherr, 2003). Further arguments are that, while using the resources, the poor are either unaware of the environmental consequences of their activities or even averse to conservation measures. One major flaw in these latter claims is that it

completely ignores the political economic dynamics of environmental degradation. A few empirical studies from underdeveloped countries have intelligently put forward evidence to refute these claims. These studies suggested that large-scale deforestation has not been caused by use and misuse of forests by the rural poor but rather through the growth-enhanced demand for the resources. The researchers have alternatively postulated that the environmental degradation is a function of a web of factors that generate and perpetuate poverty and environmental degradation – including market failure, institutional failure and policy failure.

Forests have an important role to play in alleviating poverty worldwide. Firstly, they serve a vital safety net function, helping rural people avoid poverty, or helping those who are poor to mitigate their plight. Secondly, forests have untapped potential to actually lift rural people (households) out of poverty.

3.7 Forest Degradation: Socio-Economic and Environmental Consequences

The environmental crisis of forest degradation in many parts of the world has been widely documented. Many studies have attempted to analyse the extent and cause of the problem (Myers, 1980; FAO-UNEP, 1982; WRI/IIED, 1988; Anderson, 1990; Adams, 2001; Geist & Lambin, 2002; Ogunyemi & Raheem, 2005). Available data across the globe paints a gloomy picture of the continuing dwindling of forest area cover worldwide (FAO, 2001a; 2003; 2005; 2007). This section discusses the causes and consequences of forest resources degradation.

The environmental problems facing the developing world are multiple and complex. Numerous studies agree that the main causes of forest clearing and degradation can be traced to pressures that originate in economic and demographic growth, public policy, together with the nature of political structures and institutional systems (De Montalembert & Schmithüsen, 1993; Brown & Pearce, 1994; Laarman *et al.*, 1995). The factors associated with these various changes are closely connected, interacting in ways that involve complex causal relationships, sometimes producing contradictory outcomes (CIFOR, 1995; Kaimowitz, 1997; Kaimowitz & Angelson, 1998).

Degradation of forest resources is the product of the interaction of many environmental, social, economic, cultural, and political forces, and any generalisations about the causes of degradation should be made with caution. A scan of the literature shows that these forces vary in their impact from country to country. Studies have also shown that no single factor can account for the high rates of worldwide forest resource degradation that have occurred – especially in developing countries. Causal factors can be divided into two categories: direct and indirect causes (Sitarz, 1994). The direct causes include: agriculture, logging for timber and large-scale development projects (Cooper & Palmer, 1992). These factors have been linked with a range of indirect causes, including human population growth, ever-increasing demands for forest products, unequal distribution of land, national policies and debt levels in developing countries.

Other factors include skewed land distribution, plantation agriculture, official policies encouraging unsustainable forest exploitation and ‘rich country’ exploitation of cheap tropical timber (Timberlake, 1991). Domestic policies may also determine how individuals use or abuse

natural resources. Fearnside (1993) and Eden (1994) have shown that the current state of the Amazon rainforests of Brazil is partly a consequence of the Brazilian government's decision, in the mid-1960s, to include the northern part of the country in the overall development programme. This led to the construction of a number of long distance highways that encouraged: internal migration; the establishment of large cattle farms; the development of agrarian communities by small-scale farmers; and the establishment of industrial mega-projects.

In Africa, the degradation of forests can mainly be attributed to clearances for agriculture (Contreras-Hermosilla, 2000; FAO, 2001c). Almost 70% of the forest changes in Africa – in the 1980s – occurred through the degradation of closed forest to open and fragmented forest areas, marked by the shift to cultivation with short fallow periods (WRI, 1996). The increasing demand for fuelwood, especially in urban areas, has also taken its toll on the forests. Dependence on fuelwood is almost total: wood provides over 90% of the total national energy consumption in most countries in Africa. With the increasing demand for fuelwood by the growing populations, the rate of deforestation has increased, under the influence of market forces. Repetto and Holmes (1987) identified the commercial exploitation of forests as an important factor in the destruction of forests. In the Ivory Coast and Nigeria, for example, the main force behind deforestation has been the logging of hardwoods for the export market. In Nigeria, most of the exploitable forests have already been logged, and government has now banned the export of timber. Ivory Coast, the biggest timber exporter in Africa, lost two-thirds of its closed forest in the 20 years leading up to 1980 (Ogunyemi & Raheem, 2005).

Many people blame the serious problems of degradation in the developing countries on population growth (FAO, 1998; UNDP, 2000). Population pressure, particularly in closely settled areas, has undoubtedly forced the extension of agriculture into forests and increased the demand for fuelwood, setting in motion a downward spiral of forest destruction. However, deforestation is a complex problem, and rapid population growth alone may not explain the rapid rate of deforestation experienced in many other developing countries.

Other factors – such as a breakdown of traditional common property management and commercialisation of the forest resources – have also led to increasingly severe pressure on forests in most developing countries (Repetto, 1985). Therefore, to regard population growth (and the consequent increase in the demand for food, fuel and other forest products) as the sole cause of deforestation is to oversimplify the problem, and creates the danger of formulating inappropriate policies and strategies to solve it. Other underlying causes (according to WRI, 1990, 1994; FAO, 2003a; Federal Republic of Nigeria, 2005) of natural degradation include:

- poverty;
- inappropriate policies;
- destructive logging; practices by foreign logging companies;
- weak and inefficient forest management institutions;
- non-involvement of indigenous people in planning and management;
- conflict and contradictions concerning land-use rights and responsibilities;
- poor design of agricultural and forestry projects financed by international aid agencies;
- illegal trade.

In Nigeria, the following factors (FAO, 2003b; Federal Republic of Nigeria, 2005; Ogunyemi & Raheem, 2005) have contributed to the degradation of forest resources:

- inequitable policies regarding the allocation of forest resources
- forestry companies that fail to comply with conservation regulations;
- endemic corruption;
- collusion and nepotism;
- lack of law enforcement;
- poor monitoring system
- poor coordination between sectors;
- adoption of a centralised model of development.

From the preceding discussion, it is clear that no single factor can explain the process of deforestation. Because so many factors are intertwined, the problem must be regarded a complex one, requiring deeper, more thorough and more complex analysis.

3.8 International and National Policy Initiatives on Forest Resource Conservation

An overview of the relevant literature suggests that addressing environmental problems demands action from four main areas: research and documentation, developing a holistic organisational structure, legislation and its enforcement, and environmental education (Lawal, 1995). In this section, review of international, regional and national policy initiatives and legislation related to forest resource conservation is presented.

I begin with a brief account of the meaning of policy. According to Anderson (1997:311) "*…public policy is the means of defining in a rational and authoritative manner the distribution of goods and services according to benefits and costs in society…*" Policy is a statement of intents or objectives that government sets out as part of its vision. The statement provides a framework that guides and determines the action of government, its agencies and other stakeholders who may be either affected by or interested in the policy. Therefore, forest policy defines the role of government – and all other stakeholders – concerning the exploitation and management of forest resources. The policy is concerned with the manner in which forest and tree resources should be managed to serve both the material and non-material needs of the people. Forest policy is a tool to guide the forestry sub-sector of any country (Prunty, 1994; Hill, 1997).

Since the late-1980s several international and regional environmental policy initiatives have been established. Never before in human history has the global community come together to search for sustainable solutions to the world's environmental challenges. In 1987, the World Commission on Environment and Development began this global move with its Brundtland Report: *Our Common Future*. Five years later, the Earth Summit, organised by the United Nations, was held in Rio de Janeiro, Brazil, 1992. *Agenda 21, an Action Plan for Development* and the *Rio Declaration on Environmental Protection and Responsible Development* was the international initiative that came out of the summit. All the countries that participated in the summit pledged and signed a statement of forest principles for more sustainable use of forest resources. Chapter 11 of *Agenda 21* discussed action plans for: (i) sustaining the multiple roles and functions of all types of forests, forest lands and woodlands; (ii) enhancing the protection, sustainable management and

conservation of all forests, and the greening of degraded areas (through forest rehabilitation, afforestation, reforestation, and other rehabilitative means); and (iii) promoting efficient utilisation and assessment to recover the full valuation of the goods and services provided by forests, forest lands and woodlands. *Agenda 21* promotes improved legislation, action plans, and research for halting deforestation (UNCED, 1992).

The Millennium Summit of 2000 reaffirmed commitment to sustainable development and the proposed Millennium Development Goals (MDGs) were unanimously adopted – another international initiative for achieving human development. Among other issues, the Millennium Development Goals stressed the urgent need to reduce extreme poverty and hunger; to improve education and gender equality; to combat HIV/AIDS; to ensure environmental sustainability, and to strengthen the capacity of the global community to undertake development. Specifically related to forest resource conservation is MDG 7 – namely, to ensure environmental sustainability. It is estimated that every year over 14 million hectares of tropical forests are converted to unsustainable land uses with the accompanying loss of biodiversity, increases in greenhouse gas emissions, increases in soil erosion, and the disruption of watershed services (UNESCO, 2002; World Bank, 2002b).

Although only one out of the nine MDGs explicitly refers to the environment, there is no doubt that the attainment of other goals in this Millennium Summit's declaration rests on the health of the environment. Governments all over the world, including those in sub-Saharan Africa, have willingly initiated projects toward achieving these targets.

Johannesburg, South Africa, 2002, was when government leaders, delegates, scholars and researchers gathered for the *World Summit on Sustainable Development* (WSSD) (otherwise called *Rio+10*). The summit served as a platform to review and assess the progress made by countries towards the attainment of those commitments/principles of UNCED, as pledged ten years earlier in Rio de Janeiro, Brazil. The focus of the WSSD, unlike UNCED, was much broader than the environmental aspects of sustainable development. WSSD covered poverty alleviation, consumption and production, health, globalisation, conserving and managing the natural resource base, the role of institutions, and the process required for implementing the plans of action adopted. The summit produced a document entitled *'Plan of Implementation of WSSD 2002'* (World Bank, 2002b; United Nations, 2002).

Another global convention that has shaped interaction with the environment in general, and forests in particular, has been the United Nations *Convention on Biological Diversity* (CBD) (UNEP, 1992) whose provisions are especially relevant to forests in Africa. Although desertification and land degradation are major environmental problems in both developing and developed countries, when one considers the rate of desertification, the yearly loss of topsoil and the attendant loss of biodiversity in sub-Saharan African countries, it would not be out of place to assume that the CBD was initiated for the African nations. Governments of all countries are to accept primary responsibility for creating appropriate conditions for implementing the principle of sustainable development. These efforts will be based on the strategies, plans and programmes, all

formulated in cooperation with various social groups and non-governmental organisations. Nigeria and South Africa are signatories to most of these international conventions and initiatives.

Before reviewing the policy initiatives at the regional and national levels in the two countries of study, it is pertinent to examine briefly a concept that encapsulates all the initiatives or the ultimate goal: that of human sustainability through the sustainable use of environmental resources and development.

Sustainable development is a concept that has at its core numerous inter-related global concerns – such as poverty, inequality, hunger and environmental degradation. Since sustainable development came to prominence (through the Brundtland Commission report in 1987), the idea of has generated much interest and debate. The point at issue is the model of sustainability suited for future development. The term 'sustainable development', which also connotes 'sustainability', remains a catch phrase for all ideas for future development. Sustainability is itself a complex notion, determined by economic, ecological and socio-cultural factors. Although sustainable development has many definitions, the most widely quoted comes from *Our Common Future*:

> "*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*" (WCED, 1987:87)

Clearly, according to this definition, sustainable development is a concept that encompasses a wide range of economic, technological and political, as well as environmental, perspectives. Technological perspectives promote the view that advances in technology and the operation of free market economic forces will be sufficient to remedy the effects of an environmental crisis. By contrast, environmental perspectives of sustainable development promote world-views towards more fundamental, transformative cultural changes. According to O'Riordan (1981:8), ecological perspectives promote "*...a humble and humane approach of harmony with ecological processes and a sense of true association with the Earth, which in turn requires a fundamental change of attitude away from a sense of technological hubris...*" Despite the disagreement over the acceptability and attainability of sustainable development, international organisations have continued to endorse the concept and have brought it into the broader development discourse.

Sustainable development is essentially concerned with the prosperity and quality of life. Smith and Williams (1999:1) asserted that "*…sustainability is about the relationships between human beings and the world; it is about morality…*" In this sense, sustainability is a concept that concurs with those views on environmental ethics that assume a moral stance towards the world. The concept recognises the limit in the carrying capacity of natural resources to sustain the world's human population. Sustainable development should not be interpreted as a fixed notion, but should rather be seen as a process of change in the relationships between social, economic and natural systems and processes. Sustainability is the alternative to resource depletion caused by "*…excessive exploitation for short-term benefits…*" (Clerk, 1992: 428). The IUCN advanced sustainability as a strategic approach towards: the integration of conservation and development consistent with objectives of ecosystem maintenance; the preservation of genetic diversity; and the sustainable utilisation of resources. The criterion for sustainable use is that the resources should not be harvested, extracted or utilised in excess of the level at which the resource can be regenerated.

Sustainable development is an integrated and innovation-oriented way of seeking solutions that have a *"…triple bottom line…*", with outcomes that are good for people, the environment and the economy (WCED, 1987).

3.8.1 African Policy Responses to Environmental Crisis: Continental and Regional

Considering the number of policies, initiatives, programmes, projects, conferences and workshops – both at continental, sub-regional, bilateral and national levels – countries in sub-Saharan Africa have responded energetically to environmental crisis in the continent. Many African countries have initiated and developed new national environmental policies, laws and regulations and several have entered into bilateral and multilateral environmental agreements. However, the degree of success has been uneven and there remains the question of why the original problems persist. It has been argued that most of these policies and projects, laudable as they may be, remain mere intentions, without the political will or capacity for their implementation.

Collective initiatives or actions taken by African governments to address the challenges of environmental degradation include:

- The Algiers Convention on the conservation of nature and natural resources signed in 1968 by African governments;
- The Organisation of African Unity (OAU) in 1980, during an extraordinary summit of African heads of state and governments, adopted the *Lagos Plan of Action;*
- The establishment of the *New Partnership for Africa's Development* (NEPAD) in 2001, by African heads of state.

3.8.2 Sub-Regional Policy Responses and Actions

Many of Africa's policy responses to the environmental issues and challenges of the 1992 Earth Summit, MDGs (2000) and WSSD (2002) can also be found in the various sub-regional frameworks and agreements developed since 1992. These responses are based on sub-regional political and economic groupings and priorities.

In 1990 the Southern Africa Development Community (SADC) was established with the main aim of formulating regional policy and strategy to ensure both efficient and sustainable use of natural resources and their effective management and conservation. SADC incorporates environmental considerations in all policies and programmes, and integrates the sustainable use of natural resources with development needs. Environmental policies in the sub-region include the SADC Wildlife Policy; the SADC Wildlife Protocol; the Forestry Sector Policy and Development Strategy; the Protocol on Shared Watercourse Systems; the Southern African Power Pool; and the Southern Africa Trade Protocol. Running parallel with these initiatives are other important sub-regional responses including: the SADC Environmental Information Systems Programme; the SADC Wetlands Conservation Programme; the SADC Environmental Education Programme; and the Southern Africa Biodiversity Support Programme (Dalal-Calyton, 1997; Kowero *et al.,* 2003).

The countries in the West African sub-region were brought together under the aegis of a regional organisation entitled the Economic Community of West African States (ECOWAS), formed in 1976. However, there has not been much cooperation between the countries, especially

on environmental issues. Most of the policy responses to environmental issues in western Africa have been made at the national level. Although regional frameworks for coordination and cooperation exist on paper, their implementation on the ground has been weak, because of lack of funding and institutional problems (Africa Environment Outlook, available online www.unep.org/aeo downloaded on 7-06-04).

In addition to these regional and sub-regional initiatives, there have also been country level efforts. In their efforts to address environmental degradation, African countries have focused on a range of policy responses. International policy and policy dialogues set the framework for national-level policies, and are therefore very important because their influence can be felt even at the local level.

3.8.3 Forest Policy and Related Policies in Nigeria

Nigeria has several policies and plans that affect the environment and forest resource conservation. Several of these have been adopted and are being implemented; others are being drafted or under review. These documents include: the National Environment Policy of 1988 (revised in 1996), and the National Agricultural Policy (2003). Other policies include: the National Policy and Plan of Actions, 1991–1995; National Policy on Population and Sustainable Development (2003); the Water Supply and Sanitation Policy (adopted in 2004), and the National Policy on Women (2000) – the latter strives to enhance the status of women. Other sectoral policies relevant to forest resource conservation are: the National Energy Policy; the National Conservation Strategy; National Resources Conservation Action Plan; the National Environmental Action Plan (NEAP); the State Environmental Action Plan (SEAP); the National Tropical Forestry Action Plan; the National Biodiversity Strategy and Action Plan; The Green Agenda of the Vision 2010 Report; the National Empowerment and Economic Development Strategy (NEEDS); and the National Action Programme to Combat Desertification (EC-FAO, 2003; Federal Republic of Nigeria, 2005).

3.8.4 Forest Policy and Related Policies in South Africa

Since 1994, there has been a conscious effort on the part of government to initiate, formulate and implement various reconstruction and development programmes for the country to reduce poverty, ignorance and inequality. Policies include: the National Environmental Management Act, No. 107 of 1998; the White Paper on Environmental Education and Training (Republic of South Africa, 1995); Environmental Implementation Plans and Environmental Management Plans (2002); the White Paper on Environmental Management Policy for South Africa (1998); Land Policy (1995); White Paper on the Conservation and Sustainable use of South Africa's Biological Diversity (1997); and the White Paper on Sustainable Forest Development in South Africa, (1997); National Forestry Action Plan (NFAP); and National Forests Acts of (Republic of South Africa, 1998). These policies are not only geared towards sustainable management of natural resources, but also emphasise local community and private sector participation in managing and sharing accrued benefits from the resources. This is a radical shift from earlier policies that had restricted forest management to the government and its agencies.

In South Africa, the protection and conservation of the environment is a constitutional matter. Chapter 2, section 24 of the country's Constitution (Republic of South Africa, 1994) specifies, within the Bill of Rights, that every citizen has the right:

- *"…to an environment that is not harmful to their health or well-being, and to have the environment protected for the benefit of present and future generations, through reasonable legislature and other measures that:*
- *prevents pollution and ecological degradation;*
- *promotes conservation; and*
- *secures ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."*

The Constitution places the responsibility for the protection of forest resources at both national and provincial government levels. It is the responsibility of the central government, through the Department of Environmental Affairs and Tourism, to formulate the general policy concerning the conservation and use of forest resources, the implementation of which will be undertaken by the different government institutions within central, provincial, and local spheres (DWAF, 1997; Twine, *et al*, 2003; Shackleton, 2004b).

Literature shows that, despite the formulation of forest and forestry policy and legislation by many of the African countries in the past decade (1990 to 2000), both the implementation and law enforcement remain weak in most countries. Africa's natural endowments, especially the forest resources, are still under threat by human activities – bush burning, land fragmentation, and over-farming, grazing – which lead to uncontrollable soil erosion, deforestation and degradation of the ecology of the continent (particularly among rural inhabitants in their quest for survival) (World Watch Institute, 1991; Sharp & Koné, 1992; WRI, 1994; FAO, 2001c). The questions posed here are: To what extent are the goals and objectives of these policies related to (and relevant to) the concerns and needs of the people? What has been the level of involvement of local people in the formation and implementation of these policies? Providing answers to these and other questions will help illuminate the possible contradictions between policy goals and objectives and the impact on the people for whom the policy has been formed.

The content of the forest policies of Nigeria and South Africa will be analysed in Chapter Four, the first chapter on analysis in this thesis.

3.9 History and Conceptualisation of Environmental Education

The practice and perceptions of environmental education (EE) have evolved over time. In this part of the review of literature, the various definitions of EE and its historical development are briefly outlined to provide insight into both current practices, and the emergence of the different perspectives that are represented today across the globe, beginning with a brief history.

Scholars such as Haan and Kuckartz, (1996); Gough (1997); Palmer (1998); and Michelsen, (2006) have dated the beginning of EE at the end of the 1960s, when it was discussed at an international level. This discussion was a response to the world's growing understanding of the scientific and ecological problems facing the environment, and the need for greater public awareness of these problems. However, according to Disinger (1983), EE pre-dated the 1960s –

back to ~1948 when the term was first used at the meeting of the International Union of the Conservation of Nature and Natural Resources.

Nonetheless, since its 1960s' popularisation, the field of EE has continuously witnessed the development of a variety of definitions and approaches, seeking to improve on the previous ideas and to achieve the primary aims of raising awareness and motivating individuals, whether within institutions or communities, to engage in environmentally friendly and sustainable behaviour (Janse van Rensburg & Lotz, 1998).

The 1972 United Nations Conference on Human and Environment, held in Stockholm, was the first environmental meeting at the global level – thus creating an awareness of environmental crisis as a global phenomenon. The Conference placed the environment on world's political agenda, and its principles formed the basis of international environmental laws and actions in the 1970s and 1980s. It recognised environmental education as a critical to address the world's environmental crises. The declaration from the conference identified *"…man as both creature and moulder of his environment…"* (UNEP 1972:) and added that the *"protection and improvement of human environment is a major well-being of peoples and economic development throughout the world."* One of the principles of this Declaration states that education in environmental matters for the younger generation, as well as adults, is essential to broaden the basis for enlightened opinions and responsible conduct by individuals, enterprises and communities in protecting and improving the environment in full human dimension. Since this conference, many international activities have been initiated to encourage and promote environmental education programmes in the member states of the United Nations (Hall & Hanson, 1992; Ogunyemi, 1994).

In 1974, in line with several of the recommendations of the Stockholm Conference, UNESCO and UNEP jointly established the International Environmental Education Programme. The first International Environmental Workshop on Environmental Education was held in Belgrade, Yugoslavia, 1975. This conference produced far-reaching recommendations on the aims, objectives, key concepts and principles of environmental education. The Belgrade Charter: *'The Belgrade Charter: A Global Framework for Environmental Education'* was the outcome of the conference. The framework included the following aims:

- to foster clear awareness and concern about economic, social, political and ecological interdependence in rural and urban areas;
- to provide every person with the opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment;
- to create new patterns of behaviour of individuals, groups and society towards the environment (Hungerford, 1990:8).

The first intergovernmental meeting on EE was held in Tbilisi, USSR, in 1977, to share experiences and chart a new direction for EE; the resolution at the conference was titled the *Tbilisi Declaration.* This meeting was attended by 66 member states and recommendations for the wider application of EE in formal and informal education were prepared. The 1977 Tbilisi conference specified the following goals for environmental education (UNESCO-UNEP, 1985:5):

- *"To foster clear awareness of, and concern about, economic, social, political and ecological interdependence in rural and urban areas;*
- *To provide every person with the opportunities to acquire the knowledge, values, attitudes and commitment and skills needed to protect and improve the environment; and*
- *To create new patterns of behaviour of individuals, groups and societies as a whole towards the environment."*

The Tbilisi conference also endorsed the following objectives for environmental education:

- *"Awareness and sensitivity to the environment and environmental challenges;*
- *Knowledge and understanding of the environment and environmental challenges;*
- *Attitudes of concern for the environment and motivation to improve or maintain environmental quality;*
- *Skills to identify and help resolve environmental challenges;*
- *Participation in activities that lead to solutions to environmental challenges."* (Hungerford, 1990:8)

The purpose of Environmental Education, according to the Tbilisi principles, is to develop a well-informed world population who are passionate about – and show concern for – the environment and its associated problems. The appropriate knowledge and skills should be taught, alongside inculcating those positive attitudes, motivation and commitment in the population – working individually and collectively – which will act positively towards solving current problems and preventing new ones from arising. People need to be taught how to evaluate environmental conditions and how to participate in fieldwork studies of the environment.

Another landmark conference tagged "Tbilisi + 10" was organised by UNESCO-UNEP in Moscow 1987, to both evaluate the progress made by member states since the Tbilisi Conference and to develop guidelines for an internationally agreed strategy – for the 1990s – for future action on EE and awareness. The congress document emphasised the needs and priorities in developing EE and associated training and suggested 42 international actions required in EE and training for the 1990s.

The United Nations Conference on Environment and Development was held in Rio de Janeiro, Brazil, in 1992. The conference, known as the Earth Summit, emphasised that economic, political and social changes were needed to achieve sustainable development. The Summit brought to attention a number of environmental problems that transcend national boundaries – for example climate change; global warming; loss of biodiversity and desertification. The Rio conference also deepened understanding of the inter-relationship between conservation and development and how global environmental concerns are linked to issues of poverty and human development. A major outcome of this conference was the forty-chapter action plan, entitled *"Agenda 21"*, which presented a number of strategies aimed at achieving improved sustainability. One of the key outcomes of the conference – for educators – was the recommendation that environmental and developmental education should be incorporated as an essential part of learning, within both the formal and non-formal education sectors. *"Governments should strive to update or prepare strategies aimed at integrating Environmental and Development as a cross-cutting issue into*

education at all levels within the next three years." (*Agenda 21*, Ch. 36; Fien 1993; Tibury 1995) The 1992 Earth Summit concluded that:

> *"Education is critical for promoting sustainable development and improving the capacity of people to address environment and development issues…It is critical for achieving environmental and ethic awareness, values and attitudes, skills and behavior consistent with sustainable development and for effective public participation in decision-making…"* (UNCED, 1992: Chapter 36:2).

The statement recognised that education is one of the key processes by which people can be engaged in making changes towards sustainability. Education is more than raising awareness – awareness alone will not bring about the necessary changes. Education for sustainability needs to promote personal initiatives and social participation to achieve sustainability. Education – together with innovative legislation, responsible actions by individuals, communities and corporate organisation and effective governance – all are important to achieve effective action in achieving sustainability. An environmental education programme is one means to help create good environmental citizens. Environmental education is an important element, in raising both the awareness and understanding of sustainability and environmental issues, within communities and in encouraging changing behaviour for a more sustainable future.

Furthermore, the Rio Summit introduced the term 'Education for Sustainable Development' in furtherance of the process of educating the peoples of the world about environmental issues, having recognised the inadequacy of the EE perspective and approaches to accommodate emergent concerns about human survival in HIV/AIDS (UNESCO, 1992; Ogunyemi, 2005). *Agenda 21*, from the 1992 Earth Summit, called for the re-orientation of environmental education towards sustainable development and proposed the following activities for governments:

- *"Cooperation with all sectors of society including the preparation of strategies aimed at integrating environment and development as a cross-cutting issue into education at all levels within three years.*
- *Curricula to be thoroughly reviewed to ensure a multidisciplinary approach, including environmental and development issues and their socio-cultural and demographic aspects and linkages, with due respect given to community-defined needs and diverse knowledge systems, including science, cultural, and social sensitivities.*
- *Every school to be assisted in designing environmental activity work plans, with the participation of students and staff.*
- *Governments should affirm the rights of indigenous peoples – through legislation if necessary – to use their experience and understanding of sustainable development to play a part in education and training."* (UNCED, 1992:18)

Other conferences, held after the Rio conference, have included the following: IUCN-UNESCO in 1994 (held to evaluate the development of EE strategies among European Countries); the UNESCO 1995 Athens conference on Environmental Education for Sustainable Development; the UNESCO-UNEP 1995 conference in the Czech Republic (with the theme *Education and Public Awareness for Sustainable Development*); and the Third International

Environmental Education Conference held in Thessaloniki, Greece, in 1997 (Sauve, Berryman & Brunelle, 2007; UNESCO, UNEP and Government of India, 2008).

The 1997 Thessaloniki Conference, organised by UNESCO (with the theme *"…environment and society-educating for a sustainable future: A transdisciplinary vision for concerted action…"*), was designed to highlight the role of education and public awareness for sustainability. The final report from the conference, "The Thessaloniki Declaration", was endorsed by more than 1 400 participants from 84 countries. This report suggested sustainability can only be achieved through the coordination and integration of effort and – in particular – appropriate education and public awareness should be regarded as important approaches that will bring about a change in behaviour and lifestyle. The report declared: *"Education was no longer seen as an objective in and for itself but as a means to bring about changes in behavior and lifestyles, to disseminate knowledge and develop skills, and to prepare the public to support changes towards sustainability emanating from other sectors of society."* (UNSECO, 1997:1) This report also recognised the issue of poverty and that it should be eradicated to achieve sustainability. The Declaration also emphasised the importance of addressing sustainability from a holistic and interdisciplinary view, where issues pertaining to this concept should not be treated in isolation but should be included in all disciplines and approaches (UNESCO 1997; Sauvé, Berryman & Brunelle, 2007).

Ten years after the 2002 *Earth Summit*, the World Summit on Sustainable Development (WSSD) took place in Johannesburg, South Africa – the third major conference of the United Nations (in the third decade after the Stockholm conference). The 2002 World Summit aimed to strengthen and review the progress since the earlier Earth Summit and to build on the goals set out in *Agenda 21*. It was an opportunity to establish stronger commitment to sustainability. While considerable progress had been made in developing the concept of sustainable development, achievement of the UNCED goals had been lagging. Pressures on the environment and natural resources kept the state of world's environment fragile; poverty had also increased. According to the Worldwatch Institute (2002) progress had been made in particular areas since the Rio meeting – for example, ozone-depleting chlorofluorocarbons (CFCs) were phased out and death rates from death from certain diseases (such as pneumonia, diarrhoea and tuberculosis) had decreased. However, many other important trends had worsened – including deaths from AIDS; increasing global emissions of greenhouse gases (an increase of more than nine percent since Rio) – and many of the goals has been not been attained (Worldwatch Institute, 2002).

Because of their continued interest in the quality of human environment, culminating in the UN General Assembly in 2004, the United Nations took the decision to establish a 'Decade of Education for Sustainable Development (ESD)' commencing in 2005 (UNESCO, 2004: 16). This decade was to focus on achieving the critical balance between what people need for inter-generational survival and what the environment requires to regenerate itself. The Decade for ESD has probably been the most important initiative to date in terms of strengthening international and national efforts towards sustainability through a focus on education. Since the 1992 and 2002 World Summits, Education for Sustainable Development (ESD) has been better understood – beyond the traditional view of education about sustainability – which had been focused merely on the dissemination of knowledge. ESD is rather seen as a process of adaptive management and

systems thinking, requiring flexibility and critical reflection. Central to ESD is the promotion of values and ethics, through education at different levels, to make an impact on people's lifestyles and behaviour and help build a sustainable future. ESD has been designed to motivate, equip and involve individuals and groups in reflecting on how people currently live and work, both by encouraging better informed decisions and creating improved ways of working towards a more sustainable world (UNESCO, 2003; Ogunyemi, 2005; 2006).

The first and second World Environmental Education Congresses were held in Portugal and Brazil in 2003 and 2004 respectively (UNESCO-EPD, 1997; Knapp, 2000). Various other regional meetings of experts on the environment have also been held and have advocated the need for all countries in all the sub-regions across continents to evolve their own environmental education programmes in line with UNESCO-UNEP agenda. At each of these conferences, EE has been promoted and re-echoed as one of the tools to address the emerging environmental crisis.

From the historical account, it is clear that perspectives about environmental education have continued to change and develop. The various declarations adopted by international conferences or summits have guided, and continue to direct, environmental education programme initiatives. It is also clear that there are strong links between environmental education and social, political, environmental, and cultural issues in time and space. Environmental education was conceived, not only for the school systems, but also for communities.

Since the first use of the term in 1948, 'environmental education' has acquired a broad range of meaning and definitions. Many preconceptions of environmental education exist, from those that are focused on ecology, to those that reflect more socially critical and political dimensions. The evolution of EE to ESD, through the past three decades, has also seen the development of a variety of definitions and approaches that can be used to address environmental problems. The different definitions reflect different orientations. Stapp's definition was one of the early definitions (Stapp, 1969, cited in Gigliotto, 1990):

> "*Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution.*" (Gigliotto, 1990:9)

The Environmental Education Act (U.S. Public Law 91-516, 1970) offered a process-focussed definition for the purposes of the Act:

> "*…the term environmental education means the educational process dealing with [man's] relationship with [his] natural and man-made surroundings, and includes the relationship to population, conservation, transportation, technology, and urban and regional planning to the total human environment.*"

At the international level, Recommendation 96 (of the 1972 Stockholm Conference on the Human Environment) called for the development of environmental education as one of the most critical elements for an all-out attack on the world's environmental crisis. The conference identified a need for:

"*…creating citizens not merely aware of the crisis of overpopulation, mismanagement of natural resources, pollution, and degradation of the quality of human life, but also able to focus intelligently on the means of coping with them.*" (UNESCO, 1972:5)

The International Environmental Education Workshop in Belgrade similarly offered an aim-focused definition:

"*…the goal of environmental education is to develop a world population that is aware of, and concerned about, the environment and its associated problems and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones.*" (UNESCO-UNEP, 1976:2)

The UNESCO-UNEP (1978) Intergovernmental Conference on Environmental Education, held in Tbilisi, Georgia, USSR, produced the Tbilisi Declaration, which aimed:

"*…to succeed in making individuals and communities understand the complex nature of the natural and built environments resulting from the interactions of their physical, biological, social, economic, and cultural aspects and acquire the knowledge, values, attitudes, and practical skills to participate in a responsible and effective way in anticipating and solving environmental problems, and in the management of the quality of the environment.*" (UNESCO-UNEP, 1978)

In 1989, the Australian Association for Environmental Education (ASEE) defined EE as:

"…an approach to learning that is useful to individuals and groups in coming to a better understanding of interrelationship between individuals and environments. Environmental education encourages people to develop caring and committed attitudes that will foster the desire and ability to act responsibly in their relationships with environments. Thus environmental education is concerned with knowledge, feelings, attitudes, skills and social action…" (Fein & Gough, 1996:200)

Allers (1997) simply defined EE as *"…the education 'about', 'for', 'in' and 'through' the environment…"* Education about the environment means having a basic knowledge and understanding of the environment and the complex relationships within it (Palmer, 1998). This is the purpose for developing people's knowledge and understanding surrounding their values and attitudes toward the environment. Education for the environment is also concerned with reflecting the ethical element of values, attitudes and positive actions. The primary purpose is to encourage pupils to explore their personal response to, and relationship with, the environment and environmental issues. EE is also linked to the development of attitudes and values, including the elements of human understanding and behaviour necessary for the development of a sustainable and caring use of the environment. Effectively EE incorporates teaching for the benefit of the environment (Palmer, 1998).

In South African EE literature, EE is viewed more holistically and is considered to be an interdisciplinary consideration. According to the White paper on Education and Training (South Africa, 1995:22), EE is perceived as *"…an interdisciplinary, integrated and active approach to learning, must be a vital element of all levels and programmes of the education and training system in order to create environmentally literate and active citizens and ensure that all South Africans,*

present and future, enjoy a decent quality of life through the sustainable use of resources." EE is regarded as *"…the acquisition of a critical understanding of human-ecological principles and processes (i.e. socio-economic and biophysical) to make informed decisions about environmental issues…"* (Irwin, 1990:56). EE enables the exploration of environmental issues through educational experiences and reflection on the state of the environment.

Janse van Rensburg and Lotz (1998: 10) referred to EE as *"…a process through which we might enable ourselves and future generations to respond to environmental issues in ways that might foster change towards sustainable community life in a healthy environment."* This definition stresses the understanding of environmental issues through educational experiences and reflection on the environment, knowledge about the environment, and knowledge of the appropriate actions with regard to the environment. EE is envisaged as a way to change people's attitudes and behaviour towards the environment through involvement in the education programme.

The Environmental Education Association of South Africa (EEASA) promotes the idea that *"…we share one environment, and the better we share it and collectively care for it, the better future all of us are likely to have."* (Irwin, 1990:17) EEASA proposed that the adoption of the principle that *"…EE is a fundamental necessity for a successful society, espousing principles or values such as democratization, respect for people and the natural resources."* (EEASA, 1993:15) The Environmental Education Policy Initiative (1995:2) perceived environmental education as being a field of study that seeks to develop the necessary knowledge, understanding, values, skills and commitment that allow people to become proactive in securing a healthy and properly functioning environment – one that is sustainable. Environmental education, therefore facilitates the exploration of environmental issues through educational experiences by reflection on the environment, thereby allowing learners to both obtain knowledge about the environment and to develop appropriate commitments and actions for the environment (Tselane & Mosidi, 1998:11).

Blignaut (1993) opined that many South African field workers view EE as embracing *"…'society' and the 'environment' in an inseparable process…"* It is also described as involving an *"…understanding of political processes and the creation of political and legal structures, which enable the individual to participate actively in decision making about environmental issues on a local, national and global scale…"* (Blignaut, 1993:15).

In the Nigeria, several perceptions of environmental education may be found in the literature. For example, the Nigerian Conservation Foundation (NCF, 1990) defined environmental education as the integration of environmental elements in schools for a sustainable life. This definition focuses on future and current environmental situations; the focus is interdisciplinary in nature and emphasises active participation in solving environmental problems. EE entails the study of the relationships and interactions between natural and human systems. Yoloye (1981) conceived it as *"…education from the environment, about the environment for the environment…";* while Adara (1997) viewed EE as *"…a process of developing a citizenry that is aware of the total environment, concerned about it and its associated problems and which has the knowledge, skills, attitudes, motivation and commitment to work individually and collectively towards its sustenance."* Environmental education can be viewed as an attempt to cause learners to appreciate, understand

and have a basic knowledge of the environment because EE entails the development, on the part of the present generation, of values, attitudes and skills regarding responsible behaviour, particularly when bearing future generations in mind. EE also aims at the judicious use of existing resources so that future generations will also be able to enjoy a comfortable way of life – as is currently experienced in most parts of the world.

Despite differences in emphasis and in detail, the proponents of the various definitions tend to have several viewpoints in common. A summary of the available definitions in literature show such shared characteristics as:

- interdisciplinary and holistic approach in the study of the environment;
- develop a healthy and sustainable society;
- concern with the protection and conservation of biological species and the environment;
- inculcate environmental literacy and environmentally sensitive behaviour;
- acknowledgement that environmental education is value laden;
- importance of local, national, regional and international relevance; and
- recognition of environmental education as an in-school, out-of-school and field activity.

The importance of environmental education in achieving sustainable development cannot be overstated. The objective of environmental education is to enable citizens to become more conscious of their environment. This consciousness must be allied to a sense of the value of the co-existence of all living beings, and to an understanding of every human's responsibilities towards the natural environment. This means that simply being conscious of the entire natural process and the characteristics of the environment is not enough. Rather, it demands that conscious citizens be actively engaged in a lifelong process to conserve natural resources, spurred by a sense of responsibility towards the environment, and the needs of future generations, of both humankind and other species.

3.10 National Initiatives for Environmental Education: Nigeria and South Africa

The Koko toxic waste saga of 1988, in Nigeria's Delta State, was the catalyst that woke Nigeria to the responsibilities of protecting its natural environment (Ogunyemi, 1994). This disaster also revealed the widespread ignorance of the population about environmental hazards, especially among the inhabitants of rural areas. This episode led to the development, formulation and promulgation of environmental policies – among which is the National Prototype Environmental Education Curriculum in 1992 (Aina, 1990; Ogunyemi, 1994; Adara, 1996a; 1996b). The philosophy and objectives of EE in Nigeria, as stated in National Environmental Education Curriculum of 1998, are oriented toward producing people who can (and will) apply knowledge to the improvement and solution of environmental problems for the use and convenience of human beings. Three main objectives were identified:

- *"…acquiring knowledge and understanding of the nature of environmental problems, and the role of human beings in them;*
- *developing skills in investigating the various dimensions and factor situations for solving the problem; and*

- *developing attitudes, values and strong feelings of content for the environment and motivation for actively participating in its protection and improvement*." (NERDC 1998:5)

The South African Environment Management Policy (1998) also recognises the value of EE as a strategy for responding to, and overcoming, the country's environmental problems. *Goal 5: Empowerment and Environmental Education* conceived of environmental education as a holistic and systematic strategy with the following objectives:

- *"To integrate environmental education in all programmes, levels, curricula and disciplines of formal and non-formal education and in the National Qualification Framework.*
- *To integrate environmental education into all training and unemployment relief programmes.*
- *To enhance environmental literacy through the use of all forms of media.*
- *To ensure that environmental education programmes and projects foster a clear understanding of the inter-relationship between economic, social, cultural, environmental and political issues in local, national and global spheres.*
- *To promote capacity building programmes and projects that assist people, particularly those from disadvantaged sectors of society, in developing social and organisational skills to employ local and other knowledge in assessing and addressing their environmental concerns.*
- *To assist small, medium and micro enterprises in developing appropriate environmental management procedures.*
- *To encourage and support the involvement of special interest groups such as women, workers, the unemployed, the disabled, traditional healers, the elderly and others in the design, planning and implementation of environmental education and capacity building programmes and projects*." (Republic of South Africa 1998:93)

Furthermore, both in the pursuance of the constitutional provision and in response to the growing concern about environmental degradation and the need to promote sustainable living among students, the Department of Education in its White Paper on Education and Training stated that:

> "*Environmental education involving an interdisciplinary, integrated and active approach to learning, must be a vital element of all levels and programmes of the education and training system, in order to create environmentally literate and active citizens and ensure that all South Africans, present and future, enjoy a decent quality of life through the sustainable use of resources.*" (Republic of South Africa, 1995:18)

To translate the policy statement into practice, the environment was included as one of the principles to be promoted through the Revised National Curriculum Statement 2005 (RNCS). According to the RNCS:

> "*…the curriculum can play a vital role in creating awareness of the relationship between human rights, a healthy environment, social justice and inclusivity …all learning area statement reflect the principles and practices of social justice, respect for the environment and human rights as defined in the Constitution.*" *(DoE, 2002)*

One of the eight learning areas identified in the curriculum is *social science*, which has environmental education and human rights education incorporated, integral to both the history and geography curriculae.

Despite the acceptance, support and introduction of environmental education programmes into policies – and as part of school curricula in many countries – the effect of the programmes has not been visible – neither within schools, among the school-going population nor in the non-formal (often adult) education system. This is especially true among people in the rural communities. In many respects, environmental education remains more of policy statement than a programme for practical action. Researchers and scholars in environmental education have examined and tried to articulate reasons for the failures encountered in integrating environmental education into communities – the aim envisioned in most of the international resolutions cited above.

3.11 Previous Empirical Studies

In this section, existing empirical studies on forest resource conservation, in particular and natural resources in general, are reviewed. EE research at community level is also considered to develop an empirical background for this study.

Over the last two decades, many empirical studies have been conducted, across the world, on the effect of human actions on the environment, together with the determinants of conservation behaviour. I will not attempt a comprehensive overview of these studies here. A preliminary scan of the literature, in preparation for this research, revealed that most studies in the field of EE have been school-based, with few carried out in communities, primarily in urban areas. Rural communities, whose socio-economic activities have a direct effect on the natural resources, have been largely neglected. In this brief review, the focus is on empirical studies pertinent to an understanding of rural communities and their attitudes and behaviour towards forest resources.

Bonaiuto *et al*. (2002) investigated pro-environmental attitudes, local identity and place attachment in the protected natural areas. Their study involved two Italian studies, one in the vicinity of Gennargentu National Park, sample 115, and the other around Tuscan Archipelago National Park, sample 854. The results showed that local groups had negative attitudes toward both general and specific natural protected areas and high degrees of regional identity (RI) and place attachment (PA); non-local groups exhibited the opposite attitudes.

Lutz *et al*. (1999) investigated the perception of wilderness among 75 rural and 75 urban residents (administered via an attitude questionnaire and photographs). Both populations expressed positive attitudes toward the wilderness and a relatively high degree of environmental concern. However, the photograph test demonstrated that the two populations had a different understanding of what constitutes a wilderness. In other words, the urban and rural respondents differed in their perception of the same environment. The authors concluded that the ability to manage natural resources would be enhanced if the perception and preferences – of those who will be most closely affected by the policies and plans – are known and considered in both policy formulation and its implementation.

Using ethnicity as an independent variable, Lacuna-Richman (2003) compared ethnicity and the use of non-wood forest products (NWFPs) from three Philippine villages. The findings indicated that there was no significant difference in the number of NWFPs used by either the indigenous people or the migrants. Socio-economic characteristics – such as the presence of a hunter within the household and size of the family – were found to have a positive correlation with the use of NWFPs in several of the study villages. Income and food expenditure of the individual households were found to be inversely related to the use of NWFPs in the native villages.

Kaczensky *et al.* (2004) used a quasi-natural experiment to compare attitudes and knowledge of different bear history, management and damage levels in two areas of Slovenia. Using a questionnaire survey, they sampled 924 locals and 177 hunters within the two areas. Contrary to expectation, the authors found very positive attitudes towards bears in both study areas and within both targeted study groups. In short, regional differences did not influence participants' attitudes toward bears in Slovenia. Perceptions of how harmful bears can be were the most important predictive variable of an individual's attitude towards bears. Knowledge and socio-demographic factors were of only minor importance. The authors also reported low and negative support for bear policy among the respondents.

Frost (2000) surveyed the attitudes of young adults to forests in Iquitos, Peru and North-Central Florida. Altogether, 1 231 young adults participated in the survey. Frost found that the attitude profiles of the Floridian and Peruvian participants were unexpectedly similar. The *Moralistic Attitude* domain was the strongest in both samples, followed by the *Humanistic, Scientific and Naturalistic* (HSN), *Utilitarian and Dominionistic* (UD), and *Negativistic* domains respectively. Peruvians held significantly higher UD attitudes than Floridians. Research showed that the Peruvians also held significantly higher HSN and Negativistic attitudes. Multiple variables influenced the attitude domains differently in the Peruvian and Floridian groups. In Florida, humanistic, dominionistic, naturalistic and utilitarian - all four-attitude domains were influenced both by the participant's gender and by their discussions with others about the environment. In Peru, age was the only variable that influenced all four domains. There were also consistent variable relationships in Peru and Florida. It was observed that the HSN domain increased with: (i) time spent in a forest; (ii) talking with others about the environment, and (iii) among females. The UD domain attitudes increased because they consider a forest as a renewable resource. The negativistic domain decreased with: (i) age; (ii) time spent in a forest; and (iii) knowledge. Based on the findings, it was suggested that an environmental education and communication programme be developed and implemented – in both Florida and Peru – to provide better understanding of the forests and to encourage positive attitudes among the local young adults.

In another attitudinal study, Fiadjoe and Boating (1999) examined the knowledge, attitudes and needs that can influence human behaviour towards the exploitation of the forest and its regeneration. Thirty inhabitants were interviewed, using questionnaires, in the Greater Accra region of Ghana. The research instrument included items on: the knowledge of tree regeneration; attitudes towards tree felling; bush burning and tree planting; items on the individual and social needs; what motivates respondents to fell trees – or to plant trees – and motives for burning bushlands. Results from the study indicated that, although the inhabitants acknowledged that tree planting could

replace the trees cut, only very few saw the need to plant trees. They believed that trees regenerate on their own and that birds are the main agents that help in tree regeneration. The inhabitants also had negative attitudes towards bush burning; they all agreed that bush burning destroys the vegetation. They also agreed that tree felling destroyed the quality of the vegetation. The authors argued that the main reason why people cut trees, despite knowing the negative effects, was their need for money could be satisfied by the sale of fuelwood and charcoal. Individuals also burned bush to satisfy both their need for game and to reduce the volume of weeded plant debris (thereby easing their cultural practices in agriculture). To curb the increasing rate of tree felling and its consequences, Fiadjoe and Boating recommended that alternative forest resources should be provided to satisfy the needs of the people.

Badola (1998) focused on the attitudes of local people living in and around the forest corridor linking the Rajaji and Corbett National Parks, Northern India. Door-to-door surveys were carried out, using fixed response questionnaires (similar to the approach used in this current study). People were interviewed to determine their views towards conservation and proposed alternatives to the forest resources for reducing biomass demand from the forest. The study revealed that conservation is well supported. People had to extract biomass from the corridor forest for sustenance – their dependence on the forest has been because of an ongoing lack of alternative resources. Badola's findings also indicated that, in a situation where forest resources were not available, people without alternative recourse would be ready to agitate against any restrictions on their use of forest resources.

Jim and Xu (2002) assessed local responses towards conservation efforts through their case study of the Shimentai Nature Reserve (SNR) situated in Yingde, Guangdong Province, China. Questionnaire surveys, face-to-face interviews and group discussions were employed – in seven villages – to gauge the local residents' knowledge, perceptions and expectations towards the SNR. Many respondents had scant knowledge of the reserve. The villagers, while looking forward to expected park-related dividends, were aware of anticipated losses because of restrictions placed on traditional resource-extraction activities in the forest. Local expectations were influenced by: place of residence; the emigration of the rural young; and each household's level of affluence. Lack of local participation in management and inadequate dissemination of information posed obstacles to effective conservation.

Weladji *et al*. (2003) investigated stakeholders' attitudes towards the Bénoué Wildlife Conservation Area (BWCA) and the wildlife policy in Cameroon. Stakeholders included local people, park staff and professional hunter guides. Data were collected, through informal interviews and questionnaires, from 114 households in three communities, and from seventeen park staff and seven professional hunter guides. The researchers found that the local people's attitudes towards protected areas depended on the management category of the particular protected area. Local people were positive about the existence of the park, but negative towards the system of hunting concession areas – and there was local variation between the three communities concerning these issues. Both park staff and professional hunter guides expressed concern about the present management strategies and the extent of illegal resource exploitation. Despite their poor knowledge of the current Cameroonian wildlife policy, most of the local households expressed support for it,

but called for increased local involvement in management. However, park staff were sceptical about local participation in this context and saw such endeavours as a threat to a sound biodiversity management scheme. The findings indicated the need: to strengthen the existing wildlife policy; to promote the involvement of local people; and to empower the park staff, both in terms of resources and in skills in interacting with local people. An environmental education programme was recommended – primarily to disseminate the policy more extensively among the different user groups in the area.

Soto *et al*. (2001), in a survey carried out in Maputo, on the perception of the forestry and wildlife policy by the local communities living in the Maputo Elephant Reserve, Mozambique, reported that 65% of the community members interviewed were unaware of the forest and wildlife policy, and its associated legislation. 74% had never even heard of the new land law; 88% indicated that they were not involved in any management of natural resources in the reserve; the majority (53%) had never even heard of any community-based natural resource management programme. Based on their findings, the researchers recommended the establishment of a Community Education and Public Relations Unit (CEPRU) in the Maputo Transboundary Forest Community Areas (TFCA) to improve the community awareness of the various opportunities, and to enable effective implementation of policies and legislation.

In their study, Ormsby and Kaplin (2005) used the multi-method qualitative research approach. The approach included: individual interviews and focus group discussions; participant observations; archival research; and an environmental education and communication workshop. For their research, Ormsby and Kaplin aimed to develop a framework for understanding community residents' perceptions of Masoala National Park, Madagascar. The framework attempted to address the following questions: What are the factors that influence residents' perceptions of the Park and the existing restrictions on the use of natural resources in the Park area? How do residents of communities, on the periphery of the Park, perceive and interact with Park staff, and what factors influence interactions and perceptions? Participants included community residents, Masoala National Park staff, and employees of non-governmental conservation organisations, and residents in two villages on the periphery of Masoala National Park participated in the study. The research results suggested that many factors – including the history of Park management, the degree of awareness of Park existence, the type of interactions with Park staff and the actual or potential benefits received from the Park – were all factors influencing the perceptions held by residents living in the Park periphery. Residents were largely aware of the Park's existence but were unfamiliar with its goals.

Shibia (2010) carried out a survey: to determine the relationship between a respondent's socio-economic characteristics; the attitudes and perceptions towards protected area conservation; to determine the effect of wildlife benefits and their associated cost on attitudes and perceptions; and to determine whether the respondent's attitudes and perceptions were affected by the proximity of residence to the Marsabit National Reserve. One hundred and eighty-seven households were selected through stratified random sampling and surveyed using a questionnaire composed of both open- and closed-ended questions. Information acquired was triangulated through informal interviews, field observations and focused group discussions. The findings revealed that the

attitudes of the local people towards wildlife conservation were independent of gender and conservation knowledge. There was a significant difference in the relationship between the age of the respondents and attitudes (χ^2=23.036, p=0.001). The young respondents were more positive about conservation. The age also significantly affected the perceptions of the benefits from the reserve (χ^2=14.398, p=0.001). The study also reported that the majority of young respondents were well informed on both tangible and non-tangible benefits. The level of education significantly affected the respondent's attitudes on whether a conservation area was inadequate and should be increased in size (χ^2=10.250, p=0.017). Those respondents who had attained formal education appreciated the value of conservation areas. The economic activities significantly affected the attitudes of the respondents in deciding whether conservation should be encouraged rather than crop farming and livestock keeping (χ^2=15.816, p=0.015). Subsistence farmers are most affected by land allocated to the reserve and the damage caused by wildlife. In addition, there was a significant difference between attitudes regarding the economic activities and whether the local conservation area was inadequate – and whether it should be increased in size (χ^2=13.675, p=0.033). There was a significant difference in the relationship between wildlife benefits and attitudes on whether conservation was a waste of land (χ^2=8.308, p=0.004). Those respondents who gained benefits had positive attitudes towards conservation area. There were also significance differences in the relationship between wildlife damage and economic activities (χ^2=9.815, p=0.007). There were significance differences in the relationship between the proximity of the respondent's residence to the reserve and the respondent's attitudes on whether conservation should be encouraged over the needs of livestock keeping or farming (χ^2=17.252, p=0.008). Shibia recommended that the levels of education, economic activities, age of respondents and the impact of increased wildlife benefits should be considered, specifically to foster community-based wildlife management.

In another recent study, Triguero-Mas, Olomo-sola, Jha, Zorondo-Rodriguez & Reyes-Garcia (2010) analysed and compared the perceptions of urban and rural residents living within the vicinity of a protected area – the Dandeli Wildlife Sanctuary in the Western Ghats (Karnataka, India). The study researched the impact of the protected area and the relationship between the respondents' perceptions of the economic, social and environmental impacts. This study included researching the overall attitudes of both urban and rural residents. Results showed that the local residents' attitudes towards the protected area were positive, especially among urban residents. Multivariate analysis showed a positive association between the perception of economic benefits and individual attitudes towards the protected area. There was no statistically significant association between attitudes towards the protected area and the perception of social and environmental impact.

3.12 Determinants of forest resource conservation

In this section, I have examined literature to review studies that have attempted to predict environmental attitude and perception in general. Determining the attitudes of local people – towards conservation and forest resource conservation – has been researched by many scholars – with inconsistent and inconclusive results. Many studies – such as Ite, 1996; Pomeroy *et al.*, 1996, Shymsudar & Kramer 1997; Allendorf, 1999; Wright & Shindler, 2001; Jim & Xu 2002; Holmes, 2003; McClanahan *et al.*, 2005 – have examined the influence of socio-economic and demographic

factors on local attitudes and perception. Socio-economic and demographic factors – such as affluence, age, experience, education and level of dependence on natural resources – have previously been identified as factors influencing attitudes (Heinen, 1993; Solecki, 1997; Jim & Xu 2002; Holmes, 2003; McClanahan *et al*., 2005; Kalame, *et al*. 2009). For example, Raudsepp (2001) showed that age, sex, education, and occupation have strong relationships with natural resource conservation; income showed weaker and inconsistent relationships. Ethnicity, age, wealth, income level and type of occupation have all been shown to correlate with attitudes (Fiallo & Jacobson, 1995; Gelcich *et al.,* 2005). de Boer and Baquete (1998), Mehta and Heinen (2001), Mehta and Kellert (1998) and Dolisca *et al.,* (2007) all found associations between attitude and gender.

There are a number of factors that consistently show significant correlation with people's attitudes toward conservation, even when measured on different continents, including: level of education; level of affluence; and the perceived benefits associated with conservation. However, there are also cases where even these factors had no effect on conservation attitudes (Heinen, 1993; Parry & Campbell, 1992). Other factors that have been implicated include: age; knowledge; and residence length (Kohlin & Parks, 2001; Masozera & Alavalapati, 2005; Lepetu, Alavalapati & Nair, 2009). Several demographic variables have been shown to significantly contribute to attitudes about natural resources in more than one cultural group (Mertler & Vannata, 2005). Despite this, there is little consensus of opinion on determining which factors are most important in the development of conservation attitudes.

Education generally has a positive and significant association with environmental attitudes. The explanations provided for this positive relationship include the contention that higher education will encourage a greater understanding of the complexities surrounding ecological issues (Diamontopoulos *et al*. 2003). Hedge and Enters (2000) showed that highly-educated people have greater opportunities in non-forest based employment than less educated people. Raudsepp (2001) found the explanatory power of education on environmental attitudes to be positive and significant, Diamontopoulos *et al*. (2003) did not find a significant relationship, and the lack of a significant relationship highlighted the inconsistency of the demographic variables' explanatory power.

Gender is also a variable that has received consistent attention from researchers. Collection and use of forest resources often depends on the gender of the individual. Studies have consistently shown females to have higher environmentally conscious attitudes than males. Most researchers found slight evidence indicating that women are more environmentally concerned, or possess stronger environmental attitudes, than men do (Jones & Dunlap, 1992; Foster & McBeth, 1994). The common reason given for gender differences in environmental attitudes is the different socialisation patterns between boys and girls, and the women's resulting increased risk perception (Diamontopoulos *et al.,* 2003; Raudsepp 2001). Raudsepp (2001) found that women were significantly more likely to be concerned with environmental problems (p. 363). However, as acknowledged by Van Liere and Dunlap (1980), gender does not appear to be as significant a predictor of environmental concerns or attitudes as other socio-demographic variables.

Age may be another demographic factor that determines forest dependency as well as knowledge, attitudes and practice of individuals towards natural resource conservation (Torgler *et.al*, 2005). Age has been fairly consistent in producing negative relations with environmental attitudes. The negative association has often been explained by the fact that solutions to environmental problems are seen as threats to the existing social order – in which older people have more fully invested themselves (Diamontopoulos *et al*., 2003).

Furthermore, the level of dependency on forest resource-based activities has mixed effects on the perceived attitude towards conservation. The attitude of local people towards forest resource conservation is influenced by the benefits they derive from it and by the negative consequences of its conservation status. Negative factors – such as restriction on resource use, livestock loss and crop damage caused by animals – are the main reasons for disliking protected areas (de Boer & Baquete, 1998). Householders who rely more on forest resources for their livelihood may be more concerned with conservation initiatives than householders who have other sources of livelihood. Therefore, those rural households with a higher income share derived from forest-resources-based activities may hold more favourable attitudes regarding forest resource conservation initiatives. Rural households who are more dependent on forest and forest resources for their income may hold more negative attitudes about conservation initiatives. The benefits derived from the protected area remains a key factor for stimulating a local population to perceive conservation positively (Walpole & Goodwin, 2001). A correlation between occupation and positive attitudes has been confirmed in many cases (de Boer & Baquete 1998; Gillingham & Lee 1999; Hamilton *et al*., 2000; Abbot, *et al*. 2001; Mehta & Heinen 2001).

A recent study by Lepetu and Oladele (2009) examined the socio-economic determinants of forest conservation in the Kasane forest reserve, Chobe district, Botswana. Using a simple random sampling technique, 237 households were selected and the study was administered through a structured questionnaire. The questionnaire was used to elicit information on the socio-economic characteristics of people around the forest reserve and their involvement in conservation practices. Data collected were described, using frequency counts and percentages, and a probit regression analysis. The study reported that approximately 67 percent of the respondents were involved in conservation practices, setting aside the forest for tree and animal protection. This research also reported that eight variables were statistically significantly related to forest conservation. These variables included: gender (t=11.0), age (t=2.50), education (t=6.37), occupation (t=-426), years of residency (t=5.87), place of origin (t=2.42), and income (t=2.68). The study has shown that socio-economic characteristics influence forest conservation among dwellers in the Kasane forest reserve.

From the literature reviewed, research suggests that forest resource conservation attitudes and practices are influenced by various factors which can be classified into demographic, cultural and socio-economic factors. Although results are specific to geographical areas, many demographic variables – such as gender, age, education, occupation and ethnicity – are generally found to be significant predictors of conservation attitudes (Mehta & Kellert, 1998; Gillingham & Lee, 1999; Mehta, & Heinen, 2001; Sah & Heinen, 2001; Shrivastava, 2002; Nabin, 2005; Lepetu & Oladele, 2009). The literature further suggests that the conservation attitudes of local people residing around

forest areas will determine the fate of forest resources in the long term. It is important for forest conservation officials and managers to explore which factors have the most influence on conservation attitudes. Although favourable conservation attitudes may not always ensure the desired action on the part of local people, the probability of positive conservation action increases when people have favourable attitudes.

3.13 Conclusion

The purpose of the chapter has been to explore a range of literatures that are either directly relevant or can contribute to the articulation of forest resource conservation. In this chapter, many topics – of social construction of forest resources, the state of global and national forests, ecological, economic and social importance of forest/woodlands resources, socio-economic and environmental consequences of forest degradation – have been reviewed. Several international, regional and national policies initiatives on forest resource conservation, history and development of environmental education have been discussed. A number of previous empirical studies which examined the social cultural, psychological, economic, and bio-geographical variables influencing rural people's attitudes towards forest resource conservation were reviewed.

In this next chapter on methodology, the steps taken to conduct this study are outlined: (i) research paradigm, (ii) research design, (iii) study areas, research instruments for data collection and sampling method, (iv) procedures for administration and collection of data, and (v) statistical methods for analysing the study data, followed by a chapter summary.

CHAPTER FOUR

4 Methodology

> "*Traditionally research has been conceived as the creation of true, objective knowledge, following a scientific method.*"
> (Alvesson and Skoldberg, 2000:1, cited in Henning *et al.*, 2004:12)

This chapter discusses the techniques and procedures employed in this study. It focuses on the research paradigm, research design, description of the study areas, sampling techniques, research instruments, validity and reliability of instruments, procedures for administration and collection of data, and methods of data analysis.

4.1 Research Paradigm

One of the challenges faced by researchers, as well as doctoral students, is the choice of an appropriate research paradigm to achieve their aims. Henning *et al*. (2004:12) asserted, "*Research cannot be conducted in a theoretical vacuum.*" The implication of this assertion is that all research must be located within a research paradigm. Consequently, there is a need to identify and locate this study within a paradigm that best describes the social reality of the knowledge being sought, and identifies an appropriate methodology for the inquiry and its assessment. Before doing this, it is pertinent to explain what a 'paradigm' is and examine briefly the three main research paradigms in education.

Schwandt (1997:108) cited two definitions of Thomas Kuhn's usage of the term 'paradigm': firstly, "*…a type of cognitive framework or set of shared solutions to substantive problems used by every well-defined specific community of scientists … both to generate and solve puzzles in their field.*" Secondly, a paradigm may be described as the *"…disciplinary matrix – commitments, beliefs, values methods, outlooks and so forth shared across a discipline…"*. It is the latter sense of the word that social science researchers apply in their work, and which will be used here. In other words, a 'paradigm' is a framework that guides action. According to Cohen and Manion (1994), a 'paradigm' consists of a set of assumptions and, depending on which paradigm the researcher uses, he will identify certain issues of interest to him, ask certain questions but not others, adopt one research method rather than another, and show a preference for certain kinds of theory, analysis, and explanation. Guba and Lincoln (1988) identify a 'paradigm' as *"…a set of theories which share a common axiomatic system where undemonstrated basic beliefs are accepted as the building blocks of [the] conceptual or theoretical stance."* Lincoln and Guba, (1994:105) defined the 'research paradigm' as *"…the basic belief system or worldview that guides the investigators, not only in the choices of method but in ontologically and epistemologically fundamental ways."* A research paradigm is essentially a set of viewpoints, a framework of beliefs, values and methods within which research takes place. It is this worldview that determines and shapes the researchers' ways of responding to the epistemological, ontological and methodological questions connected with the research.

There are three common types of research paradigm discussed within the social sciences' and education research methods' literature. These are: quantitative, qualitative and mixed method paradigms (Creswell, 2003; Creswell *et al*., 2004; Tashakkori & Teddlie, 2003; Hanson *et al.*, 2005). The quantitative paradigm was the first, and dominant, research paradigm among researchers prior to the 1980s, when its dominance was challenged. Quantitative approaches are located within the positivist philosophy which seeks universal truths about reality through the use of objective and quantifiable measurements (Hathaway, 1995; Cohen & Manion, 1996). This paradigm involves an empirical approach to the verification of knowledge through scientific methods and statistical analysis. It argues that there is one objective world, which can be represented and measured. Any quantitative paradigm emphasises deductive reasoning, and the testing of theories and hypotheses – thus metaphysical explanation is rejected and the contextual meaning and interpretation of data and social reality is ignored. This paradigm seeks to test pre-determined hypotheses and use the result to make predictions and generalisations (Burns & Groves, 1990; Kim, 2003)

Quantitative research methods have the advantage of a multi-structured format, including: systemic control of variables; rigorous sample selection (which can be representative); a highly structured design; pre-testing of questionnaires and many other features (Cohen, Manion & Marrison, 2001). The ontological position of the quantitative paradigm is: (i) there is only one truth and (ii) an objective reality exists independent of human perception. Epistemologically, the paradigm maintains that all knowledge should be derived from direct observation and the logical inferences based on observation – i.e. knowledge comes from the accumulation of verifiable facts. Quantitative research involves several techniques – such as randomisation of samples, highly structured instrumental and statistical analysis (Rudestam & Newton, 1992; Devers, 1999; Kim, 2003).

The strengths of the quantitative paradigm are that its methods produce quantifiable, reliable data that are usually generalised. The greatest weakness of the quantitative method is that it decontextualises human behaviour in a way that removes the event from its real world setting and ignores the effects of any variables that have been excluded from the model (Bryman & Burgess, 1999; Cohen, Manion & Marrison, 2001).

The second paradigm is the qualitative paradigm – based on interpretivism (Schwandt, 1997; Gephart, 1999; Bryman & Burgess, 1999) and constructivism (Guba & Lincoln, 1994). Qualitative researchers hold the view that all people (including researchers) perceive and interpret reality differently – therefore assuming that there are many truths and multiple realities. Qualitative approaches explore multiple realities, gained from different perspectives and interpretations, to develop a deep understanding of issues. The qualitative paradigm gained prominence during the 1980s, in response to the criticisms of, and the identified weaknesses in the quantitative paradigm's assumptions. These weakness included the belief that social reality, with all its complexities, can be studied and understood from a strictly external perspective, and that outcomes from simulated environments could be used to make predictions and generalisations in all similar situations (Woodhouse & Livingood, 1991; Miles & Huberman, 1994; Lichtman, 2006; Johnson & Christensen, 2008). The proponents of the qualitative paradigm, who are mostly social scientists,

contend that the methodology used to study natural sciences cannot and should not be used for studying social sciences, because the scientific quantitative method ignores the meaning and interpretation of behaviour by the actors (Schwandt, 1997; Gephart, 1999; Bryman & Burgess, 1999). Cohen and Manion (1994) stated that *"…the central endeavour in the context of the interpretive paradigm is to understand the subjective world of human experience and retain the integrity of the phenomena being investigated; efforts are made to get inside the person and understand from within"*.

Ontologically speaking, there are multiple realities or multiple truths based on an individual's construction of reality. Reality is socially constructed (Berger & Luckmann, 1966) and so is constantly changing. On an epistemological level, there is no access to reality independent of our minds, no external reference with which to compare claims of truth. The researchers and the object of study are interactively linked so that findings are mutually created, within the context of the specific situation that is shaping the inquiry (Guba & Lincoln, 1994; Cohen, Manion & Marrison, 2001). This suggests that reality has no existence prior to the activity of investigation, and reality ceases to exist when investigators are no longer focussed on it. Qualitative studies take into account the real experiences of the participants thus enabling the contextualisation of the analysis of problem of study and, thereby, allow for an in-depth understanding of phenomenon (Lichtman, 2006; Johnson & Christensen, 2008). The emphasis of qualitative research is on process and meanings. Techniques used in qualitative studies include in-depth and focus group interviews and participant observation. Samples are not intended to represent large populations. Instead small, purposeful samples of articulate respondents are used – because they can provide important information – not because they are representative of a larger group (Reid, 1996).

Advocates of qualitative methods highlight the richness and colour qualitative arguments have on the big picture and the appealing explanations of how processes, chronological facts and causal links occur (Miles & Huberman, 1994). According to Miles and Huberman (1994:1):

> *"…Good qualitative data are more likely to lead to serendipitous findings and to new integrations; they help researchers get beyond initial conceptions and to generate to revise conceptual frameworks…The findings from qualitative have a quality of undeniability. Words, especially organized into incidents or stories, have a concrete, vivid, meaningful flavor that often proves far more convincing to a reader-another researcher, a policymaker, and a practitioner."*

Despite the argument for qualitative analysis, the methodology is not without problems. Qualitative research approaches lack a larger and more explicit set of procedures. Other concerns include: the privileging of intuition over reason; subjectivity over objectivity; and an unsystematic selection of information from a massive amount of data, in ways that are irreducible or even incommunicable. Ultimately, critics argue that no one, other than the researchers, can tell how the hours of field notes were reduced to form the researchers' inference for the study (Creswell *et al.*, 2005; Tashakkori & Teddlie, 2003; Creswell, 2005).

This leads to the third paradigm emerging from literature – the mixed method paradigm. Literature is awash with the different definitions of mixed method (Creswell *et al.*, 2005; Tashakkori & Teddlie, 2003; Creswell, 2005). This approach is what Tashakkori and Teddlie,

1998) referred to as 'mixed-method research', or 'multimethod' research (Brewer & Hunter, 1989) and 'triangulation' (Perlesz & Lindsay, 2003). Greene *et al.* (1989:256) defined mixed method designs as *"…those that include at least one quantitative method (designed to collect numbers) and one qualitative method (designed to collect words), where neither type of method is inherently linked to any particular inquiry paradigm."* Creswell, *et al*, (2003:212) defined it as *"the collection or analysis of both quantitative and qualitative data in a single study in which the data are collected concurrently or sequentially are given a priority and involve the integration of data at one or more stages in the previous of research."* From these definitions, mixed methods can be succinctly defined as a procedure for collecting, analysing, and/or integrating both quantitative (deductive) and qualitative (inductive) data techniques and methods within a single study to gain a better understanding of the research problem.

The central premise of mixed methods research is the use of both quantitative and qualitative approaches in a single study. When used in combination, both quantitative and qualitative data complement each other. Mixed methods allow for a more robust analysis (Greene & Caracelli, 1997; Tashakkori & Teddlie, 1998; Creswell *et al.,* 2004; Yin, 2006; Dunning *et al.,* 2008; Chow, Quine & Li, 2010). Onwuegbuzie and Leech (2004) argued that *"…mixed methods research offers great promise for practicing researchers who would like to see methodologists describe and develop techniques that are closer to what researchers actually use in practice. Mixed methods research as the third research paradigm can also help bridge the schism between quantitative and qualitative research…"*

Creswell (2003:6) identified five essential characteristics of mixed method study as:

- *"It is a methodology with steps spanning the entire process of research.*
- *It is premised on the idea that quantitative and qualitative research in combination provides a better understanding of research problems than either forms of research by itself (more evidence, more convincing arguments from different perspectives).*
- *It involves collecting two types of data – quantitative and qualitative.*
- *It involves the integration of these two types of data or research approaches.*
- *The procedures can be described as mixed methods designs in which data are collected concurrently, sequentially, or both; and in which emphasis given to quantitative and qualitative data will vary."* (Creswell, 2003:6)

Mixed methods researchers (Mertens, 2003; Newman *et al.,* 2003; Hanson *et al.,* 2005) recently expanded the reasons for conducting a mixed methods investigation, and suggested that mixed methods may be used to:

a) better understand a research problem by combining numeric information from quantitative data and specific details from qualitative data;
b) identify variables/constructs that may be measured subsequently through the use of existing instruments or the development of new ones;
c) obtain statistical, quantitative data and results from a sample of a population and use them to identify individuals who may expand on the results through qualitative data and results;
d) convey the needs of individuals or groups of individuals who are marginalized or underrepresented.

There are various research designs of mixed method in the literature. However, six designs are common and often used (Creswell *et al.,* 2003). These include three concurrent (triangulation, nested and transformative) and three sequential (explanation, exploratory and transformative) designs. Of these designs, the mixed-methods sequential explanatory design – first collecting and analysing quantitative and subsequently analysing qualitative data in two consecutive phases within one study – is more popular with researchers (Perlesz & Lindsay, 2003; Dunning *et al.,* 2008; Nicotera, 2008). This mixed-methods technique's characteristics are well described in literature (Tashakkori & Teddlie 1998; Creswell, 2003, 2005; Creswell *et al.,* 2003).The mixed-methods sequential explanatory design consists of two distinct phases: quantitative followed by qualitative (Creswell *et al.,* 2003). In this design, a researcher first collects and analyses the quantitative (numeric) data. The qualitative (text) data are collected and analysed second in the sequence and are employed to help explain, or elaborate on, the quantitative results obtained in the first phase. The second 'qualitative' phase builds on the first 'quantitative' phase – and the two phases are connected through the intermediate stage in the study. The rationale for this approach is that the quantitative data (and their subsequent analysis) can provide a general understanding of the research problem. The qualitative data (and their analysis) refines and explains those statistical results by exploring the participants' views in more depth (Rossman & Wilson, 1985; Tashakkori & Teddlie, 1998; Creswell, 2003).

Seven stages of data analysis process are involved in the mixed methods. These are:

a) data reduction and quantitative data (e.g., via descriptive statistics, exploratory factor analysis, cluster analysis);
b) data display – involves matrices, charts, graphs, networks, lists and rubrics;
c) data transformation stage – where quantitative data are converted into narrative data that can be analysed qualitatively and/or qualitative data are converted into numerical codes that can be represented statistically;
d) data correlation – involves correlation of the quantitative data with the qualitative data;
e) data consolidation – where both quantitative and qualitative data are combined to create new data sets;
f) data comparison – involves comparing data from the qualitative and quantitative data sources;
g) data integration – both quantitative and qualitative data are integrated into a coherent whole (Tashakkori & Teddlie, 1998; Creswell *et al.,* 2003; Onwuegbuzie & Teddlie, 2003).

Various scholars of research methods (Creswell *et al.,* 1996; Greene & Caracelli, 1997; Creswell, 2003; 2005; Moghaddam *et al.,* 2003) have discussed the strengths and weaknesses of mixed-methods design. The design's advantages include opportunities for more detailed exploration of the quantitative results (Johnson & Turner, 2003; Johnson & Christensen, 2004). The limitations of this design are the length of time and feasibility of resources required to collect and analyse both types of data. Using mixed methods can be time consuming, labour-intensive and expensive (Dunning *et al.,* 2008). An advantage of using a mixed method design is that the techniques will provide clearer information about various things that participants' know and believe – and also how these beliefs and knowledge may work together in directing their activities

in the real context of their environment. The mixed method approach enriches studies because it promotes clarity, accuracy, comprehensive and nuancy (Rocco, Gallagher & Perez-Prado, 2003).

Previous studies that have successfully employed mixed-method research techniques in their data gathering and interpretation include: quality of life research (Dunning *et al.*, 2008); measurement of neighbourhood constructs (Nicotera, 2008); family studies (Perlesz & Lindsay; 2003) and more recent research into assessing the poverty status of people and conservation in developing countries (Laderchi *et al*., 2003; McGee, 2004; Nyanga, 2012; Allen, *et al,* 2012). Nyanga (2012) used mixed methods to explore the factors influencing adaptation of conservation areas among smallholder's farmers in Zambia. Similarly, Allen, *et al* (2012) employed mixed methods to investigate the socio-economic barriers of conservation in four communities in North Carolina, USA. In the same vein, Silva and Mosimane, (2012), used a mixed methods approach to test the extent of community-based natural resource management in generating direct and indirect economic benefit and thereby inducing the local people's involvement in communal conservation.

4.2 Research Design

The choice of methods – and the ways they can be used to conduct research – are woven into the research paradigm (Henning *et al*., 2004; Mouton, 2002). Thus researchers' world views, values, attitudes and beliefs will influence all of their decisions in the design of a study. Various scholars have opined that employing multiple approaches in studies of this nature can provide opportunities for broader and also deeper understanding of the phenomena under investigation (Johnson & Onwuegbuzie, 2004; Yin, 2006; Creswell & Plano Clark, 2007; Dunning, *et al*, 2008; Chow, *et al*, 2010).

The assumptions of each paradigm in the research literature (relevant to the research aim (and questions which I sought to answer through this study) to provide an in-depth description of the socio-institutional constructions of forests and forest resource conservation practices in Nigeria and South Africa) were carefully considered. Furthermore, forest resource conservation and environmental education attitudes and practices form an interdisciplinary topic of research (which can be difficult to define and assess because of the numerous phenomena (social, economic, political, cultural, religious, etc.). The overlap of phenomena can influence the way people objectively and subjectively perceive their environment. It is also necessary to conceptualise and interpret the forest – including its meanings, its forms and the functions it can perform. Since there is no single understanding of forests and environmental education that will fit all societies, cultures or contexts, I have opted to use a sequential explanatory mixed methods research design – one in which quantitative data will be collected in the first phase and complemented and explained by qualitative data in the second phase.

Human beings are able to make and share meaning, and social science research seeks to understand the meaning of social phenomena. Interpretive research responds to the challenge of human-focused inquiry. Interpretive research is primarily concerned with the ways individuals make sense of and give meaning to the social interactions that constitute their daily life in and around their environment. Similarly, this research interprets the ways in which rural inhabitants understand and articulate their relationships with the forest resources. This study not only

investigated the relationships between rural inhabitants and their forest resource conservation practices but also researched the influence of the larger social organisation and culture on these accepted attitudes and practices. Thus, the best way to understand the complexities of human-environment relationship, and specifically the forest resource conservation practices of rural people, is to draw the information from those actors who actually experience it. The research questions raised in this study are best answered through the mixed method paradigm. The *"…choice of research practices depends upon the questions that are asked and the questions depend on their context…"* (Denzin & Lincoln, 1994:135). My interest in how individuals use and relate to forest/woodlands resources has led me to the use of mixed method research. The questions I was asking were intertwined within the context of the participants' experiences in forest resource conservation and, thus, this approach lent itself to the use of a mixed methods technique.

The sequential mixed method research design, as applied in this study, included triangulation of data collection and analysis methods. The study employed a variety of data sources (data triangulation), as well as quantitative and qualitative methods (methodological triangulation) (Patton, 2002). The purpose of triangulation is to test for consistency and correlation between the results yielded by the different data sources and inquiry approaches (Patton, 2002; Hanson *et al.*, 2005). The mixed methods design relied primarily on quantitative data – such as a survey questionnaire – complemented by in-depth interviews, focus group discussions, document analysis and observations. The use of both quantitative and qualitative methods allowed for methodological triangulation. In this study the methods were used together to gain an in-depth understanding of the relationships between forest resource conservation and the environmental education practices of rural inhabitants – in Ogun State, Nigeria and Mpumalanga Province, South Africa – through clarifying concepts; generating hypotheses; and constructing explanatory frameworks about attitudes and practices regarding forest resource conservation and environmental education (Figure 4.1).

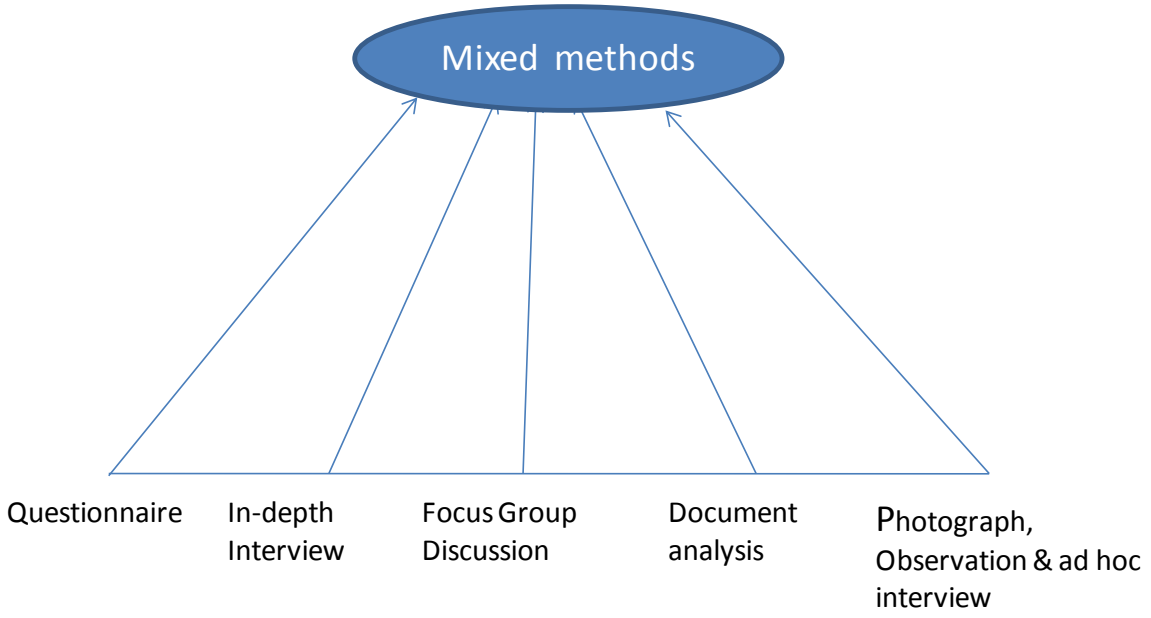

Figure 4.1 Mixed method approaches in this study.

4.3 Study Areas

Africa is a continent comprising six sub-regions – North, West, Central, East, Southern Africa and Western Indian Ocean States. This study was carried out in two countries in two different sub-regions: Nigeria (West Africa) and South Africa (Southern Africa) (Figure 4.2). Both countries exert enormous political, environmental and economic influence, both within their sub-regions and continent-wide. Policies and actions in both countries have shaped those of others in their sub-region, thus indicating that an understanding of forest resource conservation policies and efforts may provide insight into the challenges of the sub-regions to which they belong.

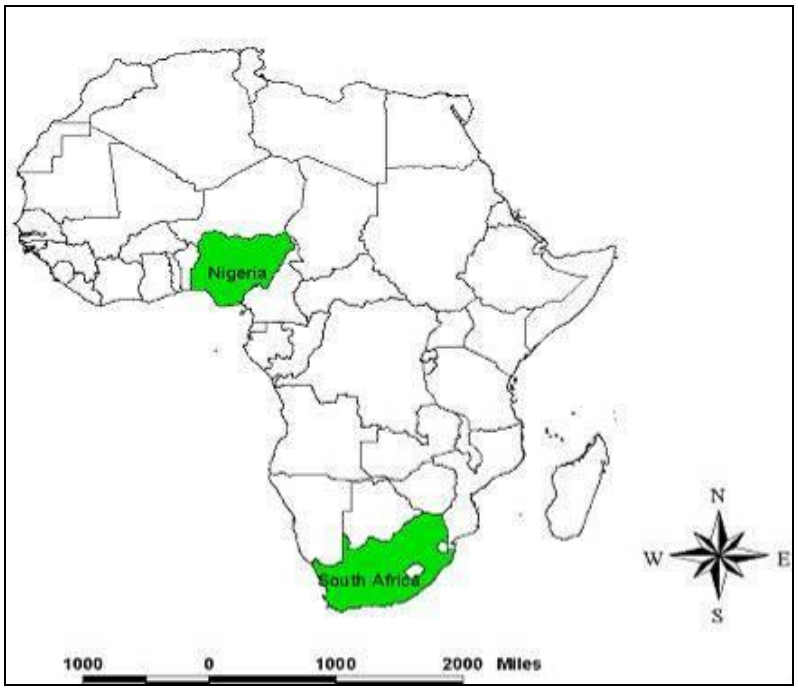

Figure 4.2 Location of the two countries selected for the comparative study of forest resources.

4.3.1 Geographical Setting of the Study Area: Nigeria

The Federal Republic of Nigeria currently has an estimated population of ~120 million (figure based on the last official census in 1991) and an estimated growth rate of 2.8% per annum (National Population Commission, 2000). Nigeria is the tenth largest (by area) and most populous country on the Africa continent, with an average density of 95.9 people km^2. Nigeria has a total land area of 923 773 km^2 and is richly endowed with abundant and diverse natural resources, both renewable and non-renewable. Nigeria lies between latitudes 4° 16’ and 13° 53’ north, and between longitudes 2° 40' and 14° 41’ east (*POLICY Project*/Nigeria, 2002; EC-FAO, 2003; Federal Republic of Nigeria, 2005). The country is in the West African sub-region of the continent. Its borders are contiguous with the Republic of Benin to the west, the Niger Republic to the north, Chad in the northeast, the Republic of Cameroon in the east. The Atlantic Ocean coastline – stretching for ~800 km from Badagry inlet in the west to the Rio del Rey, east of the Cross River estuary – serves as its southern boundary (Figure 4.3).

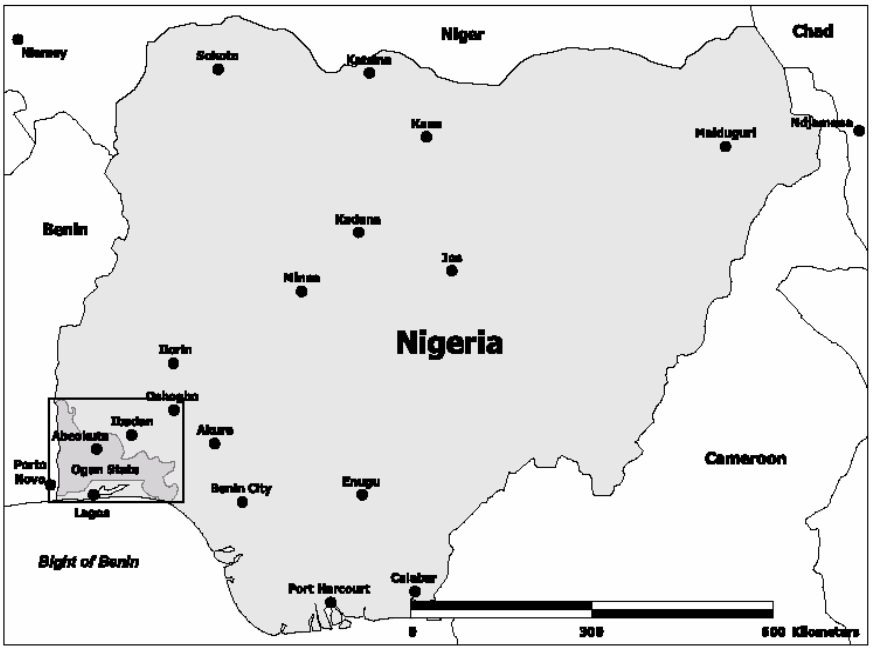

Figure 4.3 Map of Nigeria showing Ogun State.

(Source: ESRI Data and Maps, 2002)

The geographical location of the country allows it to experience nearly all the many types of weather and climate that exist in the West Africa sub-region. The country has been further classified into two broad zones: the tropical rain forest area (stretching from the coast to ~9°N latitude, covering all the Southern States and parts of Kwara, Benue, Gongola and the Federal Capital Territory); and the savannah zone (covering the rest of the country, up to the Nigeria-Niger boundary).

Currently, Nigeria comprises 36 States and a Federal Capital Territory (FCT), grouped into six geopolitical zones: North Central, North East, North West, South East, South-South, and South-West. This study area lies in the South-West. The States are further sub-divided into local government areas (LGAs) and, currently, there are 774 local government areas in the country. These LGAs were created to bring the government closer to the people at the grassroots level through the provision of basic infrastructure and services. The country's population is predominantly rural. It is estimated that 70% of Nigerians live in rural areas and are directly or indirectly dependent on forest resources (Federal Ministry of Environment, 2008). Agriculture provides gainful employment to over 75% of the country's labour force and satisfactory livelihood to over 90% of the population. Nigeria is a multi-ethnic country, with more than 250 different ethnic groups. However, there are three major ethnic groups: the Yoruba – who inhabit most of the South-West; the Hausa in the North, and the Igbo's in the East. An estimated 68 million hectares of land is used for farming, with an average of two hectares per farming family. Because of the differing vegetation and climatic conditions, as well as socio-cultural lifestyles, each ecological zone has a degree of specialisation in the farming systems, crop types and animals being reared.

Ogun State

Ogun State, otherwise known as the 'Gateway State', is one of the thirty-six states in Nigeria. Created in February 1976, Ogun derives its name from a river that traverses the major part of the

state. Ogun State is entirely within the tropics. Located in the Southwest Zone of Nigeria, with a total land area of 16,409.26 km^2 equivalent to ~1.8% of Nigeria's landmass, it is bounded on the West by the Benin Republic; on the South by Lagos State and the Atlantic Ocean; on the East by Ondo State; and on the North by the Oyo and Osun States. It is situated between Latitude 6.2°N and 7.8°N and Longitude 3.0°E and 5.0°E (Oyesiku, 1992:6). The climate of Ogun State follows a tropical pattern, with the rainy season starting around March and ending in November, followed by the dry season for the months December to February. The mean annual rainfall varies from 128 cm per annum in the southern parts of the Ogun State to 105 cm per annum in the northern areas. The average monthly temperature ranges from 23°C in July to 32°C in February. The northern part of the State is mainly derived Savannah vegetation; the Central part falls within the rain forest belt. The southern part of Ogun State has mangrove swamps.

It is a homogenous state, with the Yoruba the dominant ethnic group. The Yoruba ethnic groups is comprised of several dialect groups – including the Egbas, Yewas, Aworis, Ijebus and Remos. Administratively, there are twenty local government areas in the State, which have been divided politically into four dialect zones:

- Ijebu-speaking people in Ijebu East, Ijebu North, Ijebu North-East, Ijebu-Ode, Odogbolu and Ogun Waterside local government areas;
- Egba people in Abeokuta North, Abeokuta South, Ifo, Obafemi/Owode, Odeda and Ado Odo/Ota local governments;
- Yewa (Egbado) speakers in Yewa North, Yewa South, Imeko/Afon and Ipokia local governments;
- Remos in Sagamu, Remo North and Ikenne local government areas.

Other dialectical groups exist but these groups are not indigenous to the state because most of them are immigrants from other Yoruba-speaking states in the south-west of the country. This study was conducted in the Ijebu speaking zone across three local government areas.

The population of Ogun State is estimated to be 3.6 million, of whom more than 60% are rural dwellers (NPC-ICF, 2009; NPC-RTI, 2011). The population density is ~140/ km^2. The natural vegetation can broadly be grouped into forest and savannah. Ogun is largely a rural and agrarian state, with extensive fertile soil and savannah land suitable for agriculture and cattle rearing (Gbadegesin, 1992; Onakomaiya *et al.,* 1992). The state produces rubber on a large scale, as well as timber of various species. Of the total land area of 16 409 km^2, approximately 20% is preserved as forest reserves. The Forest Reserves have 26 352 ha of *gmelina*, teak and pine – all these species are available as raw materials for pulp and other wood-based industries (Adegbite, 2009).

The Ogun State's poverty statistics and inequality measures indicated that 81.5% of the population classified themselves as 'poor', using self-rated lines. However, in a measure using Gini Coefficient, the inequality for this state was 0.388; the poverty incidence, by relative measurement, was 38.73, placing Ogun in the 14th and 10th positions respectively when compared with other states in the country. When categorised by household dwelling type, 66% live in single rooms, 5.3% in apartments/flats, 26.4% in whole buildings, and 2.1% in other accommodations. Construction varies, with 31.% of the houses in the state were built with mud bricks; 50% with

cement/concrete blocks; 4.6% with burnt bricks; 2.1% with stone; 0.42% with roofing sheets and 1.9% with other materials. Almost 91% of the structures were roofed with iron/zinc sheets. When assessing the sources of energy available to the people, 59% had access to electricity, 36% use kerosene, 0.7% use gas and 4.4% use other means. For cooking, however, 53% use kerosene; 45% use firewood (NPC-ICF, 2009; NPC-RTI, 2011; http://ogunstate.gov.ng/).

Three rural communities – Mamu, Isanya-Ogbo and Ajebandele in the Ijebu division of Ogun State – were selected for this study (Figure 4.4).

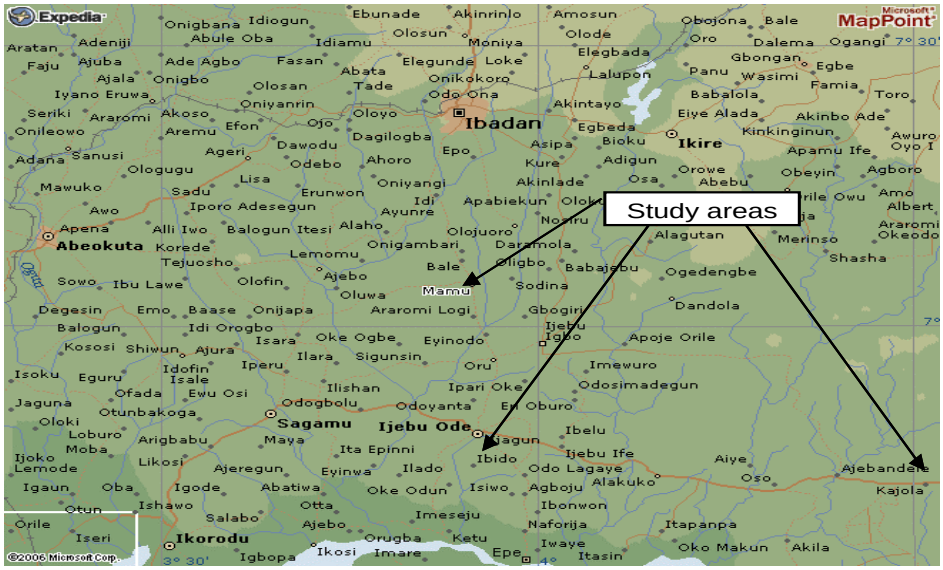

Figure 4.4 Map showing the study communities in Ogun State, Nigeria.
(Source: http://www.expedia.com)

Mamu

One of the three communities used in the conduct of the research, Mamu is an Ijebu village located 26 km north of Ijebu-Ode, along the Ijebu-Ode/Ibadan road, in the Ijebu-North local government area. Ijebu-North local government is one of the twenty local governments that make up the Ogun State and one of five in the Ijebu Division. The local government area is located at 6°57′N 4°00′E, and occupies an area of about 1 250 km^2. The region is partitioned into local wards – Atikori, Oke-Agbo, Ojowo/Japara, Oke-Sopen, Ome, Oru-awa-ilaporu, Osun and Ago-Iwoye urban I, Ago-Iwoye urban II, Ako-Onigbagbo Gelete, and Mamu/Ehin-Etiri (http://en.wikipedia.org/wiki/Ijebu_North).

Although the people are of Ijebu extraction of the Yoruba ethnic group (who live in major towns like Ijebu Igbo, Ago-Iwoye, Oru, Awa, Ilaporu), various ethnic groups – such as Hausa, Igbira and Oyo from other parts of the country equally inhabit the Mamu. Agriculture is the economic mainstay of the people of this Area. Also, several 'indigenes' of the town engage in timber business and this accounts for the existence of sawmills in the town.

Isanya-Ogbo

Isanya-Ogbo is located in the Odogbolu local government area. The Odogbolu local government is strategically located on a large expanse of land of about 640 km^2 at 6°50′N 3°46′E, and shares boundaries: on its northern fringes with the Ijebu-North Local Government; in the east

with the Ijebu-Ode Local Government; in the west with the Ikenne Local Government; and in the south with the Epe Local Government in Lagos State. According to the 2006 national censure, the local government area has a population of 127 123. The area is characterised by two distinct seasons: *Dry* (November – March) and *Wet* (April – October). The region is in the derived savanna vegetation zone, with a mean annual rainfall and temperature of 1 037 mm and 34.7°C respectively.

Inhabitants of Isanya-Ogbo are Yoruba of Ijebu extraction. Like any other Nigerian society, there are a growing number of people from other ethnic groups in the country living in the community – such as the Igbos, Isokos, Urhobos and Hausa. The people are mainly agrarian, engaged in farming, hunting, fishing, lumbering and handicrafts (see website: http://en.wikipedia.org/wiki/Odogbolu).

Ajebandele

Ajebandele is located in the Ijebu East local government area. Ijebu East is located at 6°44′N 4°10′E. It has an area of 2 34 km² and a population of 110 196 (2006 census figure). Ajabandele is a predominantly rural settlement inhabited by Ijebus, Ikales and Ilajes.

The total number of households and the number of sampled households in these three villages are shown in Table 4.1. The sample size from each location was decided on the basis of the number of households.

Table 4.1 Number of total and sampled households in the villages.

Villages	Total households	Sampled households	%
Mamu	306	100	32.7
Isanya Ogbo	178	100	56.2
Ajebandele	255	100	39.2

Source: Fieldwork, 2004

Language and Ethnic Group

Although there are many languages spoken and different ethnic groups residing in the study area. The Ijebu dialect of the Yoruba language is the most widely used. The dominant ethnic group is the Yoruba-Ijebu. Other ethnic groups include Hausa, Ilaje and Binis. Pure English and Pidgin English are also used in communication, especially by individuals who do not speak either the Ijebu dialect or the Yoruba language.

Land Use and Occupations

Farming is the dominant economic activity in the study area. Although most of the population is involved in agriculture, not all arable land is cultivated for agriculture. The study area produces a variety of crops. Shifting cultivation is practised in most of the study communities, thus exerting pressure on soil and forest resources. ‘Garri’ is the staple food of the people. It is made from cassava, thus making cassava the dominant crop grown in the area. Other crops include perishables – like plantain and maize; tropical fruits – such as mangoes, pineapples, bananas, oranges, coconuts and lemons; and other crops – such as kola nuts, palm oil, palm-kernels and rubber. Furthermore,

the population exploits forest resources for poles, timber for construction and saw-milling activities, and also for hunting animals. Thus, directly or indirectly, the local population creates pressure on the forestland cover and biodiversity in terms of flora and fauna.

4.3.2 Geographical Setting of the Study Area: South Africa, Mpumalanga Province

South Africa is located at the southern tip of Africa, covering an area of 1 219 912 km^2. The country is bordered by the Atlantic Ocean on the west and by the Indian Ocean on the south and east, with a long coastline stretching more than 2 500 km. Its land neighbours are Namibia in the west and northwest, Zimbabwe and Botswana in the north, and Mozambique and Swaziland in the northeast. South Africa's population has been estimated to be ~44.8 million (2001 Statistic South Africa census figure) (Statistics South Africa, 2003). Approximately 45% of this population is located in rural areas.

Mpumalanga Province – formerly the Eastern Transvaal Province (Figure 4.5) – is one of the nine provinces in the Republic of South Africa. Mpumalanga is located south of the Limpopo Province, east of Gauteng, north-west of KwaZulu Natal, and west of Swaziland and Mozambique. The administrative capital is at Nelspruit, which is also the business centre of the province.

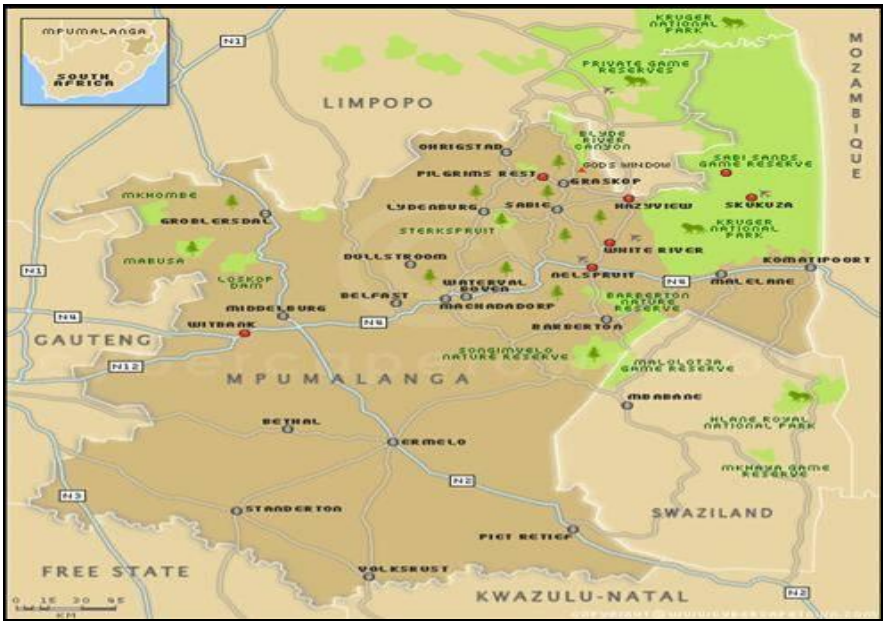

Figure 4.5 Map of South Africa showing Mpumalanga Province.

(Source: http://www.expedia.com)

Mpumalanga is one of South Africa's smaller provinces, covering 79 490 km^2, which constitutes only 6.5% of the country landmass, and has a population of ~3.64 million people (Statistic South Africa, 2007). There are extreme levels of poverty in Mpumalanga, and the province has the second lowest literacy rate in the country. Among people aged 20 years and above, more than 28% have had no schooling at all; more than 14% have had some primary education. Only 4.8% of the province's people have tertiary qualifications. 14% have Matriculated (i.e. graduated from High School), almost 28% have had some secondary education and around 7% have only completed primary school education.

The population growth rate is higher than the national average. The average household size is 5.9 persons. A large proportion of the population of Mpumalanga has limited participation in economic activity (http://www.mpuleg.gov.za). The population distribution of Mpumalanga is shown in Table 4.2.

Table 4.2 Population distribution of in Mpumalanga.

Population Group	Persons	%	Sex	%
Black African	3 303 545	89.2	Male	48.6
Coloured	24 258	0.7	Female	51.4
Indian or Asian	12 244	0.5		
White	303 388	9.0		
Total Population	**3 643 435**	**100.0**		

Source: Statistics South Africa, 2007.

Bushbuckridge is located at 31°0–31°35'E; 24°30'–25°0'S, one of five local municipalities in the Ehlanzeni district municipality in Mpumalanga Province. Mpumalanga is in the north-east of South Africa, and Bushbuckridge is situated in the lowveld area in the north-east of the province. The Kruger National Park provides Bushbuckridge with its eastern boundary, and Limpopo Province borders the northern edge. It lies between the Sabie River to the south and Klaserie-Orpen road to the north. It lies east of and below the Drakensberg escarpment; the Kruger National Park and the Sabi-Sand Game Reserve form its eastern border (Shackleton & Shackleton, 2000). Administratively, Bushbuckridge is part of the Bohlabela municipal district in Mpumalanga Province. Bushbuckridge has an area of 10.250 km^2, including part of the Mnisi tribal authority and the former black township of KwaMsane. Rivers, game reserves, forestry areas and commercial farmland define the boundaries of the municipal district. The population of the Bushbuckridge Municipality, according to Statistics South Africa (2007), is 509 970. Although Bushbuckridge is a predominantly rural area, relatively few individuals are involved in subsistence agriculture. Social and pension grants are the primary source of income for most households. Like most former homelands, the area is densely populated, with between 150—300 people km^2. Infrastructure and services are poor and formal employments are limited with unemployment rate put at 23% (Statistics South Africa (2008). The large centres of employment are located outside the Bushbuckridge area – including Acornhoek, and neighbouring Nelspruit. The major employment opportunities within Bushbuckridge are nature reserves, commercial agriculture and forestry.

Vegetation

Bushbuckridge has a natural vegetation of savanna woodland, or bushveld (Lowveld), dominated by *Combretaceae* and various acacias of the *Mimosaceae* family. This low woodland area is densely vegetated. There are also communal grazing woodland areas, which are more open. The natural forest has a canopy of 5 m to 6 m in height and is dominated by Acacias, alongside *Combretum apiculatum* and *Sclerocarya birrea* (Marula). Rainfall of the area varies from 1 000 mm in the west to 500 mm in the east (Shackleton & Shackleton, 2000; Shackleton, 2004b).

Language and Ethnic Group

The major ethnic groups are the Shangaan/Tsonga and Sotho. There are many languages spoken in the area, but Tsonga is the most widely used language. It is regarded as the language of communication between the different groups. Literate people can also speak English. The home-language distribution of the people can be classified as follows: Sepedi 57%; Xitsonga 23%; Tshivenda 15.9% and Afrikaans 2.6%; English home-language speakers constitute less than 0.5% (www.nationonline.org/oneworld/South Africa). The location of the three rural communities used for the study, Timbavati, Khokhovela (Islington) and Hluvukani are shown in Figure 4.6. The numbers of households studied in each community are listed in Table 4.3.

Table 4.3 Number of total and sampled households in the villages.

Villages	Total Households	Sample households	%
Timbavati	450	100	22.2
Khokhovela	1 100	100	9.1
Hluvukani	930	100	10.8

Source: Fieldwork, 2005

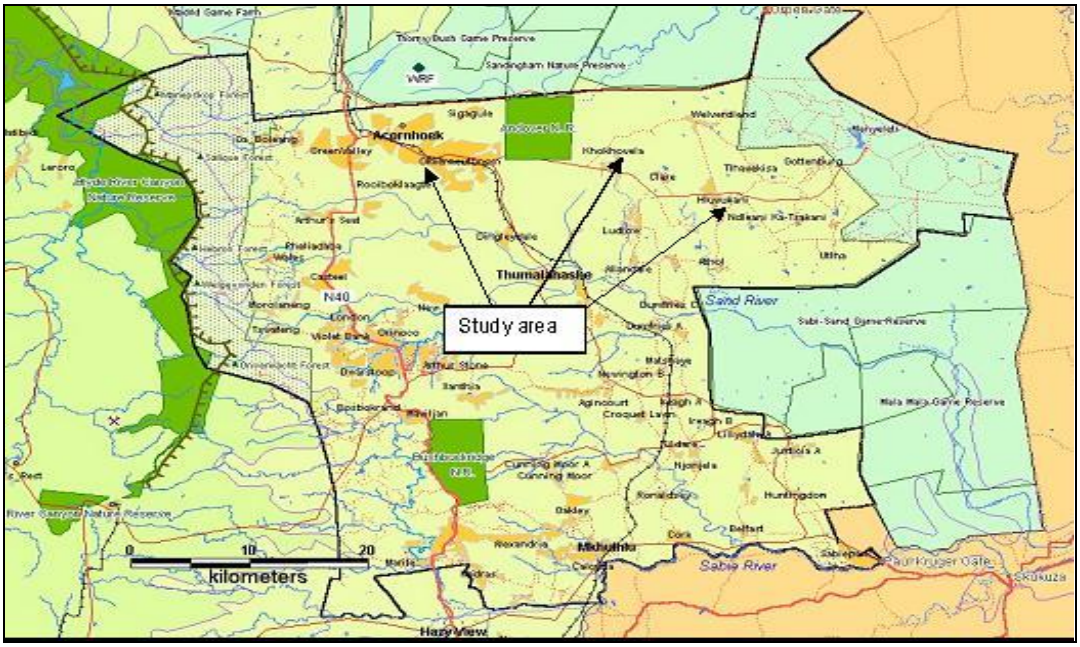

Figure 4.6 Location of the study communities in Bushbuckridge, South Africa.

4.4 Criteria for Selection

In selecting communities for research in the two study areas in both countries, several criteria were used including: proximity to the nearest forest; indicators of socio-economic disadvantage; and the presence of community groups. Although located in different geophysical and political regions of the continent, the study areas have a commonality of interest within the research topic because they are both characterised by similar environmental and socio-economic problems. The six communities all have forest/woodlands and shrub type of natural vegetation, environmental degradation, loss of biodiversity, reduction of farming, poverty, illiteracy, unemployment, and lack of access to social amenities. It is interesting to note that the governments of the two countries have

developed different initiatives and strategies to mitigate or eradicate these problems. Thus the two sites provided six suitable places for comparison of the questions posed for this research. A comparison of the population living in rural areas for the two countries is shown in Table **4.4**.

Table **4.4** **Basic data on Nigeria and South Africa: area and population.**

		Population			
Country	**Total land area ('000 ha)**	**Total, 2003 ('000)**	**Density 2003 (Population km^{-2})**	**Annual rate of change, 2000—2005 (%)**	**Rural, 2003 (%)**
Africa	2 978 394	850 558	28.6	2.2	61.3
Nigeria	91 077	124 009	136.2	2.5	53.3
S. Africa	121 758	45 026	37.0	0.6	43.1

Source: State of the World's Forests 2005 (FAO, 2005).

4.5 Sample and Sampling Technique

A total of 600 inhabitants were drawn from the two sample areas, 300 respondents each from Mpumalanga Province and Ogun State. One hundred respondents were selected from each rural community. A multi-stage stratified random sampling method was used for the selection of the samples. Several criteria were used – including proximity to forest/woodland (communities that lie within or adjacent to forested areas); socio-economic indicators of disadvantage (such as poverty, illiteracy, unemployment, limited availability and access to social amenities); and the existence of community groups (which would be used as point of entry into community). The sampling technique for the respondents took into account the variables of gender and age. For the purpose of the study, every fourth dwelling unit was identified and from each unit, one household was selected. One adult person (between 30 and 65 years) and one young person (between 15 and 29 years old) from each household was selected. Ogunyemi (1999) and Twine & Siphugu (2002c) employed this sampling method in their studies among the rural communities in Ogun State, Nigeria and Mpumalanga Province, South Africa respectively. The schema used for the research is shown in Figure 4.7.

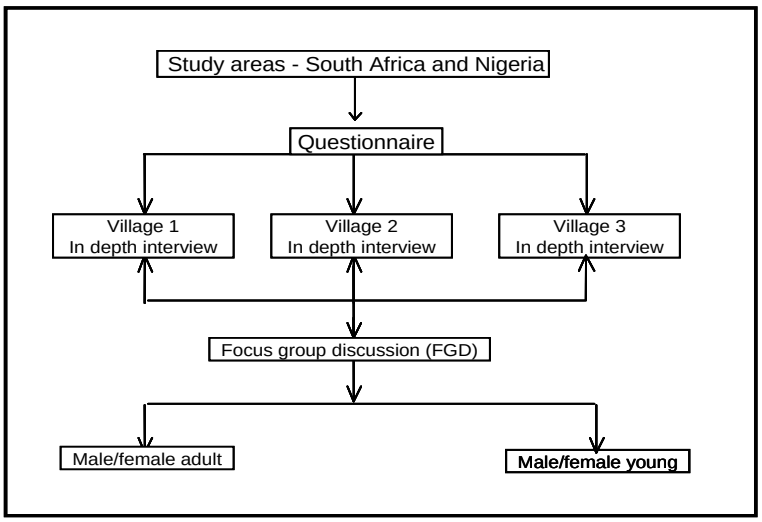

Figure 4.7 **The schema of the research procedure.**

4.6 Research Instruments

No single research method could elicit all the comprehensive information sought by this study. Thus the research made use of five sources of data collection to achieve its objectives and answer the research questions raised. The study relied primarily on: (i) a survey questionnaire; (ii) focus group discussions; (iii) in-depth interviews; (iv) policy documents; and (v) photographs, observations and ad hoc interviews. The questionnaire was used to capture a wider sample of respondents' views on the issues of interest to this thesis(data that were not possible to draw from other sources), and to complement findings of the qualitative data collected.

4.6.1 Questionnaire

The first data source was a structured questionnaire containing twenty-five (25) items administered as an interview guide. Several of the items were adopted from three separate questionnaires used in previous research (Sanderson *et al.*, 2000; Ogunyemi & Ifegbesan, 2011). The questionnaire was divided into five sections. Section A focused on information concerning background of the individual respondents. Section B covered the awareness of forest/woodlands resources; Section C was made up of questions testing attitudes towards forest/woodlands resource conservation. Section D was concerned with current forest/woodlands resource conservation related practices. Section E focused on knowledge and awareness of environmental education in the two countries (Appendix A). The questionnaire was translated (with the assistance of two translators) into the dominant local languages of the two areas of study – Shangaan (also known as Tsonga) and Yoruba respectively. The questionnaire contains 3-point, 4-point and the Likert 5-point scales (Appendix A).

Content validity is concerned about whether an instrument (questionnaire) actually measures what it is supposed to measure. Measurement error had the potential of being a threat to internal validity of this study (Cohen, Manion & Morrison, 2001). In an attempt to control this threat, content validity of the instrument was assessed by experts. Five experts (including the two thesis supervisors, an external reviewer from the Wits Rural Facility in South Africa and two reviewers from Olabisi Onabanjo University, Ogun State, in Nigeria) were asked to check the instrument to determine whether the actual instruments used adequately measured the objectives of the research study. Recommendations from the experts were incorporated into the instrument revisions and unclear or inappropriate items were deleted from the final version.

4.6.2 Focus Group Discussions

The second data source for the study was Focus Group Discussion (FGD). Focus group discussion is one of the qualitative techniques that have been used in a variety of studies. According to Krueger and Casey, (2000:5) focus group has been defined as a *"…carefully planned series of discussions designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment…".* Powell, *et al* (1996:499) also defined a focus group as a *"…group of individuals selected and assembled by researchers to discuss and comment on, from personal experience, the topic that is the subject of the research."* A focus group could be described as a collection of individuals with several common characteristics, brought together by a researcher, to interact and discuss a particular topic or issue in relation to their personal experiences. For example FGD has been used in developing HIV education in Zimbabwe

(Munodawafa *et al,* 1995); condom use before marriage in India (Santhya, *et al*., 2011); and in the area of forest resource conservation (Hundera, 2007; Robinson, 2008; Robinson, *et al,* 2009; Christie & Giri, 2011; Nyanga, 2012) These examples illustrate that focus groups can be used in various settings and for various functions. Depending on the research design, the FGDs can be used for needs assessments, for programme development and evaluation, and for exploratory research. The primary aim of an FGD is to describe and understand how a selected group of people construct, perceive and interpret the issues of interest to the researchers (Wilkinson, 2004; Kitzinger, 2005; Stewart *et al,* 2007). Krueger (1994) described focus group discussion as a powerful research technique for gaining deeper understanding of opinions and beliefs of a particular group of people. In this study, focus group discussions were employed to understand whether people of different socio-economic categories had different perceptions, access, and attitudes towards the forest and forest resource conservation.

FGDs are suitable to record the experiences of all types of people (Waldegrave, 1999; Wilkinson, 2004). A focus group involves a group of 6—8 people, from similar socio-cultural backgrounds or with similar experiences of a specific topic (Waldegrave, 1999; Kitzinger, 2005). A focus group discussion is an organised (but flexibly structured) meeting, involving six to ten participants, normally lasting between one and two hours. The researcher creates a permissive and nurturing environment that encourages different perceptions and points of view, without pressuring participants to reach consensus (Krueger, 1994; Patton, 2002). The focus group helps to explore and generate hypotheses. An FGD enables participants to ask questions of each other as well as to clarify, re-evaluate and re-consider their understandings of their individual experiences, values, beliefs and practices (Krueger, 1994; Kitzinger, 1994). Careful and systematic analysis of the discussions provides insights on how the issue being investigated is perceived by the group.

The purpose of such discussions is to collect information on a particular research topic. According to Krueger (1994), focus groups are beneficial for the identification of major themes. Unlike one-to-one interviews and questionnaires, focus groups involve group interaction, thereby allowing greater insight into people's experiences and opinions than could be achieved outside of the interactions found within a group (Krueger, 1994; Morgan, 1998; 2002). The focus group discussion is particularly effective in providing information about why people think or feel the way that they do (Morgan & Krueger, 1993; Krueger, 1994; Morgan, 1998; 2002). Participants can respond freely and spontaneously without the limitations imposed by questions that require fixed responses (Krueger, 1994; Patton, 2002; Kamberelis & Dimitriadis, 2008). Such participant interaction can rapidly produce valuable ideas – rather than the narrower individual responses obtained with questionnaires (Caplan, 1991). Focus groups can produce concentrated amounts of data on the topic of interest and, in this respect, are more efficient than individual interviews (Morgan, 1998). Focus groups are useful for gaining formative project information because they can indicate the range of a community's beliefs. In addition, they are useful tools for designing question guides for individual in-depth interviews and formulating questions for structured interviews (Wilkinson, 2004; Kitzinger, 2005; Kamberelis & Dimitriadis, 2008).

In this study, a total of twenty four FGDs were conducted, with four each in the selected communities. Volunteers for each group were solicited during administration of the questionnaires.

Participants were divided into two broad categories. The first group consisted of community leaders and elders. The second group consisted of youths and adults of both genders. A total of four 2-hour focus group discussions were carried out in each village. Each focus group contained 7 to 10 participants who were both readily available and willing to participate in the discussion. The reason for separation of the participants into gender and age grouping was to eliminate the culture of passiveness and domination that are part of most rural African societies. In addition, men and women face different challenges and understand changes differently; because they have different roles within the community. Furthermore, women tend not to express their opinions when men are present because of the prevailing cultural behaviour relating to gender roles. Eleven questions were generated to guide discussions (Appendix B). The research assistants arranged the dates and venues for the focus group discussions in consultation with participants. Figure 4.8 and Figure 4.9 show pictures of young people and women participants in the focus group discussions.



Figure 4.8: A focus group discussion with young people in one of community in South Africa



Figure 4.9: A focus group discussion with women in one of the communities

4.6.3 In-depth Interview

The third source of data used was the in-depth interview. The use of interview as the second-phase data collection method in this study was informed by the need for face-to-face, in-depth exploration of issues raised by respondents in their answers to the questionnaire and in group discussions (FGD). Interview is a common method used in qualitative research. Interviews can be both highly structured, as in the case of fixed response questionnaires, or minimally structured, as is the case in the narrative method (Heyink & Tymstra, 1993; Rubin &Rubin, 2005; Adams, *et al.,* 2008). An interview is a purposeful conversation *"…used to gather descriptive data in the subjects own words so that the researcher can develop insights on how subjects interpret some piece of the world…"* (Bogdan & Biklen, 1998:64). In-depth interviewing is done face-to-face, eliciting oral responses from the interviewee. An in-depth interview can provide rich and robust information about the experience of the individual concerning the problem being studied. Interview types vary in their degree of structure (Johnson, 2002; Fontana & Frey, 2005). For this study, the *in-depth interview* used open-ended questions that built upon, and directed, the probing of participants' responses. The aim was *"…to have participant reconstruct his or her experience within the topic under study…"* (Seidman, 1998:9).

Mishler (1986: vii) described the interview as *"...a joint product of what interviewees and interviewers talk about together and how they talk with each other. The record of an interview that we researchers make and then use in our work of analysis and interpretation is a representation of that talk."* The benefits of qualitative interviewing have been elaborately described by many researchers. Heyink and Tymstra (1993:295) have offered a concise summary that has been adapted into the following list:

- The respondent has the opportunity to raise issues deemed essential for the research;
- Misunderstandings can be easily clarified in the interview situation;
- Fresh hypotheses and research questions can be tested out immediately in an interview with minimal structure;
- The respondent and the researcher build 'rapport' – a relationship based on confidence, security, and mutuality of purpose;
- The interview is a 'wide-band method' – many themes can be checked for relevance at short notice; and
- The interview is an appropriate forum for research into feelings, attitudes, intentions, and motivations of behaviour.

However, difficulties exist with qualitative interviews. Interviewers must be knowledgeable, skilled and well prepared before entering the field. Interviewing, as well as the processing of interview data, is both laborious and time consuming, only allowing for relatively small sample sizes. Unstructured and unstandardised interviews are unlikely to fulfil positivist criteria for validity and reliability (Heyink & Tymstra, 1993). The cultural bias that both the interviewer and the respondent bring to the interview can distort data (Miller, 1991:161). This is because the interviewer or researcher is as much a part of any study as the respondent. Denzin and Lincoln (1994:353) asserted that the interview, as a qualitative research tool is "*…the art of asking questions and listening…*"

Interviews were conducted with village heads to gather information about their experiences and opinions regarding forest resource utilisation and conservation. The purpose of these interviews was to learn directly from the chiefs what attitudes and practices of forest resource conservation were common in the communities. An interview guide (Appendix C) was used to direct the interview and ensure that all relevant topics were covered. I used open-ended questions and a conversational approach in the interview. This allowed a thorough examination of the experiences, feelings and opinions that closed-ended questions would not have captured. Interviewees were encouraged to articulate their viewpoints and experiences freely. The expressions and views of the interviewees were recorded (on tapes and in field notes) in their own words.

Each interview was carried out by me, with the assistance of field assistants, for a maximum of two hours. The field assistants helped me as the researcher by obtaining prior approval of dates for interviews through their visits to the chiefs beforehand. The key informants were individuals who, because of their knowledge, previous experience or social status in the community, had access to valuable information and insights about the context and functioning of the society. Before the different interviews, an interview guide was prepared with a list of questions or issues to be explored during the interview. Key informants for this study were mainly the chiefs or village heads.

4.6.4 Document Analysis

A fourth data source in this study was *document analysis*. In this context, document analysis is used synonymously with policy analysis. Merrian (1998:126) opined that *"…data from documents are particularly good sources for qualitative studies because they can ground an investigation in the control of the problem being investigated."* Policy documents can provide useful information on the different forest policies and the two governments' implementation and strategies – which all constituted (or contributed to) part of the context of the problems being researched.

Policy analysis is an applied social science discipline that uses multiple methods of inquiry and argument to produce and transform policy-relevant information that may be used in political settings to resolve policy problems (Ball, 1995). Policy analysis is a normative discipline. The scope and methods of policy analysis are partly descriptive and, together with information about the causes and consequences of policy, are essential for understanding public problems. According to Dunn (1981:53—54), there are three forms of policy analysis. The first is prospective policy analysis, which involves the production and transformation of information before actions are initiated and implemented. This often creates large gaps between preferred solutions and the efforts of governments to resolve them. Secondly, retrospective policy analysis is confined to the production and transformation of information after policy actions have been taken. The third form of policy analysis is integrated policy analysis. This is more comprehensive form of analysis combines the transformation of information both before and after the policy actions have been taken. In principle, integrated policy analysis is iterative and unlimited, linking retrospective and prospective phases of inquiry.

Within the context of this study, policy analysis did not only come from the insider's perspective, but also from the point of view of the outsiders, who observe the working of policy process and its impact. The focus was on the implementation of content (and not on how decisions were made) and on how practitioners should think about policy problems. The policy was taken as a dependent variable to explain just how much of the policy is known to the people for whom it was formulated – and the extent to which the policy objectives are being achieved and are affecting their lives.

According to Bell (1993:71), document analysis involves a form of internal criticism where the content of a document is subjected to rigorous analysis. Mason (1996:71) views document analysis as "…*a major method of social research, and one which many qualitative researchers see as meaningful and appropriate in the context of their research strategy*." Document analysis is a means of finding out the extent to which formulated policies are achieving their set goals. It is a useful means of gathering information on the effects of policies on people for which the policies are meant. According to McMillan and Schumacher (1993:542), "*...policy analysis evaluates government policies to provide policy makers with pragmatic action oriented recommendations*." The outcome of document analysis could be either recommendations (or decisions) on planning and improving the policy or for justifying the adoption of an alternative policy. Content analyses of policy documents – such as forest and environmental policies – were carried out to understand and establish the perceptions, levels of authority and implementation of policies for forest conservation and environmental education in the rural areas of the sampled communities. This analytical process was used to both illuminate the research process and support the data derived through other processes.

To analyse the policy documents and address the questions raised for the study, a thematic analytical framework was used. The framework shows how the documents provide for the seven themes – perception of forest and forest resources; aims and objectives; structures of authority; strategies for conservation, livelihood, community participation and awareness and environmental education for the promotion of forest resource conservation among rural people in the study countries. Data from these documents were also used as a means of complementing and triangulating the data from FGD and the interviews carried out in the study communities.

4.6.5 Photographs, Observation and ad hoc Interviews

Photography can be an aid in recording physical trace data because visual stimuli activate reflection and stimulate memory (Dempsey & Tucker, 1994). Photographs, observations and ad hoc interviews were used in the study. Marshall and Rossman (1989:79) defined observation as *"...systematic noting and recording of events, behaviour and artefacts in the social setting chosen for study…".* It is a process of collecting information through looking and note taking of events, the behaviour of individuals or groups that are of interest to the researcher. Merrian (1998:111) wrote *"...observation offers a firsthand account of the situation under study and when combined with interviewing and document analysis, allows for a holistic interpretation of the phenomenon being investigated."* In this study observations of daily life in the study areas constituted a very important research method during the fieldwork and supplemented the data collected in household surveys, focus group discussions, interviews and documents. Observation can be participant or

non-participant, direct or indirect. Observations provide researchers with opportunities to understand the behaviour of people and the processes in a context that is more natural than during interviews (Mertens, 2005; Merriam, 2009). Using observations in this study provided a deeper and richer understanding of the subject in relation to forest resource conservation. Observations of physical structures, social behaviour, actions and symbols were major sources of materials for discussion during interviews.

The observation technique provided an opportunity to see the various things that participants' claimed to know, use and believe about forests and forest resource conservation and environmental education. I took detailed field notes of my observations and included descriptions and direct quotations of respondents' comments in the field notes. Few other studies that used observation techniques in their data collection include Ozor and Odo, (2008); Robinson, (2008) and Giliba, *et al*, (2010).

Ad hoc interviews/informal conversations were also used during the fieldwork. Conversations were often related to observations made while, for example, walking from house to house. They were aimed at further understanding the relation between the communities and forest resources and to present visual account of reality, experiences of the people and of the fieldwork.

4.7 Pilot Study

A two-phase pilot study was conducted with people from communities similar to the target communities. One community each from Nigeria and South Africa was selected. This section describes the pilot study process, goals and results.

Each phase of the pilot study was conducted with the following objectives:

- to validate the research instruments;
- explore the workability of the identified field activities;
- anticipate the likely problems in the course to the main study and plan remediation;
- trial test the analysis procedure;
- to explore different introduction and presentation styles in the communities;
- obtain information which will be used for review of the research instrument where necessary.

The first phase was carried out during the second week of May 2003. Fifty inhabitants of the Sigagule village, Bushbuckridge in the Bohlabela District, Mpumalanga Province, South Africa were involved. With the assistance of one of the community leaders, I was able to enter the community. He took me to the headman, from whom I obtained permission to carry out the study among the local people. He also served as my field assistant and interpreter during the pilot test. He assisted in the translation and interpretation of the questionnaire for those respondents who were not literate enough to read the questionnaire in English. Two sections of focus group discussions were also conducted. The pilot study lasted for one month.

In November 2003, the second phase of the pilot was conducted with forty inhabitants in the Iperin village, Ijebu Northeast Local Government, Ogun State, Nigeria. A local teacher from one of the primary schools served as the link to the community. It was not difficult to administer the

instrument and conduct the FGDs to the illiterate respondents among them because my assistant and I could speak the language of the people. The Cronbach's alpha reliability analysis was conducted on the collected data using the main survey questionnaire to determine its reliability. The values obtained were 0.70 and 0.78 for South Africa and Nigeria respectively; which suggested that the items under discussion were understood.

4.8 Translation of the Instruments

One of the lessons learned from the pilot study was the need to translate the instruments, especially the questionnaire, into the local languages of the selected communities. This consideration was paramount to the study's validity and, as a result the process of translation was treated with the utmost care. A front-back method of translation was adopted to validate the translation (Figure 4.8). In this method, the original English version was translated to the local language and then back to English. In the case of Nigeria, two Yoruba language experts were hired to translate the instrument, the first from English into Yoruba; the second translated the Yoruba version back to English. This latter translation was compared with the original version to ensure that there was no distortion or loss of meaning in the Yoruba version. The same procedure was adopted in the translation of the English version into Tsonga – the local language of the target rural inhabitants of the selected communities in Bushbuckridge, South Africa.

In addition, two experts selected from the two countries determined the content validity of the instruments. The experts were scholars and researchers in the area of human-environmental interface, with interests in conservation of biodiversity of the forest/woodlands.

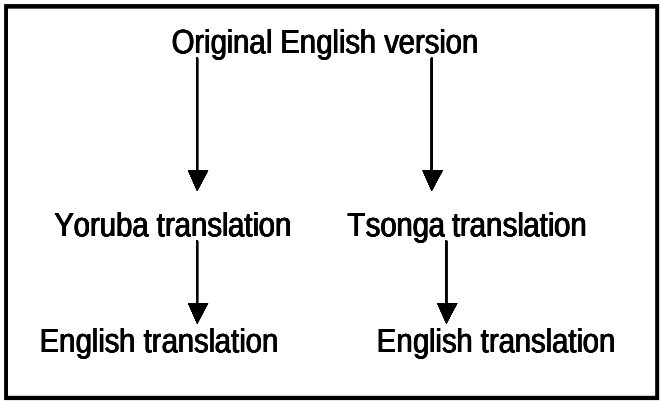

Figure 4.8 The schema for translating the questionnaire from English to local language and back to English.

4.9 Main Study: Procedure for Administration and Collection of Data

Before the commencement of the study, permission was sought from the Nigerian community chiefs and South African headmen. This was important not only as an ethical condition for the study, but also for gaining the confidence of the people under them. In addition, the chiefs and headmen were part of the subject to be interviewed. To obtain permission, I made several visits to each community before the commencement of the study. The first visit served to identify one of the leaders of the community group, with whom a relationship was developed and through whom I met with the community headman or chief. A letter of permission and informed consent with copies of

the research instruments were given to each of the chiefs and headmen. The second visit was used to build on the initial contact, and inform the chiefs and headmen of when the study would commence. The mapping of the community was also carried out to ease the selection of households and movement through the community. In South Africa, after talking to the headmen of the selected communities, I was told that permission must also be sought from the traditional authority Chief. This was done before starting the study in each of the communities, with the assistance of a locally-based long-term researcher as an intermediary.

4.9.1 Procedures for Interviews

In-depth interviews (that lasted between forty-five minutes and one and a half hours) were conducted with each of the village headmen/chiefs. I personally conducted the interviews, with the assistance of a translator – especially in the three communities in South Africa. All interviews were tape-recorded. The tape recordings allowed me to capture the interview in a detailed manner. Participants were assured of confidentiality regarding the information they disclosed. Most of the interviewees had questions to ask before the interview began, which I answered happily. I then proceeded to introduce the study and myself, indicating both the nature of my interest in and experience with environmental conservation and education.

Field notes were taken in combination with the audio tape-recording. Social demographic information was recorded before the beginning of the interview. The final question asked interviewees whether they felt they had anything else to share. The setting of the interviews was personal and friendly. The chiefs/headmen were warm and eager to participate. Many became emotional at some point during the interview, and several asked to have the tape recorder stopped briefly. A total of six interviews were conducted in both Nigeria and South Africa.

4.9.2 Procedure for Conducting Focus Group Discussions

To conduct the FGD for this research, I identified volunteers who were willing to participate in discussions during the administration of the survey questionnaire. Younger people, especially students, were forthcoming and were more willing to be involved in discussions than older people. It was difficult persuading women to participate in the discussions – the few that participated were the wives of liberal-minded men who encouraged their partners to be involved.

Once the people selected to participate had given their verbal agreement to attend, the date was conveyed to them about three days before the scheduled focus group session. Participants were invited to think about the study topics before attending the discussion. These topics were also explained to the participants in detail just before the discussion began at the focus group meeting that they attended. Each focus group session was held at a location that the participants regularly attended and at a date and time that they were usually there. Several were conducted at the local primary schools and others at the home of one of the community leaders.

A short period of small talk was used to ascertain dominant talkers, self-appointed experts, and shy people, so that they could be seated at appropriate locations in relation to the researcher, as recommended by Krueger (1994). Participants were asked what they preferred to be called, and these names were written in large letters on name cards. The researcher and field assistants were

similarly identified. Participants were asked to speak one at a time so that everyone's comments could be heard on the tape later on. Participants were offered refreshments half way through the session.

The researcher guided each focus group through a discussion about the research topic. With the help of field assistants, discussions were tape-recorded and an assistant moderator took written notes. At the start, participants were reminded of the purpose of the discussion. After each issue had been discussed, I carried out a debriefing or summary of the opinions of the interviewees. Later, a complete debriefing was conducted with participants. At least three FGDs were conducted in each of the communities, with each session lasting between one and two hours. All FGD sessions were carried out within two weeks after the administration of the questionnaire.

4.9.3 Procedure for Administration of Questionnaire

The administration of the questionnaire took almost eighty days to carry out in Nigeria and fifty-six days in South Africa. In the company of the trained field assistants, I moved from house to house in each community to administer the questionnaire. The two versions of the questionnaire were introduced to the respondents with the explanation that both contained the same content. In some households, where the selected respondents were able to read and write, the questionnaire was given to him/her to complete; it was read out to those who were unable to read or write either in English language or the local language. Respondents who were able to read and write were asked which version of the questionnaire they would prefer and their preferences were always granted. The majority however, preferred to complete the local language version of the questionnaire. In several cases, respondents with school going children requested the children to read the content or statement and the options for them; thereafter, as they made their choice, the researcher or attending field assistant ticked the option.

4.10 Selection and Training of Research Assistants

In Nigeria, three field assistants were recruited and trained for field activities. The research assistants were teachers living and working in one of the community schools, known to the people and familiar with the geography of the communities. A one-day training workshop was organised for training of field assistants on administration of the questionnaire. They were briefed on the sampling technique and I administered the instrument to them. As practical exercise, the field assistants were required to administer the instrument on each other – and on myself. A similar approach was used during the data collection in South Africa.

4.11 Validity and Reliability of Research Findings

According to Adam and Schvaneveldt (1991:77), "…validity refers to the general correctness and appropriate representativeness of facts, while reliability refers to the consistency or dependability of the facts itself." Determining the validity and reliability of qualitative research is not as straightforward as in quantitative research, for which standard precision and accuracy procedures are readily available. Qualitative research meanwhile involves what interpretive researchers have tagged trustworthiness. The notion of trustworthiness, according to Lincoln and Guba (1985:290),

raises the question: "…how can an inquirer persuade his or her audiences that the research findings of an inquiry are worth paying attention to?" Marshall and Rossman (1995:143) opined that:

> "*All research must respond to canons that stand as criteria against which the trustworthiness of the project can be evaluated. These canons can be phrased as questions to which all research must respond. First, how credible are the particular findings of the study? By what criteria can we judge them? Second, how transferable and applicable are those findings to another setting or group of people? Third, how can we be reasonably sure that the findings would be replicated if the study were conducted with the same participants in the same context? And, fourth, how can we be sure that the findings are reflective of the subjects and the inquiry itself rather than a creation of the researcher's biases or prejudices?*"

According to Lincoln and Guba (1999:397), "…*trustworthiness is defined as that quality of investigation (and its findings) that made it noteworthy to the audiences*." It is about the rigour and integrity of the process of data collection and analysis. From the literature, four criteria for establishing the trustworthiness of qualitative research have been identified. These are *credibility*, *transferability*, *dependability* and *confirmability* (Bryman & Burgess, 1999; Mouton, 2002). These four criteria were each defined by Schwandt (1997:164—5) in *Qualitative Inquiry: A Dictionary of Terms* as follows:

> "***Credibility*** *[which] addressed the issue of inquirer (researcher) providing assurances of the fit between respondents' view of their life and the inquirer's reconstruction and representation of same.* ***Transferability*** *dealt with the issue of generalization in terms of case-to-case transfer.* ***Dependability*** *concerned with the process of the inquiry and the inquirer's responsibility to ensuring that the process was logical, traceable and documented.* ***Confirmability*** *(objectivity) concerned with establishing the fact that data and interpretations of an inquiry were not mere figment of the inquirer's imagination.*"

Strategies used to attain trustworthiness include peer debriefing, prolonged engagement and persistent observation, audit trails and member checks (Guba & Lincoln, 1981; Bryman & Burgess, 1999). To establish the four criteria of trustworthiness in this research, the methodological triangulation of the data sources was adopted to achieve credibility. According to Cohen and Manion (1994:208), triangulation is defined as *"…the use of two or more methods of data collection in the study of some aspect of human behaviour…"* The need for triangulation arises from the ethical need to confirm validity of phenomena (Tellis, 1997). Triangulation is used to eliminate the problem of single method – offering a balance between logic and storytelling and therefore makes findings more robust (Jacobson, 1995). Through triangulation, the different research methods complement each other. Methodological triangulation was employed in this research: both a qualitative approach (focus group discussion and in-depth interview) and a quantitative approach (questionnaire) were used because of their complementary nature. This two-pronged approach to data collection and analysis not only ensured reliability, internal consistency of multi-dimensional variables and sample selectivity bias control, but also made it possible for thorough and robust findings – supported with appropriate theory – to be achieved. This further assisted in theorising as well as confirming empirical findings. It is the conviction of the researcher that employing the focus group interview, face-to-face interview, observation,

documents, photographs and questionnaires went a long way towards enhancing the credibility of the research. Secondly, *transferability* (generalisation) of the findings was not a major issue in this research because the study was context-bound. However, the selection of more than one site for the study within a country, as well as the process of selecting the respondents, coupled with detailed description of the context, increased the degree of generalisation of the findings. Lincoln & Guba (1999:420) argued that *"…since there can be no validity without reliability (and thus no credibility without dependability), a demonstration of the former is sufficient to establish the latter…"* Thus, the overlapping methods were used to determine the *dependability* of the research findings. *Confirmability* was enhanced through peer debriefing, which involved cross-checking findings and interpretations against the conceptual framework and literature. In addition, the randomisation and purposive sampling techniques, used for the selection of the respondents, helped to increase the *dependability* of the research.

The trustworthiness of any research is predicated on two major elements: the suitability of the proposed research design or methodology to address the specific questions posed by the study and the scientific rigour of the methodology itself. For the findings to be trustworthy, a researcher must use an appropriate methodology and apply it in a rigorous manner. I am convinced that the research paradigm and methods adopted for this research are those best suited for the study of the relevant phenomena.

4.12 Data Analysis

Data analysis was guided by the descriptive and naturalistic approaches. The content analysis of the focus group discussions and in-depth interview transcripts involved the identification of key words, phrases or issues frequently occurring in the focus group and in-depth interviews. Drawing from the principles of content, and *discourse analysis* and grounded theory, the data sets were worked upon at two levels of analysis. Firstly, data sets were analysed on a country-by-country basis, with triangulation, before making cross-national comparisons.

Bogdan and Biklen (1982:145) define qualitative data analysis as "*…working with data, organising it, and breaking it into manageable units, synthesising it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others*." Qualitative researchers tend to use inductive analysis of data – meaning that the critical themes emerge out of the data. Qualitative analysis requires some creativity because the challenge is to place the raw data into logical, meaningful categories; to examine the data in a holistic fashion; and to find a way to communicate this interpretation to others.

Three process steps are involved in *grounded theory*: description, conceptual ordering and theorising (Strauss & Corbin, 1998). The analysis begins with reading each transcript to understand each participant's responses. The goal is to create descriptive, multi-dimensional categories that form a preliminary framework for analysis. Words, phrases or events that appear to be similar are grouped into the same category. These categories are gradually modified or replaced during the subsequent stages of analysis that follow. Qualitative research reports are characterised by the use of 'voice' in the text, that is, participant quotes that illustrate the themes being described.

The next stage of analysis involves the re-examination of the categories identified to determine how they are linked – a complex process (Strauss & Corbin, 1998; Patton, 2002). The purpose of coding is not only to describe but, more importantly, to acquire a new understanding of a phenomenon of interest. Therefore, the causal events contributing to the phenomenon, detail description of the phenomenon itself and the ramifications of the phenomenon under study must all be identified and explored. Finally, the researcher translates the conceptual model into the story line that can be read by others. Although the stages of analysis are described here in a linear fashion, in practice they may occur simultaneously and repeatedly. During coding the researcher may determine that the initial categories identified must be revised, leading to a re-examination of the raw data. Additional data collection may occur at any point if the researcher uncovers gaps in the data. In fact, informal analysis begins with data collection, and can and should guide subsequent data collection for a more detailed yet very understandable description of the analysis process (Strauss & Corbin, 1998).

Because of the approach employed in the collection of data, the rate of response 100% was recorded. All 600 hundred respondents returned their questionnaires. Responses to the survey items were entered into the Statistical Package for Social Sciences® (SPSS) Version 13. To determine the general knowledge, attitudes and practices of the respondents the frequencies, percentages, means, and standard deviations were calculated.

For ease of data entry, nominal values were assigned to the items according to scales. Questions on knowledge had an assigned score of 3 for "Yes", 2 for "No" and 1 for "Not sure". The items on the importance of forest resources were scored as follows: 4 = "Very important"; 3 = "Important"; 2 = "Somewhat important"; and 1 = "Not important". The attitude and practice statements were scored considering the negative or positive wording of the items. For every positively worded questionnaire, the respondents progressed from 5 through 4, 3, 2 and 1 for "Strongly Agree" (SD), "Agree" (A), "Undecided" (UD), "Disagree" (D) and "Strongly Disagree" (SD); "Very Acceptable" (VA), "Acceptable" (A), "Don't Know" (DK), "Not Acceptable" (NA) and "Very Unacceptable" (VUA) respectively. The scoring pattern was reversed for the negatively worded items. To statistically determine the level of knowledge, binary partitions for knowledge (low/high) and behaviour index (negative/positive) were used. To determine the partitioning value of items, the maximum of each of the nominal values was divided by N. Thus, the upper limit of knowledge was put at 2.00; importance was put at 2.50; attitudes and practices were put at 3.00.

For purposes of data interpretation, mean values of 2.50 and above were deemed to indicate 'important' and values below 2.50 were regarded as implying 'not important'. Mean values of 3.00 and above were considered for agreement and acceptance of items; mean values below 3.00 were taken to mean disagreement and non-acceptance with respect to items on the attitudes and practices of the respondents. A standard deviation greater than 1.00 was taken to indicate high variability among respondents. The analysis of variance (ANOVA) and t-test statistics were used to determine whether significant differences existed in the importance, knowledge, attitudes and practice scores of respondents within, and between, the target groups and the two study areas. To assess the most parsimonious sets of independent variables that would best predict forest resource conservation, stepwise multiple regressions were used following a simple causal model (Figure

4.9). To determine the relationship between several socio-economic variables – age, gender, literacy level, occupation and religion and the dependent variable knowledge, attitude and practices of forest/woodlands resource conservation – the Pearson Product Moment Correlation (PPMC) was used. All completed questionnaires were cleaned and edited. Thereafter an appropriate codebook was developed in preparation for computer processing. Incomplete items on the questionnaire were treated as missing values and not counted in the statistical analysis. Table 4.5 summarises the various methods that were used to address each research question.

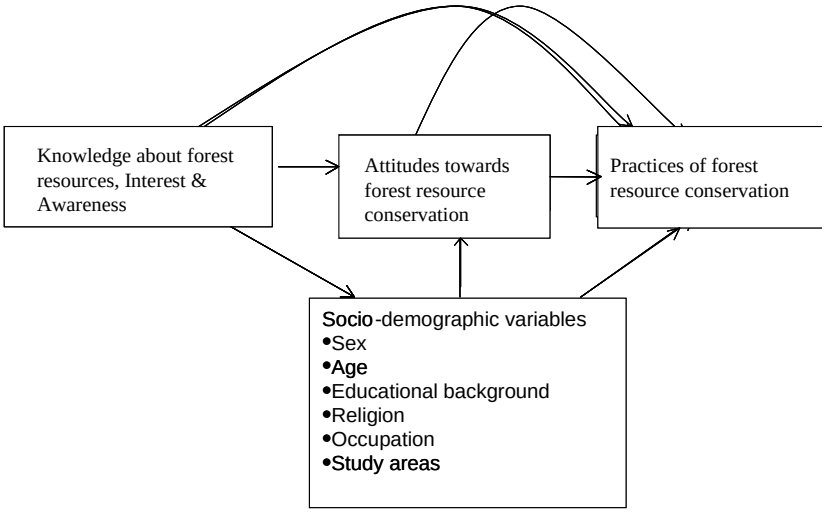

Figure 4.9 Model used for testing of the relationship of different variables on the dependents variables of forest resource conservation.

4.1 Ethical consideration

This study followed the guidelines for ethical conduct of research with humans, as laid out by the Research Office of the University of Witwatersrand. Participants were contacted and given an official letter describing my study, a request for their involvement, and the extent of the commitment required on their part. These points were reviewed again with the participants at the start of focus group discussions and interviews and consent to take part in the research was formally obtained by respondents signing a consent form. Participants were assured that their responses would be confidential, and were made aware of future access to the study results. (Samples of information letters and informed consent forms are provided in Appendix D).

In this chapter, I have identified and discussed the methodology employed for conducting the study. I have provided detailed descriptions of the study research paradigm, the study areas, instruments and method of data analysis used. The next four chapters will deal with the presentation and interpretation of the results from the application of methods described in this chapter. Chapter Five will present the analysis of the forest policy documents of the two countries studied to address the issues of perception, levels of rural inhabitants' participation in formulation and implementation, and strategies to answer the first objective and the corresponding research questions raised.

Table 4.5 Overview of multiple methods used in forest resource conservation and environmental education.

Research Questions	Question.	IDI	FGD	Doc. Analysis	Observation/ Photograph
What are the socio-institutional constructions of forest resource conservation and environmental education practices among rural inhabitants of Ijebu division, Nigeria and Bushbuckridge, South Africa, and how do their socio-demographic characteristics contribute to knowledge, attitudes and practices of forest resource conservation?	√	√	√	√	√
What similarities and differences exist in the provisions of the forest policy about (i) conception of forest and forest resources (ii) aim and objectives (iii) structure of authority (iv) strategies for conservation (v) rural livelihood and poverty (vi) community participation (vii) environmental education and public awareness between South Africa and Nigeria?		√	√	√	
What is the meaning, importance, level of knowledge and use of forest resource among rural inhabitants in Ijebu Division in Ogun State, Nigeria, and the Bushbuckridge district in Mpumalanga Province, South Africa?	√	√	√		√
What are the general attitudes and practices of forest resource conservation among rural inhabitants in Ijebu Division in Ogun State, Nigeria, and the Bushbuckridge district in Mpumalanga Province, South Africa?	√	√	√		√
What is the level of exposure of the rural inhabitants in Ijebu Division in Ogun State, Nigeria, and the Bushbuckridge district in Mpumalanga Province, South Africa to environmental education?	√	√	√		
Are there significant differences in knowledge, importance, attitudes and practices of forest resource conservation between rural inhabitants in Ijebu Division in Ogun State, Nigeria, and Bushbuckridge district in Mpumalanga Province, South Africa across their socio-demographic variables?	√		√		
Are there significant relationship between socio-demographic characteristics with knowledge, importance, attitudes and practices of forest resource conservation in rural inhabitants in Ijebu Division, Ogun State, Nigeria, and Bushbuckridge District, Mpumalanga Province, South Africa?	√		√		
To what degree do socio-demographic characteristics of rural inhabitants predict their knowledge, importance, attitudes and practices of forest resource conservation in Ijebu Division in Ogun State, Nigeria, and Bushbuckridge district in Mpumalanga Province, South Africa?	√				

CHAPTER FIVE

5 Forest and Forest Policy: The Voice of Rural People

"*Policies are best understood in terms of practices on the ground, rather than in terms of idealist statements of intention or blueprints for action.*"
(Christie, 1997:121)

5.1 Introduction

This is the first in a series of four chapters devoted to the analysis and interpretation of research data. Here an analysis of the forest policy documents of the two countries studied is presented, to address the issues of perception, levels of participation and strategies relevant to the first objective and research question raised. The next two chapters will examine the qualitative and quantitative analyses of data gathered in Nigeria and South Africa. The final chapter in this group offers a comparative analysis and interpretation of data from the two countries.

Policy analysis is an important component of this research. In this section I provide analyses of forest policy and its relevance to rural livelihood and attitudes and practices of forest resource conservation in the study areas. My analyses focussed on the national and state policy documents on forests and forestry. This was complemented with an extensive survey of literature on forest resources and forestry development in Nigeria and focus group discussions (FGD) and In-Depth-Interviews (IDI) to gain insight into the perception of the interviewees' understandings of the policies and their impact on the respondents' livelihood. This is done with a view to addressing the first objective and related questions described in Chapter One.

5.2 National Forest Policy and the voice of Rural People from Ogun State, Nigeria

At the time this study was conducted, there was no single comprehensive national forest policy built upon legislation and harmonised with stakeholders' interests. The new forest policy of Nigeria was prepared in 2005 and approved in 2006 – the content of these documents was used in this analysis (Federal Ministry of Environment, 2006). A number of other policies relating to forest resource management and conservation also existed. While several of these have been approved, others were being reviewed at the time of the study. These documents include: the National Environment Policy of 1996 and the National Agricultural Policy 2003. Other policies include the National Policy and Plan of Actions (1991–1995); the National Policy on Population and Sustainable Development (2001 draft); the Water Supply and Sanitation Policy (2000); and the National Policy on Women (2000). Other sectoral policies relevant to forest resource conservation are: the National Energy Policy; the National Conservation Strategy and National Resources Conservation Action Plan; the National Environmental Action Plan (NEAP); the State Environmental Action Plan (SEAP); the National Tropical Forestry Action Plan; the National

Biodiversity Strategy and Action Plan; the Green Agenda of the Vision 2010 report; the National Empowerment and Economic Development Strategy (NEEDS), the National Action Programme to Combat Desertification; and the draft National Forest Policy. The National Forest Policy is in the process of being developed, under the auspices of the Ministry of Environment, and is yet to be presented to the National Assembly (EC-FAO, 2003; Federal Republic of Nigeria, 2005).

The Nigeria forestry sector has undergone a radical transformation through institutional restructuring, the formulation and delivery of programs, and changes in societal values with respect to the forest. This has resulted in a fundamental shift in the country's forest management paradigm. Nigeria forest policy is no longer focused on fibre output, but is characterised by three equally important objectives: enhancing the role of forests in ecological rehabilitation and environmental protection; increasing timber supply by commercial investment; and promoting rural well-being and poverty reduction through agro forestry.

5.2.1 The goals and objectives of forest policy

The National Forest Policy (Federal Ministry of Environment, 2006) covers a wide range of issues. It addresses and incorporates concerns relating to the conservation of biological diversity, sustainable utilisation of forest resources, ecological and environmental stability as well as the role of local communities in forest management. The latter is a departure, or shift, from the traditional approach of forest management which had primarily been focused on timber production (adopted in the National Forestry Policy of 1988). The new policy is focused on renewable natural resources of Nigeria – forests, watershed, rangeland, wildlife, biodiversity and their habitats. The policy is hinged on eight principles which are: national objective; improving livelihoods and reducing poverty; food security; biodiversity conservation and environmental services; partnership in governance; national forestry legislation; international obligations and forestry valuation. Specifically the principles are based on the need to:

- address the factors affecting the decline of forest resources;
- streamline the contribution of forests to economic development and growth particularly the National Economic Empowerment and Development Strategy (NEEDS) whose four key strategies are – reorienting values, reducing poverty, creating wealth and generating employment;
- mobilise the community and civil society in forestry development;
- promote partnership with the private sector, the Non-Governmental Organisation (NGOs) and Community Based Organisations (CBOs);
- address transparency in the tendering administration of forest concessions and to encourage long term concessions;
- accommodate the international forestry policy initiatives, the implementation of the Intergovernmental Panel in Forests (IPF) and in Intergovernmental Forum on Forests (IFF) proposal for action for sustainable forest management;
- mainstreaming forestry activities into Millennium Development Goals (FME 2006:19).

The overall goal of the national forest policy is to *"…achieve sustainable forest management that would ensure sustainable increases in the economic, social and environmental benefits from forests and trees for the present and future generation including poor and the vulnerable groups"*.

The National Forest Policy provides a balance between the development and conservation needs required to achieve sustainable forest management. As such, the policy document identifies the following objectives (Federal Ministry Environment, 2006: 23):

- increase, maintain and enhance the national forest estate through sound forest management practices;
- address the underlying causes of deforestation, desertification including lack of policy support, market distortions, weak regulations and rural poverty;
- promote and regulate private sector involvement in forestry development, and to create a more positive investment climate in the sector;
- capitalise on the economic, social and environmental opportunities in forestry without undermining the resource base;
- encourage forest dependent people, farmers and local communities to improve their livelihood through new approaches to forestry;
- ensure the survival forest biodiversity and to balance this with the pressing development needs of the country;
- rehabilitate and conserve key watershed forests;
- promote and maintain the greening of the urban environment, and meet the increasing demand for forest products by urban centres;
- ensure that improved tenure to land and tree acts as an incentive for individuals, communities and women in particular to invest in forestry;
- help private owners and communities to reserve land for forestry;
- build capacity and systems for state and local government to engage actively in forest resources management and development;
- apply an effective regulatory system to safeguard public interests under private sector forest management agreements to ensure adequate legal provisions for tenure in order to encourage long-term involvement;
- develop partnership or management agreement with local communities that improve forest management and alleviate poverty;
- strengthen and make best use of capacity and reach of NGOs and CBOs in facilitating forest development;
- develop and promote responsive, affordable, well-formed and decentralized forestry advisory services to farmers', communities and the forest industry
- develop and support demand driven, well-coordinated forestry research and training institutions and programmes; and
- develop a forest sector programme that translates forest policy into action in a way that complements programme in related sectors (Federal Ministry of Environment, 2006:23-24).

5.2.2 Conception of forest and forest resources

The National Forest Policy is not explicit in its perception of forests and forest resource. The policy views forests from a broad-based approach – particularly focussing on the relationship between people and the resources provided by the forest. In the context of the policy, it addresses

all components of the forest sector which include 'forests of all kind' that is, the indigenous forest, natural woodlands, plantations and community forests.

5.2.3 Institutional arrangement for administration of forest

The institutional arrangement for the control and management of forest resources in Nigeria, and according to Section 20 of the Constitution of the Federal Republic of Nigeria, states that forests and forestry are within the jurisdiction of both the Federal and State governments: "*The state shall protect and improve the environment and safeguard the water, air and land, forest and wild life of Nigeria.*" Further, Section 152 (1d) states that one of the objectives of local government (the third tier of government) is "*…to promote [a] safe and healthy environment…*" (Federal Republic of Nigeria, 1999). By these provisions, forests and forestry are administered in Nigeria at all the three tiers of government, federal, state and local. At the federal level, the Federal Ministry of Environment (FME), created in 1999, is responsible for the administration of forests and forest resources through the Federal Department of Forestry (FDF), which was previously controlled by the Federal Ministry of Agriculture and Natural Resources (FMANR).

According to the section of the National Forest Policy on forest administration it states *inter alia* that *"...the federal Department of Forestry shall play a leading role in forest management throughout the country..."* (FME, 2006:38). This Department is responsible for the formulation of National Forest Policy and supports implementation of federally funded projects. It also plays an advisory role to the State Forestry Departments (SFD) and is responsible for relations with international development agencies. At the state level, responsibility lies with the SFDs. Most SFDs are still placed under the State Ministry of Agriculture and Natural Resources (MANR) – because many states are yet to create their own Ministries of Environment (as advised by the Federal Government). State governments are empowered to formulate forest policy, enact laws on forestry, and manage conservation of forest resources within their territories. The local government roles, as stipulated in the current National Forest Policy, include the establishment of woodlots to protect watersheds and river courses; the protection of forests and farm trees in arable land against fire and illegal felling of trees; and the protection of wildlife against poaching (FME 2006:38-41).

The document is an umbrella policy providing guidelines to the federal, state and local governments for the management of their forest resources. In consonance with this policy, the state and local government may devise their own policies relevant to with their circumstances. This umbrella policy also stressed stricter control over public forests. According to the document, the policy *"…shall encourage the state government to create and effectively managed protected area networks in areas under their control seeking the needed financial and technical assistance from federal government"*. But at the same time, the policy recognised the importance of community involvement in the resource management. It says in part *"...appropriate institutional mechanism shall be devised for the collaborative management of such protected forest areas with local communities in order to give them economic and environmental stake in the endeavour and in the poverty alleviation" alleviation and other development programmes, high priority shall be given to integrated land use projects for the sustainable rehabilitation of renewable natural resources with the participation of organised local communities. Such projects not only provide employment to the rural poor but also improve the environment and increase the supply of firewood and fodder."*

(FME 2006: 42) However, there are challenges inherent in this type of power relative to forest resource management and conservation. Firstly, to ensure that forest policy and other national policies are appropriate to the relevant states. Secondly, because state and local governments are predominantly rural and have populations who depend on forest resources for their livelihoods, it is necessary to balance the national quest for economic development and the conservation of forest resources with the local resource demands of rural communities.

5.2.4 Strategies for the implementation of forest policy

The existing National Forest Policy statement and the strategies for its implementation cover all the relevant functionaries of the sub-sector. The operational modalities for achieving the set objectives are spelt out under *"share of Responsibilities"* where responsibilities are assigned to the federal, state and local government levels. The successful implementation and enforcement of the policy, therefore, hinges crucially on the interaction between the three tiers of government institutions designed and established for forest development. However, the Federal law – National Forest Act (which would give effect to these tiers) – is yet to be promulgated.

To achieve the policy objectives, a number of strategies have been employed, as follows:

- *"The promotion of partnership with all stakeholders including the private sector, communities, and society, NGOs and CBOs;*
- *Decentralisation;*
- *Promotion of community participation in forest resources management;*
- *Encouraging the active participation of all women and men, young people and elderly and the vulnerable group in forest resources development* (Federal Ministry of Environment, 2006:24)

Chapter One, section 1.1 of the document on forestry acknowledges the importance of forests to the government and people of the country:

> *"Forestry accounts for a high proportion of energy, food and medicinal supply [to] the people of the State. A lot of food, drugs, timbers, building materials, fibers, spices, resins, gum and cash crops that support the State's economy are derived from the remaining forests in the State … thus conserving remaining forestry resources in the State is not only necessary but also imperative for sustainable development."*

The National Forest Policy also provides for the development biodiversity conservation, national parks and games reserves for conservation interest. Such forests can play an important role in increasing public awareness and appreciation of the multiple roles that forests afford to society. In this regard, the policy is been formulated to ensure the management of national park and game reserves in line with sustainable forest management principles (FME, 2006:29).

Beside the production of timber products, the policy is geared towards the development of non-timber forest products (NTFPs), forest services and agro forestry. The policy is directed to promote the development and conservation of NTFPs in all the ecological zones for the benefits of the present and future generations and to increase NTFPs contribution to the national economy. This is to maximise returns to investors and to diversify the forestry sector – an important aspect of sustainable forest management. Non-timber forest products provide an appreciable source of edible

fruits and foods, fodder, medicine and cash income for many rural people. NTFP, including cane/rattan, bamboo, honey, herbal and medicinal plants, would be developed in a more integrated manner (FME, 2006:42).

5.2.5 Rural livelihood and poverty

The policy recognised that forest resources contribute to livelihoods and has the potential for poverty reduction. The policy's aim is to at ensure that forests, apart from providing timber, also provide another array of goods and services, on a sustainable basis, to improve human livelihood through the expansion of forest reserves to meet the needs of rural people. Establishment of multi-purpose tree species – such as Gum Arabic, Shea butter, Parka, breadfruit and medicinal plants species – will be promoted to diversify sources of income. In addition, the people will be encouraged to establish co-operatives society to ensure the appropriate pricing of their forest products (FME, 2006:50). Many communities reside near or inside the forest reserves. In line with the principles of sustainable forest management, the policy have been formulated to protect the forest reserves from any further deterioration attributable to the activities of these communities while also sustaining their livelihood. This is to be achieved through policy measures to improve their livelihood, by the provision of infrastructures and other basic facilities, diversification of economic activities to increase incomes, introduction of new and improved farming system and promoting the participation of local communities in forestry management (FME 2006:34).

In pursuit of the policy objectives, the overriding concern is to alleviate poverty and increase the *per capita* income of Nigerians. Consequently, the country has developed strategies and programmes for sound and sustainable management of forest resources, specially involving the most vulnerable groups – particularly women and children. The strategies have been designed to promote sustainable and adequate levels of funding and focus on integrated human development programmes, including income generation, increased local control of resources, strengthening of local institutions and capacity building including greater involvement of community–based and non-governmental organisations, as well as the lower tiers of government as delivery mechanisms.

5.2.6 Community participation in forest management and conservation

The policy recognises the importance of effective people participation to ensure multi-purpose forest management. This is an innovative approach to forest management/conservation on both the forest reserves and forest areas outside the reserves, which will address the disincentives associated with a protectionist approach to forest management whereby government is regarded as the major stakeholder on forest management and reduce the destructive practices related to open access to forest resources (FME, 2006: 29—30). In pursuance of this provision, the policy includes the following strategies:

- develop a supportive legal basis for tree tenure, access rights, and sharing benefits from wood and non-wood forest products;
- develop both the capacity and attitude changes in government and non-governmental organisations so as to create genuine partnerships for collaboration with local community group;

- develop a virile community, institutions to ensure transparent decision-making, the adequate representation and participation of women, men and vulnerable group and the equitable sharing of forest benefits and responsibilities;
- ensure resolution of conflicts relating to problem animals around protected areas;
- grant tax relief and liberal financial arrangements as incentives for commercial tree growers during the gestation period;
- formulation of community or stakeholders forest committees to share management responsibilities;
- provision of rural infrastructure and facilities e.g. roads and school;
- encourage sustainable forest management on private lands and foster positive impact of forest dependent activities on the environment;
- assist in the building and strengthening of the capacity of the communities by providing alternative sources of livelihood such as beekeeping and mushroom production (FME, 2006:30—31).

5.2.7 Environmental education and Public awareness

Although, the National Forest Policy did not overtly mention environmental education, it recognises and is committed to the provision of information (on how to use forest resources effectively and efficiently), education and communication for the rural communities, especially those living within and adjacent to forest reserves. This commitment is captured in the policy statement. The Nigerian Forest Policy acknowledges the need *"…to create awareness among the populace on the importance of the forests and the need to conserve forests for the benefit of the present and future generation."* It emphasises the importance of a highly sensitised society that is aware of the importance and the need for a participatory approach in sustainable forestry development (FME, 2006: 66). The policy strategies in the document are not an EE approach and not capable of bringing about the desired behavioural change. Strategies identified include: the institutionalisation of the National Tree Planting Campaign; introduction of training in forestry at the primary and secondary school levels.

Analysis of this policy document reveals numerous contradictions and gaps. Most of the policy's statements and strategies remain on paper; it is more theory than practice. The policy has acknowledged the need for protecting and conserving the natural forests for posterity. While it emphasises the importance of retaining the natural forest cover and increasing tree cover, revenue generation for economic development is the driving force behind their formulation. However, there is no provision in the document for the definition of forest, and no clarification of what constitutes a forest. Acknowledging the differences between natural forest and forest plantation and between protected and unprotected forests are essential to the sustainable conservation and management of these resources.

Furthermore, the developmental trends in relation to policy objectives have been unsatisfactory. The country's forest resources have diminished in the last two decades. Deforestation and forest degradation have reduced biological diversity and agricultural productivity and depleted the sources of wood and other non-forest products. The revenue generation of forestry

to the national economy has dwindled. The involvement of rural people and communities in forest development activities is limited. In the late 1990s, Nigeria shifted from a military administration to democratic government (which means a government that is expected to be more responsive to local input into political decisions). While political democratisation is fostering reforms in forest governance, it has not necessarily benefited local people. Local voices in the management of forests resources, in forestry planning and in policy formulation are still few and not heard. Forest management activities in Nigeria are still mostly limited to government programmes. All the forest reserves, which form the bulk of the nation's productive forest, are under the management of state or local governments. Forests outside the designated forest reserves constitute the larger fraction of the national forestland – this is where most of the forest resources (both wood and otherwise) are exploited for economic and commercial purposes.

Existing policies put rural people into conflict with state management by restricting access to forestland, thereby separating them from a resource base that is crucial for their subsistence and income. Rural people increasingly view the forests as being administered by the forest protection units and the state – entities that give local people no rights over forest resources. Livelihoods of rural populations are not given priority in these policies. This issue, which has not been given serious attention and treatment, is a major contributing factor to forest degradation.

Nigeria does not have specific agencies responsible for formulating, coordinating, implementing and monitoring forest conservation policies and programmes. Although the country and several states have bodies – such as the National Environmental Commission (NEC) and the Federal Environmental Protection Agency – whose purpose is high-level discussion on issues of environment in general, including forests and forestry, these institutions are not adequate for addressing the forest resource conservation issues. The establishment of separate forest protection agencies is imperative, considering the importance of forests to the economy of the country and the livelihood of rural populations. It is also imperative that comprehensive, well-crafted forest policies – to encourage rural people to be more efficient and sustainable in the use of forest resources – are formulated at both federal and state levels.

Furthermore, there is an absence of specific regulatory instruments – codes and standards for industry, certification, planning tools and fiscal policies – all of which are required to achieve sustainable forest management. Presently, there is no forest certification practice in the country at either federal or state levels.

To complement this analysis, interviews, focus group discussions and informal conversations were carried out among the sampled respondents to ascertain their perception of the government policies and programmes currently related to forest resource management and conservation. An extract from a discussion is presented below. In one community a forestry officer, who had participated in the focus group discussion, granted me an interview on condition of anonymity. When asked to give his assessment of the implementation of the policy, the officer had this to say:

> "*National or State policy on forest and forestry is not being implemented, as it should be. The only interest the government has is revenue generation. The moment you generate revenue there is no problem but when you do not generate revenue, you are in problem*

with them. They post you out or reschedule your work. Look, I must say that there is no relationship at all between what the policy says in terms of objectives and what the people of the communities around here want or are doing. People in the community want to use the resources while government wants to conserve or make revenue from them. It is two different and opposing objectives. One thing I have discovered here is that government is not concerned about the welfare of the people, not only the villagers from whom the land was seized for the plantation even the workers on the plantation. They too engage in illegal farming, felling of trees and corrupt practices with the timber contractors. If you go to speak with the villagers, they will express their pain and anger. To be sincere with you, I'm a government officer and should be protecting the image of the government but look the truth is that there is a conflict of interests here. Even, on the part of the government too, there exist contradictions in policy objectives. If you look at it, you will agree with me that there is conflict between the desire to conserve forest resources, biodiversity and other environmental services and the quest for the production of timber and wood for revenue."

Reacting to another question, the officer had this comment on the policy formulation:

"*There is no single document for forest policy. What we have as forest policy is part of the agricultural policy, which I think, should have undergone review. It is obsolete and not in line with international conventions. The institutional arrangements are weak and could not yield the desired results of sustainable forest resource management. In fact it is not just that the policy has a problem, the enforcement of the law is weak; no sufficient political will and power from government; there is inadequate and mismanaged funding; corruption among forest guards. I [would] like to see not only the review of the current policy but the formulation of another separate one for forest which should be more comprehensive and must address the problem of the rural inhabitants' livelihood.*"

One of the village heads, who was ignorant of the policy, said:

"*It is what you are involved in or told about that you know. I have told you I did not know anything about the policy (maybe my children know). How can I say whether it is good or bad, when we have not been consulted or invited to any meeting to discuss such issues? Do you think they should be talking to us about all these things?*" (Question addressed to the researcher.)

Another village head said this:

"*I don't know what you are calling policy, but I know that there are rules and regulations or laws concerning illegal logging. That is all that I know. This one about protection, conservation, don't kill animals you are mentioning, I don't know them. We kill animals and people buy, even government officers. Are you saying there are also laws on protection of natural resources other than illegal felling of trees in the State?* (Question addressed to the researcher.) *You have to tell me more about these issues, I'm interested, and I'll like to know.*"

A male participant at a FGD commented thus:

"*People in the rural area like us are only remembered when [an] election is around the corner, that is when government or politicians comes around and make empty promises.*

I don't think they consider us as important or our opinion relevant in the formulation of their policies or programme."

A female participant commented:

"*What do you mean by policy? We only hear that they say there are laws for punishing those who cut trees from government forest. I don't think it concerns us here. We are at the local, we use our forestland and resources as we like.*"

When asked what are the major challenges to forest resource conservation in their communities, participants at the FGDs identified and prioritised the major problems and challenges to forest resource conservation:

- widespread poverty and increased population;
- deforestation – mainly caused by illegal commercial logging;
- socio-cultural practices;
- poor public services at the grass root level;
- socio-cultural practices;
- lack of empowerment at the grassroots level (FGDs)

On constraints leading to unsatisfactory performance in terms of the forest policy in Ogun State, views of respondents can be summarised thus:

- lack of community participation or involvement in policy formulation and implementation;
- weak enforcement of forestry laws and regulation;
- no incentives and credit facilities;
- ignorance and lack of awareness of the existence of policy; and
- lack of information that is vital for planning and decision-making (FGDs).

The forestry officer interviewed corroborated the opinion expressed by the participants at the FGDs, when he said that *"…there are activities and practices that tend to promote the use of forest resources in unsustainable ways among people in the study areas. Widespread poverty and unemployment exist in the community which is forcing the people to turn to the forest for survival."* Others factors are:

- low pricing and tariff on wood products;
- under-valuation of forest products;
- the high cost of non-renewable materials and services, especially energy;
- traditional beliefs;
- uncoordinated development plans by natural resources and agriculture officers; and
- conflicts with other sectoral policies and development activities (Interview with Forestry officer).

Qualitative evidence concerning education and awareness, however, showed that little or no educational activities have been carried out in these areas. Excerpts from interviews and FGDs in the study areas demonstrate this:

"They have never come here to provide us any form of education on how and why we should conserve the natural resources, not for once."

Another participant had this comment:

> *"Education about what? Look, government is not interested in the type of education you are talking about…maybe they do it elsewhere but certainly not in this community. People like you can tell them to do so. We need it to help us know other modern ways of protecting and managing our environment not only the forest now".*

An excerpt from the interview for with the forestry officer further illustrates this fact. In reply to my question 'Is there any effort on the part of the government to speak or educate the people about the need to conserve or manage the resource?' he responded as follows:

> "*It is not that government is not trying, but their efforts have not been good enough and have not been carried out within the right structure and vision. In fact, it has been a long time since we carried out (an) educational programme for communities around this place. There are over 42 communities living within and around this reserve if you must know. The government staff that is supposed to carry out this assignment is not well paid. The welfare of the staff is not solid and they are not happy. There is a plan on ground that staff should educate the communities concerning bush burning, illegal felling of trees and other issues related to forest and forest policy but you cannot discuss with a hungry man, a hungry man is an angry man. There is limit to what the staff, who are themselves hungry, can do. How can they face the community who are much hungrier? The government is not doing itself any good or helping matters by not considering the welfare of the staff. If the welfare of the staff is taken seriously and well-motivated, I can assure you the staff will carry out their responsibilities effectively and efficiently. It is part of the state government policy that you cannot harvest any tree without a license. Bush burning and illegal farming are prohibited. The government does not allow farming within the plantation. However, because people want to earn income and feed their families, people are now encroaching on the plantation to carry out farming activities within it. They plant kola nut, cocoa, plantain, banana, cassava and yam and as a result of these activities lot of the plantation are being destroyed. The penalty for this is a fine.*"

On what should be done to ensure that forests are protected and the livelihoods of the people in rural areas are guaranteed, the forest officer said:

> "*First, I think the government should take good care of its staff. They should be paid a good remuneration. What they are paid now is very low. There is a need to increase the salary of the staff. The machinery to be used should be put in place in order to reach the community. There are over 42 communities within and around this project. We cannot trek. There must be the provision of mobility – Jeep or motorcycle – also a microphone or public address systems et cetera. In terms of energy, if the price of kerosene can be reduced and made available and affordable to people, I think people will be relieved. However, that aspect is being controlled by the Federal Government. The state government cannot do anything about that. If the Federal Government can do something, it will be good. Also government should mark out a place for farmers. You see, the previous land they were farming on is no longer fertile and because they need fertile*

land they go into the plantation which they believe is fertile. If government wants to implement another project of this nature, the people in the community should be involved in terms of participatory and partnership deals. By so doing, the people will be happy and have some sense of belonging."

An interview with forestry officer captures the state of forest law in the country today.

"The Act has undergone several amendments over the years to suit the emerging geo-political (following State creation) and constitutional arrangements as well as to address contemporary forestry issues from time to time. However, many substantial provisions dealing with reservation, protection, conservation and management of forest resources have remained virtually the same over the years based on the principles of sustained yield management. The result of the various developmental phases in forestry legislation nation-wide is that there is no more national law on forestry. Furthermore, some of the provisions of the extant laws in most of the States are archaic, obsolete and piecemeal with several conflicting provisions and in all cases to mild in sanctions for breaches. These laws are inadequate for effective sustainable forest resource management, conservation and development required to meet the present day realities and challenges." (Interview with forest officer in Nigeria)

Nigeria is one of many developing countries that are signatories to conventions, declarations and resolutions on environment and forest resource management. Many of these international instruments contain recommendations, actions and programmes for ensuring sustainable development as well as promoting and encouraging sustainable rural livelihood by providing alternative sources of income and energy. Nigeria is one of the few countries on the African continent – and indeed in the world – that is blessed with abundant forest resources from which it derives great economic and environmental benefits. However, as it stands today, and in the light of available information on the dwindling fortune of its forest cover, the country is in crisis. The management and protection of the state-owned forest reserve has been ineffective. Natural forest, forest plantations and protected areas are being encroached upon. There is poor monitoring and evaluation of policies. Feedback mechanisms are absent, which affects the quality of the policy reviews. The lack of forest cover statistics and data on the national wood market is a serious impediment to planning of the national forest economy, and control of corruption and illegal forest exploitation. It could be argued that any intervention that addresses these issues would make a significant difference to the development of the sector as a whole and could contribute to the achievement and effective implementation of conservation objectives and projects. There is a need to decentralise the formulation of forest policy and to involve state and local officials and local communities in the process. Forest policy should adopt and incorporate the principles of sustainable forest management and livelihood, formulating policies that harmonise between revenue generation and economic goals of government and the livelihood strategies and needs of rural people.

This study noted that, while the existing forest policies at federal and state levels in Nigeria contain statements requiring that forests and forest resources should be conserved; they are often too vague to allow for effective implementation. There is inadequate detail about what the

provisions on forest conservation mean in practice, or how they should be implemented. The forest policies at both levels of government are deficient in strategies to achieve the policy statements and objectives. It was also observed that there has been little effort to integrate forestry issues in other sectoral policies – such as energy, agriculture and industry – which also impact on forest and forest biodiversity. The integration of forest biodiversity into the broader sectoral policies and landscape planning requires adequate policy analysis. The lack of a legal framework for integrated management, with the involvement of the forest communities in forest development plans, has been a major bottleneck in evolving truly participatory forestry practices.

Furthermore, the analysis revealed that there are inadequate mechanisms for debate on forest biodiversity issues within and among the states. This resulted in poor conception, incorrect articulation and ineffective integration and implementation of the technical, economic and social issues on forest biodiversity in federal and state plans and programmes. This failure is ascribed to weak enforcement of the law, inadequate human resources in the area of integrated environment management, insufficient political will, inadequate and mismanaged funding, a low degree of public awareness on environmental issues, and an ineffective top-down approach to the planning and implementation of environmental programmes.

5.3 National Forest Policy and the voice of Rural People from Bushbuckridge, South Africa

In this section, I present an analysis of South African forest policy documents with a view to addressing the above-stated related research questions. The views on the policy of the rural people are used to complement and illuminate the analysis.

Until 1994, the South African government viewed forests and woodlands in the country as being the *"...guardians of its land, soil, vegetation, water, climate, wildlife, landscape, aesthetics and outdoor recreation..."* (van der Zel, 2000). Forest policy was made by the government's Forestry Department to protect and maintain the forests for the benefit of the people. However, this approach did not take into account the many rural dwellers that used the forests and woodlands as part of their livelihood strategies. As part of the transformation of post-1994, the new democratic government began the process of substantial forest policy revisions that involved a commitment to wider participation in policy formulation by those who would be directly affected by the implementation of such policies The process began with stakeholder consultation, through public presentations, workshops and discussions with a broad spectrum of user groups, including those that had previously been marginalised (Foy *et al*., 1998; van der Zel, 2000).

The 1996 Forest Policy (DWAF, 1997) and the 1998 National Forests Act (Republic of South Africa, 1998) are currently the two documents guiding the management of forest/woodland in South Africa. The forest policy places the emphasis on management and conservation of forest resources for the general good of the people of the country and, at the same time, for meeting global demands. The forest policy environment reflects a dynamic struggle between global and national priorities by providing a blend of international, regional and national forest issues. The policy is concerned with seven elements (or policy areas): industrial forestry, community forestry, conservation of natural forests and woodlands, response to global concerns, research, education and

training, and relationships with states in the Southern African Development Community and bilateral relations with countries beyond SADC (DWAF, 1997). This means that, like most other sub-Sahara African countries, the policy is shaped and influenced by both national aspirations, and by conventions, declarations and resolutions of international organisations and agencies of which the country is a member or signatory.

5.3.1 Conception of forest and forest resources

The policy is explicit in its conception of forests – it views forests from a broad-based approach about the relationship between people and resources provided by the forest. In the context of the policy, forests are: *"…a natural forest, woodland and a plantation…"*. It addresses all components of the forest sector including *"forests of all kind"* that is, the indigenous forest, natural woodlands, plantations and community forests. Community forestry is defined very broadly in the policy as *"…forestry designed and applied to meet local social, household and environmental needs and to favour local economic development. It is implemented by communities or with the participation of communities...rural people, as well as tree planting in urban and peri-urban areas."*

> *"Contrary to the traditional view of forestry as the science of managing forested land, forestry today is about the relationships between people and the resources provided by the forest. It includes the use and husbandry of the wood, fruits and other products that come from trees, as well as the wildlife that dwell in the forest."* (DWAF, 1997)

5.3.2 The goals and objectives of forest policy

The White Paper (1997) and the resultant National Forests Act (1998) provide the framework for sustainable development, cooperative governance and participation of local communities in forest management. The Department of Water Affairs and Forestry (DWAF) has responded to this new policy with a range of initiatives and, in 2003, produced a Vision statement: *"Forests are managed for people and we need to create an enabling environment for economic and social development through sustainable forestry, especially at the local level."* The vision implies a significant departure from DWAF's previous role of forest manager towards one that puts people at the centre of all its activities. The overall goal of the forest policy, as contained in *The South African White Paper on Sustainable Forest Development* (DWAF, 1997:12), is as follows:

> "*…[T]o promote a thriving forest sector, to be utilised for the lasting benefit of the nation, and developed and managed to protect the environment. This goal will be pursued by wide participation in formulating and implementing policy and plans for forestry, which will be developed to facilitate the role of people in communities, the private sector, and government.*" (DWAF, 1997:12)

This goal is loaded with implicit and explicit tasks and meaning. Explicitly it expresses the intention that there should be access to, efficient and sustainable management and utilisation of forest resources by all citizens. It recognises the importance of an increased role for forestry in environmental protection, conservation of plants and animals, genetic resources, and rehabilitation of degraded land. The policy is also explicit in intent – it sees forestry not as the science of managing forested land – which is a narrow conception that excludes natural forest areas and people – but is concerned with the relationship between people and forest resources. It covers the

understanding and appreciation of the aesthetic, cultural and environmental values of forest/woodlands to people.

The document also identifies what it refers to as 'nine principles' upon which the policy is anchored. These are (DWAF, 1997:4):

- Forest and forest resources as national assets;
- Policy to be formulated and implemented so as to promote democratisation;
- Gender equity;
- People-driven development;
- Consultation in formulating and implementing policy;
- Sustainable forest development;
- Recognition of the scarcity of water resources;
- A competitive and value-adding forest sector; and
- Decent employment conditions.

5.3.3 Institutional arrangement for management of forest

Other key provisions of the policy are: participatory forest management, decentralisation and privatisation to address local, national and global demands of forest products and services. These are shifts from earlier policy conditions that restricted management to state authorities, with the focus more on preservation and controlled utilisation. This change is a result of emerging macro-economic policies, and local and global environmental management trends. It is also a result of pressure to recognise the rights of communities, the roles of the private sector in managing resources, and of opportunities for forest resources to contribute to poverty alleviation.

According to the policy documents, the South African Central government no longer manages forest plantations. The focus of DWAF has shifted towards creating enabling conditions that will allow for broader socio-economic development based on the country's diverse forest resources. This has meant, in part, developing a range of policies that address the constraints previously holding back the benefits of forest enterprise from reaching the majority of the population. The Department of Water Affairs and Forestry (DWAF)'s main responsibility is to provide the policy and regulatory framework within which appropriate institutions can manage forest resources. DWAF is legislatively mandated by The National Forests Act (No. 84 of 1998) to: promote and enforce the sustainable management and development of forests for the benefit of all, to the promote the sustainable use of forests *and* to formulate the provision of special measures for the protection of forests and trees. To balance the protection of forests with sustainable use, the Act regulates a wide range of uses, and sets out the right of every citizen to have a reasonable right of access to state-owned forests for non-consumptive purposes. The rights to the use, manage, control and operation of the state forests (and the produce within them) rest with the Minister of Water Affairs and Forestry and are regulated by the Department through this Act. Administration of state-owned forests is in the hands of the Department of Water Affairs and Forestry (DWAF),

which is responsible for implementing operational level management. Private forests are used and managed by white landowners or predominantly white-owned companies[1].

5.3.4 Strategies for the implementation forest policy

To realise the stated mission statement, the forest sector will be guided by the following the programme areas *"…*(a) *the forest sector integrated into resource management strategy; linkage with land use planning and integrated catchment management, resolved to district and quaternary catchment levels (b) community forestry (c) industry forestry (d) conservation of natural forest and woodlands (e) research, development, and innovation…"* (DWAF 1997). The community-based management of natural forests will involve the participation of rural communities in forest management and will entail granting them ownership and tenure rights to forest resources to achieve management/conservation objectives. The institutional capacity building programme will focus on policy and legislative reforms, development of institutional management system, human resource development, research and information management.

5.3.5 Rural livelihood and poverty

Given the complexities of different types of poor people, their need for access to forests and trees is germane. The policy confirmed that the central government recognises natural forests and woodlands play a vital role in the household economies of many of the communities. Forests provide a number of valuable functions and services to local communities. In addition, forests contribute to the livelihood and poverty reduction of the rural population. This is duly recognised and enshrined in the South African forestry policy where it states that *"…Government recognises that community forestry can contribute to improving the environment, enriching the resources, and creating income opportunities in previously disadvantaged communities in rural, peri-urban and urban environments. It can be an important component of the range of activities that is needed in every rural district to create employment."* (DWAF, 1997)

5.3.6 Community participation in forest management and conservation

The White Paper on Sustainable Forest Development reflected a break from parochial concerns of the past. The policy is aimed at improving the living conditions of South Africa's people, particularly the rural poor, through promoting sustainable forest development. The forest policy emphasises participation of stakeholders in policy development and in management decision-making.

> *"The Government will place special emphasis on the development and application of community-based methods of managing forested resources and sharing the benefits obtained, wherever appropriate, i.e. in the forests and woodlands of the former homelands, and wherever else local communities have the right, moral or otherwise, to the benefit of the resource. Protection of forests and woodlands will be reinforced by promoting the sustainable harvesting of indigenous resources, to provide benefits and*

[1] This situation is gradually changing under the impetus of a vigourous Government policy on Broad Based Black Economic Empowerment – BBBEE.)

commercial opportunities to local communities. Government will consider incentives to promote sustainable management of these resources." (DWAF, 1997)

The South African forestry policy has been developed with strong motivation for including the participation of local people in the management of natural resources, both within communal areas and in state-owned land. The policy recognises the importance of people's effective participation to ensure multi-purpose forest management. The policy also proposes a more rational economic valuation of forest resources towards promoting efficient domestic use and development of viable forest-based industries. The policy encouraged the involvement of local people in tree plantation but, at the same time, it limited the rights of local people by bringing more land under the control of state and establishment of national parks. Community forests in the former homelands are often still the responsibility of tribal authorities. This provides rural people access to and opportunities to participate in management of natural resources within their domain. However, there are restrictions and limitations. People are expected to collect permits from the tribal authorities in their domain before they access forest resources. Many people interviewed expressed their discontent and lack of support for the policy and decried their non-involvement in the management of forest resources. Even their involvement in the management of communal forest is limited. It is the tribal chiefs and '*indunas'* – headmen – who are involved in the management of the forest/woodland. They have the authority to issue permits to villagers within their communities, giving permission to cut a specific number of indigenous trees from communal forests.

5.3.7 Environmental education and Public awareness

The government recognises that communities who understand forestry and its relationship with their livelihood are an essential part of an effective policy and that sustainable development of forest sector requires well educated, skilled and competent workers and managers. Citizens – especially those, the policy says, who understand the connection between forests, the environment and their livelihood – are an essential part of an effective policy. The policy thus advocates the provision of education and training for all those involved in the forest and forestry sectors, including inhabitants in rural communities. If implemented, this will help increase people's understanding of the roles of forest resources to the national economy, and assist indirectly in reducing illiteracy and poverty. However, the study observed that little education has been – or is being – provided to the communities by government. Individual researchers, non-governmental organisations (NGOs) and research institutions – like Sustaining Natural Resources for the African Environment (SUNRAE), Wits Rural Facility, and the Timbavati Wildlife School – are the only agencies carrying out any form of community environmental education in the South African study areas.

The South African Government recognises the fact that, for sustainable forest management to succeed, it must relate forest policy to policies in other sectors – such as water, land, tourism and environment. This will ensure that activities of these other sectors do not conflict with goals of the forest policy. An effective national land use policy must maintain a balanced forest use and conservation programmes with agricultural and other land uses. Forest policy also reflects development patterns contained in national and regional policies.

The Government recognises that laws and regulations are the legal instruments necessary to put into effect the objectives of a forest policy. This is the motivation behind the Forest Act of 1998 (Republic of South Africa, 1998). This Act provides a framework for translating and carrying out the policy objectives. Although the National Forest Act followed the principles of sustainable management of resources by limiting access to them, it is nevertheless perceived to offer a few incentives to users to participate in forest management and conservation. Ideally, an institutional and legal framework that allocates user rights and managerial responsibilities to households is required, but clearly suitable alternatives to forest products are also vital for successful management. Greater trust between the provincial authorities and users is needed, but this is complicated by weak traditional leadership and poor community representation.

Forest conservation policy was discussed during focus group discussions and interviews with the *indunas*. South Africa has a history of a forest conservation policy that dates back more than 50 years, and has included a government-run permit system for: tree cutting and conversion of forest to agricultural land use on all private land; restrictions on clearing forests or cutting trees; and cash incentives and technical assistance for reforestation. Many government policies place restrictions on land use that are difficult for poor rural people to follow. Those community members with high conservation orientation tended to support government forest policies, while acknowledging that many people do not abide by these laws. Several statements illustrated how people felt about government forest policy and laws. For example, a participant at a FGD session had this to say:

> "*There are lots of woodlands, but you cannot cut without a permit. We need forest guards who will make sure that cutting does not occur. It is good that the government has these laws. We need to protect the forest and wildlife. I do agree with the taxes that are charged on every tree that is cut.*"

This statement and similar ones suggest that, in spite of the fact that forest conservation laws may cause hardships and are unevenly enforced, rural people may support them for their role in maintaining important perceived community-level forest benefits.

The attitudes, problems and challenges of forest officers and guards living in the community came under focus during the focus group discussions and interviews. The attitude of the forest guards especially was affected by the fact that they tended to be the actual field implementers of the policy when it came to forest protection and ensuring that people did not indiscriminately cut trees or kill animals. Most often, these guards are recruited from the community. They interact daily with the people for whom the policy is implemented. The guards find themselves in the dilemma – being both foresters and villagers. They are employed by the government and expected to implement forest policies that restrict forest use of local communities of whom they are members. They are therefore constrained by the various relationships, power and obligations imposed by the community.

Several members of the community expressed pity for the situation of the forest guards and said that social rules, kinship and friendship mattered more than the guards' responsibility to the government. Forest guards have a hard time keeping the two obligations separate and this definitely

affects the implementation of forest policies. Local politics and divisions in the society – such as class, gender, social and political power – affects the guards as much as the villagers. To live in the villages they often have to follow the local customs and traditions and are bound by the social rules of kinship, friendship, and obligations. For instance, although a forest guard is expected to check the genuineness of applications and enforce the compliance of rules and regulations, he is constrained by social relationships within the community, who expect him to look the other way when forest rules are broken.

Forest policies in South Africa are instituted to provide local communities with opportunities to participate in the management of protected areas, to receive economic gains and access to resources within the protected areas. However, the government ownership of forests limits the benefits to local people and serves as a disincentive for community participation. While consultation with local village men was claimed by a forestry official, interviews with several headmen suggested that they considered they had neither been consulted nor fully understood the process. This inevitably has important consequences for local people understanding of the purpose, location and regulations of forestland. Although the policy has been developed without consultation with rural communities it has, however, become accepted practice by the rural people to establish community forums and to accept the need for policing of the many conservation areas.

5.4 Conclusion

In this chapter, I have analysed the forest policies in Nigeria and South Africa. In the analysis of these policies, the focus has been to examine those provisions of the policies that directly affect forest resource conservation and management and how these influence the rural dwellers' livelihoods and survival. I have drawn on materials from interviews and focused discussion groups to give voice to community members from the two study areas in Ogun State and Bushbuckridge. The following broad conclusions were reached.

From the analysis, it is clear that the forest policies in both countries cover a wide variety of issues related to forests. The importance of forest resources to the livelihood of rural household and the national economy is recognised. The policies provide for the conservation of biological diversity, sustainable utilisation of forest resources, ecological and environmental stability as well as encouraging the involvement of local communities in forest development. It was evident from the analysis that the most important objective of forest policies in both countries is the promotion, preservation and conservation of the sector to obtain maximum revenue for national economy. State and provincial governments are empowered to enact regulations on forestry, formulate forest policy and undertake corresponding forest management responsibilities independently. This division of power was found to pose challenges and conflicts. There also appears to be a more effective and efficient decentralisation of forest management and commitment to conservation in South Africa. The analysis further revealed that there is a feeling that forest policies only resided in, and with, government documentation, and were not accessible or known to rural dwellers. This was evident in both countries. The majority of the people were not aware of the existence of forest policy and, where they were aware –, like in South Africa – they felt the policy was too stringent and should be relaxed. Rural dwellers dependent on forest resources would like to be involved in

the formulation and implementation of forest policy in both countries. It is evident that, in both countries, community engagement and education are poorly implemented.

In the next two chapters, I address the second and third research objectives with their corresponding questions stated in the introductory chapter of this thesis. I will provide descriptive and inferential quantitative evidence, complemented with selected opinions from gathered from the interviews and discussion groups.

CHAPTER SIX

6 Rural people, Forest Resource Conservation and Environmental Education: Evidence from Ogun State, Nigeria

This chapter is the second of four chapters devoted to the presentation and interpretation of data analysis. Here the results of the analyses of the Nigerian data are presented to address the second and third objectives and their corresponding questions. The presentation is organised to deal with the analysis of both qualitative and quantitative data in an integrated manner.

6.1 Socio-demographics of Study Group

The socio-demographic characteristics of the sample were consistent with the most recent studies on the country's population (National Population Commission, 2001; National Population Commission, 2004; UNDP, 2003). The sample consisted of 57.7% male and 42.3% female respondents. There were two reasons for the slightly higher percentage of male respondents, both of which relate to the politics of gender in the everyday practices of the community. Firstly, women are not allowed to interact with visitors without the permission of their husbands. Secondly, during the evening period when the researcher was in the communities, most women were busy preparing dinner and it was difficult to interrupt them. However, when they had the freedom and opportunity, women were equally as willing as the men and ready to fill the questionnaires. The age distribution of respondents is presented in Figure 6.1.

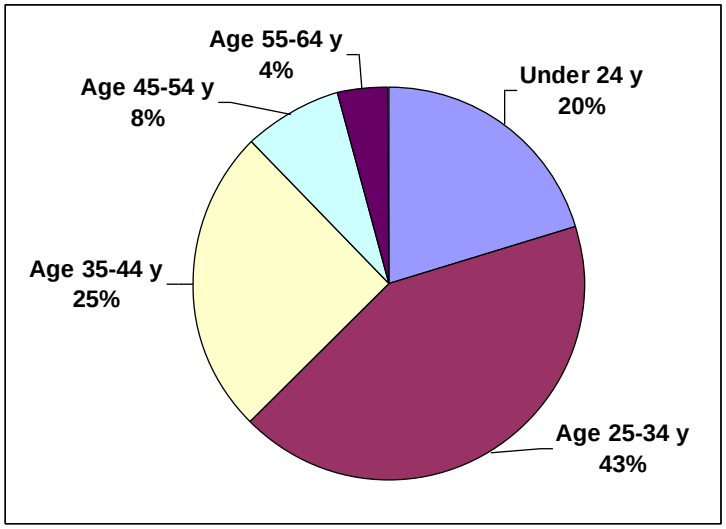

Figure 6.1 Age distribution of Nigerian respondents.

The mean age of the respondents was 30 years. There was a relatively youthful population in the sampled communities, with many individuals in the 15—34 year-old age group. There were no respondents in the age brackets (65 and over). This was not deliberate, but as a consequence of the protectiveness of the children of their elderly, protecting them from participating in meetings that

are seen as stressful. Members of the 55—64 year-old age group, though they still participate in farming and other labour activities, returned late in the evening already exhausted, and hence were under-represented.

The religious affiliations of respondents are more complex than is reflected in Figure 6.2. In reality, the majority of people practice dual religions – i.e. many of the respondents who claimed to be either Christian or Muslim are also involved in traditional religion, although they do not willingly acknowledge this. Ogun State is a rural community with a relatively primitive way of life. Family and community shrines to various gods worshipped in the community can be seen as one moved from one household compound to an another.

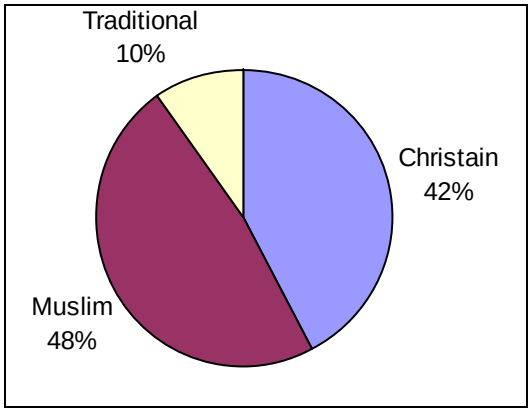

Figure 6.2 Distribution of respondents according to religion.

The pattern emerging from Figure 6.3 shows that most of the people in the study area are engaged in farming. A few are involved in the timber business, in trade, and in hunting. The majority of traders are involved in the processing and marketing of forest products. Thus, most of these people rely upon forests and agricultural practices for their household livelihood.

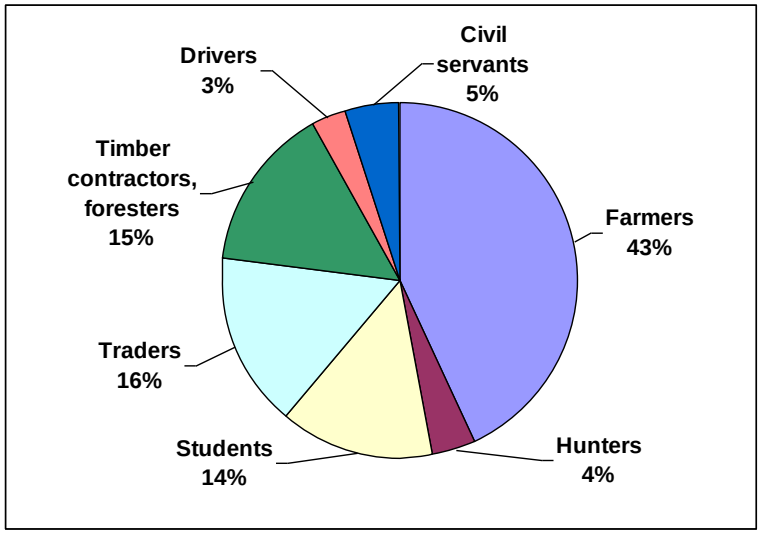

Figure 6.3 Distribution of respondents according to occupation.

Most of the people claimed to be secondary school graduates (Figure 6.4). However, I found out through informal conversations with several people that the majority of those who claimed to

have a secondary school education were either junior secondary school graduates or dropouts. The distribution across other educational levels was not surprising because there are several primary and secondary schools in and around the communities, and teachers and civil servants were among the respondents. This is a reflection of the national policy of education being taken a level of a minimum qualification for teaching in (junior) schools.

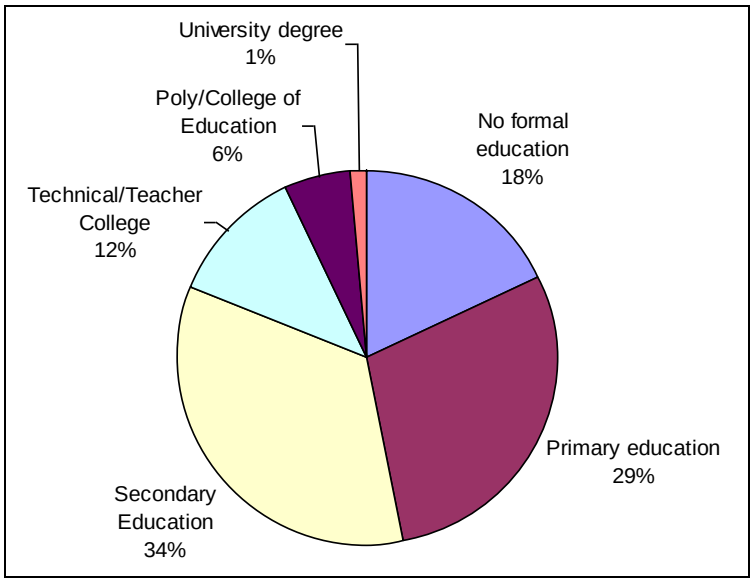

Figure 6.4 Distribution of respondents according to educational status.

According to Figure 6.5, there was an average of five (5.1) persons per household in the community. This result is consistent with the results of the 1991 National Population Census and the 2003 Nigeria Demographic and Health Survey (DHS). Both studies reported that the average household size in Nigerian rural communities is 5.0 persons. However, a close look at the data revealed that 36.7% of the respondents failed to give an accurate accounting of the number of persons inhabiting their households. The reason for this is a cultural belief that forbids individuals from counting their children.

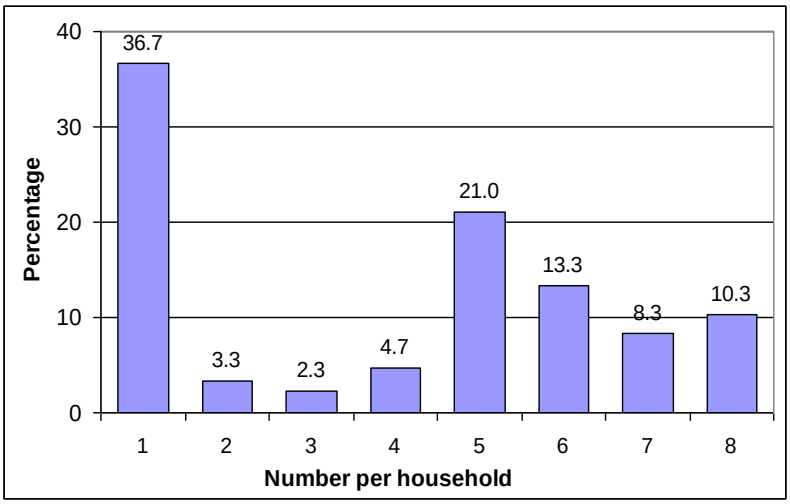

Figure 6.5 Frequency distribution of household size.

The number of persons per household making a livelihood from the resources of the forests is shown in Figure 6.6. These are the people who are engaged in the extraction, processing and marketing of the forest resources, (both timber and non-timber forest products) for income – farmers, hunters, traditional doctors, wood carvers and palm-wine tappers. The data revealed that an average of three persons per household make a living from resources of the forests. When comparing this percentage with the occupational distribution, it was found for the majority of households in the study areas, forest resources are vital to the construction of their livelihood pattern and their strategies for survival. People were making their livelihoods from the forest resources, either directly or indirectly.

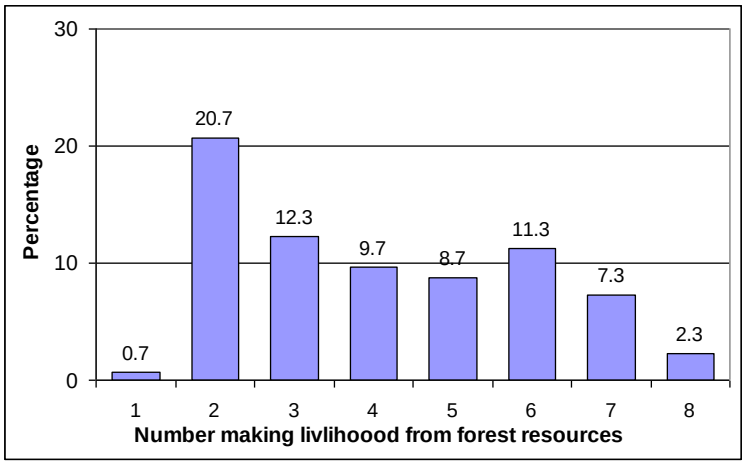

Figure 6.6 Frequency distribution of number of persons per household making a livelihood from forest resources.

Informal conversation with local people revealed that many people earn their living from the informal sector in forest-based employment – forestry, wood industries, and furniture making. Cross tabulation of this variable with gender and educational background produced an interesting result. Firstly, there are more females making their livelihoods from the forest than males. This result is consistent with conclusions drawn in previous studies and literature on the correlation between gender and natural resource utilisation. Most people involved in making a livelihood from forests have an educational level lower than secondary education. In addition, at the time of this research, there were more young people (than older) using the forest resources for their livelihoods. Thus, people with a higher educational level tended not to make their livelihoods from forests.

6.2 Level of Interest in Forest Resources

Responses to the questions related to people's interest in forest/woodland resources are presented in Table 6.1.

Table 6.1 Numbers and (percentage) of responses indicating interest in forest resources. (n = 300)

	Don't know	Disagree	Agree
Are you interested in issues related to how we use our forest/woodlands resources?	16 (5.3%)	4 (1.3%)	280 (93.3%)
I don't really care about forests/woodlands.	31 (10.3%)	208 (69.3%)	61 (20.3%)

***** Percentage of the responses in parentheses.

The majority of respondents indicated that they were interested in the forest resources. Although the second statement was negatively worded, people's responses can be interpreted positively. Because the mean score of both statements was higher than 70%, it can be concluded that most people are interested in issues related to the forests. The relatively low level of 'Don't know' responses (in this and in subsequent tables) indicates that respondents understood the questions and had clear opinions. The explanation for the high level of concern simply lies in the fact that forest resources constitute the major source of livelihood. To demonstrate this further, excerpts from participant statements from the FGDs and interviews are given:

> "*O je ohun ti o se pataki fun mi lati ni fe si oro ohun alumoni ti o wa ninu Igbo, nitoripe ibe ni mo ti ri ounje ojo mi. O ni sowo a gee gedu ni mi, nitori naa mo ni lati show interest si nkan ti o wa ninu igbo. (I'm concerned and interested in the forest resources because that is where I make my living. I'm a timber contractor by profession, which demands that I should be interested in everything that happens in the forests)*" (Adult male participant)
>
> "*A gbodo ni fe lati mo ohun ti o se le si Igbo nitori o je orisun oroo fun wa ninu ilu yii. Ko si ebi kan ti ko ni oko, gbogbo wa la gbe. Ti a ko ba lo si oko ni ojo kan ko si ounje. (We must be interested in the forest resources because it is everything to us here. It is our life. Virtually every member of this community has a farm, and if we don't go to the farm, we don't eat.)*" (Adult male participant)
>
> "***Ore*** (friend, referring to the researcher), *to fail to have interest in the forest here is killing yourself or starving – you will go hungry and begging. You see, you can just take your cutlass in the evening, head straight for the forest and search for some rodent holes, dig them and get for yourself meats for food or you sell to get some money.*" (Participant in a FGD)
>
> "*Whatever happened to or in the forests concerns us. It is our land, it is where we make our livelihood so we must be interested not in small measure. It is our ancestral property.*" (A village head)

If people are interested in what happens to and in the forests, why is it that they tolerate, or are even actively participating in, the degradation of the forests? This is one of the challenges that motivated this thesis.

6.3 Awareness of Conservation Efforts

The majority of participants claimed that they were aware of government conservation efforts as well as the importance of forest resources to the country's economy (Table 6.2). The explanation for this is that two of the villages are located close to state forest reserves and residents had seen forest guards arresting illegal timber merchants. However, when asked how much of the government efforts to conserve forest they knew about, the response was negative. They have little or no knowledge about the policy or strategies, nor about the programmes. However, they claimed to know that the government had programmes for forest resource conservation, especially for the reserves, because those community members who work on the reserves had talked to them about the laws and regulations.

Table 6.2 Numbers and percentage of responses indicating awareness of forest resources. (n = 300)

	Don't know	Disagree	Agree
Are you aware of forest/woodlands resource conservation efforts in this country?	13 (4.3%)	81 (27.0%)	206 (68.7%)
Do you know the importance of forest/woodlands resources of this country?	5 (1.7%)	64 (21.3%)	231 (77.0%)

*Percentage of the responses in parentheses.

Some comments from the respondents illustrate this further:

> "*We hear from the radio and sometimes when the timber lorries carrying illegal timbers pass through this place in order to cut off the forest guards. We know from that action that government has documents for the conservation of forest resources.*" (Adult male participant at a FGD)

> "*Yes, we are aware the government doesn't want us to cut trees or use the forest resources especially the reserves, but we don't know much about it. We don't know what they are doing or the ways they are doing it. They have not come here for once to tell us about their programme or get us involved.*" (Adult male participant in a FGD)

> "*I think government conservation efforts or programmes are for the reserves and the people they employed to look after them – not for us in the local unprotected forestland.*" (Adult male participant in a FGD)

The latter comment captures the general perception of people across the study communities. People believe that forest policy and laws are meant for government protected forestland and plantation and not for what they refer to as the 'local' – which is the unprotected forestland in the hands of individual family and community. It is in these unprotected forestlands – home to most of the country's wildlife and biodiversity plant species – that people carry out their daily activities of survival – by hunting of wild animals, collecting fuelwood and harvesting timber-forest products and non-timber forest products.

6.4 Knowledge of Forest/Woodland Resources

Three statements to establish the local people's knowledge of forest/woodland were presented to respondents on a three point categorical scale. Remarkably, people's answers were equally distributed among the positively and negatively worded statements (Table 6.3). The results suggest that people are largely knowledgeable concerning what 'forests/woodlands contain', with 94% and 93% responding negatively to the statement that they "*…are just collections of trees/plants with no values to life…*" Furthermore, 90% agreed that forests/woodlands are globally useful, not only to countries endowed with them. This result indicates a consistently high level of knowledge about forest resources. People perceive forests as integral parts of their lives. They possess the sociological, ecological and economic knowledge and values concerning forest resources.

Table 6.3 Numbers and (percentage) of responses indicating knowledge of forest resources. (n = 300)

	Not sure	Disagree	Agree
Forests/woodlands contain the largest reserve of various plants, animals, and insects in the world	13 (4.3%)	4 (1.3)	283 (94.3%)
Forests/woodlands are just collection of trees/plants with no values to life	14 (4.7%)	279 (93.0%)	7 (2.3%)
Forests/woodlands may be useful in other countries, but they are not useful here	4 (1.3%)	269 (89.7%)	27 (9.0%)

* Percentage of the responses in parentheses.

To further explore the people's knowledge and to illuminate the meaning attached to forest and forest resources, the researcher posed additional questions. The general conclusion drawn from the resulting comments was that people's beliefs about forests and forest resources is crucial in determining their attitudes and practices and also shapes the extent to which they will become involved in the protection and conservation of forest resources. It was interesting that most people did not agree with the negative statements about forests. The majority of their associations revolved around the tangible and intangible benefits derived from forests. Again, statements made by participants are provided to complement the above result:

> "*Forestlands are areas, or place which contain interesting species of plants and animals, which people use for the generation of wealth.*" (A male participant)

> "*Here, there are a diversity of plants and animals in the forests. We are richly blessed, but have not utilised it to the maximum. We carelessly enter the forests, cut down the trees and kill animals, expose the soil to erosion and degradation.*" (A village head)

In general, the awareness of forests, trees and their values seemed remarkable for the study area. This negated the theory that forest degradation results from the people's lack of knowledge about the importance of natural resources.

6.5 Perceived Importance of Forest/Woodland Resources

Table 6.4 summarises the responses on the perceived importance of forest resources to human life, based on seven items with a four-point scale ranging from 'not important' to 'very important'. A value of 2.0 (indicating a somewhat indifferent opinion) was taken as the reference point for this scale. Using the mean scores as the bases for interpretation, five of the seven items, 6.4(a), (c), (d), (e) and (g), had mean scores of more than one standard deviation (SD) above the reference point, indicating that there was a significant and coherent majority opinion that these items are 'important' or 'very important'. The remaining two items, 1.4(b) and (f), had mean scores within one SD of the neutral position, indicating that the item is viewed as 'somehow important' to 'important', or with a divergent fraction of the population group holding a view that these items were 'not important'.

Table 6.4 Analysis of the importance of forest resources: number (percentage), mean and standard deviation. (n = 300)

Aspects of life	No opinion	Not Important	Somehow Important	Important	Very Important	Mean Score	SD
Score	**0**	**1**	**2**	**3**	**4**		
a. Wealth	1 (0.3)*	3 (1.0)	14 (4.7)	110 (36.7)	172 (57.3)	3.50**	0.67
b. Recreation	6 (2.0)	28 (9.3)	132 (44.0)	95 (31.7)	39 (13.0)	2.44	0.90
c. Household economy	0 (0.0)	0 (0.0)	3 (1.0)	49 (16.30	248 (82.7)	3.82**	0.41
d. Quality of life	0 (0.0)	10 (3.3)	52 (17.3)	127 (42.3)	111 (37.0)	3.13**	0.81
e. Quality of environment	0 (0.0)	4 (1.3)	52 (17.3)	92 (30.7)	152 (50.7)	3.31**	0.80
f. Survival of other life forms	13 (4.3)	22 (4.3)	21 (7.0)	171 (57.0)	73 (24.3)	2.90	1.00
g. National economy	9 (3.0)	10 (3. 3)	4 (1.3)	89 (29.7)	188 (62.7)	3.46**	0.92

* Percentage of the responses in parentheses.

** Mean score more than one SD above the reference value of 2.00, indicating significant importance.

The analysis revealed that *(c) household economy* and *(a) wealth* respectively had the highest mean scores. *Recreation (b)* and *(f) survival of other life forms* had the lowest mean scores. It is reasonable to expect that the majority of people found forest products important to their individual household economies because they can collect the products for domestic use and sell them for income. Forests are important only to the extent that they meet socio-economic needs. This also implies that personal gains from forest resources counted much more than indirect collective benefits accruing to the people through government policies. To the respondents, forests are not avenues for relaxation. The inference drawn from this result is that the greater the economic and social benefit derivable from forest resources by individuals or groups, the more they perceive the forest to be 'important'.

Statements by participants during the FGD further complement the results of statistical analyses as illustrated below:

> "*Forests are very important to our livelihood and survival. As a school boy I made a little money to get something for myself and support my parents by killing rodents and selling them.*" (A participant in a FGD)
>
> "*O se Pataki fun wa inu ilu yi. Ti a ko ba lo si oko, ko si o je. (It is important to us in this village. If we do not go to the farm there is no food for us.)*" (Participant in a FGD)
>
> "*Igbo je ohun ti awon enyin ma mu fii se ooro. O je ohun alumoni ti Olorun fun wa lati ma lo fun igbadun. Iwe mimo papa fi ye wa pe, gbogbo eranko eyiti ti nrin tabi ti nfo ati awon eweko la fifun ni fun lilo awon enyin. (Forests are the source of wealth for people. It is the natural resources given to us by God for our comfort. The Holy Bible makes us understand that all animals and vegetation are given to us humans for our use.)*" (Participant in a FGD)

Reacting to the question on forests as sources of recreation, a participant stated the following:

> "*Forest resources are important to me and majority of people living here only when we can derive our livelihood and riches from them. What is recreation? You mean going to play around in the bush for nothing. How could I go into the forest to play or watch animals and birds running and hopping from tree to tree, when such animals are good for food?*" (Participant in a FGD)

Another participant declared:

> "*You are right; it could be a source of recreation for people who live in urban centres with money and time, but not to people like us here. Rural people don't have time to wander about in the forest for fun. People go into the forest to meet their household needs. If people see you walking about in the forest here, they will think you are not normal.*"

An enlightened participant had this to say:

> "*I don't think people understand you rightly. A forest can be and is an avenue for recreation and tourism. The problem here is that government is not promoting tourism and the challenges people are facing in order to make ends meet do not leave them with time for leisure. I don't think people in urban centres or rich people have the time either.*"

Asked about the importance of forests to the country, a participant reacted this way:

> "*I don't care whether the government makes money from the forests. It is the survival of my household that is important. When government makes the money, do they bring it to the community or [to] me? For years government has carved out that reserve* (referring to a forest reserve nearby) *you see on your way here and have not bothered to do anything for the community. We were not employed to work there. When our women and children mistakenly go there in search wood for fire they are sometimes arrested or driven out by the forest guards.*" (Participant in a FGD)

One of the village heads during an interview captured the mood of his community members:

> "*Forests are important for the people here; they provide many things for people to live on. The majority of people here depend on the forest for their livelihood. As for government, I don't want to discuss government.*"
>
> (Interviewer) "*We are not discussing government. I just want to know your opinion about how forest is important to the government.*"
>
> "*We know they (government) are making lot of money from the forest reserve. We see Lorries "agbegilodo" carrying woods passing here every day. People sat they sell them to some people who take them to places like Lagos, Ibadan even outside the country. But we are not getting anything. They said they have paid our fathers and forefathers' money (compensation) when the land was collected from them, now we do not have rights to the place again.*"
>
> "*The forest and all that is in it are important. I am a farmer and a rural man to the core. I have lived all my live in the village. I was born in the forest, grew up in the forest, and forest is my life. So, I should be interested in what goes on in the forest. It is however sad*

and disheartening to see how the forest has been exploited in the quest for money and development especially by the government." (A village head)

In Nigeria, as in many cultures and communities throughout Africa, there exist sacred trees and forests. Also, there are myths and folktales which are used to explain human relationships with spiritual realms. In the study areas, forests are seen as dwelling places for spirits and gods. Forests play a significant role in the cultural life of communities. The elders, chiefs and traditional rulers are the custodians of culture; they perform rituals and sacrifices in the forest for ancestral gods. Shrines and places for traditional worship are built in the forests. In the study areas, people value traditional rituals and protect forests.

Traditionally protected forests are used for four purposes. These include sacred forests where the gods of the land are worshipped, forests where the coronation of new kings is carried out, places where herbalists look for new plants, and forests used for initiation into secret cults. When people were asked about the spiritual importance of the forest to the community in an informal conversation and FGD, several of the participants were quick to respond; others bluntly refused on the grounds of their religious beliefs.

"*You mean "Igbo Oro" (sacred forests)? The "Igbo Oro" is a designated forest set aside by the community for religious and ritual activities. It is often associated with secrecy and initiation rites.*" (Participant in a FGD)

"*You see, among the Ijebus some natural forests are reserved as "Igbo Oro" or "Igbo Agemo"* (*Agemo* is the traditional festival of the Ijebus) *where not many people are allowed to enter. Such reserved forests are usually used for traditional worship which requires that few people go into them maybe once or twice in year, thereby preventing the destruction of the forest.*" (Participant in a FGD)

Asked if there are other purposes for the *"Igbo Oro",* one of the participants responded:

"*Yes, especially for the herbalists and Ifa priests. They go there to search for wild herbs used in the preparation of medicine. I think it is a long tradition, people are forbidden to go into the place to defecate. Some people say it is a means of preserving the wild herbs by the herbalists.*" (Participant in a FGD)

"*You see, when some people talk of home, they don't think of home and house around here but they think of the forest. Every tribe or people have a place in the forest referred to as home – "Oko". People go to the forests sometimes to enjoy the solitude and tranquility and run away from the stress of the life in the community.*" (A chief of one of the villages during an interview)

An old man explained:

"*Every family has their own forestland and the use of the resources therein, but the community sacred grove has been there since the establishment of the community. It is this forest that people are not allowed to go into without our permission. In fact, here in the forest you are not allowed to hunt or defecate. It is the home of the spirits of the founding fathers of this community.*"

These comments confirm the earlier assertion concerning the dual religious practices among people. The remarks also suggest that forests have cultural and spiritual meanings and values for the people.

6.6 Forest/Woodland Resource Use

Table 6.5 illustrates the extent and uses of forest resources by households within the communities. The inevitable conclusion is that forest resources are used in a wide range of ways. People collect forest resources for a variety of needs and uses, including energy, fibre, building, medicine, fruit and food. This result revealed the high level of interdependence between rural inhabitants and forests, and was consistent with previous surveys – WCFSD (1999); World Bank (2002); Twine, 2002b; Dovie, 2001; Dovie et al, 2004; Shackleton (2004a); and Vedeld et al. (2004) – which stressed the vital importance of forests for basic subsistence living in the rural villages. It can also be inferred that there are no households in these communities that do not use at least one (or more) of the resources from the forest for their daily survival. The high proportion of household use of these resources suggests that forest resources are highly valued.

Table 6.5 Percentage of household forest resource utilisation.

Utilisation category	%	Rank
Fuelwood	94	1st
Wood for furniture	92	2nd
Indigenous poles for construction	90	3rd
Wild animals/bushmeat for food and income	90	3rd
Medicinal plants	86	4th
Honey	84	5th
Wild herbs	83	6th
Grass/tree for livestock	81	7th
Edible wild fruits	78	8th
Grass/twigs for sweeping	74	9th
Wood for household utensils	69	10th
Reeds for weaving mats	69	10th
Reeds for construction	65	11th
Wood for carving	64	12th
Bird eggs	62	13th
Mushroom	56	14th
Edible insects	61	15th
Seed for rattle/decoration	53	16th
Thatch grass	48	17th

6.6.1 Fuelwood

An overwhelming majority of the households collect fuelwood. In all three communities used for this study, fuelwood serves as the main source of energy for all households. Fuelwood is not only collected for domestic cooking but also for income. Small-scale processing enterprises – food vending, cassava (garri), palm oil production, and fish/bushmeat smoking – use fuelwood. Women and children are responsible for the collection of fuelwood. Trading in fuelwood is also carried out in the study areas, where the main buyers are restaurant owners.

One of the Village heads had this to say:

> "*There are lots of things people get from the forest. But the common one is firewood that is used for doing all the cooking. Some collect wood for selling. Some species are used for construction of the roofs of houses and poles. If you look up here, you will see that the planks on top are not the type that you see in cities. Do you know Paako (chewing stick)? We use it here to wash our teeth/mouth, instead of brushes and toothpaste. In the forest, all the things are useful to our lives. We depend entirely on the forest resources. The herbalists get the herbs for their medicine. Look young man, the forest resources are wealth and life to us in this community and other rural areas.*" (A village head during an in-depth interview)

A participant at a FGD stated:

> "*Firewood is not only collected for domestic cooking, but also for sale. In fact, the majority collect it for sale. They take wood to the urban centers for sale to commercial vendors, and for those doing large cooking for ceremonies. There are even some who make it their occupation.*" (A male participant)

A female participant said:

> "*Firewood is not only used by rural people. Today people in the city too use it for cooking. The non-availability and increase in the cost of kerosene and gas has made people from city to use firewood. They also use sawdust collected from sawmills. You see there was a time [when] there was scarcity of kerosene, and people collected sawdust and designed special stoves and used it for cooking.*" (A female participant in a FGD)

Another female participant said:

> "*Fuelwood is not only used for domestic cooking, but for commercial cooking by food vendors and during ceremonies as well. It is the cheapest and most accessible source of energy available for such purposes. The uses are not limited to rural areas. People in urban centres also use fuelwood in like manner. Coal, which serves as an alternative, would seem not to enjoy patronage of people and is not used because of the time it takes to get it to combustion. Again, it is relatively expensive when compared to fuelwood and cannot be used for large cooking for ceremonies such as burials, naming, coronations and housewarmings, which are some events that attract large number of people for feasts.*"

Figure 6.7 to Figure 6.10 illustrate activities associated with the exploitation, processing and sale of fuelwood in the study communities.



Figure 6.7 A young girl returning from the forest with fuelwood.
(Photograph by Ifegbesan Ayodeji)



Figure 6.8 A woman splitting fuelwood.
(Photograph by Ifegbesan Ayodeji)



Figure 6.9 A man packaging fuelwood.
(Photograph by Ifegbesan Ayodeji)



Figure 6.10 Packaged fuelwood arranged for sale.
(Photograph by Ifegbesan Ayodeji)

6.6.2 Wild Animals

Nigeria is richly endowed with wildlife, which is extensively exploited by rural communities. This is largely because there are few or no restrictions on hunting activities. A total of 83% of sampled households kill wild animals for food or income. Common among the species consumed are glasscutters' or cane rat, rodents, duikers, antelopes, monkeys, bushfowl and reptiles. Glasscutters and other rodents are heavily exploited. It was observed during the fieldwork that foresters show little or no concern for protecting animals and forest products, even in the reserves – because currently there are no law focusing specifically on this aspect of forest resources. For many rural communities throughout the country, *bushmeat* is in high demand and provides an important source of protein in both rural and urban household diets. Although many households possess domestic

animals – goats, sheep and chickens – these animals are generally consumed only on ceremonial occasions and do not constitute part of the daily source of protein. The amount of wild animal meat in the diets of both rural and urban dwellers varies considerably, depending on the availability of supply.

There has been an increase in commercial hunting to supply the urban market with bushmeat, which is used in the preparation of a spiced soup at beer parlours. These activities will deplete the population of the wildlife if not checked. Figure 6.11 to Figure 6.13 present photographic illustrations of the activities associated with the processing and sale of bushmeat in the study communities.



Figure 6.11 Bushmeat being smoked.
(Photograph by Ifegbesan Ayodeji)



Figure 6.12 Fresh bushmeat.
(Photograph by Ifegbesan Ayodeji)



Figure 6.13 A woman smoking bushmeat.
(Photograph by Ifegbesan Ayodeji)

Focus group and informal conversations indicated that people hunt mostly individually – or in small groups – and stay out in the forest all night. Hunters use guns, traps and dogs. Asked if they hunt for particular species, many respondents said they did not look for specific animals – unless on special request – but kill whatever animals they could. In the words of a participant at the focus group discussion in Mamu village: "*There are some animals used for medicine and people may come to ask us to get them for them.*"

It seems that almost every household in the study communities carries out some form of hunting of wild animals. Their comments reveal their attitudes towards these activities:

> "*We hunt right in the forest because no animals come near the village. I kill any type of animal that comes my way. Within a week I could go to the farm for three days and hunt for one. If I'm lucky, I can see about five animals to kill.*" (Participant in a FGD)

> "*One cannot actually determine the number of animals one can kill, but it all depends on the nature of one's state of mind. You see, hunting also depends on luck. At times one can have two animals a day, especially the duiker and at times you can wander the forest all day or night and never get any animal but rodents.*" (Participant in a FGD)

> "*Hunters do not hunt every day. They have their rest time. In fact, some of them have seasons for hunting, and it is part of the things you have to know. People do not go hunting during the rainy season. Animals too react to seasons. When it rains some of these animals will go into hiding. Nobody can hunt throughout the year because one needs to cultivate crops to eat with animals.*" (Participant in a FGD)

Several of the participants observed that it is not necessary to be professional hunters before killing animals, for either domestic consumption or to generate income. What is required is a knowledge of the footprints of these animals and simple skills. The majority of people set traps around farmlands, especially during the cassava and yam harvest season, to catch larger rodents and even bigger animals, including snakes.

From the focus group discussions and interviews nineteen species of mammal and birds were reported to be hunted by households in the study areas (Table 6.6). Of the identified species, it was observed that grasscutter (*Thryonomys swinderianus*) and the African giant rat (*Cricetomyx gambianus)* were the most hunted wildlife.

Table 6.6 List of wild animal/birds commonly hunted in the study areas.

Local name	Common name	Scientific name
Ewuju/Oya	Grasscutter, cane rat	*Thryonomys swinderianus*
Etu (Olube)	Duikers	*Gazelle thansoni*
Okete	African giant rat	*Cricetomys gambianus*
Ijapa	Tortoise, African spurred tortoise	*Geochelone sulcata*
Esi/Elede Igbo	Red river-hog, bush pig	*Potamochoerus porcus*
Igala	Bush buck	*Tragelaphus scriptus*
Obo	Mona monkey	*Cecopithecus mona*
Alepa	Monitor lizard	*Vharanus niloticus*
Okere	African pygmy squirrel	*Myosciurus pumilio*
Efon	Buffalo (Bush cow)	*Synceros cafer*
Adan	Bat (Edible bat)	*Chiroptera magachiroptera*
Ejo Oka	Royal python	*Python regius*
Agbunrin	Royal Antelope	*Neotragus pymacus*
Igbin	Giant snail	*Archachatina marginata*
Owawa	Hyrax, rock hyrax, dassie	*Procavia capensis*
Oni	Nile crocodile	*Crocodylus niloticus*
Elegu	Porcupine, crested porcupine, brush-tailed porcupine	*Hystrix cristata, Atherus africanus*
Ese	African Manatee	*Trichechus senegalensis*
Eta	African Civet	*Viverra vivitta*
Apora	Sparrow hawk	*Acciptar nisus*
Eyie aawo	Guinea fowl	*Numida meleagris*

Source: Fieldwork

6.6.3 Palms

The study area is rich in indigenous palm trees of a variety of species. Palm leaves are used for a variety of purposes. However, little use is made of palm wood or sap. Two species of palm are commonly grown in the study area. The oil palm (*epo*) is found throughout the study area, and its fruits are used for cooking oil. The fruits and kernels are processed into edible oil and their sap is used to make wine and alcohol. All the households studied consume palm oil. Palm wine is not only consumed as a drink, but also used in ritual activities – especially in the worship of the god of iron '*Ogun*'.

Coconut palms, meanwhile, are an important resource, both for production of coconuts and because their leaves are used for thatching and as palm 'sheets' for building walls and fences. These leaves are also used to make fish baskets. Since coconut palms are cultivated resources, their value is not considered to be within the scope of this research.

Numerous products are made from the palm tree, both by men and women. Women are the main producers of mats, palm oil, brooms, palm kernel oil and baskets; men are the main producers of palm wine, and are involved in the harvesting of ripe palm kernels. Most of these products are common in most households throughout the study areas. Figures 6.14 to 6.16 show the uses of non-timber forest products in these three communities and across the state.



Figure 6.14 Houses made of bamboo trees.
(Photograph by Ifegbesan Ayodeji)



Figure 6.15 Baskets and mats made from some non-timber forest product.
(Photograph by Ifegbesan Ayodeji)



Figure 6.16 Market women with raffia – a non-timber forest resource.
(Photograph by Ifegbesan Ayodeji)

6.6.4 Edible Wild Fruits and Vegetables

There are vast numbers of edible plant products collected from forests, including seeds and nuts, leaves, fruits, roots and tubers. Collectively they add diversity and flavour to the diet while providing sources of protein, energy, vitamins and essential minerals. Children and women collect numerous types of wild edible fruits from the wild. Over thirty species were named in the focus group discussions and in the household surveys. Most fruits and vegetables are available during the rainy season. Many households also trade in wild fruits and vegetables – mostly collected from the forest. These fruits and vegetables are often collected by women and children on their way to and from their farms, but there are times when people make purposeful trips into the forest to collect certain species, especially when it is the season for harvesting these fruits or vegetables. Interestingly, people reported that wild fruits and vegetables are not as easy to find now than they were several years ago. This was attributed to bush burning, deforestation and the conversion of natural forests for other purpose – such as housing and agriculture. Several respondents were of the opinion that some of the wild fruits and vegetables may have become [locally] extinct.

A few of the common wild fruits and vegetables collected by the people include: mushrooms *Celosia argentea var. argentea* (*soko*, *yokoto*), and waterleaf '*gbure*'. Edible insects constitute a very important source of high quality protein, fats and minerals for rural people. Edible insects, mentioned by participants during the focus group discussions, include the Saturniid caterpillar (*Cirina forda*); cricket (*Gryllus*); '*Ire*', grasshopper (*Zonocerus veriegata*); '*Tata*', termite (*Macrotermes bellicosus*); and '*Esunsun*', palm grubs (*Phyncophorus phoenicals*).

6.6.5 Medicinal Plants

An estimated 75% of the population in the study areas relied on traditional medical treatments. There are a great variety of healing practices and beliefs. It is important to note that forest plants are components of a medical system, rather than the sole medicinal resource. Common plant

treatments are known and used by the majority of rural people in addition to the orthodox medicine. Forests provide essential components of the traditional health treatments, supplying medication for majority of both rural and urban dwellers. Medicinal plants are collected and used extensively, with many households claiming that they prefer to consult traditional healers than travel long distances to consult medical doctors in government hospitals.

> "*There are various plants that are medicinal here – some are harvested wet while some are dry leaves or roots. They put them together to make "Agbo" concoction.*" (Participant in a FGD)

During the FGD and informal conversation on why people have to depend so much on medicinal plants, it was reported that:

> "*It is part our inheritance and culture. Some of these medicines have been practiced and used for a long time and [are] difficult to change. It is part of our belief.*" (Participant in a FGD)

> "*I think the reason why people still depend on the traditional medicine is that there is no hospital. The closest hospital is about five kilometers from here and it is far. So people prefer to either treat themselves or see the herbalists or traditional healers.*" (A participant, FGD)

> "*You see, no one wants to go and waste his/her time in the hospital waiting to see the doctor. In fact it is only in serious illness that people go to the hospital, that is, why majority here prefer to use traditional medicine.*" (Participant in a FGD)

During the fieldwork, it was discovered that the knowledge and use of medicinal plants are not limited to traditional healers. Ordinary people in the community also possess an understanding of these medicinal plants. The knowledge, collection and practices of traditional medicines are no longer the exclusive preserve of elders and traditional healers – women and children collect, process and administer many of the plants. Every household seems to possess some level of knowledge of some medicinal plants, especially for cure of malaria fever, which, according to health experts and researchers, is the commonest illness among Nigerians. Several people also collect these medicinal plants for sale to herbal dealers.

6.6.6 Honey

Honey is collected from the wild throughout the study area. The estimated annual harvest collected was not given. Those who collected honey said they were not interested and did not keep records, since it was not their trade but just for household use. Only a few respondents claimed to collect honey – presumably most avoid the activity though fear of being stung. Keeping of beehives is not practiced among the people in the study areas (*This is one project that can be introduced to empower them in future*). According to the people, bees make use of both cultivated tree crops and natural forests and honey can be collected within a range of one hour's walk from most villages. It is a seasonal activity. Honey is used in naming and marriage ceremonies and in the preparation of herbal medicines. It is of economic as well as socio-cultural value.

6.6.7 Chew sticks

Chew sticks *(pako*) are the most widely used plant for dental care in rural and urban areas in southwest Nigeria. Sticks, made from the stems, bark, or roots of several different species, are chewed daily to clean the teeth. Many tree species are used for chew sticks. The most commonly used species include: *Garcinia afzelii, Garcina kola, Garcina epunctata, Acacia kamerunensis, Teclea verdoorniana, Massularia acuminata, Morinda lucida, Baphia nitida, Vernonia amygdalina* and *Acioa barteri*. Species have particular flavours (bitter, sweet and antiseptic) and qualities. Figure 6.17 captures a chew stick dealer at work.



Figure 6.17 A woman processing *Garcina kola* into chew sticks.
(Photograph by Ifegbesan Ayodeji)

6.6.8 Farming

Nearly all households in the study area have farms and consider farming their primary economic activity. There are varieties of crops grown in the study areas. Cassava *(locally called gbagudu or paki*) which is used to make cassava flour (locally referred to as *garri* and *lafu*) – a staple food of people in the area that is grown and produced by every household. Maize, yam, cocoyam, plantain, banana, vegetables and fruits are also grown, largely for subsistence, but with a proportion sold for cash income. In addition, other crops – such as oranges and coconuts – are grown primarily for cash income. Figure 6.18 shows a local trader displaying agricultural produce for sale.



Figure 6.18 Domestic agricultural produce being prepared for sale.
(Photograph by Ifegbesan Ayodeji)

It was discovered that most of the planting activities are carried out without fertilisers or manure. Rural domestic farmers rely simply on traditional crop rotation and shifting cultivation – which depletes and degrades the forests.

6.6.9 Poles and Timber

Indigenous poles and timber of different types and thickness are cut from forests, mainly for use in construction. Most rooftops of houses in the study areas are built with poles. In most cases, members of households go into the forests to cut the quantity needed. Occasionally this is supplemented with purchased timber. There are people who also cut for commercial purposes. Although people are required to be licensed to cut these poles, this is not always the case. Much of the pole cutting for domestic purposes is carried out illegally. In the villages studied, poles are usually cut from deep in the forest. According to participants at the focus groups, the majority of households cut poles for domestic purpose. Villagers in these areas mentioned seven species commonly selected for cutting poles. These are *Mitraguta ciliate* (*Abura*), *Khaya spp*. (Mahogany), *Nauclea diderrichii* (*Opepe*), *Milita excelsa* (*Iroko*), *Lophira atata* (Ironwood) and *Cleistopholis patens* (*Otu*).

Timber cutting as a commercial activity is driven mainly by demand from major cities. Timber cutting of indigenous poles and exotic trees requires a license from government. However, not all activity is legal, and licensed traders often cut far greater amounts than permitted. Respondents estimated that about 6 000 or more trees are cut and harvested from the study area per year. Most of this timber is sold to sawmills in major cities (Lagos, Ibadan, Benin and Ijebu-Ode), while some is even exported. This could be an underestimate of the total amount of timber being removed from the study area, because, during one visit to the Ajabandele study area, I counted over twenty truckloads of timber within one and a half hours. (Aerial surveys could have been good to buttress this claim but this was not available, and to some extent, not part of the data needed for this study.) Participants at the FGD and IDI say not all trees felling near their villages is carried out by the villagers. They accused people from other villages of harvesting resources from their forest,

which they said had led to inter-communal conflict in the past. Figure 6.19 shows a truck carting away logs from the study area.



Figure 6.19 Truck with logs of wood harvested in the study area.
(Photograph by Ifegbesan Ayodeji)

6.7 Attitude towards Forest Resource Conservation

Attitudes and practices cannot be measured directly because of their complex and multi-dimensional nature. It was necessary to create an index that captured the different dimensions of each of the statements as an added index. It was assumed that the higher the respondent's score on the index, the more positive attitude or practice he/she has towards forest resource conservation. If a sufficiently representative sub-sample of the population is sampled (in this chapter n=300), an overall index of a community towards a particular value statement would be obtained. Negatively formulated statements were coded in reverse order to the positively worded statements, so that the scoring follows a consistent structure of increasing values, allowing means and standard deviations to be compared across all statements. The numerical results of the questionnaires were tabulated, together with the mean scores and standard deviations. To assist in the presentation of the discussion, the means and standard deviations have also been presented in graph form. The first example, for forest resource conservation, is argued in detail to demonstrate how these graphs are to be interpreted. Thereafter the arguments are presented in a more succinct form.

Responses to the question: '*What is the prevailing attitude and practice of forest resource conservation among rural inhabitants?*' are presented in Table 6.7 and Figure 6.20.

Table 6.7 Evaluation of attitudes towards forest resource conservation: number (percentage), mean and standard deviation. (n = 300)

Statement	Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree	Mean Score	SD
Score	**1**	**2**	**3**	**4**	**5**		
a. Forest/woodlands resources should be conserved to ensure healthy population of all wild species of trees, plants and animals	4 (1.3)		3 (1.0)	68 (22.7)	225 (75.0)	**4.7##**	0.6
b. Forest/woodlands resources have ways of regenerating themselves whether we care or not	22 (7.3)	76 (25.3)	48 (16.0)	127 (42.3)	27 (9.0)	3.2	1.1
c. Protecting the job of forest industry workers is more important than protecting endangered species	19 (6.3)	122 (40.7)	18 (6.0)	64 (21.3)	77 (25.7)	3.2	1.4
d. The most important objective of forest/woodlands management should be to protect the environment for all	0 (0.0)	29 (9.7)	16 (5.3)	113 (37.7)	142 (47.3)	**4.2#**	0.9
e. Everyone should be concerned and do something towards protecting the forest/woodlands resources	4 (1.3)	22 (7.3)	7 (2.3)	131 (43.7)	136 (45.3)	**4.2#**	0.9
f. It is government responsibility alone to protect and conserve the forest/woodlands resources	28 (9.3)	22 (7.3)	21 (7.0)	142 (49.7)	47 (15.7)	2.6	1.4
g. God gave us the forest/woodlands to use in meeting our needs and we should not be denied that natural right	4 (1.3)	30 (10.0)	35 (17.3)	88 (29.3)	143 (47.7)	**4.0#**	1.3
h. If we want wildlife to survive, we must look after the natural places where they live.	9 (3.0)	32 (10.7)	46 (15.3)	74 (24.7)	117 (39.0)	3.6	1.5

\# Mean score more than one standard deviation above neutral value of 3.0

Mean score more than two standard deviations above neutral value of 3.0

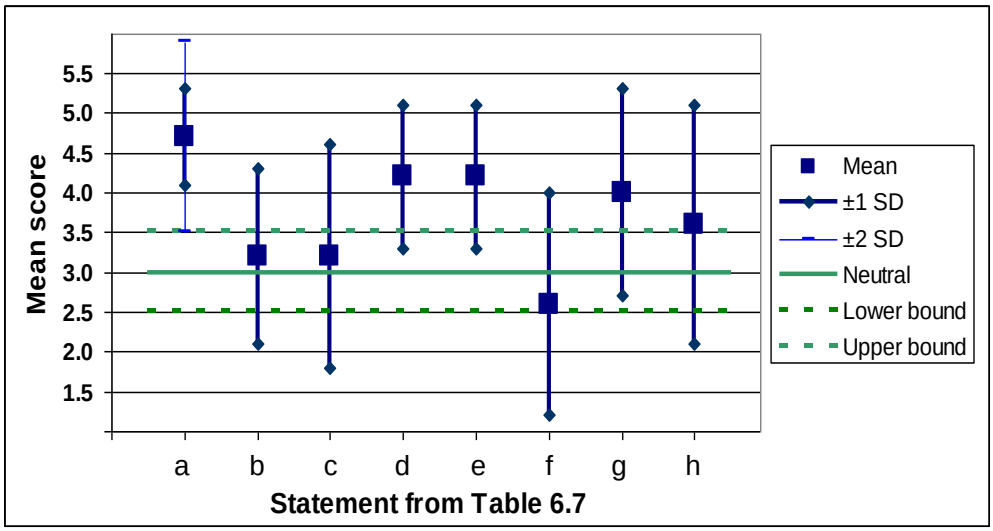

Figure 6.20 Attitudes towards forest resource conservations – means scores and standard deviations.

Table 6.7 reveals that four of the eight statements have a strong positive score of ≥4.0 (indicated in Table 6.7 by # or ##), well above (≥ 1.0) the neutral value of 3.0, indicating that population is in strong agreement with these propositions. Statement 6.7(a): '*Forest/woodland resources should be conserved to ensure healthy population of all wild species of trees, plants and animals*', had a highly significant positive response, with a mean score of 4.7, more than two standard deviations above the neutral score (Figure 6.20). Two further statements, 6.7(d) and (e), had significant positive responses; with the mean score more than one standard deviation above the neutral score (indicated by # in Table 6.7). That the score differed from the central neutral value by more than one or two standard deviations is read as indicating that the population has a coherent majority view on that particular statement. Conversely, statements 6.7(g) and (h) had high mean scores (Mean ≥ 0.5 above the neutral value), but with larger standard deviations (SD ≥ 1.0), spanning the neutral value 3.0 (Figure 6.20), indicating divergent opinions. The results indicate that there was a preponderance of agreement with the statement, but with a significant minority disagreeing or strongly disagreeing. The remaining statements 6.7(b), (c) and (f) had scores close to neutral (0.25 < Mean < 3.5) with a large standard deviation (SD ≥ 1.0), which can be interpreted to indicate that the population has divided views on these propositions. A score close to neutral with a small standard deviation (SD < 1.0) (there is no instance occurring in this particular table), would indicate that the populations had not considered the proposition previously, or alternately did not understand the statement.

These findings showed positive and thoughtful attitudes towards forest resource conservation among the rural inhabitants of Ogun State. Certain facts stand out as remarkable and significant. Knowledge about, and the importance attached to, forest resources plays an important role in determining the type of attitude exhibited towards it. However, more significant and important to the people (and that invariably informed their attitudes) are the value of or benefits from forest resources as sources of livelihood and means of survival. They see the protection and conservation of the forest resources as a prerequisite far more for their own survival than for the country's economy or other life forms. The values and benefits from the forest determine the decisions, actions taken, and attitudes towards forest resource conservation. There was an ambiguous response to the government's role, reflected in a neutral mean score of 2.6, to the statement: '*t is government responsibility alone to protect and conserve the forest/woodland resources*.'

Excerpts from the submissions of some of the participants at the FGD session attest to the above deductions.

> "*The forest needs protection so that we can conserve it since it belongs to us.*" (Young male adult)
>
> "*It is good to protect the forest so that our children's children will have resources to live on. It is a nice idea to protect the forest so that some of the wild herbs are not destroyed. It is good for our tomorrow [future]. But how do you ensure that when the same forest is [the] source of livelihood of the people.*" (Adult male participant)
>
> "*What do they mean by protecting or conserving the forest? We are capable of protecting and conserving our resources, we have been doing that and that is why they are still there for us to use. Do they think they can protect the forests, when we the*

people living in the area have no other source of livelihood? They are joking, look they cannot protect the forest without us." (Young adult participant)

"*I don't appreciate the idea at all. And I don't think it will work because they also eat the meat we kill; eat banana, plantain, oranges and vegetables. Look "aburo"* (referring to the researcher as a brother) *don't mind them; they eat the best of the farms produce.*" *(*Adult male participant)

"*I don't support it because God has created the forests for human consumption. This idea is a wicked idea because they are rich and can afford cow meat, buy imported rice and semotiva. So they don't want to eat garri* (one of the staple foods of the Ijebu made from cassava) *again.*" (Adult female participant)

"*I don't like it. It is all we depend on, we have no other [occupation]. They in the offices receive salaries. What are we to do if we stop exploiting the resources of the forests, let them give us office job so that we can also receive monthly salaries? Do they think we enjoy turning our back to the scorching sun? No one dislike government job, where you receive salaries without doing any serious work. Here if you don't work, you don't eat, and no money, we eat from our sweat.*" *(*Adult male participant)

"*The general idea of conserving the forests is good but here it is not good because people must exploit the forests to live.*" *(*Adult female participant)

"*The idea of protecting the forests and its animals is good for the government and their collaborators who believe that the resources will get exhausted, but for us they will not. Our forefathers utilised the forest for years [and] it did not finish. Why now? Should we conserve the forests and the animals, and go hungry*?" (Adult male participant)

6.8 Practices of Forest/Woodland Conservation

Table 6.8 summarises responses and gives basic statistics for the ten statements concerning forest resource conservation practices. The results indicate that the majority of the respondents accepted the need for good forest resource conservation practices.

Table 6.8 Evaluation of attitudes towards practices of forest resource conservation: number (percentage), mean and standard deviation. (n = 300).

Statement	Very Unacceptable	Not Acceptable	Don't know	Acceptable	Very Acceptable	Mean	SD
	1	2	3	4	5		
a. Harvested areas should be allowed to regenerate itself naturally	24 (8.0)	68 (22.7)	4 (1.3)	120 (40.0)	84 (28.0)	3.6#	1.3
b. Leaving clumps trees for wildlife in habitat		76 (25.3)	47 (15.0)	139 (46.3)	38 (12.7)	3.4#	1.1
c. Closing forest access road to control illegal logging	113 (37.7)	113 (37.7)	28 (7.3)	30 (10.0)	16 (5.3)	3.7#	1.5
d. Inadequate forest management planning	81 (27.0)	91 (30.1)	69 (23.0)	30 (10.0)	29 (9.7)	2.4	1.3

Statement	Very Unacceptable	Not Acceptable	Don't know	Acceptable	Very Acceptable	Mean	SD
	1	2	3	4	5		
e. Loss of protected land to urban expansion	86 (28.7)	106 (35.3)	53 (17.7)	42 (14.0)	13 (4.3)	2.2	1.2
f. Lack of protection for old Growth forest/woodlands	53 (28.7)	158 (52.7)	14 (4.7)	59 (19.7)	13 (4.3)	2.3	1.1
g. Construction of oil/pipeline across forest land	63 (21.0)	149 (49.7)	19 (6.3)	19 (6.3)	28 (9.3)	2.1	1.3
h. Not planting of trees to replace the ones cut	90 (30.0)	146 (48.7)		43 (14.3)	12 (4.0)	2.1	1.2
i. Indiscriminate bush burning	97 (32.3)	143 (47.7)	3 (1.0)	32 (10.7)	12 (4.0)	2.0	1.1
j. Current logging/cutting practices	74 (24.7)	137 (45.7)	36 (12.0)	24 (8.0)	20 (6.7)	2.2	1.2

Mean score more than one standard deviation above neutral value of 3.0

Mean score more than two standard deviations above neutral value of 3.0

According to the descriptive statistics Table 6.8 and Figure 6.21, three (i.e. a, b, c) of the ten statements raised to capture forest resource conservation practice among rural inhabitants had mean scores higher than the neutral value of 3.0. Statements d to j refer to the practices that threaten forest resources and causes degradation of the environment. As they are negative practices, the results are interpreted inversely as if they were equivalent to acceptance with the positive practice statement. The seven statements had mean scores from 2.0 to 2.4 which, though below the neutral limit of 3.0, suggested that respondents accepted that the practices expressed in the statements are bad. Taken together, these results indicated that respondents can identify and recognise forest resource conservation practices that are acceptable and those that unacceptable. Similarity in the pattern of responses between the attitudes and practice statements appears to indicate a relationship between attitudes towards '*forest resource conservation'* and '*practices of forest resource conservation'*. This also confirms several hypotheses tested in previous studies (Bechtel et al., 1999; Frost, 2000; Kaiser & Beil, 2000), in which significant relationships were found to exist between attitude and practices towards natural resources. The similarities also affirmed the use of the theory of planned behaviour as a theoretical framework for the study. Overall, looking at the mean scores of both positive and negative statements, and when interpreted inversely or conversely, one can conclude that the majority of people were disenchanted with the practices of forest conservation but possessed positive attitudes towards the challenges facing forest resource conservation.

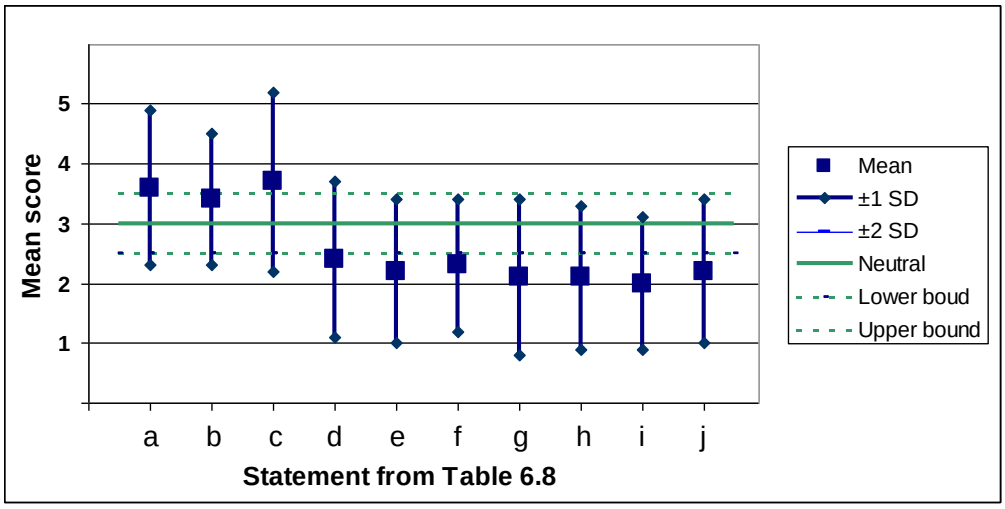

Figure 6.21 Attitudes towards practices of forest resource conservation – means scores and standard deviations.

Excerpts of the participants at the FGD/IDI session attest to the above deductions.

"*It is a nice idea to conserve the forests and animals in it. But we need to cut down trees to make houses, for fire, medicine and money. We have to hunt/kill the animals to get food. Like I said, it is nice that we protect and conserve the forest resources but most of the people who cut it down are poor and don't have alternatives to make money.*" (A village head during an IDI)

"*Bush burning is bad, agreed, especially when it is done without monitoring it. But I use it to clear the farm after harvest.*" (Adult male participant)

"*Truly, I believe that there are lots of forest resource utilisation practices that people in this community do that damage the forest, but what can we do, since we do not know any other ways.*" (Adult male participant)

6.9 Knowledge of Environmental Education

When asked '*Have you heard or read about the concept of environmental education before this questionnaire*', only 23% claimed to have heard of environmental education. The majority responded in the negative. This result was interesting and surprising because almost all government policies relating to the environment explicitly talk about providing environmental education or training programme in both formal and non-formal sectors. It seems that government has not shown genuine efforts to implement the policy objective concerning environmental education, especially in rural areas where literacy levels are low.

Respondents were also asked for their source(s) of information on environmental education. The pattern of response to the question (see Figure 6.22) shows that most of the respondents' claimed that they gained much of their environmental knowledge from newspapers and magazines.

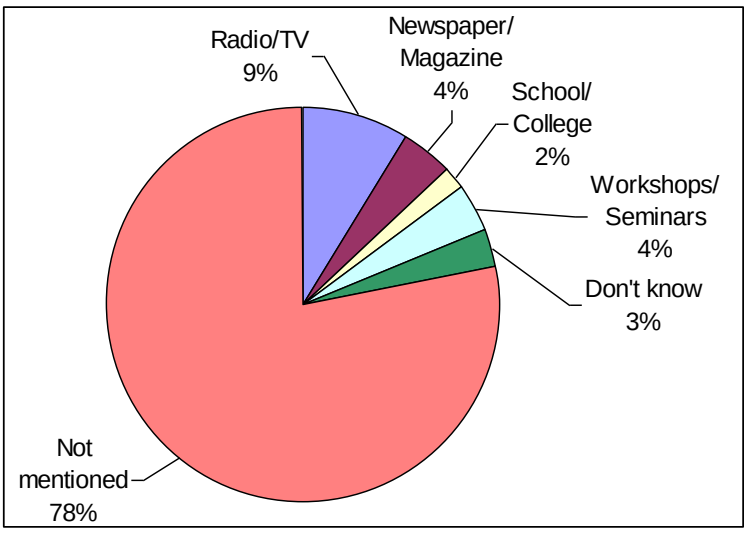

Figure 6.22 Percentage distribution of respondents' sources of environmental education.

Only a few responded that they gained their environmental knowledge from TV and radio programmes, school/colleges, conferences, seminars and workshops. It was surprising that none of the respondents selected government officials, poster/pamphlets or neighbours/friends – these options were in the questionnaires because they were considered likely sources of environmental knowledge and environmental education. The implication these responses is that government has not been doing anything to sensitise the people to environmental issues applicable to their society. This finding indicates that mass media – especially television and radio – are the major sources of environmental information and knowledge. The implication is that better coverage of environmental issues by mass media would improve the knowledge and attitudes of the rural people. The low response to other suggested sources is understandable given the low level of literacy in these rural communities. It is most likely that those respondents who identified other sources (such as newspapers/magazine, schools and conference, seminar and workshop) could be students, teachers as well as a few civil servants working and living in the communities. Overall, the implication demonstrates the need for development and implementation of environmental education programmes for rural communities not only to sensitise the people but also to assist them to develop positive environment friendly behaviour and practices.

A respondent commented:

> "*When you don't know something or hear about it, how can you tell the source of your information? The government or any of it agencies have never come here to talk about environmental management or protection.*" (Adult female participant in a FGD)

> "*Maybe they teach our children something of that in the school, I don't know, you may ask those school boys or girls.*" (Adult female participant in a FGD)

> "*I will like it, if they can teach environmental education in primary schools so that children should know how to protect the forest.*" (A village head during an IDI)

6.10 Assessment of Government's Protection of Forest/Woodlands

As part of the questionnaire survey respondents were asked: '*What is your assessment of government's effort to protect forest/woodlands resources in this community?*' The most frequent

response to this question was fair, while 29.7% rated it as good, which suggests the clear dissatisfaction of the respondents with government's manner of protecting the forest resources.

Comments made by respondents who gave fair and poor assessment of government efforts to protect forest/woodland resources suggest that these people view the government and government forest officers as the sole beneficiaries of forest conservation efforts. In the words of one participant:

> "*The government is protecting the forest reserve for their own gain. They do not tell us what they are doing, we are not told of what we can benefit from looking after the forest resources and they do not involve us.*"

6.11 Assessment of People's Attitudes to Forest/woodlands Resource Conservation

Responses to the question '*What is your assessment of people's attitude to forest/woodlands resource conservation in the community?*' 50% of the respondents were of the opinion that forest resource conservation of members of the community is fair, while and 46% of the respondents considered it poor.

The assessment of the attitude of people towards forest resources conservation was surprising because I did not expect them to be as honest when rating themselves so low. The implication is that people's attitude towards forest resource conservation is bad and effort needs to be made to encourage the people to show more concern on the issue of conservation. The fact that the people mentioned activities – such as bush burning, tree felling, and wildlife poaching are being carried out – attested to the fair judgment returned by the respondents. The people acknowledged that there has been, and there still is, widespread destruction of forests and that these resources were gradually diminishing. They also understood that the destruction resulted in environmental crises – such as soil erosion, decreases or loss of biodiversity, decrease in wildlife etc. However, they said there was nothing they could do to stop it, since there were no alternative sources of livelihood available to them.

> "*I'm worried when trees are cut down and bushes are set on fire especially during Harmattan under disguise of looking for rodents. It is dangerous, if people must set the bush on fire, they should stand there to monitor it so that it does not spread to another man's farm. What people do is set the bush on fire, get the rodents, snails and other animals, and then leave without putting out the fire.*" (Adult female participant in a FGD)

Figure 6.23 and Figure 6.24 illustrate some of these activities.



Figure 6.23 Cleared forestland for housing.
(Photograph by Ifegbesan Ayodeji)



Figure 6.24 Slash and burning activities.
(Photograph by Ifegbesan Ayodeji)

On whether there are resources that are no longer available for people's use or whether there have been changes in the forest over time, the respondents declared:

> "*You are right, there are some animals and plants that can no longer be found in the forest and if you have to see them you have to go deep into the forest. It has changed, not small change. There has been reduction in the thick forest area around.*" (Village head during an IDI)

When asked if he could advance reasons for this situation, the village head in one of the communities had this to say:

> "*…there are various reasons – one is over-exploitation or demand for the resources. You see, animals are as intelligent as human, when they notice that you are killing them too much in a place, they run away from that place. Another reason is expansion in the town*

– some of the forests are converting into houses. People are building more houses. Many of our sons in the big cities are coming home to construct modern buildings which demand that their parents give them land." (Village head during an IDI)

When asked if they had any specific rules or requirements for those going into the forests, one participant replied: "*Yes, and no*". Asked to explain his response, he replied:

"*I said "Yes", because every portion of the forests is owned by a family and you are not allowed to just go into the forestland that does not belong to your family. It is an offence if one is caught and reported to the village head. On the contrary, you don't have to take permission from anybody before going into the forest, especially when you are just looking for herbs and animals. For instance, hunters do not take permission to go on hunting.*" (Participant in a FGD)

However, another participant has a different opinion. She declared:

"*To some extent he is right, there are rules and you have to take permission to enter some forests, like the community owned forest and those scared forest. You have to see the village head or the keeper of the scared forest to get permission. Just as he said, one does not take permission where the forest belongs to your family, you are free.*" (Participant in a FGD)

Another participant interrupted:

"*Even if it is your family's forest, you still have to take permission from the family head.*"

Another participant retorted that:

"*We have situations where people from neighbouring community come to ask for permission. These are mostly hunters. They bring their guns and join their colleagues here.*"

6.12 Responsibility for Care of Forest/woodlands

Responses to the question: '*Who should be responsible for looking after the forest/woodlands?*' are shown in Figure 6.25.

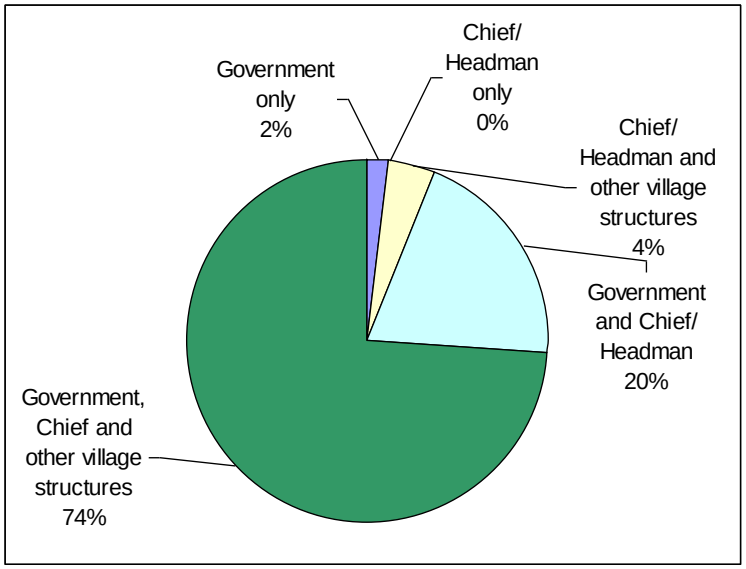

Figure 6.25 Frequency of views as to who should be responsible for looking after forest resources.

As anticipated, rural people are more likely to support the notion that local communities be consulted, and kept constantly informed, of government activities. The study found that people want greater participation and involvement in the natural resource management of their communities. The survey showed that the majority of the respondents would like government, chiefs and other members of the village-community development council, age grades and artisan groups to be jointly responsible for looking after the forests. Clearly, this is an indication that respondents see themselves as having both the responsibility and the capability to protect and conserve the forests. This is understandably right because, to them, it is their source of livelihood and to relinquish the responsibility – for protecting and conserving their livelihood – into the hands of outside groups or agencies could be suicidal. Just 2% responded that only the government should be responsible for conservation of forest resources. The result could also be an indication or indictment of government administrative inefficiency and a lack of trust in the government. Generally, the implication of the result is that there is need for community participation and involvement in the management and conservation of forest resources if the quest for sustainability is to be achieved.

To further buttress this conclusion, a participant opined:

> "*Neither the government nor chief owns the forest. The forest belongs to us all, every family has one expanse of farmland and it is their responsibility to care for it. Giving the government or chief the mandate to look after the forest resources is like selling one's birthright.*" (An adult male participant in a FGD)

Another participant commented that:

> "*We relate with forest daily, it is our source of livelihood; we should be allowed to look after it in our own way. When the responsibility is left to the government or chief, they may deprive and prevent us from having access to it.*" (An adult participant in a FGD)

Capturing his thought with a local saying, another participant observed:

> "*Look, it is our people that say:* "Agbajo owo la fi so aya, ajoji owo kan ko gbe eru de ori'ati wipe Oju loju ko le dabi oju eni." (Meaning: "*It is with all the fingers we beat the chest and one strange hand cannot single handedly lift a load unto your head, and that another person's eyes cannot be the same as one's own eyes.*") *Everybody should take care of the forests or environment.*" (An adult participant in a FGD)

Like a person who is about to be deprived of his heritage, another participant spoke out:

> "*It is important to protect the forest for our children ['s] children – there is no doubt about that. Our forefather(s) protected it and left it for our father, our father left it for us. It is our responsibility to leave or bequeath something worthwhile to our children, but it seems difficult. Government is taking over control of all forestland, using them for housing project(s) or forest reserves.*" (Adult participant in a FGD)

Although, the majority of respondents accepted that there is a need to protect and conserve forest resources, this view did not extend to situations in which the villagers' interests and livelihoods were being threatened. Those comments made by the participants suggestive of an antagonistic posture towards government stemmed from the villagers not having been given fair treatment to take up the employment opportunities on the forest reserves – and the

over-zealousness of forest guards who unnecessarily harassed and denied villagers access to the forest to pick fuelwood.

During the group discussion, when asked whether they believed that there could come a time that some of the resources would not be available for the people to exploit the way it is being used now. One of the women put it thus:

> "*No, the forest cannot end. Somewhere there will always be forests. You know, wherever you are, there is the sky, the forest and the earth. You can go anywhere, but you will always find these things. We have never seen or hear (d) that the forest ceased to exist; there is no place without a forest.*" (An adult participant in a FGD)

Another participant added:

> "*Look since when the forests have been exploited when I was a child, it has not finished. Maybe the only thing is that we go deep into the forest to get what we want now and that is not to say that it is going to finish. What is happening is because people are now building houses. Expansion is occurring which is pushing forward the frontier of forests away from the village and it is understandable because people need houses to live in.*"

6.13 T-test and Analysis of Variance Results

To investigate the differences between respondents' socio-demographic characteristics and their knowledge, attitudes and practices towards forest resource conservation, t-test and analysis of variance (ANOVA) were employed. This post hoc analysis was carried out using the Scheffé multiple range comparison (where necessary) to show the differences within the groups.

Analysis of gender significance in interest, awareness, knowledge, attitude and practices towards forest resource conservation are presented in Table 6.9.

Table 6.9 Test of significant differences because of gender on importance, attitudes, practices, interest, knowledge, awareness. (n = 300)

Variable	Sex	N	Mean	SD	MD	t	Sig
Importance	Male	173	3.18	0.61			
	Female	127	3.28	0.43	-0.10	-1.65	0.10
Attitude	Male	173	3.73	0.51			
	Female	127	3.87	0.40	-0.13	-2.43	**0.02***
Practice	Male	173	2.62	0.53			
	Female	127	2.79	0.77	-0.18	-2.40	**0.02***
Interest	Male	173	2.46	0.29			
	Female	127	2.54	0.41	-0.08	-1.93	**0.06***
Knowledge	Male	173	2.25	0.21			
	Female	127	2.32	0.13	-0.07	-3.37	**0.00***
Awareness	Male	173	2.68	0.45			
	Female	127	2.72	0.35	-0.05	-0.95	0.35

***** The mean difference is significant at the 0.05 level.

Evidence from the Table 6.9 suggests that there were significant differences between the attitude, practice, interest and knowledge of male and female respondents. However, no significant differences were found between the importance attached and level of awareness in both genders. This implies that both male and female respondents attached equal importance and possessed similar levels of awareness about forest resources. On the other hand, a critical look at the results shows that female respondents maintained a higher mean score than male respondents. Therefore, it can be hypothesised that female respondents tended to have slightly higher and more positive knowledge, interest, attitudes and practices towards forest resources conservation. The result is not surprising and indeed supports many previous studies which reported gender differences exist in the human interaction with natural resources, including forests (Kellert, 1996; Frost, 2000). A possible explanation for this finding may be the gender role ascribed to women in relation to the collection and use of forest resources. In almost all households in rural communities, both men and women exploit the forests. However, women exploit the forest, for domestic and income purposes, more often than men do. Although women may not have equal access to land, they are the major users of forests. They are the main gatherers of fodder and fuelwood, and fruits to provide food. They collect and use tree bark, roots and herbs for medicines in their households. In sub-Saharan Africa, it is estimated that women contribute 80% of the agricultural labour force for crop production and that 8 out of 10 people engaged in farming are women, involved in 90% of the processing and 60% of the marketing (Murray, 2002). Women play an important role in forestland use, management and conservation – their activities as fruit and wood collectors are very important to household income and nutrition. Because of these activities and roles, women are bound to have considerable knowledge of natural resources. Table 6.10 shows the variances in mean scores of respondents' ages against importance, attitudes, practices, interest, knowledge and awareness.

Table 6.10 Analysis of variance of mean scores of respondents' ages against importance, attitudes, practices, interest, knowledge and awareness. (n = 300)

Variables	Sum of Squares	Df	Mean Square	F	Sig
Im*portance*	1.73	4	0.43	1.47	0.21
	86.52	295	0.29		
	88.25	299			
Attitude	10.65	4	2.66	14.06	**0.00***
	55.87	295	0.19		
	66.51	299			
Practice	9.37	4	2.34	6.03	**0.00***
	114.62	295	0.39		
	123.99	299			
Interest	1.06	4	0.26	2.17	0.07
	35.91	295	0.12		
	36.97	299			
Knowledge	0.55	4	0.14	4.31	**0.002***
	9.34	295	0.03		
	9.88	299			
Awareness	2.62	4	0.66	4.08	**0.003***
	47.33	295	0.16		
	49.95	299			

* The mean difference is significant at the 0.05 level.

Contrary to expectation, the result of the analysis of variance of age showed that no difference existed between the mean scores of respondents on the importance of forests and their interest in forest resources. This indicates that the groups are homogenous and attach relatively equal importance to – and have an equal interest in – forest resources.

However, significant differences were observed in other variables. Further analysis post hoc revealed the differences that occurred between – and within which of – the age groups. As expected, older respondents were more knowledgeable and aware than younger respondents. This is supported by the post hoc analysis, which showed the scores of older respondents being significantly higher than those of the younger respondents. Although people of all ages are forest dependent, a cross-tabulation revealed that young people tended to be more dependent on forest products than older residents. The explanation for this may be that young people are much more concerned about the indirect value of forests – such as tourism, recreation and environment. In addition, forests remain one of the sources for accumulating capital for investment. I also observed that most of the people in the study areas involved in the extraction of forest products (furniture makers, mat weaving etc.) are younger people. Scheffé post hoc analysis was used to determine the groups between and within which significant differences were found. Significant differences existed in the attitude of people in the following age brackets: 55—64 years and 24—34 years, 55—65 years and 35—44 years, below 24 years, 25—35 and 45—54 years. In practice, significant differences were observed across all ages. With respect to awareness, the significant difference was between the age bracket below 24 and 45—54 years (Table 6.11).

Table 6.11 Scheffé multiple comparison post hoc analysis of respondents' ages for attitude, practice, knowledge and awareness.

Dependent Variable	(I) Age (yr)	(J) Age (yr)	Mean Difference (I - J) (yr)	Std Error	Sig
Attitude	Below 24	25-34	0.32	0.07	0.00
		55-64	0.58	0.13	0.00
	25-34	Below 24	-0.32	0.07	0.00
		45-54	-0.52	0.09	0.00
	35-44	45-54	-0.43	0.10	0.00
	45-54	25-34	0.52	0.10	0.00
	55-64	Below 24	-0.58	0.13	0.00
		45-54	-0.78	0.15	0.00
Practice	Below 24	55-64	0.82	0.19	0.00
	25-34	55-64	0.83	0.18	0.00
	35-44	55-64	0.69	0.19	0.01
	45-54	55-64	0.91	0.21	0.00
	55-64	Below 24	-0.82	0.19	0.00
Knowledge	25-34	35-44	-0.09	0.03	0.02
	35-44	25-34	0.09	0.03	0.02
Awareness	Below 24	45-54	-0.36	0.09	0.00
	45-54	Below 24	0.36	0.09	0.00

***** The mean difference is significant at the 0.05 level.

As expected, older respondents' were more knowledgeable and have greater awareness than younger respondents. This is confirmed by the post hoc analysis, which showed scores of older people to be significantly higher than those of the younger respondents. Significant differences were observed between the 25—34 and 35—44 age groups in knowledge (MD = -0.088, $p \leq 0.01$), and between below 24 and 45—54 age groups with respect to awareness (MD = -0.36, $p \leq 0.00$). This result, when compared with the analysis of variance on the aspect of life according to age, suggests a similar conclusion – there is a clear generational gap between young and old respondents in the study.

Table 6.12 shows that there were significant differences in the respondents' importance, knowledge, attitude, interest, awareness and practices of forest resource conservation dependent on their religious beliefs.

Table 6.12 Analysis of variance of mean scores of respondents' religion against importance, attitudes, practices, interest, knowledge and awareness. (n = 300)

Variable	Sum of Squares	Df	Mean Square	F	Sig
Importance	2.7	2	1.36	4.7	**0.010***
	85.5	297	0.29		
	88.3	299			
Attitude	1.7	2	0.85	3.9	**0.021***
	64.8	297	0.22		
	66.5	299			
Practice	4.7	2	2.37	5.9	**0.003***
	119.2	297	0.40		
	124.0	299			
Interest	1.1	2	0.54	4.4	**0.013***
	36.0	297	0.12		
	37.0	299			
Knowledge	0.34	2	0.17	5.3	**0.006***
	9.5	297	0.03		
	9.9	299			
Awareness	1.4	2	0.70	4.3	**0.014***
	48.5	297	0.16		
	50.0	299			

***** The mean difference is significant at the 0.05 level.

When the result was further subjected to post hoc analysis, using Scheffé multiple comparison analysis, it was discovered that significant differences existed between the groups in their interest and practice of forest resource conservation(Table 6.13).

Table 6.13 Scheffé multiple comparison post hoc analysis of respondents' religion.

Dependent Variable	(I) Religion	(J) Religion	Mean Difference (I – J)	Std Error	Sig
Importance	Christian	Muslim	0.18	0.07	0.02
Attitude	Christian	Muslim	0.15	0.06	0.04
Practice	Christian	Traditional	0.34	0.13	0.03
	Muslim	Traditional	0.44	0.13	0.00
Interest	Traditional	Christian	0.19	0.07	0.03
Knowledge	Christian	Muslim	0.07	0.02	0.01
Awareness	Christian	Muslim	0.14	0.05	0.02

***** The mean difference is significant at the 0.05 level.

There were also significant differences between Christians and Muslims (MD = 0.15, $p \leq 0.01$) – i.e. Christians had more a positive attitude than Muslims. In practice, significant differences existed equally between Christians and traditionalists (MD = 0.34, $p \leq 0.03$) and between Muslims and Traditionalists (MD = 0.44, $p \leq 0.00$). There were significant differences between traditionalists and Christians regarding their interest in forest resources (MD = 0.191, $p \leq 0.01$), implying that traditionalists tend to have more interest in forests and forest resources. There was a notable significant difference in knowledge and awareness of forest resources between Christian and Muslim respondents, (MD = 0.07, $p \leq 0.01$) and (MD = 0.143, $p \leq 0.015$) respectively. This can be interpreted to mean that Christians were more knowledgeable and aware than Muslims in forest resource conservation. The plausible explanation for this can be that majority of those people who claimed to be Christians either are farmers or are involved in occupational activities that relate to forests.

When occupational groups were compared with all variables, the result of the analysis of variance showed a significant difference in the mean scores in all variables between all occupational groups (Table 6.14).

Table 6.14 Analysis of variance of mean scores respondents' occupation and importance, attitudes, practices, interest, knowledge, awareness. (n = 300)

Variables	Sum of Squares	Df	Mean Square	F	Sig
Importance	10.3	6	1.72	6.5	**0.000***
	78.0	293	0.27		
	88.3	299			
Attitude	9.37	6	1.56	8.0	**0.000***
	57.1	293	0.20		
	66.5	299			
Practice	10.1	6	1.70	4.4	**0.000***
	113.8	293	0.39		
	124.0	299			
Interest	2.4	6	0.40	3.4	**0.003***
	34.6	293	0.12		
	37.0	299			
Knowledge	1.6	6	0.26	9.2	**0.000***
	8.2	293	0.03		

Variables	Sum of Squares	Df	Mean Square	F	Sig
	9.9	299			
Awareness	14.8	6	2.47	20.6	**0.000***
	35.1	293	0.12		
	50.0	299			

***** significant at 0.05 level

Farmers attached more importance to forest resources than students. This is not surprising considering that it is their livelihood. A contrary result would have contradicted both the reality existent in the society and findings in previous studies in literature. As expected, there were considerable significant differences in attitude of the respondents in the other occupational groupings. The Scheffé post hoc results in Table 6.15 suggest that all respondents of occupational groups with direct interaction with the forest resources for livelihood possess more positive attitudes than others whose activities do not involve forests. One can hypothesise that the higher the economic benefits derived from – or the more dependent an individual or group is on – forest resources, the more knowledgeable and interested in forests they will be. And the more negative attitudes and practices towards forest resource conservation they will possess. In terms of practices, differences occurred only between farmers and hunters, with farmers having negative practices towards forest resource conservation. This could be accurate, considering the practices of shifting cultivation and bush burning which are common among farmers. However, the differences between hunters and traders showed that hunters have more positive practices than the traders. This result contradicts the reality and practices among hunters in this society, in which poaching activities are largely unregulated and bushmeat is openly sold.

Table 6.15 Scheffé' multiple comparisons post hoc of respondents' occupation on attitude, practice and interest in forest resource conservation.

Dependent Variable	(I) Occupation	(J) Occupation	Mean Difference (I – J)	Std Error	Sig
Importance	Farmers	Students	0.46	0.09	0.00
	Students	Timber contractors, foresters	-0.43	0.11	0.02
Attitude	Farmers	Hunters	-0.57	0.13	0.01
	Hunters	Timber contractors, foresters	0.69	0.14	0.00
		Drivers	0.94	0.20	0.00
		Civil Servants	0.74	0.17	0.00
	Students	Timber contractors, foresters	0.38	0.09	0.02
		Drivers	0.63	0.17	0.04
Practice	Farmers	Hunters	-0.77	0.19	0.01
	Hunters	Traders	0.82	0.20	0.01
Knowledge	Farmers	Traders	0.19	0.03	0.00
	Traders	Students	-0.20	0.04	0.00
		Timber contractors, foresters	-0.16	0.03	0.00
Awareness	Farmers	Students	0.25	0.06	0.01
		Traders	0.62	0.06	0.00

Dependent Variable	(I) Occupation	(J) Occupation	Mean Difference (I – J)	Std Error	Sig
	Students	Traders	0.37	0.07	0.00
	Traders	Timber contractors, foresters	-0.57	0.07	0.00
		Civil Servants	-0.54	0.10	0.00
	Timber contractors, foresters	Students	0.21	0.07	0.27
		Traders	0.57	0.07	0.00
	Civil Servants	Traders	0.54	0.10	0.00

***** The mean difference is significant at the 0.05 level.

Farmers tended to attach more importance to forest resources than students (MD = 0.46, $p \leq 0.01$);students tended to attach lower importance than timber contractors/foresters (MD = -0.43, $p \leq 0.03$). This is not surprising. considering the fact that it is their livelihood. A contrary result would have contradicted the reality in the society. There was significant difference in attitude of the respondents: Farmers and hunters (MD = -0.60, $p \leq 0.01$), hunters and timber contractors/foresters (MD = 0.70, $p \leq 0.01$), hunters and drivers (MD = 0.94, $p \leq 0.02$), hunters and civil servants (MD = 0.74, $p \leq 0.04$), students and timber contractors/foresters (MD = 0.36, $p \leq 0.018$), students and drivers (MD = 0.63, $p \leq 0.04$). The result suggests that all those respondents, with direct interaction who exploit the forest resources for their livelihood, possess more positive attitudes than others whose activities do not involve forests. One can hypothesise that the higher the economic benefits derived from – or the more dependent an individual or group is on – forest resources, the more knowledgeable and interested in forests they will be. And again the more negative attitudes and practices towards forest resource conservation they will possess. In terms of practices, differences occurred only between farmers and hunters (MD = -0.80, $p \leq 0.01$), with farmers having negative practices of forest resource conservation. This could be true considering the practices of shifting cultivation and bush burning common among the farmers. However, the difference between hunters and traders (MD = 0.82, $p \leq 0.01$) showed hunters having more positive practices than the traders. This result contradicts the reality and practices among hunters in a society where poaching activities are largely unregulated and bushmeat is sold openly and is a major source of protein to those who live in rural areas.

With respect to educational background, the results of ANOVA (interest.

Table 6.16) revealed significant differences between respondents' educational background and all dependent variables except for one – specifically interest.

Table 6.16 Analysis of variance of mean scores respondents' educational background and importance, attitudes, practices, interest, knowledge, awareness. (n = 300)

Variables	Sum of Squares	Df	Mean Square	F	Sig
Importance	4.8	5	0.95	3.3	**0.006***
	83.5	294	0.28		
	88.3	299			

Variables	Sum of Squares	Df	Mean Square	F	Sig
Attitude	5.2	5	1.04	5.0	**0.000***
	61.3	294	0.21		
	66.5	299			
Practice	26.9	5	5.38	16.3	**0.000***
	97.1	294	0.33		
	124.0	299			
Interest	0.70	5	0.14	1.1	.344
	36.3	294	0.12		
	37.0	299			
Knowledge	0.64	5	0.13	4.1	**0.001***
	9.2	294	0.03		
	9.9	299			
Awareness	7.6	5	1.49	10.3	**0.000***
	42.5	294	0.15		
	50.0	299			

***** The mean difference is significant at the 0.05 level.

The Scheffé post hoc conducted revealed within which group of education level the differences were observed. Table 6.17 indicates that those with higher education levels appeared to have little knowledge, awareness and attached less importance to the forest resources than those with no education or a lower education level. However, educated respondents tended to express more positive attitudes and practices than respondents with lower education levels.

Table 6.17 Scheffé multiple comparisons post hoc analysis of respondents' educational background.

Dependent Variable	(I) Educational Background	(J) Educational Background	Mean Diff (I – J)	Std Error	Sig
Importance	No formal education	Poly/College of Education	-0.50	0.15	0.05
	Technical/Teacher College	Poly/College of Education	-0.57	0.16	0.02
Attitude	No formal education	Secondary Education	-0.34	0.08	0.00
		Poly/College of Education	-0.43	0.13	0.05
Practice	No formal education	Primary education	-0.40	0.10	0.01
		Secondary Education	-0.39	0.10	0.01
		Technical/Teacher College	-1.05	0.12	0.00
	Secondary education	Technical/Teacher College	-0.66	0.11	0.00
	Technical/Teacher College	No formal education	1.05	0.12	0.00
		Primary education	0.65	0.11	0.00
		Secondary education	0.66	0.11	0.00
		Poly/College of Education	1.01	0.17	0.00
		University degree	1.17	0.30	0.01

Dependent Variable	(I) Educational Background	(J) Educational Background	Mean Diff (I – J)	Std Error	Sig
Knowledge	No formal education	Secondary education	0.11	0.03	0.02
	Primary education	Secondary education	0.09	0.03	0.03
Awareness	No formal education	Primary education	-0.25	0.07	0.01
		Poly/College of Education	-0.39	0.11	0.02
	Primary education	Secondary education	0.30	0.06	0.00
	Secondary education	Technical/Teacher College	-0.31	0.07	0.00
		Poly/College of Education	-0.44	0.10	0.00

***** The mean difference is significant at the 0.05 level.

Respondents with lower education levels attached greater concern and importance, higher knowledge and awareness level towards forest resources but possessed negative attitudes and practices towards it. These findings can be understood, considering that the majority of the people are farmers, hunters, traders and timber contractors who depend on and extract forest resources for livelihood. The result is consistent with that observed in the occupational analysis.

6.14 Pearson-Product Moment Correlation between Socio-demographic Variable and Forest Related Variables

The Pearson-Product Moment Correlation (PPMC) was used to investigate the relationship between socio-demographic variables and knowledge, interest, awareness, importance, attitude and practices of forest resource conservation. The results obtained are presented in the correlation matrix in Table 6.18. The magnitude of the relationship was described using the scale proposed by Davis (1971).

The correlation matrix shows that there was a weak correlation between gender and knowledge, practice and attitude. Age was found to have only negative correlation with practice, and weak positive correlation with awareness respectively. Thus, the results suggest that older respondents have more positive practices and higher awareness of forest resources than their younger counterparts. The findings revealed that religion was found to correlate to respondents' scores on the importance of, attitude towards, knowledge of and interest in forest resources. Occupation was found to show negative correlation with knowledge and awareness. Variables of attitudes, practice, knowledge and awareness were found to show positive correlations with the educational background of respondents. Although the correlation may have been weak, it remains a pointer to the influence the level of educational attainment of an individual or group has on their responses and is a factor worthy of studying because it is likely to determine how much interaction, concern and use each individual or group will have with forest resources.

Table 6.18 Correlations matrix of respondents' socio-demographic variables and attitude, knowledge, importance, interest, awareness and practice.

	Sex	Age	Religion	Occupation	Educational background	Number per household	Number making livelihood from forests	Importance	Attitudes	Practices	Knowledge		Awareness	Interest
Sex	1.00													
Age	-0.16(**)	1.00												
Religion	-0.03(**)	-0.08	1.00											
Occupation	0.14(*)	-0.04	0.03	1.00										
Educational background	-0.08	0.09	0.01	-0.15(**)	1.00									
Number per household	-0.14(*)	-0.19(**)	-0.07	-0.09	-0.09	1.00								
Number making livelihood from forests	-0.08	0.17(**)	0.15(**)	-0.26(**)	0.25(**)	0.14(*)	1.00							
Importance	0.10	-0.03	-0.17(**)	-0.10	0.06	-0.09	0.04	1.00						
Attitudes	0.14(*)	-0.04	-0.15(**)	-0.11	0.24(**)	-0.04	0.16(**)	0.24(**)	1.00					
Practices	0.14(*)	-0.15(**)	-0.07	0.01	0.20(**)	-0.08	-0.21(**)	-0.10	0.15(*)	1.00				
Knowledge	0.19(**)	0.08	-0.12(*)	-0.15(**)	-0.12(*)	-0.12(*)	0.01	0.30(**)	0.15(**)	0.17(**)	1.00			
Awareness	0.06	0.14(*)	-0.11	-0.23(**)	0.13(*)	0.19(**)	0.16(**)	0.46(**)	0.11(*)	0.01	0.42(**)	1.00		
Interest	0.11	-0.07	0.17(**)	0.03	-0.03	-0.02	0.01	-0.23(**)	-0.17(**)	0.16(**)	0.05	-0.11	1.00	

****** Correlation is significant at the 0.01 level. ***** Correlation is significant at the 0.05 level.

The variable of '*number making livelihood from forest'* was found to correlate with attitude, practice, and awareness. This was not surprising because normally one would expect that if an individual or group derives livelihood from a particular object he/she would naturally show or display some degree of positive attitude, practice and awareness about the source(s). What was surprising was the level of correlation – which was very weak considering that majority of the respondents claimed to make their livelihood from forest resources. Importance was discovered to have positive correlation with attitude, knowledge, awareness and interest. Awareness seems to have the most significant correlation with importance ($r = 0.458$, $p \leq 0.01$), with which it was positively and significantly correlated. Attitude showed a positive, but low correlation, to practice, knowledge, awareness and interest. This result was consistent with the findings of Bradley et al. (1999); Lukas and Ross (2005) and Barney et al. (2005) who reported moderate and strong positive significant correlation between environmental knowledge and attitude of people toward natural resources. This finding is important because it suggests that increased knowledge may help improve forest resource conservation attitudes of people. It also confirms the contribution or influence of variables – such as the socio-economic status and cultural background – on the environmental variables of knowledge, attitudes, interest and practices. The finding further suggests that environmental attitudes can be influenced and modified through education programmes.

6.15 Results of Regression Analysis

To determine which of the variables best predicted the dependent variables (interest, awareness, importance, knowledge, attitudes, and practices towards forest resource conservation), a stepwise regression analysis was conducted. The results of the final model of each of regression analysis are reported in Table 6.19 to Table 6.24.

Results of stepwise regression for '*interest in forest resource conservation'* are set out in Table 6.19. Using the same sets of independent variables, five models were set out and five variables in the final model explain up 37% of the variance of interest of respondents to forest resource conservation.

Table 6.19 Stepwise multiple regression of variables in relation to *Interest in forest resource conservation.*

Model No.	Variable	R	R^2	Adjusted R^2	R^2 Change	F	β	t	Sig
1		0.23	0.05	0.05	0.05	16.0			
	Importance						-0.23	-4.00	0.00
2		0.27	0.07	0.06	0.02	11.3			
	Importance						-0.21	-3.76	0.00
	Practice						0.14	2.50	0.01
3		0.30	0.09	0.08	0.02	10.1			
	Importance						-0.17	-2.99	0.00
	Practice						0.17	2.95	0.00
	Attitude						-0.16	-2.68	0.01

Model No.	Variable	R	R^2	Adjusted R^2	R^2 Change	F	β	t	Sig
4		0.33	0.11	0.10	0.02	9.1			
	Importance						-0.15	-2.64	0.01
	Practice						0.18	3.13	0.00
	Attitude						-0.14	-2.44	0.02
	Religion						0.14	2.41	0.02
5		0.37	0.14	0.12	0.03	9.5			
	Importance						-0.16	-2.82	0.01
	Practice						0.16	2.79	0.01
	Attitude						-0.15	-2.70	0.01
	Religion						0.19	3.21	0.00
	Gender						0.18	3.16	0.00

Dependent variable: Interest in forest resource conservation

Model 1 in Table 6.19 shows 'Importance' has negative significant associations with interest in forest resource conservation. This indicates that the degree of importance attached to forests will determine the interest express toward it. Model 2, 'Practice' shows as a significant predictor ($\beta = -0.14$, $p \leq 0.01$). Model 3 demonstrates that 'Importance', 'Practice' and 'Attitude' are related to the interest in forest resource conservation. When 'Religion' is included, Model 4, the inclusion shows positive significant effects ($\beta = 0.14$, $p \leq 0.02$). In the final model, 'Importance', 'Practice', 'Attitude', 'Religion' and 'Gender' are all found to affect rural people's interest in forest resource conservation. 'Importance' becomes a significantly negative predictor for interest in forest resource conservation ($\beta = -0.16$, $p \leq 0.01$). The final model explains 37% of the variance in interest in forest resource conservation.

Results of stepwise regression to predict '*attitudes towards forest resource conservation'* are reported in Table 6.20. Six variables emerged in the models (as predictive variables of attitudes towards forest resource conservation) together accounting for 42% of the variance of attitudes R-value = 0.42, $F(6, 293) = 10.8$, $p \leq 0.05$. In Model 1, 'Education' shows positive significant predictive ability of attitude ($\beta = 0.24$, $p \leq 0.05$) which suggests that 'Education' is a stronger predictor of attitude than other socio-demographic variables in the study. The variable 'Importance' was also significantly and positively associated with 'Attitude' ($\beta = 0.22$, $p \leq 0.05$) (Model 2). The two variables explained approximately 35% of the variance in attitude to forest resource conservation by rural people.

Table 6.20 Stepwise multiple regression of variables in relation to *Attitudes towards forest resource conservation*.

Model No.	Variable	R	R^2	Adjusted R^2	R^2 Change	F	β	t	Sig
1		0.24	0.06	0.05	0.06	18.1			
	Educational background						0.24	4.26	0.00
2		0.33	0.11	0.10	0.05	17.6			
	Educational background						0.23	4.11	0.00
	Importance						0.22	4.02	0.00
3		0.35	0.13	0.12	0.02	14.1			
	Educational background						0.24	4.35	0.00
	Importance						0.21	3.78	0.00
	Sex						0.14	2.54	0.01
4		0.38	0.14	0.13	0.02	12.4			
	Educational background						0.24	4.38	0.00
	Importance						0.17	3.09	0.00
	Sex						0.16	2.89	0.00
	Interest						-0.14	-2.56	0.01
5		0.40	0.16	0.14	0.01	11.1			
	Educational background						0.21	3.77	0.00
	Importance						0.19	3.34	0.00
	Sex						0.14	2.52	0.01
	Interest						-0.16	-2.85	0.00
	Practice						0.13	2.28	0.02
6		0.42	0.18	0.16	0.02	10.8			
	Educational background						0.16	2.82	0.01
	Importance						0.18	3.34	0.00
	Gender						0.14	2.61	0.01
	Interest						-0.17	-3.07	0.00
	Practice						0.17	2.96	0.00
	Number making livelihood from forests						0.16	2.77	0.01

Dependent variable: Attitudes towards forest resource conservation

Model 3 shows that 'Educational Background', 'Importance' and 'Gender' are positively significant predictors of attitudes of forest resources conservation. In Model 4, all the significant predictors of previous models – educational background, importance and gender remained significant: a negative significant effect was obtained in 'Attitudes' when 'Interest' ($\beta = -0.14$, $p \leq 0.01$) was added. The R-value of 0.38 indicates that taking all the selected independent variables together accounted for 38% of the total variance in attitude towards forest resource conservation. The inclusion of 'Practice' was significantly and positively associated with 'Attitude' towards forest resource conservation ($\beta = 0.13$, $p \leq 0.02$)(Model 5). In the final model, Model 6, all the variables in the previous models (including the number making their livelihood from forest) increased the adjusted R^2 by (0.02), and the beta value of ($\beta = 0.16$, $p \leq 0.01$) thereby showing the significant predictive effect on attitude.

Table 6.21 presents stepwise multiple regressions for '*practices of forest resource conservation'*. Among all the socio-demographic characteristics entered, only the number making livelihood from forests ($\beta = -0.21$, $p \leq 0.00$) was negatively significant when related to 'Practice forest conservation'. This suggests that people who make their livelihood from forests are predictably less likely to have good forest resource conservation practices than those who do not. Once the variable 'Educational background' had entered into Model 2, 'Education' became a significant predictor. Rural people with higher education are less satisfied with their promotion opportunities than those with lower education. Model 3 shows 'Number making livelihood from forests', 'Educational background' and 'Knowledge' all significantly affect forest resource conservation practices. People with higher education and knowledge are predictably more aware of forest resource conservation practice than those possessing lower levels of education ($\beta = 0.30$, $p \leq 0.00$) or knowledge ($\beta = 0.21$, $p \leq 0.00$).

Similar to the Model 3 results, 'Number making livelihood from forest resources' had negative significant associations with 'Forest resource conservation practice': the effects of 'Education' and 'Knowledge' remained positively significant (Model 4). 'Importance', when added into Model 4, showed a negative significant predictor of forest resource conservation practice ($\beta = -0.19$, $p \leq 0.05$). In Model 5, all the variables in Model 4 remained significant predictors of forest resource conservation practice. The inclusion of the 'Age' variable ($\beta = -0.17$, $p \leq 0.05$) in the model increased the adjusted R^2 from 0.18 in Model 4 to 0.20 in Model 5. Together the variables accounted for 46% of the variance in forest resource conservation practices among the rural people.

Results of the full Model 7 indicate that 'Number making livelihood from forests', 'Educational background', 'Knowledge', 'Importance;, 'Age', 'Attitude' and 'Interest' are significant predictors of forest practices among rural people. The directions of these effects were found to be consistent with previous findings. By including interest variable, the *adjusted* R^2 increases from 0.04 in the model 1 (with only socio-demographic variables) to 0.20, suggesting that the full model explains ~49% more of the variance in practices of forest resource conservation.

Table 6.21 Stepwise multiple regression of variables in relation to *Practices of forest resource conservation*.

Model No.	Variable	R	R^2	Adjusted R^2	R^2 Change	F	β	t	Sig
1		0.21	0.04	0.04	0.04	13.3			
	Number making livelihood from forests						-0.21	-3.64	0.00
2		0.33	0.11	0.10	0.07	18.5			
	Number making livelihood from forests						-0.27	-4.83	0.00
	Educational background						0.27	4.77	0.00
3		0.39	0.15	0.15	0.04	18.0			
	Number making livelihood from forests						-0.28	-5.10	0.00
	Educational background						0.30	5.35	0.00
	Knowledge						0.21	3.90	0.00

Model No.	Variable	R	R^2	Adjusted R^2	R^2 Change	F	β	t	Sig
4		0.43	0.19	0.18	0.03	17.0			
	Number making livelihood from forests						-0.28	-5.14	0.00
	Educational background						0.32	5.77	0.00
	Knowledge						0.27	4.85	0.00
	Importance						-0.19	-3.46	0.00
5		0.46	0.21	0.20	0.03	16.1			
	Number making livelihood from forests						-0.25	-4.70	0.00
	Educational background						0.33	6.07	0.00
	Knowledge						0.29	5.22	0.00
	Importance						-0.20	-3.73	0.00
	Age						-0.17	-3.22	0.00
6		0.48	0.23	0.21	0.01	14.4			
	Number making livelihood from forests						-0.27	-4.93	0.00
	Educational background						0.30	5.46	0.00
	Knowledge						0.27	4.92	0.00
	Importance						-0.22	-4.07	0.00
	Age						-0.16	-3.03	0.00
	Attitude						0.12	2.17	0.03
7		0.49	0.24	0.22	0.02	13.4			
	Number making livelihood from forests						-0.27	-5.09	0.00
	Educational background						0.30	5.40	0.00
	Knowledge						0.25	4.52	0.00
	Importance						-0.19	-3.43	0.00
	Age						-0.15	-2.76	0.01
	Attitude						0.14	2.54	0.01
	Interest						0.13	2.42	0.02
Dependent variable: Practices of forest resource conservation									

Results of the regression for the 'Knowledge' variable are displayed in Table 6.22. In Model 1, the regression coefficient for 'Awareness' is significantly and positively associated with 'Knowledge' ($\beta = 0.42$, $p \leq 0.05$). This suggests that rural inhabitants' level of awareness of forest resources is a good predictor of their level of knowledge.

Table 6.22 Stepwise multiple regression of variables in relation to *Knowledge of forest resources.*

Model No.	Variable	R	R^2	Adjusted R^2	R^2 Change	F	β	t	Sig
1		0.42	0.18	0.18	0.18	64.5			
	Awareness						0.42	8.03	0.00
2		0.47	0.22	0.21	0.04	41.7			
	Awareness						0.46	8.83	0.00
	No in a household						-0.21	-3.95	0.00

Model No.	Variable	R	R^2	Adjusted R^2	R^2 Change	F	β	t	Sig
3		0.51	0.26	0.25	0.04	35.0			
	Awareness						0.49	9.59	0.00
	No in a household						-0.23	-4.51	0.00
	Educational background						-0.21	-4.13	0.00
4		0.55	0.30	0.29	0.04	31.7			
	Awareness						0.50	9.88	0.00
	No in a household						-0.22	-4.38	0.00
	Educational background						-0.25	-4.95	0.00
	Practice						0.20	4.04	0.00
5		0.56	0.31	0.30	0.01	27.0			
	Awareness						0.48	9.69	0.00
	No in a household						-0.21	-4.33	0.00
	Educational background						-0.27	-5.38	0.00
	Practice						0.19	3.81	0.00
	Attitude						0.12	2.46	0.01

Dependent Variable: Knowledge of forest resources

Model 2 shows that 'Number per household' is a significantly negative predictor of knowledge of forest resources conservation (β = -0.21, $p \leq 0.00$). However, when 'Awareness' is taken together with the socio-demographic characteristic of 'Number per household', the predictor level of knowledge of forest resources increased to R-value = 0.47, F (2, 298) = 41.7. A negative significant effect was obtained when 'Educational background' was added (Model 3) (β = -0.21, $p \leq 0.00$). In Model 4, all the significant predictors of previous models – 'Awareness', 'Number per household', 'Education' and 'Practice' – remained significant. The R-value of 0.55 indicates that all the selected independent variables together accounted for 55% of the total variance in knowledge of forest resource conservation. 'Practice', which was added, is significantly and positively associated with knowledge of forest resource conservation (β = 0.20, $p \leq 0.05$).

In the final model, Model 5, all the variables together explained 56% of the variance in knowledge of the rural people. The inclusion of attitude in the model increased the adjusted R^2 marginally – by 0.01 from Model 4 to Model 5 – without greatly increasing the variance accounted for in Model 5.

The results of the regressions attempting to describe socio-demographic variables as function of *importance of forest resources* are presented in Table 6.23. Of all the variables entered, 'Awareness' emerged in Model 1 as the main predictor variable of importance (β = 0.46, $p \leq 0.00$). This implies that awareness is a strong predictor of importance attached to forest resource conservation and that the level of consciousness of rural inhabitants about the existence of forest resources determines the importance attached to forest resource conservation. Rural people with high levels of awareness attach more importance to forest resources. 'Attitude' is also significantly and positively associated with 'Importance' (β = 0.19, $p \leq 0.00$) (Model 2). The two variables explained 49% of the variance in importance attached to forest resource conservation by rural people.

Table 6.23 Stepwise multiple regression of variables in relation *Importance of forest resources.*

Model No.	Variable	R	R^2	Adjusted R^2	R^2 Change	F	β	T	Sig
1		0.46	0.21	0.21	0.21	79.2			
	Awareness						0.46	8.90	0.00
2		0.49	0.24	0.24	0.03	47.9			
	Awareness						0.44	8.61	0.00
	Attitude						0.19	3.65	0.00
3		0.52	0.27	0.27	0.03	37.0			
	Awareness						0.47	9.26	0.00
	Attitude						0.17	3.49	0.00
	Number per household						-0.17	-3.42	0.00
4		0.54	0.30	0.29	0.02	30.9			
	Awareness						0.46	9.08	0.00
	Attitude						0.15	2.99	0.00
	Number per household						-0.17	-3.49	0.00
	Interest						-0.15	-3.08	0.00
5		0.56	0.31	0.30	0.02	26.9			
	Awareness						0.48	9.54	0.00
	Attitude						0.14	2.77	0.01
	Number per household						-0.21	-4.07	0.00
	Interest						-0.16	-3.31	0.00
	Age						-0.14	-2.80	0.01
6		0.58	0.33	0.32	0.02	24.5			
	Awareness						0.49	9.81	0.00
	Attitude						0.16	3.25	0.00
	Number per household						-0.22	-4.42	0.00
	Interest						-0.14	-2.76	0.01
	Age						-0.16	-3.28	0.00
	Practice						-0.15	-2.99	0.00
7		0.59	0.35	0.33	0.01	22.1			
	Awareness						0.49	9.76	0.00
	Attitude						0.15	2.99	0.00
	Number per household						-0.23	-4.64	0.00
	Interest						-0.12	-2.40	0.02
	Age						-0.18	-3.52	0.00
	Practice						-0.16	-3.22	0.00
	Religion						-0.11	-2.32	0.02

Dependent variable: Importance of forest resources.

Similar to the Model 2 analysis, 'Awareness' and 'Attitude' were found to have positive significant predictive ability. However, the variable of 'Number per household' ($\beta = -0.17$, $p \leq 0.00$) had negative significant (Model 3). Model 4 shows that 'Awareness', 'Attitude' and 'Number per household' still had significant effects on the importance attached to forest resource conservation. When the 'Interest' variable was included it had negative significant effects ($\beta = -0.15$, $p \leq 0.00$). The effect of 'Awareness' ($\beta = 0.49$, $p \leq 0.00$) and 'Attitude' ($\beta = 0.15$, $p \leq 0.00$) on overall

importance continued to be strong when taking into account other socio-demographic variables. In addition, the negative effect of 'Number per household', 'Interest', 'Age', 'Practice' and 'Religion' remained significant in the final model. The variables explained ~60% of the variance in 'Importance' attached to forest resource conservation. It was also observed that there was an increase in the adjusted R^2 from 0.21 (Model 1) to R^2 = 0.33 (Model 7).

Table 6.24 summarises the results of the analysis when '*awareness of forest resource conservation'* was entered as dependent variable. In Model 1, out of all the variables, only 'Importance' emerged as a predictive variable – which accounted for 46% of the variance of 'Awareness' – R-value = 0.46, F (1, 298) = 79.2, $p \leq 0.00$. Model 2 adds measures of 'Knowledge', which increased the R^2 from 0.21 to 0.29, indicating a significant effect on the overall awareness of the respondents at R-value = 0.55, F (2, 298) = 63.4, $p \leq 0.00$.

Table 6.24 Stepwise multiple regression of variables in relation to *Awareness of forest resource conservation*.

Model No.	Variable	R	R^2	Adjusted R^2	R^2 Change	F	β	T	Sig
1		0.46	0.21	0.21	0.21	79.2			
	Importance						0.46	8.90	0.00
2		0.55	0.30	0.29	0.09	63.4			
	Importance						0.36	7.17	0.00
	Knowledge						0.31	6.15	0.00
3		0.61	0.37	0.36	0.07	57.5			
	Importance						0.38	7.85	0.00
	Knowledge						0.34	6.98	0.00
	Number per household						0.26	5.68	0.00
4		0.63	0.40	0.39	0.03	49.1			
	Importance						0.36	7.61	0.00
	Knowledge						0.37	7.69	0.00
	Number per household						0.28	6.18	0.00
	Educational background						0.18	3.94	0.00
5		0.65	0.43	0.42	0.03	43.6			
	Importance						0.37	8.02	0.00
	Knowledge						0.36	7.51	0.00
	Number per household						0.31	6.84	0.00
	Educational background						0.17	3.67	0.00
	Age						0.16	3.63	0.00

Dependent variable: Awareness of forest resource conservation

Model 3 included 'Importance', 'Knowledge' and socio-demographic variable 'Number per household', showing a significant effect on overall awareness of forest resource conservation, indicating that more people were aware of forest resources. The inclusion of the 'Educational background' characteristic variable in the model increased the adjusted R^2 from 0.21 to 0.39 (Model 4). Model 5 includes two socio-demographic measures (Educational background and Age), and dependent variables of 'Importance' and 'Knowledge'. The effect of 'Age' on the overall level of awareness of respondents remained significantly strong in the final model, accounting for 65%

of the variance of awareness, R-value = 0.65, F (5, 294) = 43.6, $p \leq 0.00$. This result suggests that people who attach a high premium to forest resources are likely to be more aware than those who do not.

Based on the findings, I hypothesised that age, gender and education positively influence environment attitudes; people with lower levels of education expressed negative attitudes to forest resources. Gender (as a predictor of forest resource conservation attitudes) resulted in the hypothesis that women will exhibit more positive attitudes towards forest resource conservation than their male counterparts. Woman in the study were significantly more likely than men to be aware of and interested in forest resource conservation. The level of forest resources awareness increased the interest and importance attached to forest resource conservation. The number making livelihoods from forest resources are less likely to be concerned about forest resource conservation. Finally, it was hypothesised that forest resource conservation attitudes will be correlated with forest resource conservation practice.

These results are consistent with findings from previous studies – i.e. that socio-demographic variable (such as level of education, gender, age) were positively and significantly related to concern for the environment (Scott and Willits, 1994; Bjerke et al., 1998b; Chanda, 1999; Bjerke and Kaltenborn, 1999; Fransson & Garling, 1999; Raudsepp, 2001). However, there were regression results for some of the socio-demographic variables that are inconsistent with literature evidence. For instance, contrary to the findings of Buttel (1989) – who reported that occupation is not related to environment awareness and concerns – the findings in this study show that occupation is significantly related to environmental awareness and concerns. In the study conducted by Van Liere and Dunlap (1980), the duo found that gender did not appear to be as significant a predictor of environmental concerns or attitudes as other socio-demographic variables – the opposite to results of this study.

6.16 Thematic Content Analysis

This section focuses on the thematic analysis of people's reaction to the open-ended questions that requested them to suggest ways by which people in communities can be encouraged to improve on their forest/woodland conservation practices. All the suggestions were categorised, and frequency count and percentage analysis carried out on them and summarised (Table 6.25).

Table 6.25 Suggested activities to promote rural environmental education.

Activities to promote rural environmental education	F	Rank
Discourage indiscriminate bush burning	82	1st
Community involvement in forest management should be encouraged	72	2nd
Alternative sources of livelihood	67	3rd
Encourage replanting of trees	55	4th
Stop illegal and indiscriminate felling of trees	50	5th
Enlightenment/education programme for community	44	6th
Provision of alternative sources of energy	36	7th
Stop indiscriminate killing of wild animals	25	8th
Monetary incentives to the people	25	8th
Formulate policies/laws to protect the forests	15	10th
Stringent penalties for offenders	15	10th
Monitoring/supervision of the forest	09	12th
Training/retraining of forestry official	04	13th

One of the FGD participants explained the matter as follows:

> "*Sometime the government talks about incentives for farmers and those who live in rural areas, but in practice, there are no incentives and even when it comes, it is for some few people. This is a big problem. If government wants us to protect the forest resources, which we do anyway in our own way, they should not discriminate in the distribution or giving of incentives. We all have to work for the environment, not people of a particular political party.*"

Another participant declared:

> "*You see, the issue of conserving forest resources is for us all, not [just] us who are here (in rural areas), but also people in the urban areas. People in the urban area don't price or buy our produce, well, if they buy them, well, and we make more money from them, we can reduce the level of exploitation of the resources. Let them help us, let them make kerosene cheaper, create employment for us. We too want to live fine and eat good food like them.*"

Another participant put it this way:

> "*When you talk about protecting natural resources, you have to protect the people that live there. And if they are protected, they will protect the forests. You can't protect a protected forest area, in the face of hunger.*"

When asked how the community can assist in protecting the forests, a participant suggested that:

> "*…one thing that seems good to me, that can be done is to create voluntary forest guards to monitor the forest during dry season when people engage in bush burning, and this, in my opinion, will perhaps stop the burning a bit, since those people who carry out this bush burning live here. They are there in the community.*"

Another participant objected:

> "*No! No! No! I don't agree with that. It's other people's job, those who get salary, should do the work, not me….What do I have to do with the things outside my farm? Nothing! I have my work for which I live from. I won't lose time running after those matters here and there. You catch somebody, report him to the chief and he sees you as (an) enemy.*"

As one village head explained:

> "*We are trying to work with the officials in the reserve to protect this reserve. They told us to tell our people not come into the reserve and we do. But we notice illegal cutting in the reserve, and the officials turn blind eyes to it and instead, they come here to say we are not doing much to help them. The officers are corrupt and they must change. People must be rewarded for helping to protect the forests.*"

Another village head opined:

> "*There are contradictory issues here. We depend on the forests and the government says it wants to reduce poverty and improve living standard. Yet they don't want us to exploit the forests but provide us with no alternative. Every time they increase the price of fuel. Kerosene is no longer available here in the village. Few people who sell it go to the town to get it at higher price and they in-turn sell it at much higher price. The government*

formulates policies without consulting us and wants it to work. No, it is impossible, we should be involved in the planning of the policy and when we are consulted we tell them the problems of our community and what can be done which will benefit not only the people but also the government. So when it comes to implementation we will cooperate because it is what all will agree to. How do you support things that you don't know its working and effects on you?

I think the government should create job opportunities for rural people, bring in development projects, and other activities if they want people to stop using the forests anyhow. People will be ready to stop killing animals, burning and clearing the forests if government can help us. We need fertilizers for our plants; people clear new land when the one they are using for long is no longer yielding good crops. Look if cow meat and fish can be made cheaper and we can see it to buy, we will not go killing all the animals." (A village head during an IDI)

6.17 Conclusion

In this chapter, I have attempted to address the research questions raised in Chapter One. There are two main sections in this chapter: descriptive and inferential analysis; complemented with extracts of comments from the in-depth interviews and focus group discussions. The study has revealed that investigation into rural people's knowledge and attitudes can produce information that could be useful in decision-making concerning the development of rural communities. It is clear from the findings that the rural inhabitants in Nigeria were interested in what is happening to the forest; the respondents understood and were aware of the direct and indirect benefits provided by the forests. They do have extensive knowledge of the forest resources. The results indicate that forest resources are important to household economy, wealth, national economy and national economy. Household economy was ranked uniquely as the most important. Results suggest that forest and non-timber forest products play an important role in the daily life and well-being of rural households in Nigeria. The local people depend on these products as sources of food, fodder, medicines, and construction materials and as a source of income. Forest resources are central to the traditional culture of the local people and they are used as materials for dyes, gum, wrapping leaves, mat weaving, chew sticks, household utensils and agricultural tools. Nigerian rural people conceive of the forest resources as abundant and view their relationship with forest as familial. They seem to know that it is vital to protect and conserve the forest resources because their loss and degradation will affect their livelihoods – yet, because of a lack of alternatives to meet household needs, conservation remains difficult to achieve. Most of the respondents thought that it is their responsibility to protect and conserve the forest. However, in reality, their actions contradict what they were thinking. It was observed that people expressed certain opinions and attitudes in the survey because of socio-cultural beliefs and pressures, but did not act in accordance with those expressed beliefs and values. Differences were found in attitudes and practices between forest resource conservation and the socio-demographic characteristics of respondents. The most important variables for respondents' attitudes and practices about forests and forest resource conservation were: gender, education, and age. It was observed that gender plays an important role in knowledge and attitudes; men's interactions with the forest tended to be for economic gain: women's interactions were to improve household living conditions. It was found that

socio-demographic variables provided strong but limited explanatory power for forest resource conservation. Forest resource conservation knowledge and behaviour were correlated. Age, educational level and gender showed strong relations with forest resource conservation.

The respondents put forward several suggestions that could encourage rural inhabitants to become engaged in forest resource conservation. These included: reassessment of existing forest policies, discouragement of indiscriminate bush burning, increased community participation in forest management, provision of alternative sources of livelihood and introduction of community based environmental education (which adopts an action-oriented approach rather than a knowledge-based approach) to re-orientate and change people's forest resource use and conservation practices. The fact that the people gave environmental education as part of their suggestion suggested that they recognised the immense potential contribution environmental education could make towards addressing the problems relating to forest resource conservation and management.

In the following chapter, I present findings of the analysis of data collected from the three communities in Bushbuckridge, Mpumalanga Province, South Africa, using a similar approach of presentation.

CHAPTER SEVEN

7 Rural People, Forest/woodland Resource Conservation and Environmental Education: Evidence from Bushbuckridge, South Africa

7.1 Introduction

This is the third chapter of four chapters devoted to the presentation and interpretation of data analysis on the data from Bushbuckridge, South Africa. As in the preceding chapter, it addresses the second and third objectives of this study and the corresponding questions and employs the same approach.

The characteristics of the sample households are presented in Figure 7.1 to Figure 7.3. The socio-demographic characteristics of the respondents are presented in graphs. The respondents were 55% male and 45% female. Christians constituted an overwhelming majority of the sampled population; 27% were adherents of traditional faiths. None of the respondents was Muslim.

The mean age of respondents was 39 years. There were more people in the 25—44 age groups; were fewer people were in the 55—64 and over—65 age ranges (Figure 7.1).

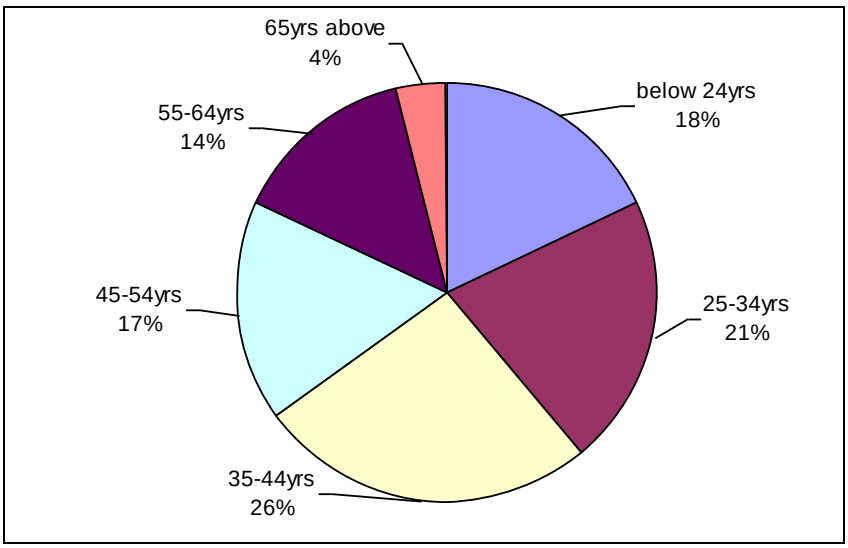

Figure 7.1 Percentage distribution of respondents' age.

Figure 7.2 shows the occupational distribution of respondents. The result reveals that almost half of the respondents were either housewives or unemployed. A few were students, and a few were traders or self-employed. 6% were farmers and drivers respectively; 12% were civil servants. This distribution largely reflects the national occupational and employment statistics in the country.

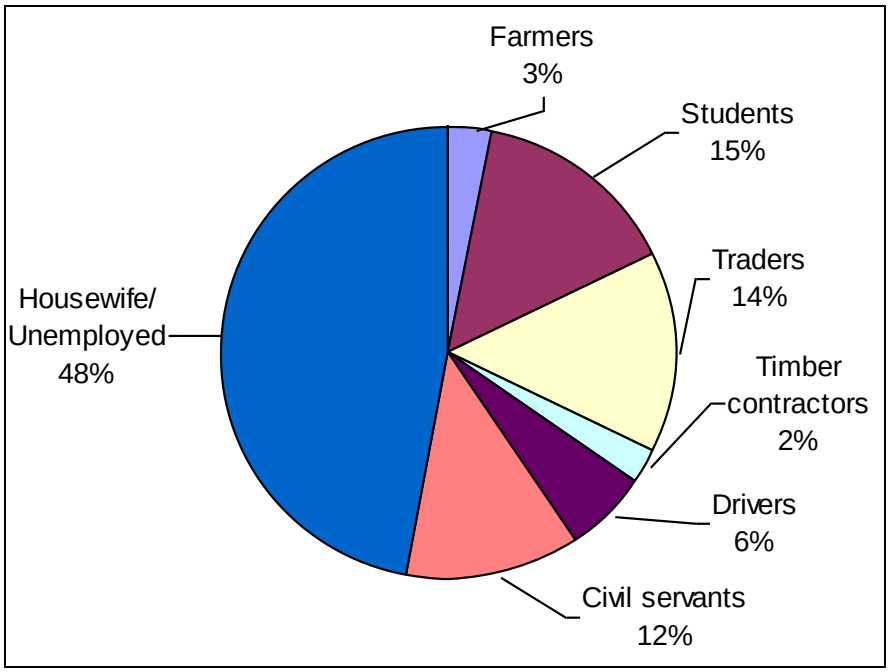

Figure 7.2 Occupational distribution of respondents.

The educational distribution (Figure 7.3) shows that half of the respondents are secondary school graduates. Just as in Nigeria, the majority of those who claimed to possess secondary school education had actually reached only grade 10 or 11. A few had only a primary school education; 11% had no formal education. 7% had completed degrees at technical/teacher colleges and 4% of the respondents had completed courses in a polytechnic/technikon/college of education or had a university education.

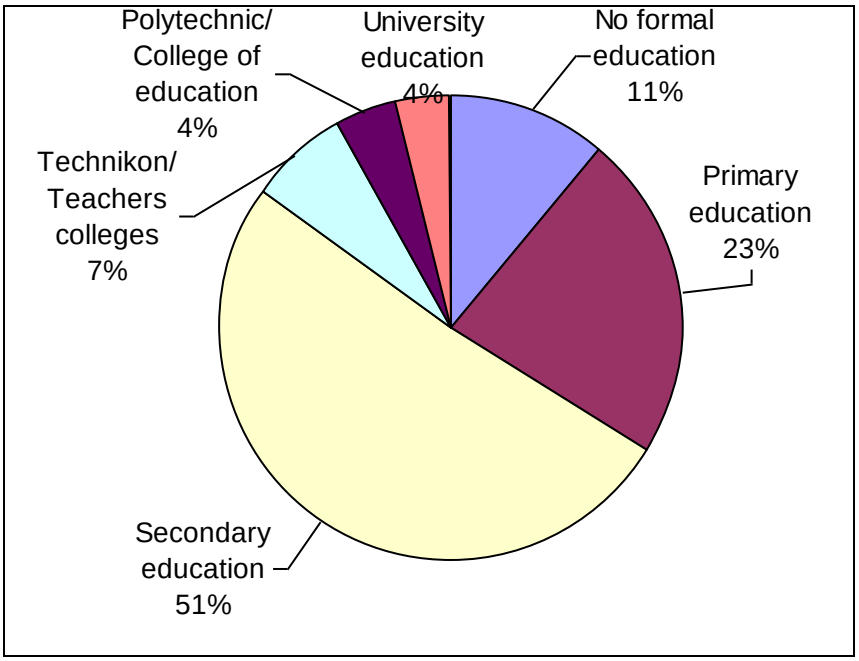

Figure 7.3 Percentage distribution of respondents' educational background.

According to Figure 7.4, the average number per household was six – the same as the national average for South African rural communities.

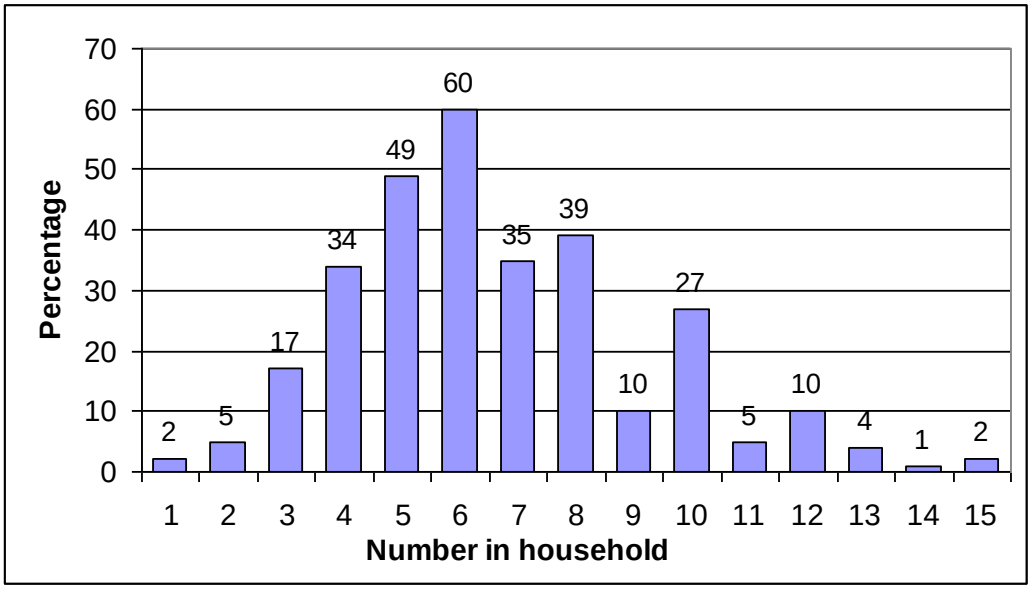

Figure 7.4 Distribution of number of persons per household.

Figure 7.5 shows that, in 60% of the households sampled, one person makes their livelihood from forest resources; 23.7% make their livelihood from forest resources. The explanation for is underpinned by the following opinions were (obtained through informal conversation with the people): firstly, the perception is that farming and related occupations are dirty and meant for the uneducated. Secondly, the government's social welfare policy may actually encourage both idleness and the quest for white-collar jobs among the youth because of the restrictions on access to forestland.

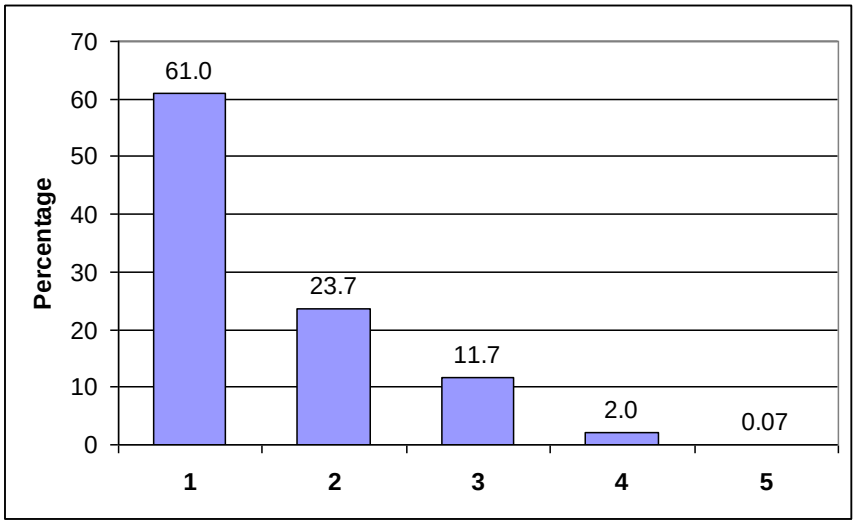

Figure 7.5 Percentage distribution of respondents making livelihood from forest.

Before the relationship between dependents and socio-demographic variables are presented, it is necessary to assess the level of the scores of respondents, according to the dependent variables on forest/woodland resource conservation.

To statistically determine the level of interest, knowledge, awareness, attitude and practices of respondents to forest/woodland resource conservation, two level of indices were identified for each of the dependent variables as follows:

- High and low interest;
- High and low knowledge;
- High and low awareness;
- High and low importance;
- Negative and positive attitudes;
- Good and bad practice.

To determine the low or high for each variable, the sum of the nominal values assigned to the scale were divided by the number of scales in each variable. Thus, for a variable with a 3-point scale, any response with the mean equal to 2.00 and above was regarded as high; any below 20.00 was taken to be low. For variables with 5-point scale – such as attitudes and practices – any responses with mean of 3.00 and above were regarded as positive; any below 3.00 were taken to be negative. This explanation applies to Table 7.1 to Table 7.10, with the exclusion of Table 7.5.

7.2 Interest in Forest Resources

Respondents were asked to rate their levels of interest and concern regarding forest resources using a 3-point Likert scale with the options 'very interested', 'not at all interested' and 'not sure'. Table 7.1 shows that the majority indicated that they were very interested in issues concerning forest/woodland resource conservation. The second question, which was framed in negative terms, also revealed that a large majority care about forest/woodlands. Since the overall mean score is above 2.00, it can be inferred that there was a generally high level of interest and concern for forest and forest resources among the people in the study areas.

Table 7.1 Percentage, mean and standard deviation of interest. (n = 300)

Statement	Don't know	Not much	Yes	Mean	SD
Are you interested in issues related to how we use our forest/woodlands resources?	11 (3.7)	8 (2.7)	281 (93.7)	2.90	0.41
I don't really care about forests/woodlands.	34 (11.3)	242 (80.7)	24 (8.0)	1.97	0.44
Total	45 (7.4)	250 (41.6)	305 (51.0)	**2.43**	0.30

Respondents' interest in forest resources is further demonstrated by the comments of participants at an FGD and interview. A male participant observed that:

> "*We are interested because it is part of our environment and we get many things from there.*"

Another participant opined:

> "*The woodland or forest is where some people make a living, collect fuelwood and fruits, and government too makes money from it through tourism. So we have to be interested in the conservation of the forest.*"

"*Everybody is interested in the woodland. Although now the rain is not falling and everywhere is dry, yet people still go to the veld to collect fuelwood and some fruits. We still collect trees from the woodland and graze our cattle there. So we must be interested in what is going on the veld.*" (An *induna* from one of the villages)

7.3 Awareness of Forest Resources

The awareness of government conservation efforts by respondents was assessed using two questions. A 3-point scale was used for these items, with the options 'Yes', 'Not much' and 'Don't know'. The results indicated that the level of awareness is high (Table 7.2).

Table 7.2 Percentage, mean and standard deviation of awareness.

Statement	Don't know	Not much	Yes	Mean	SD
Are you aware of forest/woodlands resource conservation efforts in this country?	8 (2.7)	162 (54.0)	130 (43.3)	2.41	0.54
Do you know the importance of forest/ woodlands resources of this country?	6 (2.0)	178 (59.3)	116 (38.7)	2.37	0.52
Total	14 (2.3)	340 (56.6)	246 (41.0)	**2.38**	0.44

The mean score of these questions suggests that the level of awareness among the people concerning government efforts – at conserving the forest/woodland and its importance to the country's economy – is very high. This is expected considering the fact that these communities are in close proximity not only to the national game park (Kruger National Park) but also near many private game reserves.

7.4 Knowledge of Forest Resources

Knowledge of what constitutes forest/woodland resources was evaluated using three items. The results in Table 7.3 reveal that people were highly knowledgeable about the forests. The majority affirmed that forests/woodlands are home to the largest number of varieties of plants, insects and animals. An equally high majority showed their knowledge of the forest resources by rejecting the statement that forests/woodlands are *"Just collections of trees with no values to life"*. A clear majority also said "No" to the item that stated that *"…forests are useful in other countries but not in the country of study."*

Table 7.3 Percentage, mean and standard deviation of knowledge.

Statement	Not sure	No	Yes	Mean	SD
Forests/woodlands contain the largest variety of plants, animals, and insects in the world.	43 (14.3)	12 (4.0)	245 (81.7)	2.67	0.71
Forests/woodlands are just collections of trees/plants with no values to life.	12 (4.0)	272 (90.7)	16(5.3)	1.99	0.31
Forests/woodlands may be useful in other countries, but they are not useful here.	3 (1.0)	259 (86.3)	38 (12.7)	1.88	0.35
Total	58 (6.4)	543 (60.3)	299 (33.2)	**2.18**	0.30

The first statement shows that the people were highly knowledgeable about what constitutes forest resources. Although the two other statements display lower scores, people's knowledge of the forest may be interpreted as high because the statements were negatively formulated.

7.5 Importance of Forest/Woodland Resources

Using the mean scores as bases for interpretation, it was found that all the seven aspects of life had mean scores above the value 2.25 – the upper limit used to determine the level of importance placed on forest resources by the respondents (Table 7.4). The overall mean score of 3.37 suggests that a high premium has been placed on forest resources among the people of the study areas. The country's economy was rated as the most important (3.72), with wealth, household economy, quality of environment, quality of life, survival of other life forms and recreation following in that order. The conclusion drawn from this is that forests are seen as socially, economically and culturally valuable – both to the country and to individuals. This result is consistent what has been reported by other studies on the importance of forests and forestry to the country's economy and the livelihood of the rural people in South Africa (Dovie, 2001; Shackleton *et al.,* 2002; Cookes, 2003; Twine *et al,* 2002d; Shackleton, 2004a). This result indicates that a high level of importance is attached to forests/woodlands. People's opinions about the relative importance of forest – to both their household economies and the national economy – became more evident when they were asked to choose between the two economies. The majority felt that the household economy remains much more important than the country's economy.

Table 7.4 Percentage, mean and standard deviation of importance of forest resources. (n = 300)

Aspects of life	Very Important	Important	Somehow Important	Not Important	Mean	SD
Wealth	190 (63.3)	104 (34.7)	4 (1.3)	2 (0.7)	3.50*	.67
Recreation	86 (28.7)	160 (53.3)	50 (16.7)	4 (1.3)	2.44*	.90
Household economy	155 (51.7)	137 (45.7)	8 (2.7)	0	3.82*	.41
Quality of life	107 (35.7)	167 (55.7)	26 (8.7)	0	3.13*	.81
Quality of environment	107 (35.7)	167 (55.7)	26(8.7)	0	3.31*	.80
Survival of other life forms	75 (25)	188 (62.7)	37 (12.3)	0	2.90*	1.0
Country's economy	222 (74.0)	74 (24.7)	1 (0.3)	3 (1.0)	3.46*	.92
Total	942 (45.0)	992 (47.2)	152 (7.2)	9 (0.4)	**3.37***	0.36

Numbers in parentheses are percentage responses ****** Mean score above 2.25.

Several comments of participants at the FGD and informal conversation demonstrated the importance of forest resources to the people:

> "*The benefits we derive from forests are numerous. Forests provide food, medicines, fibres, wild vegetables, and fruits. They are a source of income and employment. The*

various animals found and conserved at the game reserves are both a tourist attraction and a source of national pride." (A participant at FGD*)*

"*The importance of these resources to the people is that they help to alleviate poverty and suffering. People are really suffering here. There are no jobs and they cannot afford to buy electricity to cook, so they rely on the resources from the woodland.*" (A participant at FGD.)

Another participant said:

"*We find things to decorate our houses and collect trees to build kraals to keep the cattle in. Forests protect our houses from strong wind. We get wild fruits like tintoma and tintshigin in order to survive, and our livestock get food from the forest. There are many animals, which are not available in other countries, like the big five, and many people come here to see them and this brings money to not only government but also some people from neighbouring communities.*" (A participant at FGD)

During an informal conversation, a respondent had this to say:

"*The veld or forest is very important to the people here: even more than the government. The majority of the people cannot afford to buy electricity to use for cooking so they rely on fuelwood. And there are some people who collect the wood reeds and thatch grass for sale. It is just that these days there is no rain again and most of these resources are very scarce. The few that we have are eaten up by cattle during grazing. You see, here people are not allowed to feed their cattle at home. You have to take them to the forest and anything they see they eat up.*" (A participant at FGD)

It is clear from the analysis that forest resources are highly valued and that forest degradation poses an increasing threat. The economic and recreational importance of forests has been well documented. The high economic value placed on forests is reflected in the amount of foreign exchange and tourism in the country. Game parks, for instance, provide a popular recreational activity.

7.6 Forest/Woodland Use

The percentages of reported use of forest resources among rural households are summarised in Table 7.5. Numerous forest resources are harvested and used for various purposes A list of nineteen forest/woodland resources was given to respondents and they were asked to say which of these resources they (and others) use in their communities. The results revealed that people rely heavily on the woodland resources for cooking, building materials, food and medicines. They extensively collect and use both tree and non-tree products to meet their daily needs. Forests products – such as fuelwood, fodder, medicinal plants, edible wild vegetables and insects – and other forest products are used. Most of these forest products are collected for subsistence purposes – very few are processed for income generation. This finding is consistent with those in papers by Twine et al. (2003), Williams, (2004), and Shackleton (2004a) which indicated that people in rural South Africa depend heavily on forest resources for their livelihoods. According to Shackleton (2004a: iii):

"*In many instances, the full-time engagement in forest related activities has either lifted participant households out of poverty, or ensured that they have never been close to poverty. However for many others with low skills in remote, rural areas, with few*

employment opportunities or markets for forest products, the direct benefits are more for household consumption, such as fuelwood, edible fruits, medicinal plants and construction timber."

Table 7.5 Percentage distribution of forest resource utilisation.

Forest resources	%	Rank
Fuelwood	98.0	1st
Indigenous poles for construction	92.0	2nd
Wood for household utensils	84.0	4th
Wood for furniture	56.0	16th
Wood for carving	56.0	16th
Wild herbs	74.0	9th
Edible wild fruits	80.0	6th
Mushrooms	57.0	15th
Honey	51.0	18th
Edible insects	67.0	11th
Wild animals (bushmeat) for food and income	58.0	14th
Bird eggs	42.0	19th
Medicinal plants	73.0	10th
Thatch grass	66.0	12th
Reeds for weaving mats	79.0	7th
Reeds for construction	85.0	3rd
Grass and trees for livestock	84.0	4th
Seed for rattles or decoration	61.0	13th
Grass and twigs for sweeping	79.0	7th

7.6.1 Fuelwood

As in many developing countries, fuelwood constitutes the cheapest and most accessible source of household fuel for the majority of the people in the study area. The survey reveals that the majority of householders are dependent on fuelwood for their primary source of energy for cooking and heating and also use wood for other purposes. Fuelwood contributes over two-thirds of the total energy used in the study areas. Of the 300 households sampled, 98% used fuelwood for cooking. Only 2% said they used other sources of energy. This is consistent with the findings of Shackleton *et al.*, (2002), Williams *et al.*, 2002; Shackleton (2004a); Twine (2005). Figure 7.6 and Figure 7.7 illustrate several of the activities associated with the exploitation fuelwood in the study communities.



Figure 7.6 A woman returning with fuelwood from the veld.
(Photograph: Ayodeji Ifegbesan)

Comments from the FGD and IDI in the study communities further illustrated the wide range of uses of forest resources. Most of the respondents advanced reasons for relying on the forest/woodland resources. The people complained that they were poor and could not afford to buy electricity and had to depend mainly on forests for their building materials.

A man said:

"*We don't have any other source for building poles and cooking than the forest/woodland. Most of the people here are unemployed, and do not have or know any other thing we can use.*" (A participant at FGD)

Another had this to say:

"*The most common use of the forest resources is fuelwood. People collect firewood for cooking. That is the major source of energy for cooking. We only use electricity for operating radios and to light the house in the night. People also use it for the construction of kraals to keep cows. Thatch grass is used for roofing. Some use wood for furniture and carving of household utensils and items which they sell to tourists.*" (One of the *Indunas*)



Figure 7.7 A woman cutting wet trees for fuelwood.
(Photograph: Ayodeji Ifegbesan)

Fuelwood collection was not perceived by people as causing degradation to the woodland if it was limited to dry or dead wood. The majority of the respondents said they did not collect wet or green wood. While walking through the veld with my field assistant, I saw a few women in the act of cutting wet wood. I asked my field assistant to seek permission from one of the women to take a photograph in action, to which she agreed. I asked her no questions so she would not misread my intention. I could hear the sound of blades cutlasses as they landed on wood in other parts of the woodland while we walked. I foresee a crisis in fuelwood collection in the near future if the rate at which people cut down wet trees is not controlled. The environmental effects of this act are already noticeable in the form of soil erosion and excessive heat and lack of rainfall. People attribute some of these problems to God. As one *Induna* put it, when he was asked what caused the low rainfall, in the area:

> "*I do not know. I don't think there is anyone that has an answer for that. I think it is God's way of punishing us for our wrong doings. Long ago, we used to feed our cattle and take them to the fields across the valley. It was always full of water and wet. When the cattle entered the water, it came up above their thighs. We used to collect and eat whatever we wanted from the field. Now the story is different.*" (*Induna*.)

7.6.2 Thatch, Reed, Grass for Livestock

Various species of reeds are available and are used for a variety of purposes, for instance – weaving mats and roofing. Between 66% and 85% of the households sampled in the study areas used thatch grasses, reeds and grass. However, because of low rainfall in the recent past, these resources are now in short supply. Several said they have to travel far to places of relatively high rainfall to buy products, especially reeds (Figure 7.8), which they use for roofing their rondavels.



Figure 7.8 Reeds growing along a watercourse.
(Photograph by Ayodeji Ifegbesan.)

7.6.3 Indigenous Poles

Almost every household in the study area has evidence of the collection and use of indigenous poles in their compounds – 92% of the households sampled use poles for constructing their traditional rondavels (circular huts with conic thatched roof). Most of the fences and kraals for the

livestock are also constructed from poles. These poles come in various thicknesses and are cut, by local individuals, from the woodlands. People are expected to obtain permission from the tribal chief before cutting indigenous poles.

In the study areas, community forests exist where village people graze their cattle. It is from these communal forests that people cut wood for fuelwood. Every household visited had a pile of wood in their compound. Most of their fences are made from trees of various shapes, size and thickness. Many of the houses are constructed entirely out of wood. A few houses were made of red burnt bricks and cement, with roofs of reeds and thatch grasses. The roofs are so tightly woven that water cannot penetrate. Although there are fewer agricultural activities among the people – when compared to Nigeria – many compounds contained small gardens. Figure 7.9 and Figure 7.10 show a variety of uses of wooden poles.



Figure 7.9 A traditional rondavel.
(Photograph by Ayodeji Ifegbesan)



Figure 7.10 A traditional kitchen (*guma*) made of woodland trees.
(Photograph by Ayodeji Ifegbesan)

7.6.4 Wildlife

Wildlife is one of the most valuable living natural resources in the country, providing income and revenue in terms of tourism, employment and food. The tourism industry generates income not

only within the tourism sector, but also in other related areas – such as local handcraft, agriculture, transport, communication and culture. Several of the diverse wildlife species that are abundant in the game reserves are illustrated in Figure 7.11 and Figure 7.12.

Only about half (58%) of the household surveyed acknowledged that they used bushmeat; 42% of the households collect bird eggs. It seems that the proportion of people who admitted to using bushmeat and bird eggs is underestimated because of the legal sanctions. Many acknowledged that they are not allowed to kill the animals, but claim that they buy and eat wild animal or bushmeat. They noted that the people who sell it go into the reserve under the cover of the night to steal it.

To some groups this is seen as bad: others say they do it for survival. An old man said:

"I don't blame those people poaching the animals. They have no job and they have to survive, and we buy it from them. It is cheaper than what you get at the store."



Figure 7.11 Giraffe.
(Photograph by Ayodeji Ifegbesan)



Figure 7.12 Buffalo.
(Photograph by Ayodeji Ifegbesan)

"*If there is no wildlife, there will be no tourists coming to South Africa. Everybody comes here because we conserve our animals, so people should not be allowed access to the forests especially the reserves to collect fuelwood in order to prevent them from killing the animals.*" (A young male participant at FGD)

"*Wildlife is the true attraction of South Africa and tourists are coming to see them. It boosts the economy and creates employment. I know some people who are employed on the game reserves, parks and lodges. It must be conserved and protected.*" (Participant at the FGD)

7.6.5 Wild Fruits and Vegetables

The variety of wild fruits and vegetables collected and consumed by households was discussed at interviews. These are not only consumed for their nutrition, but also used to generate income. Between 57% and 80% of households sampled used mushrooms, edible fruits and wild vegetables. Women gather wild vegetables, fruits and plants, which are used in households as medicine or food, from the forests. The food plants gathered in the forest and in the fields are green-leafed vegetables, mushrooms and sometimes fruits. The majority of the green-leafed vegetables are available during the rainy season. Wild vegetables are seen not only as an important food source, but also as a source of income. Women in the study areas use more than 20 wild plants species to make a traditional soup. Wild fruits collected by households are common – several were mentioned during the focus group discussions. The knowledge and processing of these wild fruits and vegetables into food is done only by the older generation. The knowledge and skills have not been transferred to the younger generation because the younger people tend to prefer modern foods. The knowledge of traditional foods is complex and demands a lot of time and patience.

Among the commonly eaten wild fruits are *Strychnos spinosa* (Green monkey orange or Masala) (Figure 7.13), *Sclerocarya birrea* (Marula/Nkanyi) (Figure 7.14), *Diospyros mespiliformis* (Jackelberry/Ntoma) and *Carissa edulis* (Tinthuguri).



Figure 7.13 Green monkey orange or *Masala*.
(Photograph by Ayodeji Ifegbesan.)



Figure 7.14 Marula seed.
(Photograph by Ayodeji Ifegbesan)

7.6.6 Honey

The collection of honey from the wild is not common among the respondents in the study areas. However, 51% of the people said they use honey, but do not collect it for fear of being stung. Several respondents, during informal conversation, observed that because of the lack of rain and deforestation, there is no longer vegetation in the area in which bees can build their hives. Honey is said to be used to cure stomach ailments and other diseases.

7.6.7 Medicinal Plants

Like most Africans living in forests, South Africans in the study areas use wild plants for traditional medicine. 73% of the respondents say that they – or people in their communities – collect and use medicinal plants. This supports previous research findings that also concluded that rural people rely on medicinal plants for their primary health care needs (Farnsworth *et al.*, 1981; Kothari, 1996). The problem with traditional medicine is that it is seen as part of the traditional religious belief system. Several people claimed to be using traditional medicine, which they had bought from the *sangoma* or *inyanga*. Many felt that, as Christians, it is immoral to talk about or use traditional medicine. Medicinal plants are not collected as extensively as food plants, with many households claiming that they prefer to consult medical clinics. It is generally agreed that the knowledge and collection of traditional medicines is increasingly the domain of elders and traditional healers. The younger generation has overlooked the significance of traditional medicine and favour modern medicine. A significant proportion of the households surveyed do collect medicinal plants for home use, but many buy them from traditional healers.

7.7 Attitudes towards Forest Resources

Participants were asked to reflect upon their attitudes towards forest/woodland resource conservation by indicating the extent to which they agree or disagree with eight statements. The 5-point scale included the options “’strongly agree’, ‘agree’, ‘don’t know’, ‘disagree’ and ‘strongly disagree’. With the overall mean score of 3.81 that is above 3.00, the results indicated that the overwhelming majority of respondents possessed favourable/positive attitudes toward forest/woodlands.

Table 7.6 Percentage, mean and standard deviation of attitudes towards forest/woodland resource conservation (n = 300)

Statement	SA	A	Don't know	D	SD	Mean	SD
Forest/woodlands resources should be conserved to ensure healthy population of all wild species of trees, plants and animals.	201 (67.0)	83 (27.7)	8 (2.7)	7 (2.3)	1 (0.3)	4.59*	0.69
Forest/woodlands resources have ways of re-generating themselves whether we care or not.	69 (22.3)	153 (51.0)	35 (11.7)	36 (12.0)	9 (3.0)	3.78*	1.02
Protecting the jobs of forest industry workers is more important than protecting endangered species.	16 (5.3)	84 (28.0)	36 (12.0)	89 (29.7)	75 (25.0)	3.41*	1.28
The most important objective of forest/woodlands management should be to protect the environment for all.	139 (46.3)	135 (45.0)	12 (4.0)	14 (4.7)	-	4.33*	0.76
Everyone should be concerned and do something towards protecting the forest/woodlands resources.	152 (50.7)	125 (41.7)	7 (2.3)	13 (4.3)	3 (1.0)	4.37*	0.81
It is government's responsibility alone to protect and conserve the forest/woodlands resources.	56 (18.7)	168 (56.0)	19 (6.3)	33 (11.0)	24 (8.0)	2.34	1.14
God gave us the forest/woodlands to use in meeting our needs and we should not be denied that natural right.	15 (5.0)	58 (28.0)	39 (13.0)	77 (25.7)	85 (28.3)	3.44*	1.30
If we want wildlife to survive, we must look after the natural places where they live.	142 (47.3)	111 (37.0)	27 (9.0)	16 (5.3)	4 (1.3)	4.24*	0.92
Total	790 (34.5)	917 (40.0)	183 (8.0)	285 (12.4)	116 (5.1)	**3.81**	0.42

Note: SD – strongly disagree; D – disagree; DK – don't know; A – agree; SA – strongly agree.

* Mean score above 3.00 indicates a positive attitude.

Mean scores on individual attitudinal statements ranged from 2.34 to 4.59. The scores of these eight statements were added together to create a single attitude scale for the study areas. On average, 87% and 83% of the respondents either 'strongly agreed' or 'agreed' with the first three attitude statements. Mean scores on individual attitudinal statements ranged from 4.19 to 4.25 on a 5-point scale. The scores of these eight statements were added together to create a single attitude scale for forest/woodland resource conservation in the study area.

To the majority of the respondents (94%), forest/woodland should be conserved to ensure healthy populations of all species of trees, plants and animals. 73% agreed that forest/woodland will regenerate themselves whether they are conserved or not. To 73% of respondents it was more important to protect jobs in the forest industry than to protect endangered species. 91% agreed that the most important objective of forest management and conservation should be to protect the environment for all. 92% believe that everyone should be concerned and do something towards protecting the forest/woodland. Respondents agreed that it is the government's responsibility alone to protect and conserve the forest/woodland (75%), but 54% disagreed with the statement that 'God gives us the forest/woodland resources to meet our needs and we should not be denied the right to use them'. 84% felt that if we want wildlife to survive, we must look after their natural habitats.

"*We must love and protect the forest resources and not the jobs of people working there. Although their jobs are important, nature is more important and in any case it is because the forests are being conserved, that is why they are getting job to do.*" (A woman participant at FGD)

"*Yes, God gives us the resources but now we are not allowed to use them. They know that some of us are poor and depend on them to survive*." (A respondent in an informal conversation)

"*If we say God gave us the rights to consume the plants and animals for free, it should not be denied. Yes, it is true, but I think people must still learn to use it effectively and not destroy it. Government should come in to take charge*." (A participant at an FGD)

"*I will not be happy if I'm prevented from going into the woodland. If he is an elderly person, I will be heart-broken but if he is my age, I will fight*." (Young male FGD)

"*They can prevent people from killing animals and wildlife because of their importance to the country's economy, but not from cutting fuelwood that is the source of energy for majority of people here.*" (Female respondent during informal conversation)

"*The jobs of people are more important than the life of animals. Our life is more important than the lives of animals. People have to feed their families. Because of the level of unemployment, I agree to protect the jobs of people rather than the wild animals.*" (Participant at FGD)

"*If they closed the forest, where would we get fuelwood to cook? What are they doing with the forest if they don't want people to cut trees for income and energy?*" (Female during informal conversation)

From these statements, it can be seen that people's attitudes towards forest/woodland vary. While several express positive feelings, others hold negative attitudes towards the government's actions to protect the resources. This was as expected because of the level of unemployment among the people. The reason for positive attitudes is derived from the direct and indirect benefits accruing to the people – both from tourism activities going on in the area and the expectation of improved and better livelihoods – which might come in the future through conservation. Although the people in the study areas had positive attitudes towards forest/woodland, this has not been translated into environmentally friendly actions or practices. Because of their high dependency on forest/wood and the lack of alternatives, people are not able to change their present resource-use patterns. It is important to recognise and foster all positive attitudes to engender better human-environment relationships in the area.

7.8 Practices of Forest/woodland Resource Conservation

Table 7.7 shows the frequencies, percentages and mean scores relating to acceptability or otherwise of various practices of forest/woodland resource conservation. The respondents' forest/woodland resource conservation practices were assessed with ten statements on a 5-points scale. The practices statements were scored considering negative or positive wording of the items. For every positively worded statement, the respondents progressed from five through four, three, two and one for 'very

acceptable' (VA), 'acceptable' (A); 'don't know' (DK), 'not acceptable' (NA); 'very unacceptable' (VUNA) respectively. The scoring pattern was reversed for the negatively worded items. Using the overall mean score of 2.81 as the basis for the interpretation, it can be concluded that people from the study areas agreed that forest/woodland resource conservation was unacceptable to them.

The first three statements expressed clear positive practices among the respondents. The low scores observed in the other statements notwithstanding, the practices relating to these statements must be interpreted as positive because the original statements were negatively formulated, thus the low scores correspond with the symmetric high scores that represent inappropriate forest/woodland resource conservation practices.

Table 7.7 Acceptability of various practices of forest/woodland resource conservation [Frequency of responses, percentage, mean score and standard deviation] (n = 300)

Practices of forest/woodland resource conservation	VA (%)	A (%)	DK (%)	NA (%)	VUNA (%)	Mean score	SD
Harvested areas should be allowed to regenerate naturally.	145 (48.3)	101 (33.7)	5 (1.7)	39 (13.0)	10 (3.3)	4.11	1.15
Leaving clumps of trees for wildlife to inhabit.	97 (32.3)	137 (45.7)	31 (10.1)	35(11.7)	-	3.99	0.95
Closing forest access roads to control illegal logging.	100 (33.3)	140 (46.7)	17 (5.7)	32 (10.7)	11 (3.7)	3.95	1.07
Inadequate forest management planning.	57 (19.0)	136 (45.3)	49 (16.3)	47 (15.7)	11 (3.7)	2.40*	1.08
Loss of protected land to urban expansion.	46 (15.3)	109 (36.3)	49 (16.3)	75 (25.0)	21 (7.0)	2.72*	1.20
Lack of protection for old growth in forest/woodlands.	50 (16.7)	179 (59.7)	23 (7.7)	36 (12.0)	12 (4.0)	2.27*	1.01
Construction of oil/pipelines across forest land.	51 (17.0)	129 (43.0)	40 (13.3)	60 (20.0)	20 (6.7)	2.56*	1.18
Not planting trees to replace the ones cut.	89 (29.7)	166 (55.3)	5 (1.7)	30 (10.0)	10 (3.3)	2.02*	1.01
Indiscriminate bush burning.	96 (32.0)	153 (51.0)	5 (1.7)	32 (10.7)	14 (4.7)	2.05*	1.09
Current logging/cutting practices.	75 (25.0)	164 (54.7)	24 (8.0)	27 (9.0)	10 (3.3)	2.11*	0.99
Total	710 (26.4)	1261 (46.8)	243 (9.03)	381 (14.2)	95 (3.53)	**2.82**	0.59

Note: VA – very acceptable = 5; A acceptable = 4; DK – don't know = 3; NA – not acceptable = 2; VUNA – very unacceptable = 1. N = 300. * Negative practices = scores inverted.

The results indicate that the overwhelming majority supported practices with regard to forest/woodland resource conservation. This result is inconsistent with the finding on interest. Almost half of the respondents believe the forest needs to be conserved and that some of their current practices negate the interest that they expressed. Aggregating the responses, the majority of the respondents found the following to be acceptable the forest conservation practices: natural regeneration of harvested areas (82%); leaving clumps of trees to protect wildlife (78%); closing the forest roads to control illegal felling (80%); inadequate forest management planning (64%); loss of protected land to urban expansion (52%); lack of protection for old growth forest/woodland (76%); and the construction of an oil pipeline across forest (60%). 85% of respondents found the practice of not planting trees to replace the ones cut unacceptable; 85% condemned indiscriminate

bush burning and 81% disapproved of current logging practices. Respondents' attitudes towards these practices were supported with comments about what practices they thought would be acceptable.

To illuminate people's reactions further, comments from several of the participants at the FGD and interview are provided:

> "*We should be given access to the woodlands. We should not be denied access to them. It is people who use them for bad purposes or do something bad within veld that should be denied access.*" (Adult male during FGD)

> "*The government is protecting the forest well but doing so to the detriment of the people. We cannot go into the forest to cut trees or collect the wild fruits, insects and animals you are asking about. The communal forest is for cattle to graze in and they eat everything they see on their path including wild herbs and vegetables. If you want to get any you have to go deep into the forest where people are allowed cut poles for fences.*" (An *induna* of one of the villages)

> "*Look, it is true that people must not be denied access, not like outsiders. People coming from outside that are not members of this community should be denied access so that we here in the community we can enjoy the resources. You see, it is these people who cut most of our fuelwood.*" (A Participant at FGD)

> "*If you deny people access you will be creating more poor people and criminals because there are no jobs so they will go and steal or cut more trees to be sold to people. The problems of poaching and indiscriminate cutting of trees are the result of this current restriction and denial.*" (A participant at FGD)

> "*We must love and protect the forest resources and not the jobs of people working there. Although their jobs are important, nature is more important. It is because the forests are been conserved that they are able to get jobs there.*" (A participant at FGD)

> "*I don't think people should be given access to the forest because if they give us access, people will take the wood and kill animals.*" (A participant at FGD)

When I asked the chiefs to comment on the current conservation practices of the people of their communities, they expressed mixed reactions. They indicated that there are some people who tried to ensure that the forest resources are preserved by engaging in environment-friendly practices, but there were others whose activities were bad and threatened the forest's resources. Figure 7.15 is an example of the needlessly destructive practices of some people in the study area.

> "*I cannot totally say that people's attitudes and practices towards forest/woodland resource conservation are good or bad. There are some people who try not to chop the trees, or burn the veld or kill animals, but these are few. There are many people who do bad things to the forests. When people are given permission to chop certain numbers of trees by the chief, they cut more than they are permitted. When some people collect fuelwood they do not cut dead or dry wood, but also cut wet live wood. These are bad acts/practices. It is not good.*" (Headman)



Figure 7.15 Live tree cut down.
(Photograph by Ayodeji Ifegbesan).

7.9 Awareness of Environmental Education

Data on environmental education and awareness conducted among the people was measured with three quantitative questions and heavily complemented with more probing questions during the interview and focus group discussions sections. When asked whether they had heard of environmental education (EE), the majority of the respondents openly expressed their lack of awareness of environmental education. Only 25% had heard of EE (Figure 7.16).

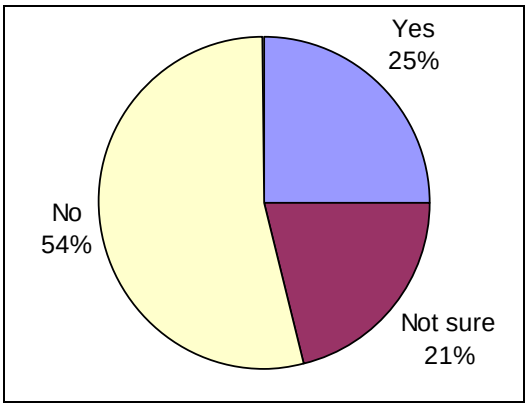

Figure 7.16 Percentage distribution of respondents' awareness of environmental education.

Respondents were asked to identify (from a standard list) their major sources of information on environmental education (Table 7.8). These sources included: radio/television (broadcast media); magazines and newspapers (print media); school/college, conferences, seminars/workshops; posters/pamphlets; government environment workers; family, neighbours/ friends, and others. The greatest percentage of respondents said they had never heard of EE (70%) and those that had heard of EE had learnt of it at school or college (10%). Approximately 6% of respondents had heard of EE from government environmental workers.

Table 7.8 Percentages of sources of environmental education information.

Sources	F	%
Television/Radio	25	8.3
Newspapers/Magazine	15	5.0
School/College teachers	30	10.0
Conference, Seminar/Workshop	2.0	0.7
Poster/Pamphlets	0.0	0.0
Government officers	18.	6.0
Neighbours/friends	0.0	0.0
Don't know	210.	70.0
Other (Specify)	0.0	0.0
Total	**300**	**100**

Few had heard of EE through radio and television (8.3%), newsprint (5%) and conferences, seminars and workshops (.7%). Accordingly, the majority of the respondents (77 percent) claimed they have not participated in any training on environmental education. It is only 23 percent of respondents who confirmed ever attended a training in EE. These percentages suggest that there is inadequate EE and awareness on forest resource conservation. This is in spite of the fact that the forest policy explicitly recognised environmental education as one of the strategies for ensuring sustainable forest resource conservation.

The question of awareness of environmental education by the respondents' and extent to which environmental education has been carried out in communities was explored further. Both interview data and focus group discussions suggested that there little or no training/education, in form of environmental education, has been carried out in the communities.

According to the *Indunas* interviewed, households in the communities have had very limited experience with the protection and conservation of woodlands and no training. One of the *Induna* explained it as follows:

> *"They are not exposed to any awareness or education programmes. No government officials have come to educate us on how to protect and conserve our veld, water or other natural resources. Despite the closeness to the Kruger National Park here, we don't have opportunity to go there and be able to look at the animals and be taught some of this things. It is the foreigners that have access to the place."*

Through informal discussions, I confirmed that none of the households were aware of EE nor had they participated in any environmental education programmes. They expressed deep enthusiasm towards learning about the environment generally and forest resource conservation in particular. Several of them talked at length about what they appreciated about nature. One of them put it this way:

> *Our environment has been destroyed. Wild fruits like tithiudulula are no longer available. You can get tintshigun very far away. We did not manage to conserve our environment well. People are cutting trees to make firewood freely. They are cutting trees that are bearing fruits. They are killing animals, birds are no longer available.*

Many people are getting poles without permit from the Chief's office. Most people are unemployed and not educated as far as nature conservation is concerned. Government and NGOs should come to educate and give training to people on nature conservation including water conservation. There should be project that teaches people to conserve forest resources Teach people to use forest resources to make money so that they can buy electric stove and it will stop them from cutting trees.

Another adult stated:

Our forefathers were the only generation which conserves this forest, but the new generation as cutting all the trees. The government has to conduct educational programmes like workshop and awareness campaigns. It is very much important to educate the new generation about the forest. They must know that this tree is bearing fruits or medicine.

Collectively, the young people who participated at the FGDs indicated that the lack of environmental education and awareness programmes for the people in the rural communities is the major cause for deforestation and environmental problems in the study areas. All of the participants reported that they had never participated in an environmental education programme, other than two who claimed to have visited the Kruger National Park on excursions where they were taught something concerning wildlife conservation. A few others who had heard of environmental education and forest resource conservation, reported that their knowledge had come from school as well as through the activities of Games Reserve Officials, non-governmental organisations (NGOs) and researchers from Wits Rural Facility who occasionally conduct research among the communities. Participants are quick to point out that there are few NGOs focussing on environmental issues – particularly forest/woodland resource conservation. They observed that much of the training and intervention programmes by the non-governmental organisations around the communities are HIV/AIDS related. Here are several responses from participants:

Participant 1: We are not aware of any training and environmental education project.

Participant 2: Well, I will not like to say there is none. There might be but I'm not sure they have been discovered that we needed it like they came to educate us on HIV/AIDs.

Participant 3: I don't know why we are not taught? Maybe it is something for the people of urban cities-joburg, cape-town. They may be the only people who should know about making the community beautiful and planting trees. But we have more trees and wildlife than them so we need environmental education and awareness programmes in our community

When I asked the householders and participants at the FGDs and informal discussions about their understanding of many of the concepts often used in EE programmes – such as nature, wildlife, endangered animals, ecology concepts, human-environment relation, pollution, conservation etc. their responses suggested that these ideas have limited meaning for many of the people.

One respondent echoed the need for information about forest resources when he remarked:

"*Well it would be nice if people can come and provide us with the necessary information about some of these plants and animals as well as government policy. Most people don't*

know which of these plants or trees are not to be cut or endangered. People here need not just information but also education, especially the youth. Many of them don't know the value of the various plants. Government should teach people about the importance of plants and the forests." (Adult male)

A majority – 53% of the sample – felt that government efforts to protect forest/woodland resources in the country are good; 40.3% rated it as fair and 6.3% as poor (Figure 7.17).

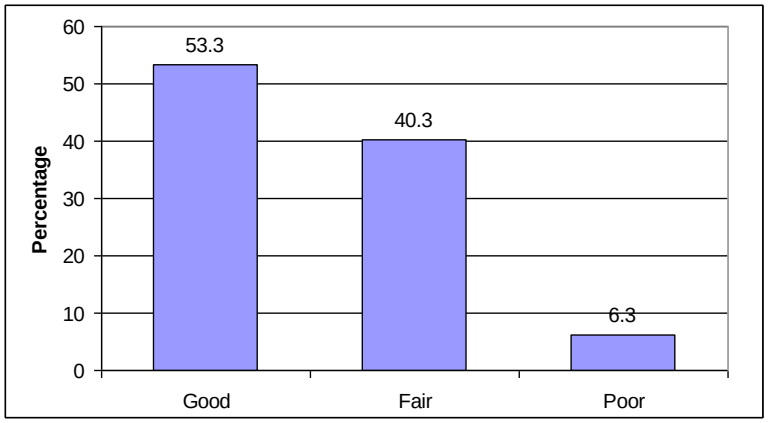

Figure 7.17 Percentage of respondents' assessment of government efforts to forest/woodland resource conservation in the community.

Figure 7.18 shows respondents' assessments of the people's attitudes toward woodland resource conservation. Unexpectedly, only 12.3% rated the people's attitude as good, 46.3% rated it as fair, and 41% as poor.

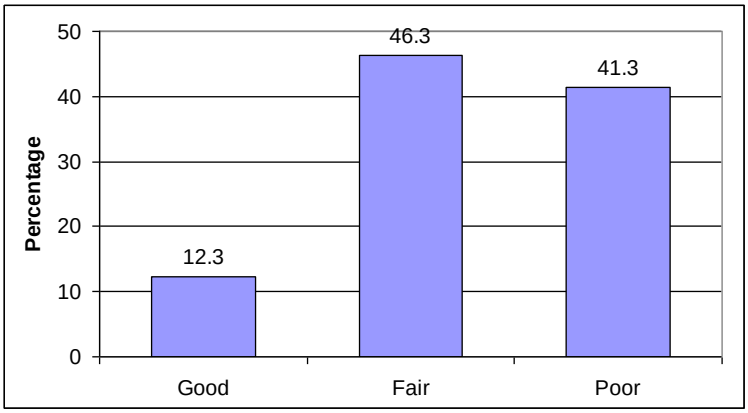

Figure 7.18 Percentage of respondent assessment of people's attitudes toward woodland resource conservation in the community.

People depend on collection in the communal forests for a variety of needs, including fuelwood, fibre, building materials, medicine, fruit and food. People do not agree that household forest use may be causing degradation to the resources. To them the factors contributing to degradation are multifarious. Causes of forest resource degradation or depletion mentioned by respondents include: poverty; unemployment; an absence of alternative sources of forest goods (such as fuelwood); population pressure; cattle grazing; soil mining; illegal harvesting and the extraction of resources by 'outsiders'.

An old man, interviewed during fieldwork, remembered with nostalgia the abundance of forest resources:

"*In the olden days, we could get lots of wild fruits, vegetables and animals. People plough the veld. Also, in those days, there was plenty of fuelwood and rainfall was high. People kill and eat wild animals without restrictions.*"

Another participant, a female expressing her concern about the level of degradation of the woodlands, described the situation where the forest is longer safe to collect fuelwood, wild fruits, eggs and others things. She put it this way:

"We have the veld, but it is not safe again. A lot of things use to happen there. You go to collect fuelwood you see condoms and syringes. People are raped, and robbed in the forests by some bad people. I just don't want my girls to go there alone. Government must make paraffin cheaper so that people can use not energy source to cook."

This comment is a pointer to the inseparability of social and physical environmental concerns. It also calls attention to the need to address the social concern of the people as part of both EE and the awareness programmes that will make the community appreciate their relationship with the forests and subsequently protect and conserve them.

When asked who should be responsible for looking after the forest/woodlands, 82% said it should be the responsibility of all stakeholders, i.e. government, chiefs and other village structures. 11% attributed the responsibility to chiefs, headmen and other village structures; 7% said it should be both government and chiefs/headmen (Table 7.9).

Table 7.9 Percentage of who should be responsible for looking after the forest/woodlands.

Responsible structure	%
Chief/Headman and other village structures	10.7
Government/Chief/Headman	7.0
Government, chief and other village structure	82.3
Total	**100**

Interestingly, none of the respondents felt it should be left to the government alone nor to the chief/headman alone. The result suggests that the people interviewed recognised their role in the protection and conservation of the resources of their community. This can be demonstrated further with extracts from the FGD and interviews.

"*We are the government here. Mbeki is up there: he cannot come down to help us prevent people from cutting down trees, and we should do it ourselves.*" (A female participant at FGD)

"*It should be the responsibility of us all to take care of the environment, not just the forest/woodland resources as you call them, because it affects us all.*" (A participant at an FGD)

"*It is our responsibility to protect our environment so that people don't set it on fire and destroy the woods, plants and animals.*" (A participant at FGD)

These statements suggest that people are ready to take control of their environment and this attitude is consistent with the principles – of decentralisation and involvement of local people in the management of natural resources – advocated in many international and national policies and documents.

Information on forest degradation was obtained in the village survey and through observation of the extent of forest degradation by the researcher. Figure 7.19 and Figure 7.20 show examples of severe erosion arising from forest degradation and slash burning around the community.



Figure 7.19 Soil erosion illustrating indiscriminate forest degradation.
(Photograph by Ayodeji Ifegbesan).



Figure 7.20 Soil erosion illustrating indiscriminate forest degradation
(Photograph by Ayodeji Ifegbesan)

The majority of people in the study areas live on communal land and depend on resources found in these areas. Traditionally, woodlands in communal areas were subjected to common property management, where a clearly defined group had user rights on resources and land. Traditional leaders were responsible for enforcing rules regarding access regulations and punishment.

"*I don't know how many of these resources are no longer available. I don't know how bad or serious the situation is. But I do know that people cut trees and burn the forest indiscriminately. I know it happens and I know where it is, but I don't know the impact it's having.*" (An *induna* of a village)

Another Induna explains:

Yes, people are expected to permit. Permits are regulated in the community by the Induna and the requirements depend on need, whether the collection is for commercial purposes or for domestic use. To enter the community forest, a collector must obtain permission from the village headman and follow the rules regarding poles, rattan harvesting. If the poles collected are intended for sale, the collector must pay tax to the treasury. If it is intended for domestic use, it is enough to obtain permission from the village head. Villagers can collect poles and other resources freely in the communal owned forest of the village without permission from or notification to the village head either for sale or domestic use. Collectors other than villagers, either people from neighboring villages or outsiders from downstream regions, must first report to the village head.

One of the young participants at the FGD commented:

There is certain amount of rands you are suppose to pay before you go to the forest. You must not cut trees that are still alive. After paying the money, somebody is appointed to follow the collect to the forests to ensure that he did not cut more than he has been given permission to cut.

It was interesting that people claimed responsibility for forest resources, but when asked how many of the people who sell bushmeat, poach wildlife or burn the forests have been arrested and reported to the authority, they cannot answer. Instead, they justify people's negative actions and blame poverty and government.

"*Look, you don't report such people. The person arrested or their family members will hate you or even threaten to kill you. That is why government must employ security guards and put up strong fences. If security guards caught someone breaking the law, there would be no problem. But if it is the member of the community, there will trouble.*" (A participant at the FGD)

"*Most of the people who poach animal or burn the veld or woodland does so when people are not watching. These activities are normally carried out it in the evening or night. And if they notice you can be a threat to them or know that you can inform the authority, they can attack you and threaten to kill you if you dare to tell the government.*" (A male participant at the FGD)

This latter statement suggests that there is a social connection between members of the study community that make it difficult for them to accuse or arrest anyone – especially members of the same community found violating the rules.

7.10 Thematic Content Analysis

A thematic analysis of people's reactions – to the open-ended questions regarding ways by which individuals can be encouraged to improve on their forest/woodland conservation practices – was

conducted. All the suggestions were categorised and frequency count and rank analyses were carried out. Table 7.10 presents the summary of the suggestions. Majority of the respondents (120) suggested education and training. This is consistent with the earlier finding on the absence of any form of environmental education in the communities. One hundred and two mentioned the provision of cheaper alternative sources of energy.

Table 7.10 Suggestions on ways of improving forest/woodland conservation.

Suggestions	F	Rank
Education and training	120	1st
Creation of job opportunities	66	4th
Employment of more security personnel	56	5th
Provision of cheaper alternative sources of energy	102	2nd
Community participation in forest management	87	3rd
Tribal authorities to be given more powers	34	6th

7.11 T-test and Analysis of Variance results

A two-sample t-test, ANOVA statistical analysis was performed on the scale scores to ascertain whether there were significant differences in attitudes between the respondents. To evaluate which factors influenced attitudes and whether a particular attitude would be a good predictor for conservation practices, stepwise multiple regression statistical analysis was applied. To assess the influence of each variable separately from the other variables, the Pearson correlation coefficients statistical analysis was used. Using the t-test, I found it surprising that no significant differences existed between males and females responses with respect to all the dependent variables (Table 7.11). Although there was a slight difference in their mean score, it was not statistically significant.

Table 7.11 Test of significant differences between importance, attitude, practice, interest, knowledge and awareness according to gender.

Variables	Gender	N	Mean	SD	t	Sig
Importance	Male	164	3.37	0.37		
	Female	136	3.37	0.35	0.04	0.97
Attitude	Male	164	3.80	0.45		
	Female	136	3.82	0.38	-0.48	0.63
Practice	Male	164	2.82	0.61		
	Female	136	2.82	0.57	0.04	0.97
Interest	Male	164	2.44	0.29		
	Female	136	2.43	0.32	0.17	0.87
Knowledge	Male	164	2.20	0.27		
	Female	136	2.16	0.33	0.9	0.37
Awareness	Male	164	2.41	0.43		
	Female	136	2.36	0.44	1.08	0.28

These results suggest that male and female rural inhabitants of the study areas were homogenous on the importance they attached to forest resources and had similar interests, knowledge,

awareness, attitudes and practices with relation to forest resources. This is inconsistent with previous literature on gender and forest resources use and conservation (Howard, 2000), which claimed that women have a greater knowledge of plants than men and perceive their usefulness differently. According to research reports (Hui, 1997; Conway, 1997; Rao *et al.*, 2003), men only gather plants for agricultural purposes; women's use of plants is related to household activities. Several research efforts have also concluded that gender roles and the division of labour, in relation to the environment, provide the basis for differences in attitudes and practices. The majority of women in rural African communities engage in more natural resource enterprises than men. However, when the comments of men and women at the FGD were compared, they were found to be contradictory. Women, especially those of the older generation, showed greater knowledge of the wild fruits, vegetables and insects than men. Men's knowledge was more related to tree products and animals. The impression produced at the FGD was that males and females differed in rating the importance, interest, attitude and practices of forest resource use and conservation. Several men were able to mention the names of some of the wild vegetables and fruits, but said they did not collect them because they rarely go to the forest.

> "*It is the responsibility of women and girls to collect fuelwood, not men. They do the cooking so they collect the wood and collect the vegetables and fruits as well. It is only when one needs poles for constructing one's house or fence that men go into the forest, and when they go, they don't bother to collect fruits.*" (A male participant)

Table 7.12 displays the t-test analysis of respondents' religion and the environmental variables in the study.

Table 7.12 Test of significant differences in importance, attitude, practice, interest, knowledge and awareness according to religion.

Variables	Religion	N	Mean	SD	T	Sig
Importance	Christian	219	3.36	0.35		
	Traditional	81	3.38	0.39	-0.28	0.78
Attitude	Christian	219	3.81	0.41		
	Traditional	81	3.82	0.44	-0.14	0.89
Practice	Christian	219	2.8	0.61		
	Traditional	81	2.87	0.55	-0.98	0.33
Interest	Christian	219	2.42	0.33		
	Traditional	81	2.47	0.2	-1.24	0.22
Knowledge	Christian	219	2.19	0.29		
	Traditional	81	2.15	0.3	1.18	0.24
Awareness	Christian	219	2.4	0.44		
	Traditional	81	2.35	0.42	0.99	0.32

The results showed no significant differences in respondents' religion and the importance, attitudes, practice, interest, knowledge and awareness of forest resources. This conformity suggests that people of different religious inclinations attach similar importance, possess similar knowledge and awareness, and hold common attitudes and practices of forest/woodland resource conservation.

Comparisons were conducted between the various age groups and the environmental variables using ANOVA. The results are displays in Table 7.13.

Table 7.13 Analysis of variance of importance, attitude, practice, interest, knowledge and awareness according to respondents' age.

Variables	SS	df	MS	F	Sig
	0.87	5	0.17	1.33	0.25
Importance	38.42	294	0.13		
	39.29	299			
	1.18	5	0.24	1.36	0.24
Attitude	51.18	294	0.17		
	52.36	299			
	2.29	5	0.46	1.32	0.26
Practice	102.48	294	0.35		
	104.78	299			
	0.71	5	0.14	1.55	0.17
Interest	26.96	294	0.09		
	27.67	299			
	0.61	5	0.12	1.41	0.22
Knowledge	25.44	294	0.09		
	26.05	299			
	1.43	5	0.29	1.51	0.19
Awareness	55.72	294	0.19		
	57.15	299			

The results obtained were contrary to expectations and what has been reported in the literature (Mensah & Whitney, 1991; Gigliotti, 1992; Sheppard, 1995; Raudsepp, 2001; Rao *et al.*, 2003), where most of these studies reported differences – with respect to age, educational level and gender – in their participants' environmental knowledge, environmental awareness and concerns. However, the current study found no significant differences between respondents' ages and the dependent variables. This study suggests that, across all age groups, there exists almost equal interests, knowledge, awareness, attitudes and practices about forest/woodland resource conservation. This was an interesting yet disturbing finding because previous studies have shown that the interaction with forests and benefits derived from them varied between individuals of different age groups. This was also discouraging because younger people need to have significantly higher scores on environmental knowledge and attitudes than older members of the community do, to ensure a sustainable future for forest resources. This finding indicates that environmental education is lacking in South Africa.

However, the focus group discussions revealed a very different picture, especially with regard to knowledge, interest and attitudes. Young people at the FGD attached more importance to the forest in terms of recreation, but showed little knowledge of the wild fruits and edible insects.

When analysis of variance for occupational group was performed with the six environmental variables, it is interesting to note that significant differences existed in 'Importance', 'Attitude', 'Knowledge' and 'Awareness' (Table 7.14).

Table 7.14 Analysis of variance of mean scores respondents occupation and importance, attitude, practice, interest, knowledge and awareness.

Variables	SS	df	MS	F	Sig
	2.26	6	0.38	2.98	0.008*
Importance	37.04	293	0.13		
	39.29	299			
	2.77	6	0.46	2.72	0.014*
Attitude	49.59	293	0.17		
	52.36	299			
	0.95	6	0.16	0.45	0.85
Practice	103.82	293	0.35		
	104.78	299			
	0.47	6	0.08	0.84	0.54
Interest	27.20	293	0.09		
	27.67	299			
	1.10	6	0.18	2.15	0.048*
Knowledge	24.95	293	0.09		
	26.05	299			
	4.77	6	0.80	4.44	0.000*
Awareness	52.38	293	0.18		
	57.15	299			

***** significant at 0.05 level

Post hoc comparisons indicated that significant differences existed between civil servants and housewives and the unemployed (MD = 0.256, $p < 0.023$). With respect to 'Attitude', the most significant differences were found between the group of farmer/game reserve workers and housewife/unemployed (MD = 0.596, $p < 0.032$). Regarding 'Awareness' the notable differences were between civil servants and housewives/unemployed (MD = 0.308, $p <. 02$). The implication of these findings is that individuals whose occupations are related to forest resources are likely to possess higher levels of knowledge and awareness *and* express a more positive attitude toward forest resources use and conservation.

The analysis revealed that rural people have a more negative attitude toward the forest/woodland resources than urban people – and are also more ignorant of conservation issues and the impact of their practices on the environment. However, their awareness and willingness to adopt an environment-friendly type of practices was very high. Although, most of the people understood the intrinsic, aesthetic and material values of these important resources and recognised that their protection can provide opportunities for promoting ecotourism activities in their communities, the majority of members were dissatisfied and disenchanted with the way government was conducting

conservation and management. Several argued that forest management was not well organised and that benefits to communities and individuals were not evenly distributed. Issues of discontent mentioned included: little or no benefits to communities; perceived incompetence of officials; and lack of interest in the welfare of local people. While these problems exist, the majority did not want the current conservation practices abolished and strongly supported maintaining the status quo. They may not be deriving benefits directly, but they admitted that their lives were no worse off than before the current conservation was put in place and they recognised that some community members were benefiting from forest resource management. They hoped that, they too, would eventually be able to take part in some form of tourism business. To gain the support of the people, government must structure the policy and management of the forest to address the problems of the rural people living within and around forests.

In Table 7.15, no significant difference – in the 'Importance', 'Attitude', 'Interest' and 'Knowledge' of forest resource management in accordance with 'Educational background' – was found. This implies that all educational groups are in general agreement that forest resources are important to the rural people.

Table 7.15 Analysis of the variance of respondents' means scores according to education importance, attitude, practice, interest, knowledge and awareness according to religion.

Variables	SS	df	MS	F	Sig
	0.79	5	0.16	1.2	0.31
Importance	38.51	294	0.13		
	39.29	299			
	1.11	5	0.22	1.28	0.27
Attitude	51.24	294	0.17		
	52.36	299			
	4.06	5	0.81	2.37	**.040***
Practice	100.7	294	0.34		
	104.8	299			
	0.34	5	0.07	0.73	0.6
Interest	27.33	294	0.09		
	27.67	299			
	0.62	5	0.12	1.43	0.22
Knowledge	25.43	294	0.09		
	26.05	299			
	5.29	5	1.06	6	**.000***
Awareness	51.86	294	0.18		
	57.15	299			

***** significant at 0.05 level

It also means that their 'Interest', 'Knowledge' and 'Attitude' towards forest/woodland resource conservation are the same. Significant differences were found, however, in the respondents' forest/woodland resource conservation practices according to the respondents' educational

backgrounds ($F = 2.37$, $p < 0.040$). The same finding was observed with respect to 'Awareness' ($F = 6.0$, $p < 0.001$). The respondents with non-formal education expressed greater concern about forest/woodland resource conservation practices and awareness. Those with higher levels of education appeared to be less concerned. The respondents with lower incomes expressed greater concern about forest/woodland resource conservation as a major source of livelihood. These results indicate that community members with different education levels have different environmental concerns; it also implies that environmental education programme development should be based on the different perceptions of various groups to best mirror the range of their interests and concerns. The result is inconsistent with the assumption (of some conservationists and development agencies) that rural populations in most developing countries are antagonistic towards conservation and that rural people are ignorant of conservation issues (FAO, 2000; Ogunyemi & Raheem, 2005). People in the study areas were not only aware but also ready and willing to support conservation activities.

7.12 Pearson-Product Moment Correlation

The Pearson-Product Moment Correlation (PPMC) was used to investigate the relationship between socio-demographic variables and 'Knowledge', 'Interest', 'Awareness', 'Importance', 'Attitude' and 'Practice' of forest resources conservation. The results obtained are presented in the correlation matrix (Table 7.16). The magnitude of the relationship was described using the classical five scale by Davis (1971). These are:

- r ranging from 0.01 – 0.09 Negligible association
- r ranging from 0.10 – 0.29 Low association
- r ranging from 0.30 – 0.49 Moderate association
- r ranging from 0.50 – 0.69 Substantial association
- r ranging from 0.70 – higher Very strong association

Although there are several positive correlations observed between the variables, most of them were weak. 'Educational background' was found to have a positive significant correlation on respondents' 'Knowledge' and 'Awareness' ($r = 0.124$, $p < 0.05$), ($r = 0.274$, $p < 0.01$). A negative correlation was found between 'Educational background' and 'Attitude' ($r = -0.121$, $p < 0.05$). However, no significant relationship was found between 'Educational background' and other variables. The variables of 'Importance', 'Attitude', 'Practice', 'Knowledge', 'Awareness' and 'Interest' were significantly correlated between themselves. Gender and variables – such as 'Numbers making a livelihood from the forest', 'Religion', 'Occupation', 'Number per household', 'Importance', 'Attitude', 'Practice', 'Knowledge', 'Awareness' and 'Interest' – were not significantly correlated. 'Age' and 'Occupation' also showed a negative correlation with 'Awareness' ($r = -0.134$, $p < 0.05$), ($r = -0.189$, $p < 0.01$).

Table 7.16 Pearson correlation coefficients between respondents' socio-demographic characteristics and importance, attitudes, practices, awareness, knowledge, and interest.

Variables	Gender	Age	Religion	Occupation	Educational Background	No per Household	No. making livelihood from forest	Importance	Attitude	Practices	Knowledge	Awareness	Interest
Sex	1												
Age	-0.10	1.00											
Religion	-0.18(**)	0.21(**)	1.00										
Occupation	0.04	0.37(**)	0.11	1.00									
Educational Background	-0.09	-.032(**)	-0.19(**)	-0.27(**)	1.00								
Number per Household	0.03	0.25(**)	0.15(**)	0.05	-.019(**)	1.00							
No making livelihood from forests	0.03	-0.02	0.05	-0.06	-0.05	0.07	1.00						
Importance	0.00	0.00	0.02	-0.05	0.03	-0.01	-0.02	1.00					
Attitude	0.03	0.07	0.01	0.09	-0.12(*)	0.01	0.06	0.23(**)	1.00				
Practices	0.00	0.00	0.06	0.02	0.01	0.06	0.02	0.08	0.15(*)	1.00			
Knowledge	-0.05	-0.08	-0.07	-0.11	.12(*)	-0.09	0.10	0.10	0.15(**)	0.11	1.00		
Awareness	-0.06	-0.13(*)	-0.06	-0.19(**)	0.27(**)	-0.11	-0.05	0.20(**)	-0.03	-0.08	-0.01	1.00	
Interest	-0.01	0.11	0.07	0.08	0.08	-0.01	0.02	0.05	0.03	-0.06	0.20(**)	-0.09	1.00

****** Correlation is significant at the 0.01 level (2-tailed). ***** Correlation is significant at the 0.05 level (2-tailed).

7.13 Results of Regression Analysis

To determine which of the variables would best predict the dependent variables ('Interest', 'Awareness', 'Importance', 'Knowledge', 'Attitude', and 'Practice' towards forest/woodland resource conservation), a stepwise regression analysis was conducted. The results of the final model of each of regression analysis are reported in Table 7.17 to Table 7.22. Table 7.17 shows the results of stepwise regression performed to determine the predictive variables of 'Interest' among the socio-demographic variables. Two models are merged with two variables in the final model.

Table 7.17 Stepwise multiple regression models of determinants of interest in forest/woodland resource conservation.

Model	Variables	R	R^2	Adjusted R^2	R^2 Change	F	Beta	t	Sig
1		0.20	0.04	0.04	0.04	12.03		15.45	0.00
	Knowledge						0.20	3.47	0.00
2		0.24	0.06	0.05	0.02	8.80		15.64	0.00
	Knowledge						0.20	3.55	0.00
	Age (Below 24 yrs)						-0.13	-2.32	0.02
Dependent variable: Interest									

In the first model, 'Knowledge' is a predictor of 'Interest' ($\beta = 0.20$, $p < 0.001$). Model 2 shows 'Age' alongside 'Knowledge' as predictors of knowledge ($\beta = 0.20$, $p < 0.001$) and 'Age below 24' ($\beta = -0.13$, $p < 0.001$). For this model, the value of R^2 was 0.06. In other words, these variables explained only 24% of the independent variable variance in interest. This finding suggests that the level of knowledge possessed on forest resource will determine the interest shown in it and that young South Africans (below 24 years) are more likely to express interest in forest resources than the older people.

Table 7.18 presents regression models for predicting 'Attitude' towards forest/woodland resource conservation, using the same sets of independent variables. Model 1 shows that 'Importance' is a positive predictor of 'Attitude'.

Table 7.18 Stepwise multiple regression models of determinants of attitudes towards forest/woodland resource conservation.

Model	Variables	R	R^2	Adjusted R^2	R^2 Change	F	Beta	t	Sig
1		0.23	0.05	0.05	0.05	16.00		13.30	0.00
	Importance						0.23	4.00	0.00
2		0.29	0.09	0.08	0.04	13.99		13.75	0.00
	Importance						0.21	3.85	0.00
	Timber Contractor						-0.19	-3.38	0.00
3		0.32	0.10	0.09	0.02	11.28		10.06	0.00
	Importance						0.20	3.63	0.00
	Timber Contractor						-0.19	-3.43	0.00
	Knowledge						0.13	2.34	0.02

Model	Variables	R	R^2	Adjusted R^2	R^2 Change	F	Beta	t	Sig
4		0.35	0.12	0.11	0.02	10.28		9.09	0.00
	Importance						0.22	3.96	0.00
	Timber Contractor						-0.17	-3.02	0.00
	Knowledge						0.15	2.68	0.01
	Housewife and Unemployed						0.14	2.57	0.01
5		0.37	0.13	0.12	0.01	9.09		8.25	0.00
	Importance						0.21	3.83	0.00
	Timber Contractor						-0.16	-2.96	0.00
	Knowledge						0.14	2.48	0.01
	Housewife and Unemployed						0.14	2.54	0.01
	Practice						0.11	1.98	0.05
Dependent variable: Attitude									

***** Significant at 0.05 level

In Model 2, 'Occupation' (Timber Contractor/Forester) is significantly negative predictor ($\beta = -3.43$, $p \leq .001$) for 'Attitude'. Model 3 shows 'Knowledge' as having significantly positive predictor. In Model 4, 'Importance', 'Timber Contractor/Forester', 'Knowledge' and 'Housewife/Unemployed' all significantly affected attitudes towards forest/woodland resource conservation. The results of the stepwise regression analysis for all respondents (Model 5) indicated that the 'Importance' attached to woodland resources ($\beta = 0.21$, $p < 0.001$); 'Timber contractor' ($\beta = -0.16$, $p < 0.001$); 'Housewife and unemployed' ($\beta = 0.14$, $p < 0.001$), 'Knowledge' ($\beta = 0.14$, $p < 0.001$) and 'Practice' ($\beta = 0.11$, $p < 0.001$) can be predictors of attitude. Together, these five variables explained 37% of the variance in attitudes. In general, the significant predictors of 'Attitude' towards woodland resource conservation are: 'Importance', 'Occupation', 'Knowledge', and 'Practice'. The results suggest that people with knowledge, people whose occupations are dependent on forest/woodland or natural resources and people who attached importance to forest resources tend to hold stronger positive attitudes towards forest/woodland resource conservation. People that hold a strong positive attitude towards forest resource will also be more likely to support actions favourable to forest/woodland resource conservation.

Table 7.19 summarises the results of the regression for practices. Only two variables emerged as predictors of practices of woodland resource conservation. In Model 1, 'Attitude' ($\beta = 0.15$, $p < 0.001$) was a significantly positive predictor of forest/woodland resource conservation practices. Model 2 shows the inclusion of 'University education' to 'Attitude'. These two variables only accounted for 19% of the variance in 'Practice'. It can be hypothesised from this finding that both people's attitudes towards forest resources will have significant positive impact on their practices of forest/woodland resource conservation *and* people with higher educational levels will have negative impact on forest/woodland resource conservation practices.

Table 7.19 Stepwise multiple regression models of determinants of practices of forest/woodland resource conservation.

Model	Variables	R	R^2	Adjusted R^2	R^2 Change	F	Beta	t	Sig
1		0.15	0.02	0.02	0.02	6.71		6.49	0.00
	Attitude						0.15	2.59	0.01
2		0.19	0.04	0.03	0.03	5.75		6.78	0.00
	Attitude						0.13	2.32	0.02
	University education						-0.12	-2.17	0.03
Dependent variable: Practice									

***** Significant at 0.05 level

Table 7.20 presents the results of regression models for 'Knowledge' of forest resources. According to Model 1, 'Interest' ($\beta = 0.12$, $p < 0.001$) was identified and found to be a significantly positive predictor of 'Knowledge' of forest resources. Three other sets of predictors were identified and are listed (in order of their importance for predicting knowledge) as: (a) 'Interest' ($\beta = 0.12$, $p < 0.001$); (b) 'Housewife and unemployed' ($\beta = -0.15$, $p < 0.001$); (c) 'Attitude' ($\beta = 0.17$, $p < 0.001$) and 'Age' (55—64 years) ($\beta = -0.13$, $p < 0.003$)

Table 7.20 Stepwise multiple regression models of determinants of knowledge of forest/woodland resource conservation.

Model	Variables	R	R^2	Adjusted R^2	R^2 Change	F	Beta	t	Sig
1		0.20	0.04	0.04	0.04	12.03		12.70	0.00
	Interest						0.20	3.47	0.00
2		0.25	0.06	0.06	0.02	9.75		13.01	0.00
	Interest						0.20	3.59	0.00
	Housewife and Unemployed						-0.15	-2.69	0.01
3		0.30	0.09	0.08	0.03	9.53		6.70	0.00
	Interest						0.20	3.57	0.00
	Housewife and Unemployed						-0.17	-3.05	0.00
	Attitude						0.16	2.93	0.00
4		0.32	0.10	0.09	0.02	8.50		6.60	0.00
	Interest						0.20	3.70	0.00
	Housewife and Unemployed						-0.15	-2.60	0.01
	Attitude						0.17	3.08	0.00
	Age (55 to 64 yrs)						-0.13	-2.23	0.03
Dependent variable: Knowledge									

Together, these four variables explained 32% of the variance in knowledge. The overall model was weak. This suggests that 'Interest' can be a predictor of people's 'Knowledge' of forest/woodland resource conservation and those people who have stronger interest in forest resources will most likely possess higher knowledge of forest resources. The model also suggests that 'Attitude' can be a strong predictor of 'Knowledge'. However, contrary to expectation, the results showed that older people are not as likely to possess higher knowledge of forest resources.

Table 7.21 presents regression coefficients for 'Importance' of forest resources. Of all the socio-demographic characteristics and other dependent variables that were included in the analysis, 'Attitude' ($\beta = 0.23$, $p \leq 0.00$), civil servant ($\beta = 0.21$, $p \leq 0.00$) and 'Awareness' ($\beta = 0.18$, $p \leq 0.00$) were identified as significantly positive predictors of importance of forest resources. By including the 'Civil servant' and 'Awareness' variables in Model 3, the adjusted R^2 increased from 0.05 to 0.15, suggesting that the full model explained 5% more of the variance of 'Importance' than in Model 1. These results indicate that awareness can be a strong predictor of the importance attached to forest/woodland resource conservation and that rural inhabitants' levels of consciousness about the existence of forest resources in their community will determine the importance attached to forest/woodland resource conservation. Rural people with high levels of awareness are most likely to attach more importance to forest/woodland resources.

Table 7.21 Stepwise multiple regression models of determinants of importance of forest/woodland resource conservation.

Model	Variables	R	R^2	Adjusted R^2	R^2 Change	F	Beta	t	Sig
1			0.05	0.05	0.05	16.00		13.99	0.00
	Attitude						0.23	4.00	0.00
2		0.31	0.10	0.09	0.05	15.94		14.10	0.00
	Attitude						0.23	4.13	0.00
	Civil Servant						0.21	3.89	0.00
3		0.36	0.13	0.12	0.03	14.55		10.40	0.00
	Attitude						0.23	4.30	0.00
	Occupation – Civil Servant						0.18	3.35	0.00
	Awareness						0.18	3.27	0.00
Dependent variable: Importance									

***** Significant at 0.05 level

Table 7.22 shows that, of all the socio-demographic characteristics of respondents and environmental variables in the regression for awareness, the set of variables that best predicted importance included: (a) 'Housewife/unemployed' ($\beta = -0.24$, $p < 0.001$); (b) 'Importance' attached to forest resources ($\beta = 0.18$, $p < 0.001$); (c) 'Polytechnic and NCE' ($\beta = 0.14$, $p < 0.001$); and 'No formal education' ($\beta = -0.14$, $p < 0.002$). These four variables explained 35% of the variance in 'Awareness'.

Table 7.22 Stepwise multiple regression models of determinants of awareness of forest/woodland resource conservation.

Model	Variables	R	R^2	Adjusted R^2	R^2 Change	F	Beta	t	Sig
1		0.24	0.06	0.06	0.06	18.75		73.61	0.00
	Housewife/unemployed						-0.24	-4.33	0.00
2		0.30	0.09	0.08	0.03	14.58		7.61	0.00
	Housewife/unemployed						-0.22	-3.96	0.00
	Importance						0.18	3.14	0.00
3		0.33	0.11	0.10	0.02	11.95		7.70	0.00
	Housewife and Unemployed						-0.19	-3.46	0.00
	Importance						0.17	3.04	0.00
	Polytechnic and NCE						0.14	2.48	0.01
4		0.35	0.12	0.11	0.02	10.52		7.47	0.00
	Housewife and Unemployed						-0.15	-2.65	0.01
	Importance						0.18	3.31	0.00
	Polytechnic and NCE						0.14	2.45	0.02
	No formal education						-0.14	-2.39	0.02

Dependent variable: Awareness

7.14 Conclusion

It is clear, from the data analysed in this chapter, that the knowledge, attitudes and practices relating to forest/woodlands among rural communities in Bushbuckridge, South Africa are diverse. The results show that, like many other rural communities located within or around the forest/woodland, much of the people's livelihood activities are connected to forest resources. It also illustrates the social, cultural and gender context of forests. The results of this study are consistent with previous findings, not just in South Africa but also in other Southern Africa regions and other communities with similar geographical and socio-cultural characteristics (Winterbottom, 2001; Twine *et al.*, 2003; Shackleton, 2004b). The findings support the idea of using the theory of planned behaviour as a theoretical framework for the study (Ajzen *et al.*, 1995), because this study has shown that attitudes influence behaviour/practices. As reported in environmental attitude studies of other scholars – Fiallo and Jacobson (1995), Jacobson & Marynowski (1996) and Sah & Heinen (2001) – this present study has identified different factors that could be involved in the expression of environmental attitudes which include knowledge of, and the people's perceived benefits associated with resource conservation.

The literature on environmental studies (Jones & Dunlap, 1992; Stern & Dietz, 1994; Davidson & Freudenburg, 1996; Diefenbach *et al.*, 1997; Sah & Heinen, 2001; Raudsepp, 2001; Duroy, 2005) identified several sets of socio-demographic characteristics – such as age, education, income, gender, political orientation, and occupation – to explain such environmental perceptions as attitudes, interest, knowledge, awareness, and concerns. Van Liere and Dunlap (1980) found that

age and education were consistently associated with environmental concern, and thus it could be inferred that younger, well-educated persons tended to be more concerned about environmental quality than their older, less educated counterparts. A similar result was found in Jones and Dunlap (1992) and Scott and Willets (1994): Young and highly educated individuals demonstrated a greater recognition of – and concern for – environmental problems. More recent studies (Nord *et al.,* 1998; Fransson & Garling, 1999; Raudsepp, 2001) also found evidence that younger age and higher levels of education were significant drivers of environmental attitudes and concern. Gender does not appear to be as significant as a predictor of environmental knowledge, awareness and attitudes as other socio-demographic variables.

Other studies have found people's knowledge of environment or ecological processes to be low (Jacobson & Marynowski (1996); Diefenbach *et al.,* (1997)) and this has been incompatible with the findings of this study which revealed that people's knowledge of forest/woodland resources processes is high. Jacobson & Marynowski (1996) surveyed the recreation users and neighbouring citizens' attitudes and knowledge about the ecosystem management of the Eglin Air Force Base, Florida and found that both audiences lacked basic ecological knowledge and held neutral to slightly positive attitudes toward the key content area. Recreation users were significantly more knowledgeable than general citizens about native and endangered species, fire ecology and forest. However, the general citizens held significantly more positive attitudes towards native and endangered species conservation and ecosystem management concepts. The lack of consistency in findings regarding environmental attitudes has also been attributed to the differences between the questions used to measure respondents' environmental awareness and attitudes.

Raudsepp (2001), Kaczensky *et al.* (2004), and others found that socio-demographic variables – such as age, education and gender – have shown strong and consistent relationships with environmental awareness and attitudes. Mehta and Heinen (2001) found (in a study conducted in Annapurna and Makalu-Barun Conservation Areas, Nepal), that the majority of local people held favourable attitudes toward these two conservation areas. Conversely the benefits from tourism, ethnicity, gender and education level were significant predictors of local attitudes. Overall, while there are correlations between environmental variables and socio-demographic characteristics, the explanatory power of socio-demographic characteristics is weak. It was found that socio-demographic variables provided limited explanatory power for environmental variables of concern in this study. When environmental attitudes and practices are correlated, it is the environmental attitude is better able to accurately predict environmental practices. Education generally has a positive and significant association with environmental attitudes. The present study confirms that knowledge has been found to have positive correlation with attitude – consistent with the reports of Klineberg *et al.,* (1998) and Duroy (2005).

The next chapter, which is the last of four chapters dealing with analysis of the questionnaires, presents a comparison of the findings from Nigeria and South Africa.

CHAPTER EIGHT

8 Forest People, Two Countries, One Continent: What Empirical Connections?

8.1 Introduction

This is the last of the four chapters on data analysis. In the previous three chapters, the results of this study have been presented on a country-by-country basis. Since the aim of this study is to compare the results from the two countries, here I attempt to present a cross-national analysis, juxtaposing the results to achieve the main aim and answer the corresponding research question of the study.

8.2 Comparison of National Forest Policies

International concerns about the increased use of forest resources and related problems of resource depletion and sustainability have called attention to the issues of forest management and conservation. In so doing, direct regulation through licensing and registration of forests and similar stringent policies have been advocated – mostly in the developing countries. In this section, I attempt to point out several of the similarities, as seen through the lens of the institutions and policies in the two study countries.

Comparing forests and forestry policies and institutions in Nigeria and South Africa is necessary and meaningful because of important similarities the two regions share – both have high levels of rural population and extensive dependence on forest resources. However, there are essential differences: firstly in the scale and dimension of the forest economies and, secondly in the very way these economies are organised at the village level.

Although various policies and programmes on sustainable forest resource conservation and management exist in South Africa and Nigeria, detailed analyses of these policies are beyond the scope of this work. In this study, the task has been to identify similarities and differences in the provisions of the current forest policies of each country, and to establish to what extent the policies have paid attention to environmental education for rural people.

The constitution of any country is the cornerstone of all the legal documents and policy recommendations. It is the *grundnorm* (i.e. basic norm). The constitution affects the lives of all citizens because it is aimed at social transformation. As the basic norm, it sets the general context for the development of other policies more specific to particular sections of the public service and the private sector. The Constitution of the Republic of South Africa, 1996, is innovative in that it explicitly enshrines a healthy environment and protection as a human right. The relevant Chapter in the Constitution – Bill of Rights – recognises the right of every citizen as follows:

> "*Section 24(a) Everyone has the right to an environment that is not harmful to their health or well-being; and*

Section 24(b) to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measure that

(i) Prevent pollution and ecological degradation;

(ii) Promote conservation; and

(iii) Secure ecologically sustainable development and use of natural safe resources while promoting justifiable economic and social development (The Constitution of the Republic of South Africa, 1996:11).

This constitution enshrines the principles for legal control by the State for the protection of the environment and guarantees a healthy environment for every citizen, as a progressive right to be realised over time. It was a right—conferring provision which can be enforced in a court of law. By this provision, South Africans have locus standing to sue for the enforcement of their right to a harmless environment. The demand of the constitution that the environment be protected and conserved to secure ecologically sustainable development is graphically captured in the purposes of the National Forests Act, No. 84 of 1998 which include *"…the promotion of sustainable management and development of forests for the benefit of all, the promotion of sustainable use of forests as well as the provision of special measures for the protection of forests and trees…"*

Section 29 (1) (a) and (b) provides further that every citizen shall have right *"…to (a) a basic education, including adult basic education, and (b) further education, which the state through reasonable measures, must make progressively available and accessible…"* (South Africa 1996:14) It also guarantees every citizen the right of access to education as a tool for the development of the nation. The government perceived education as a primary tool in handling environmental problems and promoting environment friendly behaviour and sustainable development. The constitution remains rhetorical, however, about the changes needed in the ideal nation, since it does not spell out how these changes are to be achieved.

By contrast, while the promotion of safe and healthy environment is guaranteed by the Constitution and this made it a basic right of citizens in South Africa, the same cannot be reported of Nigeria. The only section of the Constitution of the Federal Republic of Nigeria (1999) that makes reference to the environment is Section 20. It provides that *"The State shall protect and improve the environment and safeguard the water, air, and land, forest and wildlife of Nigeria*." (Federal Republic of Nigeria 1999). This constitutional provision is not self-executing and does not confer rights which can be enforced in the courts, but only provides a guideline for legislative and executive action. With respect to education, Section 18 of the constitution states that:

"Government shall direct its policy towards ensuring that there are equal and adequate educational opportunities at all levels. Government shall promote science and technology. Government shall strive to eradicate illiteracy; and to this end government shall as and when practicable provide (a) free, free compulsory and universal primary education; free university education; and free adult literacy programme."

This Nigerian constitutional provision treats environment and forestry issues through a rather broad-based approach. The protection and conservation of the environment and access to education are treated in a manner that reflects these rights as non-justifiable rather than as mere state

principles. Based on the broad constitutional framework, the Nigerian Ministry of Environment is currently putting final touches to the draft of a broad framework law encompassing all aspects of the environmental protection and natural resources management under the Nigerian Environmental Management Act.

Under Schedule 4, Part A of South African Constitution 1996, the State is specifically given the responsibility for the administration of indigenous forests, environment, nature conservation, excluding national parks, national botanical gardens and marine resources in the concurrent national and provincial legislative competence (South Africa 1996: 143). Conversely, forestry, though a pivotal ecosystem and an integral component of the environment, is not mentioned either in the Exclusive or Concurrent legislative lists in the Schedule to the 1999 Constitution of the Federal Republic of Nigeria. However, authority to legislate on forestry matters by the National Assembly, the States Houses of Assembly and the Local Government Councils is derived from the general authority to legislate on "Agricultural issues" which is provided in the Concurrent Lists. "Agriculture" (17(d)) and "Commerce" (Item 18) – but neither of these fully covers Forestry. Agriculture suggests vegetation cultivated by humans rather than vegetation in its natural state.

South Africa's 1997 Forest Policy (Section 2.1) highlighted nine (9) guiding principles through which the policy will be applied, tested and developed; in Nigeria the National Forest Policy has six principles; it described its purport as follows: *"…degraded areas to be reforested, afforested and regenerated to protect and preserve its forest resources."* In both countries the policies emphasised the necessity of implementing, at state, private and community levels, the reforestation initiatives towards restoring a significant proportion of the country's original forest cover.

The policy guiding principles of the two countries differ. South Africa's 1997 Forest Policy (Section 2.1) highlighted nine guiding principles through which the policy will be applied tested and developed. The policy is based on the following principles:

- *"forests and forest resources to be treated as a national asset;*
- *policy to be formulated and implemented to promote democratisation; gender equity;*
- *people-driven development;*
- *consultation in formulating and implementing policy;*
- *sustainable forest development;*
- *recognition of the scarcity of water resources;*
- *a competitive and value-adding forest sector;*
- *decent employment conditions"* (DWAF, 1997).

By comparison with South Africa, Nigeria's the National Forest Policy has six principles (Sections 2.2 to 2.6). The principles include:

- *"Livelihoods and poverty:*
- *food security:*
- *biodiversity conservation and environmental service;*
- *partnership in governance;*
- *National forestry legislation; international obligation and forestry valuation."*

The first section of the Nigerian National Forest Policy (NFP) deals with the goals and objectives of the government. An analysis reveals that both countries' forest policy documents pay attention to this aspect. The policy objectives for the countries differ in so far as they relate to different problems. However, there are overlaps in areas relating to:

- promoting land tenure, equitable access to land by all citizens without gender bias or discrimination;
- promoting investment in forestry and ensuring that forestland is put to most productive and sustainable use;
- improving land allocation and community participation;
- ensuring accountability and transparency in the administration of forestland;
- land dispute adjudication and conflict resolution;
- protection of customary rights and the reduction of poverty.

The 2006 "National Forest Policy" of Nigeria (Sections 2.2 to 2.6) contains the guiding Principles 7, 35, 45, 48, 85 and 88 which are open statements, without specific action plans on the conservation of biological diversity. In South Africa, Section 3.2.2 of the South African National Forests Act, No. 84 of 1998 superficially mentions the conservation of forest resources as being important to life-sustaining processes. The two countries are both involved in the management of their forest resources at national, community and household levels.

Each individual country has the following country specific goal: The White Paper on Forestry of 1996 provides a framework for conservation, management, protection and utilisation of forest resources in South Africa. The goal of the policy is to sustain the contribution of forest resources to the upliftment of the quality of peoples' lives, particularly in rural communities (who are the most disadvantaged). The policy's overall goal says as follows: "*…government is to promote a thriving forest sector, utilised to the lasting and sustained benefit of the total community and developed and managed to protect and to improve the environment*." South Africa has enacted three additional laws and enacted over five Forest Management Regulations during the last decade (DWAF 1997). The National Forest Policy of 2006 has four guiding statements and its purpose is to ensure that resources are used according to sustainable principles and towards contributing to social justice and equity. The policy primarily aims at ensuring the conservation of the environment and also aims at deriving economic benefits from forests. The main thrust of the National Forest Policy is to bring the reserved forest under effective and scientifically prepared forest management plans. The policy overall goal is "*…to achieve sustainable forest management that would ensure sustainable increases in the economic, social and environmental benefits' from forests and trees for present and future generation including the poor and the vulnerable groups…*" (FME, 2006:23).

With respect to the definition or conception of forests and classification of forests in both countries, the South African White Paper on Forestry perceived forest beyond the traditional view of forestry as the science of managing forested land. Forestry is defined as *"…the relationship between people and the resources provided by the forest. It includes the use and husbandry of the wood, fruits and other products that come from trees as well as the wildlife that dwell in the forest. Other factors of importance are the environmental, aesthetic and cultural values of forest and woodlands."* The document went further – to say that the policy was formulated to cover *"…forest*

of all kinds…" – that is indigenous forests and woodland, industrial forestry and community forestry – and addresses all the factors that affect sustainable development. In effect the South African policy adopts an inclusive approach. However, the Nigerian Forest Policy did not offer a perception of forests in the manner the South Africans Policy describes it. But the NFP has similar broad coverage for all forests. It included community natural forest – home to the country's abundant flora and fauna – *"…forests includes National Forest Estate, State Government Forest Reserves, Protected Forest, Local Government Forest Reserves and private forest land…"*

Both forest policies stress the need to manage forest resources on a systematic and scientific basis. Effective management will require the allocation of land for conservation, watershed protection areas, production forest and community forest. South Africa has a National Forestry Act, promulgated in 1998, to back up the forest policy. This Act provides for participatory forest management. Although a draft National Forest Act to give effect to the 2006 National Forest Policy is in process, Nigeria still relies on the National Forestry Act of 1958. The 1958 Forestry Act was an amendment of the country's first Forestry Act of 1938 – inadequate and obsolete in terms of current realities in forestry use and conservation. There has been a devolution of power in both South Africa and Nigeria. The actual devolution of responsibility over forestry matters from the Nigerian Federal Government to other tiers of government has its basis in the Nigeria Order in Council (1958) when Nigeria became a federation with the emergence of regional government. Each region subsequently adopted the Forestry Act 1958, with consequential amendments over the years, drawn up to suit the emerging geopolitical and constitutional arrangements and to address contemporary forestry issues from time to time. However, many substantial provisions dealing with the reservation, preservation, conservation and management of forest resources – based on the principles of sustained yield management – have remained virtually the same over the years.

There are no significant differences between the two policies in terms of their institutional arrangements which specify the rules, regulations, norms, and practices related to access, use, and control of forest resources and decision-making process. Institutional arrangements for forest resource management/conservation are generally at four levels: central, state/province, district/local, and community/village. Overall policy guidelines are provided at the central level through policy and administrative orders. To implement the central government's policy direction, all the state/province governments in Nigeria and South Africa issued state or provincial resolutions, respectively, specifying second tier rules, regulations, and benefit sharing mechanisms. The institutional arrangement for the administration of forests and forestry are well defined. Most forested land in South Africa falls under the jurisdiction of the Department of Water Affairs.

The political structure of the countries can be characterised by efforts to decentralise management of forest resources. This is clearly expressed by (i) introducing private forest ownership; (ii) allowing the private sector to participate, on a commercial basis, in the management of state forest; (iii) separating control and management functions in the state forestry, (iv) forcing timber processing industries to purchase wood on a competitive basis. These features of a new system make the administration of forest resources complex and dynamic. It is a major shift from a previously hierarchically centralised planning and constitutes a great contrast.

Another policy issue of forest resource conservation is the environmental education and public awareness. Both countries have policies with provisions on 'education and training' – South Africa – and 'education and awareness creation' – Nigeria. The Nigerian Forest Policy acknowledges the need *"…to create awareness among the populace on the importance of the forests and the need to conserve forests for the benefit of the present and future generations."* It emphasises the importance of a highly sensitised society that is aware of the importance and the need for a participatory approach in sustainable forestry development (FME, 2006: 66). Both countries also recognise that capacity building and raising awareness are vital for forest managers, rural population and decision makers. In South Africa, the South African National Forests Act, No. 84 of 1998 acknowledged the need for competence of people in the forestry sector in the country. In particular it emphasised that *"…sustainable development of the sector requires well educated, skilled and competent workers and managers."* The South African Government is to promote basic literacy and numeracy among forest workers, and implement the appropriate solution. However, in Nigeria most forest managers, rural and decision makers do not fully understand the issues related to forests and forest degradation and the present and future impacts on forest ecosystems, let alone the need for putting in place policies and management intervention strategies to increase the adaptive capacity of forest ecosystems to climate induced disturbances.

Table 8.1 presents the summary of the comparison of the provisions of the two forest of Nigeria and South Africa. However, the question is whether – and to what extent – these polices and laws were – or are – being implemented with similar vision and diligence that were present in their formulation.

Table 8.1 Comparative evaluation of forest policies in Nigeria and South Africa.

		Nigeria	South Africa
1	**Policy statement**	♦	♦
	Goal of policy	♦	♦
	Objectives of policy	♦	♦
2	**Forest and forest land**		
	Definition of forest and forest land	♦	♦
	Classification of forest and forest functions	♦	♦
	Rules for the preservation of the forest area	♦	♦
	Conditions for demarcation/change of forest land	♦	♦
3	**Property rights and management systems**		
4	**Institutional Framework**		
	Constitutional provision	♦	♦
	Legislative Act	–	♦
5	**Utilisation of forests**		
	Conditions for the utilisation of forests	♦	♦
	Forest utilisation	♦	♦
6	**Strategies to attain policy goal/objectives**	♦	♦
7	**Livelihood issues and poverty**	♦	♦
8	**Protection of forests**	♦	♦
9	**Education and awareness**		
	Institutions for applied research	♦	♦
	Institutions for training	♦	♦
	Environmental education		

		Nigeria	South Africa
10	**Enforcement rules**		
	Classification of offences and penalties	♦	♦
	Prosecution powers	♦	♦
	Utilisation of revenues from penalties	♦	♦

From the focus group discussions and interviews with participants in both countries, it is evident there are contradictions between policy statements, implementation, and realities in the lives of the people. To the two governments, forest resource conservation is necessary for revenue generation, economic growth and national development. To rural people, however, forest resource conservation is necessary only to the extent that it supports their livelihoods and day-to-day existence. One of the things that emerged from the study, in the course of interaction with the people, is that policies are most often formulated without input from local communities. They are never consulted about their views, even when the issues of interest are directly concerned with their welfare and livelihood. The majority of the people interviewed claimed ignorance of the existence of policies whether on environment or forestry. However, a few claimed that they are aware of laws, and regulations concerning forests – especially those relating to logging in the study areas. The reality is that both of these two policies seem to exist within the context of governmental structures and institutions but do not link to the survival of the rural people. The only link existing is effectively one-way – that is, the policies' top-down influence on peoples' livelihoods – which, from the content analysis and comments of people during the interviews and FGDs, is mostly negative. For instance, one of the forestry officer interviewed has this to say:

> *"Legislation is meant to provide legal instrument for the implementation of the forest policy. However, the current forest policy is not updated. There is therefore the need to slow down action on any legislative review until our policy is revised. Laws are enacted for people and for better understanding and ease implementation, those directly affected by this law need to be involved in this review exercise. There has been suspicion by the general public, farmers and forest based industries on government policies and laws. Considering current thinking, consequent to failure of past strategies where foresters managed forest, shifting to participatory management should be reflected in the new law policy and law being proposed."* (Interview with forest officer in Nigeria)

The policy documents do not make provision for alternative sources of livelihood for rural people, whose survival and existence depends greatly on the exploitation of these resources. For instance, kerosene, electricity and gas, which are, could and should be alternative sources of energy, are either not available or unaffordable, for both rural and urban dwellers – particularly in Nigeria. Electricity supply is erratic in the countryside; kerosene and gas prices are being pushed out of reach of the poor through frequent price increases either stimulated by government regulation or driven by international market forces. These trends leave people with no alternative other than to descend on the forest for any available woody biomass. Specific trees are cut down for local use; others for sale to urban centres. As at the time of writing, Nigeria had no *Land Use* policy, only a Land Use Act and there was no forest certification practice in Nigeria.

Analysis and synthesis of participants' comments, during both the FGD and the in-depth interviews, on the problems which could prevent successful implementation of current forest policies in Nigeria and South Africa identified inadequate information on forests; poor planning and funding by the government; limited inter-sectoral approaches; lack of decentralised management capacity; lack of legal backing for the forest policy; absence of reliable data for forestry planning and development; and low forest tariffs as possible factors.

What the analysis has so far suggested so far is that forest sector policies have evolved over the years only through a top-bottom approach, with a strong emphasis on revenue generation for government. However, it is misleading for anyone to think that any policy declarations, as expressed in government documents, were automatically translated into action. Many of the policies purporting to shift responsibility, either through economic or sustainable livelihood approaches, did not translate into action. Most of the policy declarations have not progressed beyond public documents, despite the fact that the policies contain clear strategies of how the policies could be achieved.

There are several controversies inherent in the existing policy frameworks. First, there is little recognition or understanding of the rights and practices of local rural people in the formulation of forest policy. It is also apparent that there is conflict – between the interests of governments in maintaining control over the resources – and the needs of local people to exploit and use forest resources.

From the FGD and interview, it can be inferred that the government policies have constrained local efforts to derive more benefits from non-timber forest resource products (NTFPs) that can contribute to household livelihoods. This is because of the high priority given to conservation objectives; many governments have adopted forest and environmental policies and regulations designed to limit, rather than encourage, the production and sale of non-timber forest resource products (NTFPs). Restrictions on forest resource use, it was observed, imposed costs on local people and reduced their motivation to be involved in forest conservation.

From the foregoing section, three conclusions can be drawn. First, South Africa, as a country, views forest resource management and conservation with great seriousness and has made legal provisions for this; Nigeria is still grappling with basic issues (such as drafting and enacting an appropriate forest policy). Second, the analysis of the differing experiences of these two countries brings to the fore the fact that formulating policies and enacting laws may be less challenging than their implementation and enforcement – as was evident in both countries in this study. Third, the current socio-economic situations and political structures in both countries are affecting their ability to effectively manage their forests. For example: the levels of poverty and unemployment among the people – and the contradictions in government sectoral policies (as exemplified in the case of Nigeria where the government pricing policy on alternative energy sources to fuelwood has pushed their prices out of reach of the common people).

The results have clearly shown that how governments react to the challenges of sustainable management of forests depends on the interplay of factors that are defined by the peculiar context of each country. These factors can differ vastly across countries and regions, and these differences

have a decisive impact on whether an approach that has worked in one country will work in another.

To show the differences in the knowledge, attitudes and practices of forest resource conservation among the people of the study areas from the two countries, t-test statistical analyses were performed on the aggregated data collected from both countries. The findings are presented below and complemented with extracts of comments from FGD, IDI and informal conversation among the participants.

Table 8.2 shows the comparative analysis of the different households' interests in forest resources in the study areas.

Table 8.2 Comparative analyses of interests in forests, Nigeria and South Africa.

Statement	Nigeria		South Africa				
	Mean	SD	Mean	SD	MD	t	Sig
Are you interested in issues related to how we use our forest/woodlands resources	2.88	0.46	2.90	0.41	-0.02	-0.56	0.57
I don't really care about forests/woodlands.	2.10	0.55	1.97	0.44	0.13*	3.30	0.00

SD is the standard deviation of the score; **MD** is the Mean Difference between the scores for Nigeria and South Africa; **T** is the t-test statistic; and **Sig** is the confidence value of the difference between the means,
* Significant at 0.05 level.

A significant difference was found in the responses to the second item which is 'I don't really care about forest/woodland resources' ($t = 3.30$, $p < 0.01$). The difference in the mean score showed that Nigerian people tended to care more about forest resources than their South African counterparts. While no significant difference was observed in responses to the question 'Are you interested in issues related to how we use our forest/woodlands resources' ($t = -0.56$, $p < 0.57$), the mean score of the Nigerian respondents was slightly lower than the South African respondents. The differences in the mean scores were not high enough to warrant drawing an alternative conclusion of significant difference. What this means logically is that there is homogeneity in the expression or interest shown in forest/woodland resource related issues among the rural people of both countries. This is not surprising because of their dependence on these resources for food and income. However, one plausible explanation for the significant difference observed in the second item might have to do with the level of access and ownership of forest/woodland across the two countries. In Nigeria, state, community, and families own forestlands – Nigerians have easier access to forestland than South Africans. Here the relevance of the political ecology theory adopted for the study can be seen.

Knowledge of forest resources among respondents from Nigeria and South Africa is compared in Table 8.3. A significant difference was only observed in the mean scores of the first statement. The result suggests that the 'Knowledge' mean score of respondents from Nigeria was higher than the average from South Africa on each statement; no significant differences were found in respect of the other two statements. This means that there is homogeneity in the mean scores of respondents from both countries and that the respondents from both countries have an adequate

knowledge of forest/woodland resources. The result also reveals the acknowledgement or appreciation of the universal usefulness of forest and forest products to humans.

Table 8.3 Comparison of knowledge of forest resources, Nigeria and South Africa.

	Nigeria		South Africa				
Statement	**Mean**	**SD**	**Mean**	**SD**	**MD**	**t**	**Sig**
Forests/woodlands contain the largest reserve of various plants, animals and insects in the world	2.90	0.42	2.67	0.71	0. 23*****	4.74	0.00
Forests/woodlands are just collection of trees/plants with no values to life	2.02	0.26	1.99	0.31	0.04	1.57	0.12
Forests/woodlands may be useful in other countries, but they are not useful here	1.92	0.31	1.88	0.35	0.04	1.47	0.14

***** Significant at 0.05 level.

The t-test analysis of differences on the level of awareness between the two groups from the two countries (Table 8.4) showed that, overall, the Nigerian respondents had a higher awareness of forest/woodland resource conservation efforts of government and the importance of the resources to the national economy. This is because a significant difference was found between the respondents from the two countries on the two items on awareness. Respondents from Nigeria are more aware of government efforts towards forest resource conservation ($t = 5.24$, $p < 0.01$) and importance of forest resources to the country ($t = 9.54$, $p < 0.01$) than their South African counterparts. This was interesting, surprising and unexpected considering several of the opinions expressed during the interviews, FGD and informal conversations with the people that had suggested a total ignorance of government policy and programmes concerning forest resource conservation. I was expecting that, given the level of tourism activities facilitated by the South African government and the availability and closeness of the respondents to game reserves, people would be more aware of government conservation efforts than the villagers in Nigeria, where tourism is not promoted as much as by South Africa. On the other hand, the consciousness of the Nigerian respondents in terms of their closeness to protected forest reserves, can be explained.

Table 8.4 Comparison of awareness, Nigeria and South Africa.

	Nigeria		South Africa				
Statement	**Mean**	**SD**	**Mean**	**SD**	**MD**	**t**	**Sig**
Are you aware of forest/woodlands resource conservation efforts in this country	2.64	0.56	2.41	0.54	0.24*****	5.24	0.00
Are you aware of the importance of forest/woodlands resources to this country	2.75	0.47	2.37	0.52	0.39*****	9.54	0.00

***** Significant at 0.05 level.

8.3 Importance Attached to Forest Resources

A majority of the respondents – in both countries – believed in the benefits of forests. Benefits identified include: wealth creation, household economy, quality of life, wildlife habitat, country economies and environmental quality. Table 8.5 shows the result of a comparison between seven

aspects of life in which forest resources are of importance to respondents from Nigeria and South Africa.

Table 8.5 Importance of forest resource to Nigerian and South African groups.

	Nigeria		South Africa				
Variables	**Mean**	**SD**	**Mean**	**SD**	**MD**	**t**	**Sig**
Wealth	3.50	0.67	3.61	0.55	-0.11*	-2.20	0.03
Recreation	2.44	0.90	3.09	0.71	-0.65*	-9.82	0.00
Household economy	3.82	0.41	3.49	0.55	0.33*	8.21	0.00
Quality of life	3.13	0.81	3.27	0.61	-0.14	-2.39	0.02
Quality of Environment	3.31	0.80	3.27	0.61	0.04	0.63	0.53
Survival of life forms	2.90	1.00	3.13	0.60	-0.23*	-3.43	0.00
Country economy	3.46	0.92	3.72	0.52	-0.26*	-4.28	0.00

***** Significant at 0.05 level.

T-test analyses revealed that significant differences existed between the groups in the six areas. Taken together, what the results suggested is that there are variations or differences in the importance attached to forest resources. One striking and interesting feature of this result was the consistency of the aspect of life to which most importance is attached in South Africa. A closer look showed that recreation, quality of life, quality of environment, survival of life forms and country (national) economy were perceived as significantly more important in South Africa than in Nigeria. This is an interesting finding, which I perceive as reflecting the reality of conservation interests in the country. A high premium placed on recreation will invariably mean an equal premium on survival of life forms (i.e. animals, plants and birds) which will attract tourists and, in turn, bring in money into the country's economy. Here we can see the connection and relationship between survival of life forms, recreation and country economy on one hand, and quality of life and quality of environment on the other. Thus, I can hypothesise that forest resources are perceived as more important to the country economy in South Africa than in Nigeria. In addition, South Africans perceived forests as an avenue for recreation, more than Nigerians did.

On the other hand, the most striking aspect of life with which forest resources are attached in Nigeria is *household economy*. This is not surprising, because the land tenure and ownership systems allow for family and clan ownership of forestland, which most people then exploit for their livelihood. One can conclude, therefore, that forest resources are perceived as more important to household economy in Nigeria than in South Africa. Land ownership in Nigeria is as complex and diverse as the country's cultural and traditional practices and customs. Although the Nigerian Land Use Act of 1978 vests the ownership of land in the Federal Government, State and Local Governments, the Act still recognises communal and family ownership, which are derived from customary rights of occupancy and makes it possible for land to be available to individuals or groups for any purpose.

8.4 Forest Resources Utilisation and Dependency

Forest ecosystems provide many goods and services valuable to society, ranging from wood-based (industrial wood, fuelwood) to non-wood forest goods (e.g. plant and animal products) and to forest services (recreational and cultural services). Forest-dependent communities in Nigeria and South Africa rely on these goods and services for their livelihoods, especially during events like droughts, floods and crop failures. These goods and services are also beneficial to forest and other forest- or tree-dependent sectors – livestock, water, energy and agriculture – which contribute to the overall national economic development. Comparison of forest resource utilisation between the groups was conducted. In some cases, the difference was so large that no similarities were found; in other cases the differences were so minimal that one could not resist the temptation of drawing the conclusion that there was the likelihood of similarities existing between the groups. Testing the homogeneity of variance between the respondents from the two study countries showed that they did not differ significantly from each other. The extent of use of forest resources was influenced by the degree of dependency on the ecosystem for sustainable livelihood.

As Table 8.6 shows that of the 19 different types of forest resource use, the two groups were similar in only six resource use categories. For the other twelve resources there were statistically significant differences at the P = 0.05 level. According to these results, there were no differences in the use of indigenous poles for construction, edible insects, grass/tree for livestock, seed for rattle/decoration and grass/twigs for sweeping. The differences in the usefulness of the other resources were significant, with Nigerian rural inhabitants having higher utilisation mean scores – for instance, wild animal/bushmeat for food or sale, bird eggs, medicinal plants, wild herbs, and wood for furniture and carving. Apart from the reasons frequently mentioned in literature to justify rural people's use and dependence on forest resources – poverty, employment and lack of alternative resources – there are three plausible reasons to advance for this result. First is the fact that Nigeria lies in the tropics and is more richly endowed with forest/woodland resources than South Africa. Second is the lack of effective forest resource conservation and management policy in Nigeria. In the third place the land ownership system in Nigeria allows individuals and groups to have title deeds to land; by contrast in South Africa all land and title deeds are controlled by the tribal chiefs.

Table 8.6 Forest resource utilisation comparison between Nigerian and South African groups.

	Nigeria		South Africa				
Forest resources	**Mean**	**SD**	**Mean**	**SD**	**MD**	**t**	**Sig**
Fuel wood	0.94	0.24	0.98	0.14	-0.04*****	-2.51	0.00
Indigenous poles for construction	0.90	0.30	0.92	0.27	-0.02	-1.01	0.32
Wood for household utensils	0.69	0.46	0.84	0.36	-0.15*****	-4.42	0.00
Wood for furniture	0.92	0.28	0.56	0.50	0.36*****	10.95	0.00
Wood for carving	0.64	0.48	0.56	0.50	0.08*****	2.00	0.05
Wild herbs	0.83	0.38	0.74	0.44	0.09*****	2.60	0.01
Edible wild fruits	0.78	0.42	0.80	0.40	-0.02	-0.50	0.62
Mushroom	0.56	0.50	0.57	0.50	-0.01	-0.25	0.81

Forest resources	Nigeria		South Africa				
	Mean	SD	Mean	SD	MD	t	Sig
Honey	0.84	0.37	0.51	0.50	0.33*	9.21	0.00
Edible insects	0.61	0.49	0.67	0.47	-0.06	-1.62	0.11
Wild animals/bushmeat for food or sale	0.90	0.30	0.58	0.49	0.32*	9.58	0.00
Bird eggs	0.62	0.49	0.42	0.49	0.20*	5.08	0.00
Medicinal plants	0.86	0.35	0.73	0.45	0.13*	4.08	0.00
Thatch grass	0.48	0.50	0.66	0.47	-0.19*	-4.69	0.00
Reeds for weaving mats	0.69	0.46	0.79	0.41	-0.09*	-2.62	0.01
Reeds for construction	0.65	0.48	0.85	0.36	-0.20*	-5.72	0.00
Grass/tree for livestock	0.81	0.39	0.84	0.37	-0.02	-0.75	0.45
Seed for rattle/decoration	0.53	0.50	0.61	0.49	-0.08*	-1.98	0.48
Grass/twigs for sweeping	0.74	0.44	0.79	0.41	-0.06	-1.64	0.10

* Significant at 0.05 level.

Rural households throughout the two countries derive a wide range of products from forests/woodlands for their livelihoods. The people typically rely heavily on collection of various products (fuelwood, leaf fodder, grass, and variety of non-timber forest products) to meet their subsistence needs. Firewood is the most important non-commercial domestic fuel energy in rural Nigeria and South Africa, collected mostly from nearby forests. In all the study communities in both countries, gathering activities are carried out. Firewood is the main source of energy for cooking household meals and animal feed preparation.

Many forest products are consumed within households with a lesser proportion marketed in the informal sector, contributing a significant proportion of household income – especially for poor and landless households. A number of studies have highlighted the essential nature of forest/woodlands to secure livelihoods of the poor especially those in the rural communities.

The mean scores and standard deviation for the dependent variables importance, attitude, practice, knowledge, awareness and interest by study areas are given in Table 8.7. With the exception of attitude, differences between the groups on the other five variables are significant ($p < 0.05$). It was a striking and surprising result to find that Nigerians and South African groups did not differ in attitude. This implies that, in spite of the environmental and social difference between the two study countries, there still exist similarities between them. The importance and practice difference between the Nigerians and South Africans was significant, with this score for the South Africans being slightly higher. Significant difference was observed in awareness and interest of the two groups with Nigerians having a higher mean score in awareness than South Africans. This suggests that the Nigerian rural inhabitants tended to be more aware and interested in forest resources than the South Africans.

Table 8.7 Test of significant difference of importance, attitude, practice, knowledge, awareness and interest in forest resource conservation between Nigerian and South Africa groups.

	Nigeria		South Africa				
Variables	**Mean**	**SD**	**Mean**	**SD**	**MD**	**t**	**Sig**
Importance	3.22	0.54	3.37	0.36	-0.15*	-3.89	0.00
Attitude	3.79	0.47	3.81	0.42	-0.02	-0.58	0.56
Practice	2.69	0.64	2.82	0.59	-0.13*	-2.51	0.01
Knowledge	2.28	0.18	2.18	0.30	0.10*	5.05	0.00
Awareness	2.70	0.41	2.39	0.44	0.31*	9.02	0.00
Interest	2.49	0.35	2.43	0.30	0.06*	2.11	0.04

* Significant at 0.05 level.

A majority of respondents, from both of the countries, seemed concerned about the degradation of their environment and the need for conservation of forest resources. However, many were aware that so many people cut down the trees because there is not enough understanding about the forests. Most of them understood the consequences of negative activity on their future livelihood and survival. Many knew that degradation occurred because of their actions and inaction. However, negative activities happened more often in unprotected and open forestlands. Many people commented that, if people came from far across the world not only to see these animals but also study them, then it was important that protection and conservation of forest resources be taken seriously.

In Nigeria, rural people in the study areas did not regard bush burning, hunting of wildlife and deforestation as a great problem because these were activities commonly used by people to earn their livelihoods. Therefore, no government legislation or force could stop them. A few did mention planting new trees. However, the trees suggested were cash crop trees. Most of the respondents did not know much about what forest reserves. Several answered that they knew that there were boundaries somewhere and they were not supposed to go to cut down the trees from the demarcated areas. Therefore, they also did not know much about the need to protect the forest. As far as they were concerned, their first priority was to ensure and maintain their livelihood, make money and build houses. Their short-term survival took precedent over the long-term survival of forest resources.

South African rural inhabitants knew about deforestation and were aware that erosion and climate change were some of its consequences. They were also aware of the forest reserve since many had originally owned land inside it, which they had given up to the government when the reserve officially became a protected area. However, they had no knowledge of government conservation policy and conservation activities except for periodic meetings with their headmen.

As to who should bear the responsibility for the protection of the environment, there was similarity in the reaction of people in the two countries. A large majority in both countries (82% in South Africa; 72% in Nigeria) believed that the responsibility should not left to the central government alone, but rather should be held by all stakeholders in the community i.e. government,

chief/headman and other village structures or groups. However, in South Africa, there was widespread support for the management of state-owned forest land for recreational uses – especially for tourism – because they believed tourism could either promote economic growth, or bring more money into the economy for government to allocate to carry out its responsibilities to them as individuals and communities. There was also opposition to management by private forest landowners. According to the respondents:

> "*It should be the responsibility of us all to take care of the environment not just the forest/woodland resources as you call them now, because it affects us all.*" (South African young female participant)
>
> "*It is our responsibility to protect our environment so that people don't put fire and destroy the woods, plants and animals.*" (South African adult male participant)

The above extracts from participants' comments at one of the South African FGD sessions, when compared to those below, captures the differences in attitude and practice towards forest resource conservation between the people from the two countries:

> "*Look, if we don't kill some of these animals they will eventually die. By then, no one will be able to eat them. We cannot leave everything to nature while we are starving. People should be allowed to kill the animals especially those that are not in parks.*" (A Nigerian participant at FGD)

Another participant disagreed with this:

> "*If people are given the opportunity to kill these animals, they will misuse the chance. Everybody will become a poacher, and start killing the big animals. I think what can be done is to allow people to hunt seasonally. People should be told the type and number of animals an individual can kill on such expeditions.*" (South Africa participant at FGD)

The individual who made this last comment was concerned about the tourist potential of wildlife to South Africa. This individual also believed that this would give hope for future generations to know and enjoy those resources that it had pleased God to endow the country.

8.5 Attitudes towards Forest Resource Conservation

Attitudes of South Africans and Nigerians towards forest resource conservation are compared in Table 8.8. In the comparison of forest resource attitudes between the study countries, there are no large differences. Even though t-tests revealed no significant differences in the attitude between Nigerians and South Africans in the overall analysis (Table 8.8), there were differences in their responses to several attitudinal statements. Table 8.8 shows that, when the aggregated attitude mean score for the group was compared, the value of the t-test was not found to be significant – 0.05 level of confidence ($t = -0.58$, $p < 0.5$). Five of the eight forest resource attitude statements were found to show significant differences between the two groups. For the remaining three statements no significant difference was observed. Table 8.8 shows the value of the t-test for the differences between the means of the two groups on attitude statements.

Table 8.8 Attitudes towards Forest resource conservation of Nigerian and South African groups.

	Nigeria		South Africa				
Attitude statement	**Mean**	**SD**	**Mean**	**SD**	**MD**	**t**	**Sig**
Forest/woodlands resources should be conserved to ensure healthy population of all wild species of trees, plants and animals	4.70	0.63	4.59	0.69	0.11*****	2.11	0.04
Forest/woodlands resources have ways of re-generating themselves whether we care or not	3.20	1.14	3.78	1.02	-0.57*****	-6.50	0.00
Protecting the job of forest industry workers is more important than protecting endangered species	3.19	1.37	3.41	1.28	-0.22	-2.01	0.05
The most important objective of forest/woodlands management should be to protect the environment for all	4.23	0.93	4.33	0.76	-0.10	-1.49	0.14
Everyone should be concerned and do something towards protecting the forest/woodlands resources	4.24	0.91	4.37	0.81	-0.12	-1.75	0.08
It is government responsibility alone to protect and conserve the forest/woodlands resources	2.77	1.26	2.34	1.14	0.43*****	4.42	0.00
God gave us the forest/woodlands to use in meeting our needs and we should not be denied that natural right	4.12	1.05	3.44	1.30	0.68*****	7.03	0.00
If we want wildlife to survive, we must look after the natural places where they live	3.86	1.14	4.24	0.92	-0.38*****	-4.46	0.00

***** Significant at 0.05 level.

'Forest/woodlands resources should be conserved to ensure healthy population of all wild species of tree, plants and animals' was found to be significant with a 0.01 level of confidence ($t = 2.11$, $p < 0.04$). The mean score for Nigeria was higher than the mean score for South Africa. Further, there were significant differences between Nigerian and South African respondents in respect to the statements 'forest/woodland resources have ways of regenerating themselves whether we care or not' ($t = -6.50$, $p < 0.01$); 'It is government responsibility alone to protect and conserve the forest/woodland' ($t = 4.42$, $p < 0.01$), 'God gave us the forest/woodlands to use in meeting our needs and should not be denied that natural right' ($t = 7.03$, $p < 0.01$), and 'If we want wildlife to survival, we must look after the natural places where they live' ($t = -4.46$, $p < 0.01$). Furthermore, an observation of the means reveals no significant difference in the three statements: 'Protecting the job of forest industry workers is more important than protecting endangered species' ($t = -2.01$, $p < 0.05$), 'Everyone should be concerned and do something towards protecting the forest/woodlands resources' ($t = -1.75$, $p < 0.08$), and 'The most important objective of forest/woodlands management should be to protect the environment for all' ($t = -1.49$, $p < 0.14$). The results of the study demonstrate that respondents with positive attitudes towards forest resources were more likely to support conservation. This conclusion was drawn based on how respondents answered the various statements – i.e. in either a generally positive or negative manner.

To further buttress the differences in attitudes, here are several extracts of comments from people interviewed.

"*We should be given access to the woodland. We should not be denied access to it. It is people who use it for bad purpose or do something bad within it that should be denied access.*" (South African adult male participant)

"*The job of people is (more) important than the life of animals. Our life is more important than the live of animals. People have to feed their family.*" (South African adult male participant)

"*Because of the level of unemployment, I agree to protect the job of people (rather) than the animals.*" (South African adult male participant)

"*You see, here there is unemployment and population is growing. People want to build their own house. If people want houses we cannot say they should not give them land and if it is for industry we cannot stop them. Once this is going to be for the good of everybody.*" (South African adult male participant)

"*We must love and protect the forest resources and not the job of people working there. Although their job is important, but nature is more important and in any case it is because the forests are being conserved that they are getting job to do.*" (South African adult female participant)

Several respondents had opinions contrary to those quoted above:

"*If we have to apply the God's right, a lot of things will go out of control, so people must be checked. I know if people are permitted to go into the forest freely, they will not cut trees alone but kill animals too. Even, now that people are given permission, where they go, they collect more than they had requested for.*" (A community leader in South Africa)

"*If we say God give us the rights to consume the plants and animals free and should not be denied. Yes, it is true but people must learn to use it effectively and not destroy it. Government should come in to give control.*" (South African adult male participant)

"*Yet people have to be controlled not denied access. They two different things, when you denied people access it is against God's will or intention of creating these resources for us to use.*" (South African adult female participant)

"*Look my husband is not working, if he can get a job there (referring to the game reserve), I will be very happy.*" (South African adult female participant)

"*Look it is true that people must not be denied access, not like outsiders. People coming from outside that are not members of this community should be denied access so that we here in the community can enjoy the resources. You see, it is this people who cut most of our fuelwood.*" (South African adult male participant)

"*If you deny people access, you will be creating more poor people and criminals because there is no job so they will go and steal or cut more trees to be sold to people. The problems of poaching and indiscriminate cutting of trees are the result of this current restriction and denial.*" (South African adult male participant)

Their Nigerian counterparts expressed similar sentiments:

"*It is selfishness for anyone to think of preventing people for going into the forest. Once I do go into your forestland, I should be free to extract whatever I want from the place.*" (Nigerian adult male participant)

"*We inherit the forestland from our forefathers, we own it. If government wants any part we give and they pay us compensation and not total take over or control, it will not be easy to do. That is where people make their livelihood, support the household, and send children to school.*" (Nigerian young participant)

"*Look, people don't take what they don't need either for domestic use or sale from the forest. People know and appreciate the need to preserve and conserve their resources, I don't think we need someone either government or chief to tell us. It is going to be unfair to these poor people here to say they should limit or reduce what they take from the forest.*" (Nigerian participant in FGD)

"*Yes, there are restrictions to people's activities within the forest, but not many people comply. You cannot blame them; they have to feed their family. The economy of the country is affecting us badly, you see, there many household here that if they don't to get to the forest or farm in a day they may not be able to eat, it is what they bring back from the farm/forest they are going to eat.*" (A community leader in Nigeria)

"*If you must change the way people exploit the resources of the forest, you must be ready to provide them alternative sources of livelihood. If not, no way (sic).*" (Nigerian adult male participant in FGD).

"*People need money for many things; participate in their age grade activities, buy clothes for children, and look after their aged parents. How do they meet all these responsibilities without going to the forest or farm?*" (A Nigerian woman participant)

8.6 Forest Resource Conservation Practices

So far, the existence of systematic cross-national differences has been established – in attitudes towards forest resource conservation that are associated with levels of socio-economic development – and that the conservation attitudes are related to broader cultural indicators. However, do these cultural patterns matter in practice? Table 8.9 provides an answer to this poser.

Table 8.9 Forest resource conservation practices of Nigerian and South African groups.

Statement	Nigeria		South Africa				
	Mean	SD	Mean	SD	MD	t	Sig
Harvested areas should be allowed to regenerate itself naturally	3.57	1.32	4.11	1.15	-0.53*	-5.28	0.00
Leaving clumps trees for wildlife in habitat	3.46	1.01	3.99	0.95	-0.52*	-6.56	0.00
Closing forest access road to control illegal logging	3.92	1.16	3.95	1.07	-0.03	-0.33	0.74
Inadequate forest management planning	2.45	1.25	2.40	1.08	0.05	0.56	0.58
Loss of protected land to urban expansion	2.30	1.15	2.72	1.20	-0.42*	-4.38	0.00

Statement	Nigeria		South Africa				
	Mean	SD	Mean	SD	MD	t	Sig
Lack of protection for old growth forest/woodlands	2.40	1.12	2.27	1.01	0.13	1.53	0.13
Construction of oil/pipeline across forest land	2.33	1.16	2.56	1.18	-0.23*	-2.41	0.02
Not planting of trees to replace the ones cut	2.14	1.12	2.02	1.01	0.12	1.34	0.18
Indiscriminate bush burning	2.06	1.08	2.05	1.09	0.01	0.15	0.88
Current logging/cutting practices	2.26	1.12	2.11	0.99	0.15	1.78	0.08

***** Significant at 0.05 level.

Having found significant differences in the forest resource conservation practices of the rural inhabitants of the two countries based on the aggregated mean score and t-test analysis, I thought it necessary and important to further the analysis by comparing the responses to each of the statements. Of the ten statements, significant differences were found in only four. For example, statements such as 'harvested areas should be allowed to regenerate itself naturally' ($t = -5.28$, $p < 0.001$). This was acceptable but unexpected because the mean score of the Nigerians ($M = 3.57$) was lower than South Africans ($M = 4.11$). The expectation was that, because of the shifting cultivation and subsistence agricultural practices among the rural people of Nigeria, they would be able to express higher acceptance of the practice than their counterparts in South Africa, where such farming is not commonly practiced.

A significant difference was found for the statement 'leaving clumps trees for wildlife habitat' ($t = -6.56$, $p < 0.001$). The result shows that rural inhabitants in South Africa have a higher mean score ($M = 3.99$) than those in Nigeria ($M = 3.46$). This is a true reflection of the realities in the two countries and of the expressions of interest and appreciation of each country towards tourism and wildlife conservation. In addition, high significance was found when analysing responses to the statements 'Loss of protected land to urban expansion' ($t = -4.38$, $p < 0.001$) and 'construction of oil pipelines across forestland' ($t = -2.41$, $p < 0.02$). Rural inhabitants in South Africa tended to agree less with these statements.

> "*It is not acceptable because we had to lead our cattle to graze in field, so if we allow them to convert the veldt into industries or what, where do we graze our cattle? I will not support the idea.*" (An elderly South African man)

> "*You see, people here do burn the forest and if oil pipeline should run through forestland where animals graze and people go to collect firewood. It is dangerous, the whole community, animals and plants can be killed if there is leakage anytime.*" (A 45-year old South Africa woman)

> "*It is acceptable if the right channel is taken to do it because industries are important to the people, we will get employment. They must compensate the people. Local people should be given priority in the employment and should partners in the industry.*" (South Africa man)

> "*Though, it is possible for us all to agree that we should not burn the forest indiscriminately or cut wet and fruit bearing trees. But how many people will keep to it?*

You have people doing these things here and when you try to correct them, they tell you they want new grasses to grow or turn it into fight with you." (A South African male respondent)

8.7 Conclusion

As expected, participants from the study zones from the two countries surveyed differed in their responses on the issues of the importance, interest, awareness, knowledge and attitudes, and practices toward forest and forest resource conservation. This study has provided an attitudinal profile of people, in both study areas, by researching their interest in forest resource conservation. Differences among the people met expectations. One of the most significant findings was people's knowledge about and awareness of government conservation efforts. People in Nigeria may have been knowledgeable about natural resources, but apparently they were not well informed about the government efforts or policies on forest resource and wildlife conservation. People's scores on attitude scales reflected their appreciation of forest and forest resources. Although the South African participants scored higher on the attitude scale than the Nigerians, the difference was not statistically significant. Nigerian and South African participants demonstrated stronger orientation toward the negative attitude and practices, but the focus group discussions and written comments suggested different reasons for the negative attitudes and practices. The relatively high knowledge and awareness about forest and forest resources conservation and management as demonstrated by participants in Nigeria may relate to their exposure to and interest in farming and ownership of forestland. The most interesting results have been those where there is convergence between the Nigeria and South Africa respondents. Results such as these can contribute to the implementation of bilateral agreements or management plans for the forest resources.

To Nigerians, more than for South Africans, income was a significant factor in shaping their attitudes and practices towards forest resource conservation. Similar to income, education can play a role in how one perceives and relates to environmental issues. As for income, it was hypothesised that a higher level of education contributes to greater positive attitudes and practices of forest resource conservation, bearing in mind the different educational approaches and philosophies between the two countries. Education was a strong predictor for Nigerian and South African responses. In both countries, university educated people expressed more positive attitudes towards forest resource conservation than those without a university degree. The same pattern was observed concerning people's practices.

In this chapter, I have compared the forest policies, knowledge, interest, importance, attitudes and practices about forest resource conservation between rural inhabitants in Ogun State, Nigeria and Mpumalanga Province, South Africa. The purpose has been to provide answers to research questions five and six. A number of differences and similarities have been identified and discussed, confirming that people in different cultures interact with the forest resources in unique ways, and hold and place diverse values on forest resources. No cross-cultural comparison of rural inhabitants and about forest resource conservation between these two countries has been previously reported in any literature. Cross-cultural research exploring the understanding and attitudes of forest resource conservation is an important step in learning about existing situations, identifying common ground and developing sustainable educational programmes to promote human survival and cultural

integration – the aim of this study which will be the preoccupation of the next chapter. In Chapter Nine, based on the findings and observations earlier made, a conceptual framework and community based environmental education programme will be discussed – one which can be implemented as an intervention programme to promote sustainable forest resource conservation among the rural inhabitants, not just in the studied communities, but also in any part of the two countries.

CHAPTER NINE

9 Lessons, Strategies and Proposal from Fieldwork

"*Education is an indispensable element for achieving sustainable development.*" (United Nations 2004 General Assembly Resolution 58/219)

9.1 Introduction

This chapter is based on the findings and experiences from the study areas. As stated in the aims of the study, this thesis involves an investigation of the attitudes and practices of forest resource conservation and environmental education in rural communities to develop a community-based environmental educational curriculum framework through which the forest resource conservation crisis can be addressed. The literature on *environmental education* (EE) and *education for sustainable development* (ESD) calls for an holistic and integrated approach for dealing with the complex environmental problems resulting from unsustainable use of forest resources – such as forest degradation, loss of biodiversity etc. The purpose of this chapter is to outline a community-based environmental education framework – based on the findings and experiences of this researcher – as a potential intervention strategy towards promoting sustainable forest resources conservation alongside rural development. The framework has been conceived as a response to the various international initiatives – such as *Agenda 21*, Millennium Development Goals (MDG) and the Decade of Education for Sustainable Development (DESD) (2005—2014) (World Bank, nd).

9.2 Ogun State, Nigeria and Bushbuckridge, South Africa: Lessons and Experiences

Without being repetitive, the present study found that people in the study areas have not been exposed to environmental education programmes. Respondents showed positive attitudes and a willingness to participate in environmental programmes and activities. In rural Mpumalanga, South Africa and in Ogun State, Nigeria, the forest conservation attitudes and practices of rural people mean a community environmental education programme is essential. The study also revealed that the forest policy – and related policies – in both countries explicitly acknowledged the role of environmental education in promoting the conservation of forest resources and environment at all levels of society. However, this recognition has not been translated into, nor matched with action, the integration of programmes at the community level. EE in South Africa and Nigeria, at the community level, has not been given its due importance; at the school level EE is not coherently organised and does not effectively offer the individuals the necessary opportunities to develop the positive attitudes, values and skills to engage in sustainable forest practices. Research revealed the need to provide formal and informal community environmental education programmes – especially for out-of-school youths and adults – and to promote the adoption of sustainable lifestyles and values and to encourage active participation in decision-making relevant to sustainable development.

The results indicated that majority of rural populations in the two countries remain dependent on natural resources. However, it has become much harder for the people to use local forests and their products, through the imposition of legal restrictions and initiatives by government – such as the declaration of State Forests, National Parks or Wildlife Reserves. The current study revealed the hostility and frustration among rural people about the implementation of forest policies without due regard for their livelihoods, their socio-cultural values and their economic well-being. All the communities in this study were located within and around forests and forest/woodland, park and game reserves and depend heavily on these forest resources for subsistence. There are increasing demands that encroach upon the natural environment – forests are being converted to agricultural use, plantation farms and human settlements by both central governments and local communities. The methods and extent of harvesting natural resources, both within and outside the forest/woodland reserves, are not always well controlled. Numerous environmental problems connected with forest/woodlands, parks, game and forest reserves – which require educational solution –, were observed among the communities. These included: indiscriminate felling of trees for timber, firewood gathering, reduction of area under fodder and pasture, increased livestock grazing on forestland, bush burning, and negative attitudes towards planting of trees.

Other findings and emerging issues with implications for education and environmental education included: poverty, inter-generational gaps, unsustainable production and consumption patterns and gender roles. Clearly, the results of this study demonstrate the need for community-based environmental education programmes – which need to be directly linked to their everyday livelihood activities – to broaden the knowledge and modify the behaviour of rural people towards the realisation of sustainable forest conservation.

9.3 Community and Community-based Environmental Education: Conceptual Overview

There is no universally acceptable definition of *rural community*. To lay people, the phrase *rural community* evokes an image of a primitive, homogenous society, an untransformed place, where people's livelihoods are tied to interacting with natural resources. Demographers, policy makers, educational researchers and other stakeholders have attempted to define the concept from their own standpoint and using different parameters. Several have used population size; others adopted land use or economic activities; others explained it in relation to the availability and distance from key social services.

Traditionally, several scholars defined the concept *rural* by differentiating it from the term *urban* – based on population, the size of its area or residence and geographical characteristics. People are considered rural if they work or live mostly on farms and live in areas with a population between 5,000 to 10,000 people (International Fund for Agricultural Development, 2001). Reardon *et al.* (2001) defined rural populations as "…*population concentrations (in village/towns) below a threshold that varies by country, usually concentrations of 1000 – 2 000 or less*". Still using the quantitative measure, Mwabu & Thorbecke, (2001) observed that, in sub-Saharan Africa, rural people may be described as persons working and living on farms, or in small towns in the proximity of farms, with population concentrations of less than 5 000 people per square mile.

The concept of *community* is a human-environment centred concept. *Community* may connote a physical administrative place – rural, urban or cities (e.g. Sisagula community, or Johannesburg city) – or refer to a group of people (and their animals) from ecological and biological perspectives that work together and share core values. As a place, *community* can be defined by its size, density, and administrative structure as an observable unit. As a network of people, community is concerned with the potential for people to come together to shape their future. Communities are complex and heterogeneous systems, composed of individuals and differentiated by many qualities – such as status, political and economic power, religion, social prestige, and intentions (Barrow & Murphree, 2001). As such, communities usually consist of individuals with differing principles and, in turn, different opinions about how forests should be managed. These differences can potentially complicate the processes of community involvement in forest/natural resource management (Murphree, 1993; Fisher, 1995; Durongkadej, 1996). The term *community* has numerous usages and can be used interchangeably with *village*.

Rural community refers to a group of socially interacting individuals living together in a rural locality and constituting the only population of that area. In this study, *rural community* is defined as a geographical location without distinguishing urban features and inhabited by people of the same primordial socio-cultural and historical background. This definition contrasts with definitions of a local community as having an homogenous social structure, or a group of people having common interests and shared norms (Agrawal, 1998). The clarification of the definition used for this study is necessary since complex issues – of international law and nation-state policy, dealing with local communities defined by territorial boundaries – are being researched. This definition permits two critical assumptions useful to this study: firstly, communities are complex and heterogeneous systems composed of individuals differentiated by many qualities (status, political and economic power, religion, social prestige, and intentions); and secondly, local communities may consist of individuals with different perceptions of forest/woodland resources and their management (Metcalfe, 1999; Chambers & McBeth, 1992).

Education has been widely recognised as an important remedy for addressing the sustainability crisis bedevilling human society (UNESCO, 2002, 2005). Findings from this study and accumulated empirical studies (as alluded to in Chapter Three and the chapters on data presentation) provide a compelling rationale for the need to increase the investment in education. This investment should focus on the elimination of institutional and socio-cultural barriers to rural people's livelihood through policies aimed at promoting sustainable forest resource conservation and development. On the importance of education for sustainability, the World Bank (2003) observed:

> "*For people education opens up a world of opportunities, reduces the burden of disease and poverty and gives a greater voice in society. For nations it opens doors to economic and social prosperity, spurred by a dynamic workforce and well informed citizenry able to complete and cooperate in the global arena.*" (World Bank 2003)

Agenda 21, a global blueprint for the implementation of sustainable development, emphasises the role of education as an agent for change in sustainable development:

> "*Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues… It is critical for achieving environmental and ethical awareness, values and attitudes, skills and behavior consistent with sustainable development and for effective public participation in decision-making*" (UNCED, 1992: 2).

At the World Summit on Sustainable Development (2002) in South Africa, the place of education in the attainment of sustainable development was reemphasised, cumulating in The UN declaration of the years 2005—2014 as "Decade of *education for sustainable development*." According to the declaration, education for sustainable development is based on principles of sustainability including: "*…intergenerational equity, gender equity, social tolerance, poverty alleviation, and natural resource conservation…"* (UNESCO, 2005). The Earth Summit Declaration on Sustainability can assist scholars and educators to help communities to identify knowledge, principles, skills, and values to address issues of sustainability as envisioned in *Education for Sustainable Development*. The objectives of Education for Sustainable Development include:

- *"Facilitate networking, linkages, exchange and interaction among stakeholders in education for sustainable development;*
- *Foster an improved quality of teaching and learning in education for sustainable development;*
- *Help countries make progress towards and attain the Millennium Development Goals through education for sustainable development efforts; and*
- *Provide countries with new opportunities to incorporate education for sustainable development into their education reform efforts" (UNESCO, 2009).*

Education for sustainability is concerned with the prevention of the destruction of the natural environment, the loss of biodiversity, the reduction of forest degradation and the loss of other natural resources. The idea addresses social issues that threaten human survival – such as poverty, inequality, social conflict, violence, and HIV/AIDS. All these issues were (and still are) present among the communities studied. In Chapter 36 of *Agenda 21*, the major thrust of education for sustainability is the reorientation of existing education, public understanding, awareness and training. These principles form the basis grievance for establishing and processing a community's understanding so that the people will be conversant with the goals of a sustainable environment and society, and encouraging them to focus on the knowledge, skills, values and perspectives that contribute to sustainability goals.

Very little literature that looked at the issues of community environmental education was available. However, literature was awash with EE in the school system (extensively discussed in Chapter Three). Community Environmental Education (CEE) forms a sub-set of EE. It can be defined as an education programme designed to increase awareness, knowledge and attitudes toward natural resources with a view to promoting sustainable and environmentally friendly practice among rural people. Community-based environmental education programmes seek to equip members of the rural community with tools to address issues related, not just to the conservation of forest

resources, but also to the other socio-cultural, economic, health and political issues facing them. CEE programmes can facilitate the understanding of unsustainable behaviours that threaten both the natural environment and human health. The resulting knowledge and understanding can give rise to attitudinal and behavioural change. As consciousness of the environment increases, people would (or should) become more appreciative of the relationships between economic, political, religious and environmental issues and would therefore work to enhance these relationships to achieve sustainable development.

The Community Environmental Education Programme (CEEP), as proposed in this thesis, is tailored towards achieving the objectives of education for sustainable development. It is aimed at addressing the awareness levels and concerns of rural people including the cultural values and perception of nature. The goals of the programme will be: (i) to promote the sustainable socio-economic and environmental conditions; (ii) to improve the quality of life of all groups of people in the community; (iii) educate people, through the creation of awareness about the need to use resources more prudently; and (iv) the consequences of environmental degradation and mismanagement of natural resources in their communities.

A community environmental education programme (CEEP) should be more than just natural resource conservation; it should encompass the politics of access and control, livelihood strategies, economic empowerment, socio-cultural and indigenous knowledge and technological issues – all of which are related to political ecology theory. CEEP has a significant role to play in forest conservation. It can be an important asset through which people are given the knowledge, skills and capabilities to help people improve their lives, manage the resources and cope with any change in the process. The role of CEEP, in this context, is beyond providing information. CEEP will touch on the core issues of attitude and behaviour change for the rural people. The Community Environmental Education, as proposed here, has multiple benefits. These benefits include: the opportunity to facilitate social and economic mobility and contributions to cultural and political identity and participation – for all participants in the programme.

9.4 Towards a Conceptual Framework for Community Environmental Education Programme (CEEP).

Much of the literature on environmental education acknowledged that an effective environmental education programme must be contextualised to reflect the priorities of the immediate and long-term needs as identified by the communities. During the focus group discussions, interviews and informal conversations with the participants of this study, a wide variety of environmental issues relevant to EE were expressed, based upon the different needs and concerns felt by the communities in both countries. Table 9.1 presents the issues that were most commonly articulated as required for integration into an effective community environmental education programme, if the programme was specifically designed for the communities surveyed.

Table 9.1 Emerging themes for community based environmental education.

Knowledge/interest –based
Gender roles
Types and importance of forest/woodland
Forest conservation policy
Disaster management strategies
Wildlife conservation – The National Park
Sustainable natural resource use
Poverty alleviation activities.
Alternative energy source
Indigenous knowledge and technological issues
Sustainable alternative livelihood strategies

Educational programmes are the key to ensuring community empowerment and participation in CEEP. Inkeep (1991:404) and Rahman (1993: 27) argued that the first step in CEEP is to conduct a survey of community characteristics and design programmes that are in line with these characteristics. The aim of the CEEP is to provide environmental and social development education opportunities to all the groups of people in the community (adults and young people) through interesting and engaging programmes focussed on producing community members who are inspired to change the world by reducing the impacts of environmental disasters, deforestation and climate change. A further CEEP aim is to improve the socio-economic and environmental conditions and the quality of life. The specific objectives of CEEP are:

- *increase awareness of forest resource conservation and related issues.*
- *improvement in skills for conservation of forest resources*
- *promote alternative income generating activities with order to reduce poverty.*
- *reducing fuelwood requirements through the production of fuel efficient wood burning stove*

The conceptual framework (Figure 9.1) includes several elements that apply to both rural and non-rural settings. These elements are presented in a way that attempts to develop a conceptual framework that comprehensively captures the various features of forest rural communities.

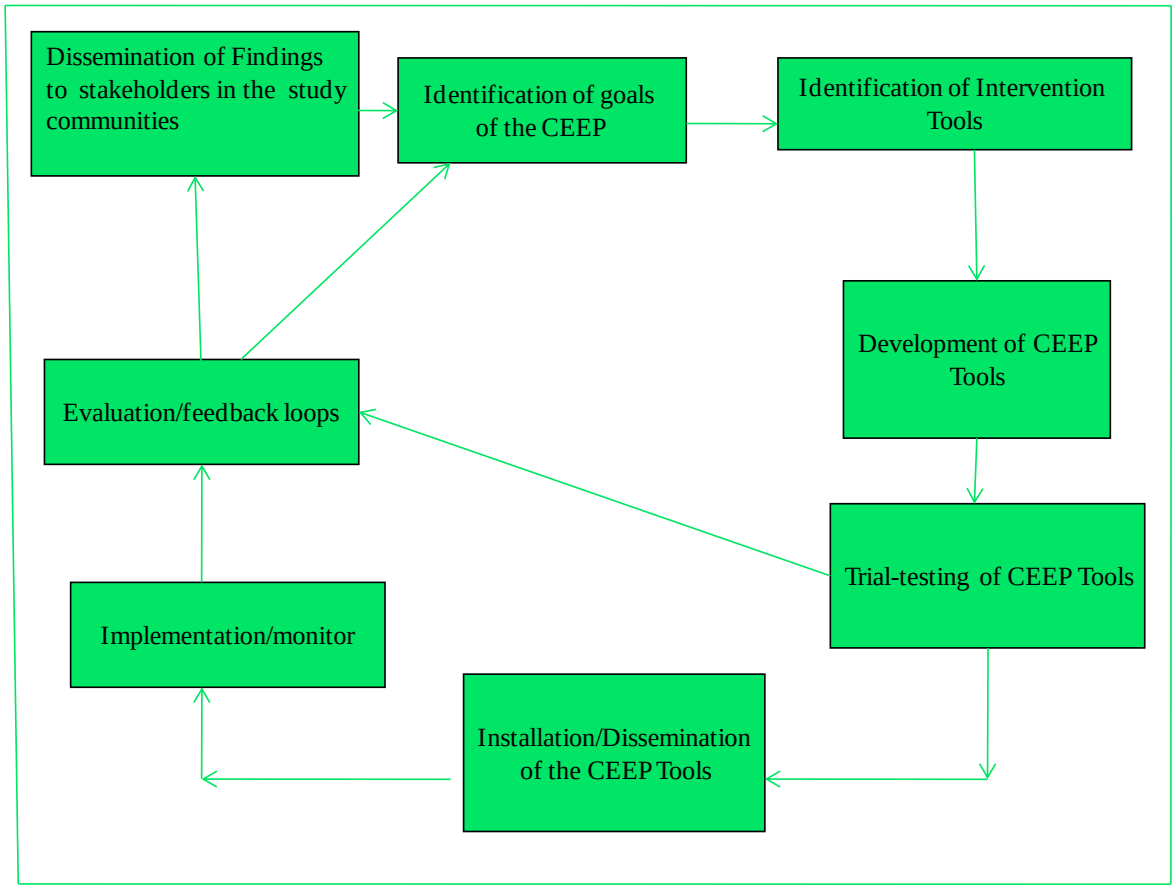

Figure 9.1 Proposed framework of community environmental education.

9.4.1 Phases of the CEEP conceptual framework

The conceptual framework posits eight steps, or phases, within the curriculum development structure. The framework adopts action-oriented steps in each phase.

Phase 1: Within the context of this study, the first step would be to return to each researched community for a round table discussion to disseminate the findings and observations to several of the participants and the major stakeholders in the community. This would acquaint them with the emerging issues and concerns that needed attention. is the discussions would also to designed to ascertain their willingness and readiness to participate in any intervention programme to be proposed.

Phase 2: The second step is to work with the people to identify objectives of the programme, including prioritising which concerns should be addressed first. Here, several questions must be addressed: What aspects of the existing environment are likely to enable or hinder change or implementing the programme? What would the communities hope to gain from the CEEP? What would be the aspirations of the communities with the proposed CEEP? What capacities do people have available for influencing their environment? Has anything been done through other programmes (if any exist)?

Phase 3: The third step is the identification of intervention tools. The programme coordinator (in this case the researcher) would help guide the stakeholders to select the appropriate tools for

addressing the problem. Stakeholders would be provided with information about the chosen programme's options. The intervention tools being considered for tabling for consideration by the stakeholders would include:

- entrepreneurial training scheme on alternative sources of income generation to reduce pressure of exploitation on natural resources;
- advocacy, in the form of awareness campaigns and liaison/cooperation with government at the grassroots level on sustainable exploration and exploitation of natural resources;
- Formation and running of Forest Management Committees (FMCs) and Forest User Groups (FUGs) to promote effective monitoring of the forest resources;

Workshops on:

- Forest resource monitoring and analysis – to empower communities to manage their natural resources more sustainably.
- Skills development on community environmental resource exploitation monitoring for youth.
- Review of state forestry laws to accommodate community-based management of their local natural resources in more sustainable manner.
- Conflict resolution and peace building between communities to promote more conducive and sustainable exploitation and natural resources.
- Socio-cultural practices and indigenous knowledge for promoting sustainable exploitation of natural resources.
- formation of Forests Volunteer Guards to protect natural resources of the community;
- development of radio and television jingles for intensive awareness campaigns through the media.

Phase 4: The fourth step is the development of intervention tools. The identified tools will be designed and developed with input from the participants.

Phase 5: The fifth step is the trial or testing of the intervention tools. Each tool is to be put to the test to establish the extent to which it will be able to address the problems for which it was designed. Here, the challenges identified as originating from the application of the tool(s) will also be brought for discussion with the people to consider appropriate adjustment or modification.

Phase 6: The sixth step is the installation and dissemination of intervention tools.

Phase 7: The seventh step is the monitoring and evaluation phase. During this phase, a group of forest users and a representative group of stakeholders would be selected for a trial implementation of the project to ensure sustainability.

Phase 8: The eighth step is the evaluation and feedback on the success etc. of the intervention tools.

There are numerous groups of stakeholders who are likely to be affected by, or involved in, the programme, although not all of them will be equally significant:

- National Level – Stakeholders would include the relevant Ministries of Education, Environment, Water and Forestry Affairs;
- Local Level – Stakeholders would include municipal organisations responsible for forest resource conservation;
- User Groups – Stakeholders would include individual, regional industries, local and national level main dealers;
- Forestry Workers – Stakeholders would include formal employees (conservation officials and janitors) of the private parks;;
- Non-Governmental Organisations – Stakeholders would include local environmental organisations, women NGOs, youth groups, etc.;
- Community-Based Organisations – Stakeholders would include those local groups responsible for the management of neighbourhood services;
- Trade Associations – Stakeholders would include associations having an interest in any aspect of forest resource conservation.

9.4.2 Project Component and Activity

Activity 1: Identification of Project Location and Target Groups. It is envisaged that the project would cover all the six communities used in the study from the two countries, namely Mamu, Isanya Ogbo and Ajebandele, in Ogun State, Nigeria; Timbavati, Khokhovela and Hluvukani in Mpumalanga Province, South Africa.

Activity 2: Train-the-Trainer Workshop: The first part of the project Activity 2 will be a training workshop for people in each of the communities. Sustainable conservation of forest resources will be unachievable if the women and young people do not appreciate the need and importance of conserving these resources. Women/Young people will be trained, not only to develop the practice of planting new useful trees, but also to respect the existing wild tress for their value as the habitat of wild animals. The participants will receive appropriate lectures on the importance of conservation and the benefits of sustainability. The lectures will also include parts designed to develop information, communication and education materials.

The second part of Phase 2 of the project will involve workshops for selected participants on the consequences of unsustainable exploitation of forest resources. During the workshop, the several of the issues outlined in Table 9.1 will be considered for presentation, to positively influence attendees' attitudes towards conservation.

Activity 3: Training Workshop: A woodfuel-efficient Stove-training workshop will be organised for selected women on production of stoves. Concerning the issue of unemployment – during the study most women complained about both this issue and the lack of access to the forests – their main source of livelihood. Skills acquisition workshops for individuals interested in acquiring alternative means of income generation activities will be organised.

Activity 4: Application, Monitoring and Dissemination. At the end of the workshops, facilitators would be requested to go and apply the prototype modules in the centres for four to six weeks.

Sustainability of Activities: The sustainability will depend on the overall commitment of the government and their institutions, NGOs and CBOs, to educate people about the protection and conservation of natural resources.

Expected outcomes will include:

- information, Education and Communication materials;
- production of woodfuel efficient stoves.

The project is expected to take a total of two years, one year each in Nigeria and South Africa.

9.5 Conclusion

The recognition of education as a tool to promote environmental sustainability in the various international declarations – such as *Agenda 21*, Millennium Development Goals and World Summit on Sustainable Development – cannot be underestimated. It requires the use of multidimensional approaches to provide necessary orientation to sustainable living and eco-friendly socio-cultural behaviour/practices. The development of an effective curriculum essential for achieving the goals/objectives of these international initiatives. Although the proposed community based environmental education programme and framework have been based on the findings and experiences from two countries – Nigeria and South Africa – I believe that the model and programme can be replicated in other communities which have similar characteristics – especially in developing countries and sub-Saharan Africa. Rural people have been the subject of this study, but also policy makers, local government officials, and legislators should be exposed to the CEEP programme.

The final chapter will provide a summary of the study, discussion of the findings relative to the research objectives and questions. In Chapter Ten, I will draw conclusions and implications of these findings and the contribution of related literature to the understanding of forest resource conservation practices of the two groups already studied. The contributions of the thesis to the body of knowledge will be highlighted. Finally, a set of recommendations is provided, followed by concluding remarks of the thesis.

CHAPTER TEN

10 Discussion, Conclusion and Recommendations

"*If there is to be an ecologically sound society, it will have to come from the grassroots up, not from the top down.*"

(Paul Hawken, EarthNet News, 9 June 2005)

10.1 Introduction

In this final chapter, the summary of the thesis will be provided. Major findings of the study will be discussed with regard to previous findings in other studies. The implications of the findings for forest conservation and environment education, contributions of the current study, suggestion for future research and the limitations of the present study will be discussed.

10.2 Summary of Thesis

Chapter One began with an introduction and motivation for the study *"Forest/Woodlands Resource Conservation and Environmental Education in Rural Africa: A Comparative Study of Nigeria and South Africa"*, and was followed by the research aim and objectives, and research questions formulated. The background to the study, the significance of study was also discussed. The focus of this research was clearly demarcated. The chapter concluded with the delimitation of the study and key assumptions, an outline of the chapters to follow and conclusion of the chapter.

Chapter Two provided the theoretical framework for the study. It examined and justified the use of both political ecology theory and the social psychology theory of planned behaviour theory in a complementary manner. Relevant philosophical approaches; anthropocentrism and non-anthropocentrism characteristic of environmental ethic as well as perspectives in comparative research was provided.

Chapter Three provided an in-depth literature research on forest resource conservation and EE in South Africa and Nigeria and in overseas countries. This was done to provide a perspective of the different methods, contents and aims of EE programmes. The aim of this chapter was to show the influence of the different conventions over the years on the development of EE programmes in countries throughout the world. In the chapter literature survey topics such as "Social construction of forest resources", "The State of the forests – global and national", the "Ecological, economic and social importance of forest/woodland resources", "Forest degradation-socio-economic and environmental consequences' were discussed as a starting point for the understanding of rural people forest resource use and conservation. "The international and national policy initiatives on forest resource conservation", "The History and conceptualization of environmental education" and EE curriculum initiatives in South Africa and Nigeria were explored. This was done because the

incorporation of EE in the South African and Nigeria Schools Curriculum is fairly recent. Thus, the need for continuous development programmes in EE in the countries at formal and informal levels. The latter part of the chapter focused on the previous empirical studies.

Chapter Four outlined the research methodology used to collect data. It identified and discussed the various research paradigms available in research, as well as the research design used for this study – namely the mixed methods of quantitative and qualitative research methods. This was followed by the discussion of the study areas in the two countries. The sample and sampling technique, the research instruments used to collect data were discussed. Both quantitative and qualitative data collection strategies were employed to collect data in this study. In addition to participants responding to the Environmental Education and Forest/Woodlands Conservation Knowledge, Attitude and Practices Questionnaire (EEFCKAPQ) survey, several semi-structured interviews and focus group discussions around forest resources conservation and EE were also conducted with participants from within the study communities. How contacts with each community were made (to gain their permission to conduct the study), the pilot study carried out and the procedures for the conduct of the main study were described. The latter part of Chapter Four focused on the methods used for data analysis. These included descriptive statistics to ascertain the profile of participants' knowledge and attitudes towards forest resource conservation. T-test and ANOVA were used to test for significant differences in the responses of participants within and between the countries. Multiple regressions were performed to predict the relationship between several independent variables and the dependent variables awareness, knowledge, attitudes and practices.

Chapters Five to Eight provided an analysis and interpretation of the empirical data. Comparison of forest policy documents of the two countries was outlined in Chapter Five. The statistical significance of differences, between all independent characteristics of participants in respect of the dependent variables of knowledge, attitudes and practices of participants, was tabulated and thereafter discussed. The transcribed interviews and focus group discussions were interpreted and discussed. Thereafter, the results from the quantitative and qualitative study were triangulated to provide the research with robustness. Similarities and differences between the two study areas were provided.

In Chapter Nine, I drew on the findings and lessons established through this study to develop a community-based environmental education curriculum framework, within which the forest resource conservation crisis can be addressed. Chapter Ten provided a summary, discussion of findings and conclusion on the findings; recommendations and reflections on the research will be done.

10.3 Major Findings, Existing Theories and Previous Findings

Here, in this section, the findings, observations and experiences reported in Chapters Five, Six, Seven and Eight are discussed and compared with previous findings in other literature to establish whether the existing hypotheses could be validated and substantiated. This was also done to see whether the theoretical and methodological approaches employed could provide new insights and

opportunities for interpreting the new empirical results and gaining a better understanding of the research problem.

10.3.1 Institutional Construction of Forest Resources

The main research question has been concerned with the similarities and differences in the forest policies in Nigeria and South Africa, specifically about the people's perceptions of forest and forest resources, aim and objectives, institutional arrangement, strategies for conservation, rural livelihood and poverty, community participation and awareness and environmental education. The results suggested large similarities between the two countries' policies. Forests are conceptualised broadly and as all encompassing. Conservation of forest resources is seen as both the science of forest management and as the interaction between human beings with the flora and fauna. The policies are comprehensive; linking the broad social and economic concerns of the people, and have identified useful strategies for achieving their objectives. However, in the analyses of the forest policy documents from both countries, large gaps were found between the objectives of government policies and people's socio-economic realities – in spite of both Nigeria and South Africa being signatories to various international conventions, declarations and resolutions.

The forest policy documents of the two countries have sustainable management of forest resources as their primary objective. However, emphasis on the way to achieve sustainable forest management differs in the two countries, caused probably by the historical antecedence of the development of forest management and pressures on forest resources. As in other tropical African countries, South Africa and Nigeria policies' concerns are with the rational utilisation, conservation and protection of the natural forest resources. In South Africa, more than Nigeria, the emphasis is on reforestation and improvement of wood exploitation techniques to satisfy local community and industrial needs which have arisen as a result of both an increasing population and expanding economies. Differences in policies between both countries were evident primarily because of the different levels of poverty and degrees of reliance of the local communities on forest resources.

Local community participation is also emphasised in almost all policy documents. Customary usage rights are guaranteed for non-commercial operations in almost all tropical countries. However, the degree of implementation varies from country to country. On the whole, local community participation is strongest in South Africa. This may have contributed to their successful reforestation programmes.

Both countries policies and laws do not address the state of forest resources outside the state reserved forests. Where the policy addressed this issue, it was to encourage the salvage felling of trees before they were released to farmers. Forest policies and laws have not had the desired effects in these countries, mainly because of the following: lack of knowledge and availability of laws and policy documents; scarcity of operational funds to ensure implementation of policies and laws; inadequate organisational structures to implement policies and laws; many policies and laws are old and ineffective; policies need to be updated regularly.

The implementation of forest policies seems to be more successful in South Africa than in Nigeria. Invariably governments are unable to coordinate policies. Besides, the policies are not

always revised in response to changing situations and circumstances – such as demands on land. This is exemplified by both the Forest Policy of Nigeria, promulgated in 1988, but which was not revised until 2006 and the Nigerian Forest Act of 1958. Potential elements which can enhance or support policy implementation are: more effective forestry organisations; reliable data; appropriate guidelines for policy implementation; stronger personnel; budgetary support; accurate management plans; and harmonisation of land-use policies.

The results of the interview and FGDs analysis revealed that many of the rural people were unaware of their government's policies and objectives. Rural people believe that forest policies are concerned with the protection and conservation of trees in government-protected forestland, and not relevant to forestland outside government reserves and people living around it. Most of the policies have been oriented towards technical initiatives to promote and enhance silviculture. Little emphasis has been given to the socio-economic context in which forest use occurs, and not much has been done to redress the persistent patterns of impoverishment that lead rural people to depend ever more heavily on forest resources for survival. The policies failed to integrate the livelihood concerns of rural people into conservation initiatives. Government and policy makers have failed to locate conservation policy and strategies within a coherent and development policy framework, and provide an organised platform for involving local people in efforts to protect and conserve the forest resource base of the community. Factors – such as rapid population growth, poverty, lack of proper management of forest resources, poor institutional capacity, lack of education and awareness and lack of effective community participation in forestry activities – were identified as influencing sustainable forest management.

Using an independent samples t-test analysis to compare the importance attached to forest resources, showed that the South African respondents scored significantly higher on the wealth ($t=-2.20$, $p<.003$); recreation ($t=-9.82$, $p<.000$); survival of other life-form ($t=-3.43$, $p<.000$) and country economy ($t=-4.28$, $p<.000$) than Nigerian rural inhabitants. On the other hand, independent samples t-test analyses indicated that Nigerian rural people scored significantly higher on household economy ($t=8.21$, $p<.000$). No significant difference was found between the South African and Nigerians rural people in terms of the importance of forests to quality of life and quality of environment.

For most South African and Nigerian rural people, forest/woodlands are an important resource of their livelihood. Most people overwhelmingly rely on locally produced foods. Forest/woodlands are used for agriculture, hunting, lumbering, fishing, and gathering of foods, medicines, firewood, and the raw materials for building and crafts. Woodlands are also used for livestock rearing, hunting, gathering of plant and animal foods and non-food items – such as building materials, firewood, craft materials and medicines. This is consistent with scholars' assertions that human dependence on forest resources is a multifaceted phenomenon because forests provide a diverse stream of benefits to humans. Several studies have demonstrated that natural forest/woodlands are surrounded by village communities – whose livelihoods are directly or indirectly bound by exploiting resources of the forests as economic buffers and safety nets for poorer households (Beckey, 1998; Shackleton *et al.*, 1998; Twyman, 2001; Masozera and Alavalapati 2005). Using the independent sample t-test analysis to compare the degree of use of forest resources by South

African and Nigerian rural people revealed differences in the degree of utilisation of forest resources between the people of communities in both countries. T-test analysis revealed that Nigerian rural inhabitants exploit the forest resource more than their South African counterpart in certain areas. For instance, in the use of wood for furniture, wood for carving, honey, wildlife/bushmeat, bird eggs, medicinal plants, and wild herbs, Nigerians had higher mean scores than South African rural people. South Africans had higher mean scores in the use of other forest resources – such as reeds for construction, indigenous poles for construction, thatch grass and seed for rattle/decoration – than Nigerian rural people (see Table 8.6). There are two main explanations that can be advanced for this :(i) lack of alternatives and (ii) lack of effective policy framework/law to control the exploitation of the forest resources.

This study also showed that, with exception of attitude, significant differences existed between the knowledge, awareness, interest, importance attached and practice of forest resource conservation of Nigerian and South African rural people living in the study areas. A higher mean score (mean=3.37) showed that rural South Africans attached higher importance to forest resource conservation than their Nigerian counterparts who had a lower mean score (mean= 3.22). In the same vein, with a higher mean score (mean=2.82) South Africans' forest resource conservation practice was higher than Nigerians (mean= 2.69). However, based on the mean scores shown in (Table 8.7), rural Nigerians were shown to be more interested, aware and knowledgeable in forest resources than their South Africans counterparts.

Most people prefer local people to be employed in the forest reserves, game parks and lodges. Many also want government to provide the people with alternative sources of energy. Restrictive laws of government suggest that local communities do not have control over their own way of life. Rural people are not permitted to settle in state-owned forests or harvest from them. The governments have not been able to meet the needs of the rural people. Forest policy, as currently being applied in both countries, is not sustainable because it lacks in participation and input from the people. Most of the policies have failed to take into consideration the practices and customs of the local people – topics which are central to the issue of conservation and management of forest resources. As Patel *et al.* (1999) suggested there is need for the understanding of societal views to "…*enable government policy to be better…"* formulated to "…*accommodate the needs of communities…"*, and to develop programmes that are in "…*tune with people's needs rather than those of outside agencies*." This is because it is the "…*poor and disadvantaged people that often suffer most from impractical policies and improper implementation of development programmes and projects…*"

10.3.2 Interest in, and Knowledge of Forest Resources

The second research question aimed at understanding the meaning, importance, knowledge and use of forest resources. Each one of the variables has been discussed. There was concordance in the social construction of the meaning of forests by both Nigerian and South African participants. The results suggested that there are multiple meanings ascribed to the different forest/woodlands and that these meanings are constructed, and based, on different experiences and belief systems. People's understanding of forests is utilitarian with respect to the cultural, spiritual, political, recreational, aesthetic and economic functions of the forests. In Nigeria and South Africa, the

social construction of the forest can be described in terms of three features. First, the forests are politically and spiritually meaningful because that is where all rituals connected with the coronation or installation of new chiefs is carried out, where leaders are buried, and erring chiefs banished. In addition, the possession of large areas of forestland (particularly in Nigeria) vests families with political power in the community. Thus, it is not uncommon to hear of conflict over competing uses of forests. Second, forests and forest resources have cultural, spiritual and symbolic meanings that are more significant than the political meanings although many of these have been lost through modernisation. Forests, however, have a myriad of socio-cultural meanings. Specific species (or individual) trees have socio-religious significance. The forests are seen as having great spiritual/religious significance, for instance, as the homes of ancestral spirits of the community and gods.

In both countries, the meaning of the forest resources was found to be a product of social construction by individuals or groups with differing values and beliefs. For instance, forests are seen as the site of initiations and other religious rituals. To the South Africans the National Parks are considered national symbols, which evoke memories of experiences, developed through cultural and social meanings attached to the places. These findings support the researches of Tyravainen and Makinen (2004) who found that woodlands areas in Finland have many functions and meanings in the rural environment – including leisure, political and shelter benefits. O'Brien and Edwards (2002) argued that people's appreciation of nature and woodlands is related to cultural, spiritual and ethical values; the meanings, perceptions and experiences that they derive from woodland use and the contribution that woodlands and trees make to the wider landscape.

A large proportion of respondents interrogated during this study were interested in issues relating to forests, but very few felt that they were well informed with regard to these matters. In Nigeria, rural inhabitants tended to show more interest than their South Africa counterparts. This can be attributed to differences in access to forestland. The land tenure system, as practiced in Nigeria, allows for families or individuals to own forestlands, which ownership is transferable through inheritance in the family. The study also found generational and gender differences in the interest of forest resources between and within the two national groups.

On knowledge, it was found that large proportion of the respondents had knowledge of forest resources. Knowledge on the conservation of forest varied across age groups. Accordingly, knowledge of conservation was higher among respondents in the older age group from both countries. Women in both countries tended to be more knowledgeable than men. Young Nigerians were generally more knowledgeable about forest resources than their South African counterparts. However, the study found that young South Africans were more knowledgeable about wildlife conservation than young Nigerians. The reason for this interest and knowledge can be attributed to the closeness of their communities to the Kruger National Park and other private game reserves – particularly the Bushman/San village, Manyaleti game reserve, and Snake Park. In fact, several of the young people reported having visited the Kruger Park and attending the Timbavati Wildlife College located in the area. To young South Africans, the forest is important for its indirect values – such as tourism, recreation and environment. By contrast, young rural Nigerians' interest and knowledge of forests is more general. It was also found that the uneducated older generations from

both countries were more interested and knowledgeable than the younger generations. This was because most of the older generation made their livelihood from extractive activities of forest resources. These findings were consistent with other researches, indicating that those whose livelihoods depend on extractive activities of forest resources are more likely to be interested in what happens to the forest resources: young rural people of both countries have less interest and knowledge of forest resources. Two different studies – Temesgen (2007) and Flintan (2003) – also showed that women possessed less knowledge than men concerning conservation and were less aware of conservation's long-term benefits. Ethnographic studies have shown that older members of society are often more knowledgeable in particular domains of expertise than younger ones (Johannes, 1981; Borofsky, 1987).

Both men and women were greatly dependent on forest resources, but they valued different forest products. Men collected timber and poles, and hunted animals; women collected non-timber forest products – such as wild vegetables, fruits, snails and fuelwood – for household use and income. Women were more involved in the processing and marketing of natural resources. In related studies conducted over much of sub-Saharan Africa, results have indicated similar findings – with women being the predominant users and managers of forest resources to provide for their households through sales of produce and food supplies (Twine, 2004; Shackleton, 2004a). Osemeobo and Ujor (1999) opined that women in rural areas carried out ~80% (by volume) of non-timber forest products processing and marketing.

10.3.3 Importance of Forest Resources in Rural Household Economies

It is clear from the results of the study that forest resources are highly valued and used. The economic and livelihood benefits of forests were seen as significantly more important than environmental benefits, which were rated as more important than social benefits. However, all were seen as important forest values. Nigerian respondents scored recreational benefits lower than other benefits. The vast majority of respondents from the two countries recognised the importance of forest resources not only to their household economies, but also to their respective country's economies. Respondents indicated that the forests are an important part of their livelihood, and that they are very important to the natural environment and to quality of life. In South Africa, contribution to the national economy was valued highest. Here wealth was not seen to refer to individual wealth, but to the wealth of the country and, ultimately to household wealth. Similarly, forests were found to be important for tourism. The National Kruger Park and other game reserves in the study areas attract tourists and thus generate revenue – both for the country as a whole and for local people.

The findings are in line with most literature and previous empirical reports on forest resources. For instance, the EC-FAO (2003) stated that forests in Nigeria are recognised as a formidable base sustaining the economy of the country and the livelihood of rural people. Forests contribute substantially to the National Gross Domestic Product (GDP). The country's forests provide the raw materials for both primary and secondary industries in addition to generating employment in the timber products and non-timber forest products businesses for a large number of people. The forests are critical to the environmental and ecological conditions of the country. Empirical studies concerned with the importance of forests to the Nigeria's economy and

households have been very few – unlike in South Africa, where volumes of empirical studies from government departments, individual scholars and research organisations exist (for example, Griffin *et al.*, 1993; Shackleton *et al.*, 2002; Twine, 2000; Shackleton *et al.*, 2000; Williams *et al.*, 2000; Twine *et al.*, 2003; Shackleton, 2004a; Shackleton, 2004b; Twine, 2005). The implication is that Nigerian government and scholars need to engage in more research related to forest resources to better appreciate the enormous benefits therein and in its conservation.

10.3.4 Forest Resource Utilisation

Findings from this study have shown that forest/woodland resources play a critical role in the lives of people living in the study areas in Nigeria and South Africa. They provide a wide array of products to meet numerous needs. Among these are: wild foods for consumption, non-food direct uses (such as medicine), materials for handicrafts (e.g. grasses, reeds, and canes for baskets and mats), wood for energy, construction, and agricultural implements, and other products (such as fodder for livestock feed). All the respondents from communities in both study areas similarly listed numerous resources that are used and processed both for subsistence and income generation. Thus, suggesting that there are commonalities in the uses of forest resources and products among households in Ogun State and Mpumalanga. Specifically, forest resources are used for food and income, wild plants for medicines, dental chewing sticks, fuelwood for cooking, timber for construction materials, and non-timber forest product (NTFP) (such as kolanut for ritual purposes). Among the studied communities, forests and woodlands have always been major sources of fruits and medicines. Local communities collect wild fruits from forests to supplement nutrition. These findings confirmed the notions that the use of forest/woodlands resources by rural communities is universal and that forest resources are vital to the livelihood of rural inhabitants, particularly those living in poor, rural areas, who often rely directly on forest ecosystems for resources (Arnold, 2001; Cavendish, 2000; Reddy & Chakravarty, 1999; Shackleton *et al.*, 2002). Forest resources contribute to national wealth, social stability, and food security. Fuelwood is the primary source of energy in Nigeria, and indeed across much of Africa. A similar conclusion was reached in previous studies (Kersten, *et al.*, 1998; Marufu *et al.*, 1999; Twine *et al.*, 2000; Shackleton *et al.*, 2002; Tabuti *et al.*, 2003; Shackleton, 2004a; Twine *et al.*, 2003; Twine, 2005), all of which indicated that rural people are highly forest dependent. The findings also corroborated other studies (World Bank 2001a; FAO 2002; Brouwer & Faclao, 2004), which have noted that the major activities in forest/woodlands have a great impact at a rural level on people's livelihoods. However, there is evidence that many of the resources are being used in an unsustainable manner: a practice that has serious implications for the future welfare of the people.

10.3.5 Attitudes toward Forests and Forest Resource Conservation

The third research question determined the attitudes and acceptable practices towards forest resource conservation. The various data collected on local attitudes to conservation reflected a diverse range of local opinion, both within and between villages. Negative attitudes to conservation were also expressed by several people who were concerned that it could amount to restrictions on their activities imposed from outside. The finding shows that, among the younger and older age group, there existed relatively higher percentages of positive attitude towards conservation measures than the middle age groups.

It was found that rural inhabitants in both countries are engaged in various practices that affect forest resource conservation. Such practices include, forest clearing for household agriculture, forest resource extraction for income generation and bush burning. Respondents were aware of the negative changes in the conditions of the forest/woodlands as a result of their practice. They believe that current forest management and conservation practices are not good enough to ensure sustainability. A strong desire was expressed for the protection of the forest for future generations, which can be interpreted as indicative of a deep sense of appreciation and concern for forests/woodland by rural people. Forest/woodlands are seen as valuable not only for the food and income they provide, but for their beauty, wildlife, and importance to the quality of life in rural areas. Most of the participants recognised the benefits of conservation. However, the necessities for livelihood and cultural belief tend to out-weigh their desire for conservation. For instance, in Nigeria, there were no rules constraining hunting by community members. Hunters continue to engage in 'in-group hunting', although people say the practice is usually carried out as part of the rite of passage for a dead hunter by members of his guild – however sometimes hunting is carried out for income. A majority of respondents believe that rabbits, wild pig, pygmy squirrels, duikers and African giant rats, the most commonly locally hunted animals, are too abundant to be left unhunted. This feeling is inconsistent with findings in Tanzania, where 71% of the sample favoured keeping protected areas, 7.8% felt poachers were law breakers, yet almost half (48%) felt that parks/game reserves do not benefit local people around the parks (Newmark *et al.*, 1993).

There were serious concerns expressed during the discussions about the impact of logging on wildlife and biodiversity, soil erosion, forest degradation, water quality and habitat loss. Observations were raised about the effects of government policies and actions such as urban expansion and housing projects, industrialisation and agriculture on forest resources. Participants were doubtful of the sustainability of forest resources if their governments take no action to involve local people in the management of the resources in the communities and to provide programmes towards alleviating poverty. Nigerian and South African participants advocated the need for information about government activities. They called for the replanting of trees through income obtained from the sale of the timber. Tree planning should be seen as necessary income generation and especially for the purpose of protecting and preserving the environment and addressing the issue of climate change.

Understanding human attitudes and practices associated with forests and forest resources is essential to their management and conservation. Attitudes and practices are closely related. The attitude or disposition of an individual towards an object largely determines his or her behaviour towards it. The attitude an individual or group has towards forest resources is therefore the function of the benefits and values derived from the resources. In addition, the decisions concerning whether or not to conserve forest resources are determined by people's attitudes. The findings of the current study are in line with the findings of researchers who have studied the correlation between environmental attitude and behaviour (Hines *et al.,* 1987; Hungerford & Volk, 1990; Volk & McBeth, 1998; Hwang *et al.*, 2000; Thompson & Mintzes, 2002). Similar to the findings of these scholars, the present study has found that the most powerful of these factors include: 'attitude and knowledge', with decreasing correlation coefficients ranging from 0.49 to 0.30 respectively. These

findings suggest complex interrelated factors that directly and indirectly influence rural people's environmental practices and stewardship in the preservation of forest resources.

10.3.6 Demographic factors and Forest Resource Conservation

The fourth research question is concerned with the difference between demographic characteristics – such as age, gender, occupation and the dependent variables of knowledge, importance, attitudes and practices. Results of t-test and analyses of variance-ANOVA conducted on the South Africa data suggested that there was no significant difference between male and female rural people, their knowledge of, awareness, importance and practices towards forest resource conservation. Similarly, no difference was observed in knowledge of, awareness, importance and practices according to their religion. Age of the respondent also showed no significant difference with the dependents variables. However, significant differences were observed between respondents' occupation and the importance attached awareness/knowledge of and attitudes towards forest resource conservation. In Nigeria, in contrast with the findings obtained in South Africa, the result showed that five socio-demographic variables were statistically significant at 5%. These are gender ($t= -2.43$, $p<.002$) for attitude, practice ($t = -2.40$, $p<.002$), interest ($t = -1.93$, $p<.006$) and knowledge ($t = -3.37$, $p<.000$). This indicated that there is significant difference between male and female rural people's interest in, knowledge of, attitudes towards and practice of forest resource conservation. It also indicated that women are more interested in, knowledgeable and possessed more positive attitudes toward forest resource conservation than men. One explanation for the difference is the division of labour which identified and assigned different occupations to men and women. As a result, an important difference in knowledge, attitude and practice towards the environment exists between the genders

The results also showed significant difference in the attitudes ($F (299) 14.06$, $p<.000$), practice ($F (299) 6.03$, $p<.000$), awareness ($F (299) 4.31$, $p<.000$) and knowledge ($F (299) 4.08$, $p<.000$) according to their age. They differed in importance ($F (299) 6.50$, $p<.000$), attitude ($F (299) 8.0$, $p<.000$), practice ($F (299) 4.40$, $p<.000$), interest ($F (299) 14.06$, $p<.000$), awareness ($F (299) 20.6$, $p<.000$) and knowledge ($F (299) 9.06$, $p<.000$) occupationally. Rural people who engaged in occupations that involved the extraction and exploitation of forest resources had more interest, knowledge, awareness, attitudes towards forest resource conservation than those whose occupation do not involve the forest. Education and importance ($F (299) 3.30$, $p<.000$), attitude ($F (299) 5.00$, $p<.000$), practice ($F (299) 16.03$, $p<.000$), knowledge ($F (299) 4.01$, $p<.001$) and awareness ($F (299) 10.03$, $p<.000$). The implication was that the higher their education qualification, the more likely that forest conservation activities will be carried out. The Van Liere and Dunlop (1980) study showed that education is consistently associated with environmental concern. According to their research, it is possible to conclude that a literate person tends to be more concerned about environmental quality than an illiterate one.

The fifth research question is concerned with the relationship between socio-demographic characteristics – such as age, sex, occupation, educational background, household size and number in the household making a livelihood from forests – and the dependent variables of knowledge, importance, attitudes and practices. The results reflected a diverse range of opinion in the two countries.

In Nigeria, almost all the socio-demographic variables showed a significant relationship with the dependent variables. The correlation between the age of respondents and the relationship with knowledge, (0.14*, p<.01); attitudes (0.14*, p<.01) and practice was: 0.19**, p<.01). The negative correlation indicated that the correlation was contrary to the set values of the variables, which – in a concrete situation – means that young people have more positive attitudes toward conservation than older people. Positive attitudes towards forest resource conservation in the communities were significantly influenced by the age of the respondents and whether or not they made their livelihood from it (see Table 6.18). The occupation variable was found to have a significant influence on interest, importance attached and attitudes towards forest resource conservation. The findings suggested that benefits derived from the forest/woodlands were a key factor for a local population to perceive conservation positively (Walpole & Goodwin, 2001). A correlation between benefits and positive attitudes has been confirmed in many cases (de Boer & Baquete, 1998; Gillingham & Lee 1999; Hamilton *et al.,* 2000; Abbot *et al.,* 2001; Mehta & Heinen, 2001; Tomićević 2005).

In this study, age showed no significant relationship with awareness. The finding of this current study is similar to the findings of (Fiallo & Jacobson 1995; de Boer & Baquete (1998) and Dolisca *et al.*, (2007) who all found no relationships between awareness and age. However, this finding contradicts Gelcich *et al* (2005) who reported a positive significant correlation between age and awareness. The findings in the present study are consistent with the findings of other previous research. For example, Williams and McCrorie (1990) reportedly found that rural children express more significant concerns about the environment than their urban counterparts – thus suggesting that the rural children's experience, knowledge and closeness to nature might have engendered their concern. The findings also contradicted Kimeli (1996) and Shibia (2010) who reported that age significantly influenced the attitudes and perceptions of the local communities towards conservation area studied in their research. The younger generations agreed that this particular protected area was inadequate and therefore should be increased in size. Similarly, results indicated that older respondents were less likely to support the reserve (or its expansion) than younger people.

The level of education also showed significant relationship with dependent variables of knowledge, and awareness. The findings further concurred with those observations made by Infield (1988), Fiallo and Jacobson (1995). However, in their study de Boer and Baquate (1998) found that education levels had no significant effect on attitudes. It can be inferred that a society with high percentage of educated people may have a higher level of awareness to influence positive attitudes than communities with lower levels of education. Literature has indicated a positive relationship between educational attainment and environmental concern. Consequently, as the level of education increases, so does the environmental concern (Arcury, Johnson & Scollay, 1986; Arcury & Johnson, 1987). Educated people are more likely to show higher levels of environmental concern than the less educated. The significant relationship between these variables and the levels of education might be further supported by Fiallo and Jacobson (1995) observations from six international studies – indicating that age, knowledge, level of education, level of affluence and perceived benefits associated with conservation have consistently shown significant correlation with attitudes towards conservation across culture and continents. Other findings – such as Bjerke

et al. (1998a) – have reported that rural inhabitants, older people and those with lower levels of education express negative attitudes; younger, well educated people expressed more positive attitudes to wildlife. However, it could be argued that, while education may not necessarily influence knowledge about forest resources directly, it may make people more open to alternative sources of income and modern ideas about forest resource utilisation and conservation.

Furthermore, correlation analyses also revealed that the house size, number of household members making livelihood from forests and importance attached to forest resources were significantly related to awareness, attitudes and practice of forest conservation. A positive relationship between forest resource conservation and household income/livelihood suggested that if people had other sources of income, they are more likely to participate in forest conservation. Furthermore, the inverse relationship between forest conservation and income suggested that if alternative livelihood activities were available and viable, dwellers would conserve the forest: in the same way as attitude was significantly correlated with awareness, (0.46**, p<.01), knowledge (0.30**, p<.01) and interest (-0.23**, p<.01). The findings suggested that more an individual becomes aware and knowledgeable about forest resources, the better the attitudes he/she will express towards its conservation. Although the relationship maybe relatively weak, the correlation is consistent with predictions of the theory on the relationships between knowledge, attitude, behavioural intention and behaviour. The findings lend credence to, and are in support of, environmental education as a potential tool through which people would be able to acquire better skills to ameliorate illegal resource extraction and change people's attitudes and practices towards forest resource conservation.

The correlation analysis conducted on the South African data revealed a different pattern of results. Only a few of the socio-demographic variables showed significant relationship with the dependent variables of awareness, knowledge, attitudes and practices. The correlation between the age of respondents and the relationship with awareness was (r = -0.13*, p<.01). The negative correlation meant that the correlation was contrary to the set values of the variables – which in a concrete situation meant that young people had more positive awareness toward conservation than older people. Education of the respondents was correlated with attitudes, as well as awareness and knowledge (r= -0.12, r = 0.12; r = 0.27,). This suggested that formal education increased awareness and knowledge about the benefits received from the forest and forest resource conservation. Furthermore, importance and attitudes, which are positively associated with each other, were also both positively correlated with awareness and practice of forest resources.

The findings of this study are consistent with environmental studies' literature which suggests that, more often than not, people hold positive attitudes towards their environment and its resources (de Boer and Baquete 1998; Mehta and Kellert 1998; Bouton and Frederick 2003; Ramos *et al.*, 2007). Interests must be met for conservation to be successful (Parry and Campbell 1992; Ramos *et al.*, 2007). Also interests are a function of socio-economic and demographic characteristics (Napier *et al.*, 1986; Dolisca *et al.*, 2006). Gender (Hill 1998; Mehta and Kellert 1998, de Boer and Baquete 1998; Mehta and Heinen 2001; Dolisca *et al*., 2007), ethnicity, age, wealth, and income level (Fiallo and Jacobson 1995; Gelcich *et al*., 2005), and proximity to a resource (Parry and Campbell 1992; de Boer and Baquete 1998), have all been shown to correlate positively in some cases – and

negatively in others – with attitudes and practice. According to several scholars, the most effective means towards attitude change (Johnson 1996; Mehta and Heinen 2001; Infield and Namara 2001; Mehta and Heinen 2001; Holmes 2003; Dolisca *et al*., 2007) should include formal education and informal community-based environmental information.

Furthermore, other previous studies have indicated that the nature and degree of household dependency on forest resources is largely determined by the socio-economic characteristics of the individual user households (Parry & Campbell, 1992; Newmark *et al.*, 1993; Hill, 1997). The findings of this study confirmed the assertion that people's knowledge, attitude and practice towards forest conservation is affected by socio-demographic factors – like gender, age, education, occupation, access to farm land, and household size and income. Based on this empirical evidence, I postulate that forest resource use and conservation is primarily a function of (i) occupation, (ii) direct ownership of cultivated lands and (iii) household demographics.

10.3.7 Prediction of Rural People Forest Resource Conservation

The sixth research question was aimed at finding out which socio-demographic variables would best predict rural people's awareness, knowledge, importance, attitudes and practices of forest resource conservation. For South Africa, the results indicated that only two of the predictor variables entered the prediction model. The degree of prediction was weak as the two predictor variables together accounted for only 24% of the variance in rural people's interest in forest resource conservation. Five predictor variables entered the prediction model of attitude. These five predictor variables accounted for 37% of the variance of the rural people's attitudes towards forest resource conservation. On awareness, the finding showed that four predictor variables entered the model and together accounted for 35% of the variance of awareness of forest resources – a weak prediction. A similar weak prediction was observed in the predictor variables for knowledge. Four variables – interest, age, attitude and occupation entered the model. Together, these variables accounted for 32% of the variance in knowledge of rural people concerning forest resources.

In contrast with South Africa, a weak degree of prediction was observed in Nigeria for five predictor variables. They were: importance, practice, attitude, religion and age – these together accounted for 37% of the variance in the interest rural people have in forest resource conservation. The result for attitude indicated that six predictor variables entered the final model and together accounted for 35% in the variance of attitude towards forest resource conservation. It also showed that educational background was the strongest predictor. Multiple regression results, however, continued to show a strong degree of prediction with respect to awareness, importance, knowledge and practices. For instance, the five predictor variables that entered the model for awareness prediction together accounted for 65% of the variance of rural people awareness of forest resources. Seven predictor variables (awareness, attitude, age, religion, practice, interest and number in household) were found in the model for predicting importance. The seven predictor variables together accounted for 59% of the variance of the importance people in rural Nigeria were attaching to forest resources.

These results corresponded with reports in literature. Raudsepp (2001) found that socio-demographic characteristics were minor factors in the explanation of environmental attitudes.

Diamontopoulos *et al.* (2003) also reported that, although regressions run using demographic variables to explain environmental attitudes were significant and the signs of the beta coefficients were as expected, socio-demographic characteristics explained only a small proportion of the variance (in every case, less than 6%), and that, despite the large sample sizes, the coefficients were rarely significant. Correlations and multivariate results indicated that although socio-demographics are associated with environmental consciousness, their explanatory power is weak.

10.3.8 Forests and Poverty

Poverty in sub-Saharan Africa is largely a rural phenomenon. Poverty, according to environmental and development literature, is one of major causes of forest degradation (World Bank, 2001a; International Fund for Agricultural Development, 2001; UNDP, 2003; Ogunyemi & Raheem, 2005). This is especially true in sub-Saharan Africa, which has both the highest incidence of poverty and the highest incidence of forest degradation – and is also where decisions taken, at both macro and micro levels to earn a living and promote economic development, have the most impact on forests. Research studies on the relationships between poverty, forest resources and degradation in sub-Saharan Africa are growing. In a previous literature review on the relationship between poverty and forest resources and degradation, such relationships were widely reported (FAO & DFID, 2001; Twine, 2005; Ogunyemi & Raheem, 2005).

Although the connection between poverty and forest resources was not directly measured in this study, the majority of the respondents, during FGD, interviews and informal conversation, mentioned that their inability to afford an alternative source of energy because of their poor status suggested that poverty levels contribute to the degree of dependence upon, and attitudes and practices towards, forest resource conservation. The study also observed a relationship between agricultural practices, environmental degradation, and poverty. Shifting cultivation, bush burning and deforestation have had severe socio-economic impact on the development of the study areas. People living below the poverty line dominated the study areas in both countries. One of the important implications of this finding is that intervention efforts to conserve forest resources should also focus on reducing poverty. Reducing poverty invariably means reducing their poorer people's dependence on forest resources. Furthermore, to blame rural populations for the problems of forest resource depletion and degradation is both unfair and a reflection of a lack of concern for their survival. It is not only the rural populations that have threatened the environment, but it is also the lack of alternative sources of livelihood and the patterns of consumption amongst urban people. In fact, the latter factor seems to account for a great deal of the exploitation of forest resources. This is because most of the agricultural products and non-timber forest products collected by rural people are purchased at ridiculously low prices from the rural people – then are taken to urban centres to be sold and the end-user prices /profits do not filter back down to the rural gatherers. For instance, in Nigeria most of the people who participated in the study asserted that the thriving market of bushmeat was as a result of the urban rich who preferred bushmeat over cow meat. They said that an estimated 75 percent of bushmeat hunted is consumed by urban population.

The findings of this study are consistent with the proposition that forest resources are important to the rural poor and that poverty, consumption patterns, and lack of alternative sources of livelihood accounted for the high dependence of the rural population on forest resources. The

results are in line with The World Bank (2001a) which observed that forest resources directly contributed to the livelihoods of 90% of the estimated 1.2 billion people around the world still living in extreme poverty.

10.3.9 Gender and Forest Resources

Women have received consistent attention among researchers in natural resource management and conservation. The role of women in rural production and conservation is critical. The participation of women in conservation and development programmes is limited in South Africa and Nigeria. This is probably because of gender-based differences in socio-economic status and education levels. More than half of resource users are women. Labour is divided along gender lines in many rural societies. Two-thirds of respondents in this study noted that men and women were engaged in different tasks. Women's labour accounted for more than 90% of the work in gathering of fuelwood and fetching of water for domestic use in both rural Nigeria and South Africa. Regional and cultural differences notwithstanding, it was observed that the women in these communities contributed significantly to household economies through the collection of non-timber forest products. Women were involved in small-scale processing industries – such as cassava and fish processing, milling, brewing and bakeries – all activities where fuelwood is used. These findings are supported by results reported in numerous previous empirical studies (Shucksmith *et al.*, 1995; Diamond, 2001). Women were primarily concerned with the prosperity and future sustainability of their households. However, socio-economic and cultural changes are forcing women to question and restructure their roles in the household and community, thus raising concerns about the future.

Tests of the homogeneity of the variance between respondents from the two countries showed that they did not differ significantly from each other. The extent of use was influenced by the degree of dependency on the forest for sustainable livelihood. Based on field observations, use influenced by generational interest and gender. In this study, predictors of rural people's interest, awareness, knowledge, attitudes and practices towards forest resource conservation were assessed. The stepwise multiple regression analyses showed that education levels are the best predictors of forest resources knowledge, attitudes and practices.

10.4 Conclusion

Many interesting conclusions can be drawn from this research, representing an important shift in human-environment research through an attempt to better understand rural dwellers. The findings provide ample impetus for future research, which can help to refine and reinforce the results and conclusions reported here.

Although tribe, tongue and location may differ, and the character of the forest/woodland may be different, there is ample evidence to show that there are more points of convergence than divergence between the study groups. This study acknowledges that most communities in both countries – and similar to those in other parts of sub-Saharan Africa – see the forest as not just a geographical entity rich in resources, but also as a place with socio-political, cultural and religious meanings. Rural people are dependent on forest resources for their immediate survival. Throughout the study, households were heavily dependent on a wide variety of forest/woodland resources for subsistence living and income, not only because they are poor, but also because they have no

alternative. Lack of alternative income generation opportunities means people are likely to continue to use (and over-use) forests and non-timber forest products (NTFPs) in the future. Tree planting is not seen as an alternative to putting a stop to wood scarcity. Instead, people shift to alternative sources of goods – such as fuel and construction materials. However, with increasing household wealth a reduction in dependence on forest resources is likely.

For forest conservation and management to be successful, it is important that National Forest Policies take into consideration the livelihood of the rural people. Policy goals and objectives, strategies and programmes should be harmonised with other sectors – such as agriculture, health and environment. Forest policy must give a high priority to national issues of development above and beyond the regional and global conventions, resolutions and declarations. Such global and regional initiatives should be pursued in such a way that they do not negatively affect local (rural) citizens.

People questioned during this study were very much interested in all aspects of the forest environment. They expressed concern about the viability of the forest as a productive environment, as an environment for recreation, as wildlife habitat, and as part of a rural landscape and cultural heritage. However, the study revealed that a lack of alternative sources of livelihood and the lack of participation in the management of protected areas by local people had led to widespread illegal use of forest resources, loss of biodiversity and degradation.

Another important conclusion that can be drawn is that people's interest in forest resources and forest issues does not readily translate into positive attitudes and practices toward forest/woodland conservation – people's interest only goes as far as they can meet their needs. The reason their awareness and interest does not translate into positive actions with longer term consequences is because of a lack of motivation, a weak resource base, the negative perception of interventions by the government in traditional roles (through the acquisition of traditional land as forest reserves), and the lack of adequate information on coping strategies for increasing alternative energy needs. People, who are currently not aware of government policies on conservation, are willing to be educated and become involved in the management of their forest resources. The study also inferred that the people themselves recognise that their attitudes and practices towards forests have not been not environmentally friendly and a change of attitude and practices is needed.

This study suggests that rural inhabitants are receiving information from other sources – which are also not having a positive effect on their attitudes and practice of forest resource conservation. The research has further indicated that majority of respondents report a lack of environmental education in the communities – and a particular need for education. Qualitative data in particular, demonstrated that there is general problem regarding environmental education. Thus, there had been a call for a community-based environmental education programme. It is felt that training and education programme is essential for effective forest resource conservation – focussed education would help increase awareness and change undesirable practices.

10.5 Contributions of this Study to the Body of Knowledge

This study was conducted in the attempt to make a significant contribution to the growing literature in human-environment research and related academic disciplines (environmental studies and environmental education curriculum development). It provides empirical evidence to support theoretical models that link attitudes and behaviour with practice and also link education with behavioural change. It has not only generated a new body of knowledge but also provided a profile of the livelihood requirements of rural people living in the communities studied. One of the most important contributions of this study lies in its cross-cultural characteristics. This study is an addition to the emerging body of knowledge (Schultz & Zelozny 1998; 1999; Furman 1998; Bechtel *et al.*, 1999; Schultz *et al.*, 2000; Frost 2000; Gardner & Stern, 2002; Oskamp & Schultz, 2005; Evans *et al.*, 2007; Shibia, 2010) focussed on cross-cultural research efforts examining the commonality and differences in environmental attitudes and behaviour/practice across cultures from different countries across the world. It has demonstrated that environmental attitudes and behaviour may differ widely across countries and strengthened the notions that, as cultures differ, so will people's attitudes, values, beliefs and behaviour of forest resource conservation differ. These results confirmed the need to understand the uniqueness of the natural and socio-cultural character of a people before conservation efforts can be successfully implemented. The establishment of conservation programmes that emphasise issues of local concern, as well as the domestication of international conventions, is recommended. This study has illustrated the cross-cultural and cross-countries nature of the underlying issues related to perceptions of forest/woodland use, their sustainability, and the need for community-based environmental education. The research has provided opportunities for the cross-national comparison of policies – a comparison which can illuminate future policy initiatives and implementation in both countries and in other parts of the sub-Saharan Africa.

Another contribution is that provided by the methodological approach employed. This involved a comprehensive inside picture of the complex relationship between human beings and the environment in rural areas. While research in literature on forest resource management and conservation in sub-Saharan Africa are numerous, many of them are conducted within a single research paradigm, using either quantitative or qualitative methods. The majority used the quantitative method, with only a few adopting qualitative methods. Thus, by employing a combination of both techniques, this study has mitigated the shortcomings of using a single research technique. Using both techniques has enabled the research to go beyond simple quantifying of people's forest resource conservation attitudes and practice to gain a deeper understanding of (and capturing of) rural dwellers' feelings in a more functional and realistic manner.

Even though several research studies have been conducted, many of these have not been at the same level as this study. Much of the previous policy research consists of reviews and evaluations carried out by relevant government ministries and departments. Seeking the opinion of the members of rural communities on what and how a policy directly affects them is rare in the literature on sub-Saharan Africa. This research constitutes a shift from this trend. It challenges the position of policy formulation, implementation and evaluation within government establishments.

In this study, policy has been removed from the corridors of power and made more accessible to the wider community. By doing this I have argued, implicitly and explicitly, that policy should not only to be found and decided at the government level. It should draw relevant input from everywhere. There is virtue in engaging with policy in this way because it contributes to democratic projects in rural areas. The study has provided a wider understanding of the concern and interest of policy makers and planners has and helped to illuminate the contradiction and conflicts between governments' desire to conserve and local communities' desire to provide their livelihoods.

Various theories have been developed to explain the meaning attributed, values placed and attitudes and practices toward forest resource conservation. Two of these are: the political ecology theory and the social psychological theory. The political ecology theory is combined with the social psychology theory of planned behaviour (TPB) to understand and interpret rural inhabitants' forest resource conservation attitudes and practices. This study has contributed to the on-going discussion of political ecology and attitude-behaviour in forest resource conservation and has increased the understanding of how rural inhabitants relate to and practice forest resource conservation. The study has confirmed that the TPB can be a useful constituent for obtaining information about respondents' decision-making and the influence of socio-demographic variables in taking such decisions. Previous studies have suggested that the socio-economic characteristics of the population – especially education and age – can determine people's attitudes towards natural resource conservation. It has also been reported that there are relationships between environmental knowledge and attitudes – and both influence behaviour and practices.

The political ecological framework has assisted in examining and highlighting many competing trade-offs that arise as small-scale indigenous economies become incorporated into the global market system and the roles of social institutions – at international, national, regional and local levels – play in creating both the opportunities and the constraints that affect human-environment interaction decision making. This study has contributed further insight into how the political ecology approach can be applied to natural resource conservation. It has shown that combining an attitude-behaviour framework with political ecology has increased the understanding of how rural people engage and form their concerns for forest resource conservation issues. The models used allow for the investigation of attitudes and attitude determinants that influence rural people's intentions and ultimately behaviour with regard to forest resources and forest resource conservation. By using the attitude-behaviour framework in forest resource conservation, a workable framework for an education programme for promoting sustainable forest conservation practices and policies has been proposed.

10.6 Implications

This thesis has various implications. It is a multi-disciplinary study that touches on multi-dimensional and multi-sectoral issues in conservation and development efforts. Any programme that seeks to integrate environmental conservation with rural development must cover several issues. These include efficient energy, preservation of the rights of indigenous people, tradition and culture, health, livelihood strategies, community-based environmental education, gender, and community participation.

10.6.1 Policy Implications

The analysis of the forest policies of South Africa and Nigeria, despite the considerable differences – concerning the importance of forest and forestry to the national economy and environmental and socio-economic indicators – several similarities can be observed. Both countries' forest policies recognised the multiple uses of forest/woodlands (including timber and non-timber resources). The problems of deforestation, demand and supply of timbers, decentralisation and privatisation of forest management have influenced these policies. The policies were aimed at forest conservation while largely ignoring the livelihood provisions of local communities. Conservation aspect of these policies (especially in Nigeria) was never implemented effectively. Little or no attention was given to the socio-cultural aspect of forest management. Local communities were never consulted in policy formulation, and so have been less motivated to participate in its implementation. The lack of awareness and knowledge of forest policies, their negative disposition and disenchantment towards forest policies and conservation, illustrate potential for conflict over future land uses and the challenges in both the management of forest resources and preserving the rural economy. First, the desire expressed by the rural people to be involved in the management of forest resources demands that they should be consulted and incorporated into the process of future policy formulation and implementation. Conservation of forests cannot be successful without the active participation of the rural poor. They must become active participants in shaping and implementing development in their areas. Greater participation in natural resource management, by community groups and NGOs, should be encouraged to ensure that responses to local concerns become more effective. This will allow for a shift to a bottom-up approach. Indeed policies designed with this approach will foster a constructive dialogue between the rural inhabitants and the governments and their agencies. It will also promote locally inspired – and mutually agreed – upon development. Second, there is need to put the local people at the centre of policies development. The focus on people will not only secure their livelihood activities but will also recognise their socio-cultural practices and knowledge. There are three steps to successful community participation in environmental policy: "…*(i) the political will to support these initiatives; (ii) a policy framework that builds capacities among disadvantaged people to foster their involvement in the design and implementation of policies, programs, and projects affecting them; and (iii) resources to support community efforts.*" (Zazueta, 1995:5)

10.6.2 Educational Implications

The most obvious implication of this study is that community-based environmental education programmes should be designed and implemented for members of the community, to increase their awareness of the economic, social and environmental challenges in the way of sustainable utilisation of forest resources. The conceived CEEP should also focus on the need to protect and conserve the forest resources in their communities. CEEP should contribute to poverty alleviation, social security, natural management and promotion of social justice in the community

Finally, I hope that this study has contributed to an understanding of rural inhabitants' interactions with forest resources in the communities studied. By obtaining information on rural people's knowledge, attitudes and practices, it is possible to gain useful insights into their

awareness of, and perceptions about, conservation, household participation in conservation activities and the direct and indirect benefits that accrue from them as a result.

10.7 Recommendations

Based on the conclusion, the following recommendations are proposed and directed at towards mitigating the concerns identified. The recommendations highlighted are for the benefit of the educators and government departments, ranging from research and policy review to education and training.

10.7.1 Implementation of Policies and enforcement Laws

Government should develop a strong and sustained political will to implement policy reforms, which will support rural people's livelihood activities and ensure that forest resources are not indiscriminately exploited. This calls for the development of human and institutional capacities, with legal and policy frameworks related to natural resources. For the effective enforcement of environmental regulations, there is a need for the decentralisation of national responsibilities. Several of the responsibilities of the national or federal governments should be given to states, provinces and local government authorities.

10.7.2 Environmental Education

The low level of knowledge and negative attitudes expressed suggests that teaching rural inhabitants about forest resource conservation practices and related issues might play critical role in helping to resolve the dilemmas at the human-environment interface. Community environmental education programmes, with a holistic approach that takes into consideration the local value of natural resources, should be designed to raise public awareness on environmental issues and towards promoting people's participation in environmental activities and the conservation of natural resources. In addition, there is need for the development of environmental education materials using traditional and modern media to disseminate information.

10.7.3 Poverty Eradication Programme

Perhaps the most subtle and often neglected cause of natural resource degradation is poverty. Although not directly examined in this study, the evidence seems to suggest that the vast majority of the inhabitants of the study areas in both Nigeria and South Africa live in abject poverty. There is enough evidence from this study to confirm the well-known hypothesis concerning the relationship between poverty and environmental degradation. People depend heavily on the natural resources within their respective areas. Thus, an effort should be made to reduce –if not to eradicate poverty – in rural areas by providing both local employment opportunities and implementing income-generating community-driven programmes. This would empower these communities to make informed judgments and determine their own priorities to improve their livelihood and reduce dependence on forest resources.

Energy poverty (more than 10% of household effort or income devoted to meeting energy needs) is not regarded as an issue in rural areas because they are perceived to have ready access to forests/woodlands. Nevertheless, development or adaptation of appropriate technologies for

increasing energy efficiency in rural cooking stoves would relieve pressure on the forest resources and poverty.

10.7.4 Development of Training Programme

Regular training and re-training of state officials and local government officials in environmental assessment and management should be a priority for the governments. This would create a pyramidal structure of expertise, with those in the top echelon constituting the critical mass of trainers for innovation in the sustainable management of natural resources.

10.7.5 Incentives

Incentives promoting forest abuse and the wanton destruction of forests should be removed; conversely incentives for promoting sustainable forest resource use should be created. Eco-tourism facilities and services should be put in place – with the knowledge and cooperation of local people. This will promote sustainable livelihoods while emphasising the links between forest resource conservation and the benefits for local communities. Community-based incentives and management options should be identified to promote the use of medicinal plant species for human needs.

10.7.6 Community Participation in Management of Natural Resources

Community participation is a process by which community members are involved at different stages of project development and implementation thereby building the capacity of the community to maintain those services created during the project, after the facilitating organisations have left. Community participation by local people is essential to any conservation effort. In forest resource conservation, participation is often associated with community forestry – which refers to forest management or co-management by people living close to the forest. One of the greatest values of participant involvement is the impact on their knowledge, attitudes, and opinions concerning forest resource (Godschalk & Stiftel, 1981; Marenin, 1989; Landre & Knuth, 1993). Social science researchers have also documented the effects of active participation on knowledge. Leeming *et al.* (1997) reported that elementary school children who participated in environmental education programmes made greater gains in environmental knowledge than non-participating children. The authors also found that participation in the programmes produced significant positive changes in the attitudes of elementary school children towards the environment. Parents of children in the groups also reported a greater change in their own environmental concerns – because of their children's participation – than did parents of non-participating children.

10.7.7 Research

Research and development efforts need to be strengthened to develop and promote appropriate low-cost environmentally friendly technologies. These should use the possibilities opened up by biotechnology and be tailored to the needs of local environmental and socio-economic conditions. Governments should encourage and challenge scientists, through the provision of grants and support, specifically offered to those who are interested in natural resource conservation, to conduct research and develop alternative technologies –, such as fuel-efficient wood stoves that will reduce the dependence among rural people on forest resources.

10.8 Suggestions for Future Research

As an exploratory study, this dissertation aimed at achieving an understanding of the similarities and differences in forest resource conservation of rural inhabitants in South Africa and Nigeria. Therefore, more extensive research is needed to ascertain to how rural people construct meaning, knowledge, attitudes and practices of forest resource conservation and environmental education across countries. Suggestions for such research include the following:

To gain a deeper understanding of the cultural and contextual similarities and differences in how rural inhabitants, from Nigeria and South Africa, perceive the forests, further research should be targeted at a greater number of rural peoples across various regions of Nigeria and South Africa. More studies are desirable to test the applicability and relevance of these findings to other communities with similar or divergent characteristics.

Further research is needed on the existing and potential use of the forest's flora and fauna. Studies are needed to analyse the impact of commercial activities and deforestation on local populations. Emphasis in future research should be placed on the institutional, political and socio-economic contexts of local resource use systems.

In terms of research methodology, interdisciplinary or multidisciplinary approaches need to be encouraged. Applied research, with direct applicability to the specific problems of sustainable natural resource use, should be the priority. Participatory or advocacy research methods should be developed which directly involve the local populations who are the subjects of the research. Such efforts would benefit those populations through information, training, protection and compensation for the commercial value of their knowledge.

10.9 Study Limitations

One of the potential limitations of this study was associated with the interview and focus group discussion method. With interviews, there was the possibility of distorted responses because of personal bias, anger, or participants' emotional state at the time of the interview (Patton, 2002). As mentioned in Chapter 4, I interviewed headmen/chiefs. In most cases, I had scheduled a time for the interviews/group discussion that would not conflict with their daily activities. However, this was not always possible. On two occasions, when I approached the chiefs to participate in the study, they agreed to participate yet clearly seemed rushed and somewhat preoccupied. Thus, their responses might be influenced by their emotional state at the time of the interview.

A second potential limitation is the suspicion towards the researcher. In this study, participants' suspicion towards me and my field assistants was evident. They believed we were government officials, and thus viewed us with distrust. We overcame the problem by explaining that I worked purely for academic purposes, and that their confidentiality was assured. Thus, I clearly stated my position and purpose. For the Bushbuckridge interviews in South Africa, the fact that I was obviously a foreign student, with a low probability of being a government employee in this type of role, assisted in establishing trust. However, it is important to be aware of the effects that I might have had. Participants were aware that I was a Nigerian doctorate student from The University of Witwatersrand several seemed to believe that I had a connection to the state

government – especially in Nigeria. Being perceived as someone in a position of authority and as part of an institutional body might have influenced how participants talked and behaved.

A third potential limitation was the sampling approach. Only one geographic region in each of Nigeria and South Africa were sampled. This research was conducted in the Ogun State, Southwest Nigeria, and Mpumalanga Province, South Africa. The results can be generalised within these geographical regions and other communities with similar characteristics in South Africa and Nigeria. However, for the results to have broader implications, it would be necessary to spread and increase the sampled communities to cover the six geo-political zones of Nigeria and the nine provinces of South Africa.

10.10 Closing Statement

Findings from this cross-cultural study suggest that forests are critical to the survival of the people in the rural areas whose livelihood largely depends on forest resources. People's appreciation of forests is linked to cultural, spiritual values, the meanings, perception and experiences that they derive from its use. Understanding why people consider forest/woodlands resources to be important could contribute to the development of appropriate management and conservation strategies to maximisee the benefits. The results emphasise the importance of community environmental education. This will increase community-level people's awareness of the environmental processes and their understanding ofthe consequences of human activities and continuing unsustainable use of forest resources. The need to decrease poverty near protected areas is also essential to reduce pressure on such environments.

Sustainable management and conservation of forest is central to the achievement of most of the international initiatives, such as *Agenda 21*, the principal agreement that emerged from the 1992 Earth Summit in Rio, which called for the integration of environment and development to fulfil basic needs, improve living standards for all, and better manage and protect ecosystems for long-term sustainability. One of the Millennium Development Goals deals specifically with the management of natural resources: "*Goal 7 – Ensure Environmental Sustainability…*", which includes a target of integration of the "…*principles of sustainable development into country policies and programmes and reverse the loss of environmental resources…*" Meeting these agreements and goals is one of the greatest challenges for sub-Saharan Africa. The present findings are a significant contribution towards addressing this challenge.

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Appendix A: Questionnaire
Environmental Education and Forest/Woodlands Conservation Knowledge, Attitude and Practices Questionnaire (EEFCKAPQ)

Dear respondent,

I am a doctorate student at school of education, University of Witwatersrand, Johannesburg South Africa. This questionnaire is about how forest/woodlands resources are used and/or protected in our communities. The study is taking place in selected rural communities in Nigeria and South Africa. It is designed as part of the requirements for the award of doctoral degree at the University. Your responses to this questionnaire have no implications whatsoever for your community or country. Please kindly respond to each item as honestly as possible. All the information obtained shall be only for academic purposes and treated with utmost confidentiality. Your fullest co-operation and assistance will be highly appreciated.

Thank you.
Yours sincerely

Ifegbesan Ayodeji

SECTION A: Demographic Information

Instruction: Kindly fill in or put a tick (√) where applicable

1. Country……..
2. State/Province……
3. Municipal District/Local
4. Village
5. Sex: Male…… Female……..
6. Age. (a) Under 24 (b) 25-34 (c) 35-44 (d) 45-54 (e) 55-64 (f) 65 above
7. Religion (a) Christian ….. (b) Islam ….. (c) Traditional …..
8. Occupation……..
9. Educational background:
    (a) No formal schooling
    (b) Primary school
    (c) Secondary school
    (d) Technical/Teacher training
    (e) Polytechnic/college of education
    (f) University
    (g) Others (Specify) ……..
10. No. of people in the household (a) Permanent……(b) Temporary…
11. How many members of your household make livelihood from forest/woodlands resources ……

SECTION B: Awareness/Knowledge of forest resource conservation

	Yes, very interested	No, not interested	Not sure
12. Are you interested in issues related to how we use our forest/woodlands resources			

	Yes	Not much	Don't know
13. Are you aware of forest/woodlands resource conservation efforts in this country			
14. Do you know the importance of forest/woodlands resources of this country			

15. How important are forest/woodlands resources to each of the following aspect of life in your community? *(Please tick (√) the relevance box to you*

Aspects of life	Very Important	Important	Somehow Important	Not Important
Wealth				
Recreation				
Household economy				
Quality of life				
Quality of environment				
Survival of other life forms				
Country's economy				
Other (specify)				

16. What purpose(s) do you or people in the community use the resources from the forest/woodland? (Tick (√) all that is applicable)

Resources	
Fuelwood	
Indigenous poles for construction of housing, fence, kraal	
Wood for household items such as spoon, axe handles etc	
Wood for furniture	
Wood for carving curios to sell to tourist	
Wild herbs	
Edible wild fruits	
Mushrooms	
Honey	
Edible Insects	
Wild animals or bushmeat for food	
Bird eggs	
Medicinal Plants	
Thatch grass	
Reeds for weaving	
Reeds for construction	
Grass/Tree for livestock	
Seed for rattles or decoration	
Grass/Twigs for sweepers	
Others (Specify)	

17. How do you see forests/ woodlands generally?

	Yes	No	Not sure
Forests/woodlands contain the largest reserve of various plants, animals, and insects in the world.			
Forests/woodlands are just collection of trees/plants with no values to life.			
Forests/woodlands may be useful in other countries, but they are not useful here.			
I don't really care about forests/woodlands.			

SECTION C: Attitude towards forest resource conservation

18. The following statements reflect the attitude of some people towards forest/woodlands resources conservation in the community. Please indicate your level of agreement or disagreement with each statement by putting a tick (√) in the appropriate box.

Statement	Strongly Agree	Agree	Don't know	Disagree	Strongly Disagree
Forest/woodlands resources should be conserved to ensure healthy population of all wild species of trees, plants and animals					
Forest/woodlands resources have ways of re-generating themselves whether we care or not					
Protecting the job of forest industry workers is more important than protecting endangered species					
The most important objective of forest/woodlands management should be to protect the environment for all					
Everyone should be concerned and do something towards protecting the forest/woodlands resources					
It is government responsibility alone to protect and conserve the forest/woodlands resources					
God gave us the forest/woodlands to use in meeting our needs and we should not be denied that natural right					
If we want wildlife to survive, we must look after the natural places where they live.					

SECTION D: Forest resource conservation related practices

19. Please, indicate how acceptable the following forest/woodlands conservation practices are to you. (Tick (√) in the appropriate box for each)

	Very Acceptable	Acceptable	Don't know	Not acceptable	Very unacceptable
Harvested areas should be allowed to regenerate itself naturally					
Leaving clumps tress for wildlife in habitat					
Closing forest access road to control illegal logging					
Inadequate forest management planning					
Loss of protected land to urban expansion					
Lack of protection for old Growth forest/woodlands					
Construction of oil/pipeline across forest land					
Not planting of trees to replace the ones cut					
Indiscriminate bush burning					
Current logging/cutting practices					

SECTION E: Awareness/Knowledge of Environmental Education

	Yes	No	Not Sure
20. Have you heard or read about the concept of environmental education before this questionnaire**?**			

21. If yes, what is your first source of information? (Please tick (√) one of the following.)

Source	
Radio/Television	
Newspapers/Magazine	
School/Colleges teachers	
Conference, seminar/workshop	
Poster/Pamphlet	
Government environment workers	
Neighbour/friends	
Don't Know	
Other (specify)	

	Good	Fair	Poor
22. What is your assessment of government's effort to protect forest/woodlands resources in this community?			
23. What is your assessment of people's attitude to forest/woodland resources conservation in the community?			

24. Who should be responsible for looking after the forest/woodlands? (Please tick (√) one of the following sources)

Government only	
Chief/ Headman only	
Chief/headman and other village structures	
Government and Chief/headman	
Government, Chief, and other village structure	

25. Kindly suggest five (5) ways by which people in this community could be encouraged to improve on their forest/woodland resource conservation practices.

……..
……..
……..

Thank you for your kind assistance.

Appendix A: Yoruba Version of the Questionnaire

IWE IWADI NIPA EKO AYIKA, IMO ATI IHUWASI NIPA AGINJU ATI AWON OHUN ALUMONI
Olufe Owon,

Mo je akeko agba ti eka ikeko, Unifasiti ti Witwaterstand, Johannesbing, South Africa. Iwe iwadi yi wa fun bi a se nlo ati bi a se n daabo bo awon aginju ati awon ohun alumoni ni ileto wa. Iwadi ijinle yi nwaye ni awon ileto kookan ti a samu ni ile Nigeria ati ile Olominira South Africa. O je ara eto ti unifasiti gbe kale fun akeeko ti o ba fe gba imo ojogbon. Alaye re ko ni nkankan se pelu ileto tabi orile ede re. Jowo dahun awon ibeere yii ni sise ntele lotito ati lododo. Mo fi ndayin loju pe iwaadi ijinle nikan ni a o lo gbogbo alaye ti a ba gba fun, beeni enikeni ko ni mo nipa re. N ko ni sai mo titi iranlowo yin.

Eseun o.

Emi ni tiyin tooto

Ifegbesan Ayodeji

Apa Kinni

Akiyesi: Jowo ko idahun re si aaye ti a pese tabi ki o fi amin (√) si ibi ti o ba ye.

1. Orile ede…….
2. Ipinle……..
3. Agbegbe…….
4. Ileto…….
5. Eya: Okunrin……. Obinrin……..
6. Ojo Ori:
   (a) N ko ti to omo odun merinlelogun
   (b) Odun meedogbon – merinlelogbon
   (c) Odun marundinlogoji – Ogojilemerin
   (d) Odun marundinladota – Aadotalemerin
   (e) Odun marunleladota lo soke
7. Esin: (a) Kirisiteni/Omo lehin Kirisiti….
   (b) Musulumi ……. (c) Esin abalaye …….
8. Ise wo lo nse……
9. Iwe melo lo ka:
   (a) N ko lo ile iwe rara
   (b) Ile-iwe Alakobere
   (d) Ile-iwe Girama
   (e) Tekinika/Ile-iwe oluko
   (e) Ile-iwe gbogbo ise/Oluko Agba
   (f) Ile-iwe gigajulo Unifasiti
   (g) Ile-iwe miran……..
10. Iye awon eniyan ni ojule (a) Titi laye ……. (b) Fun igba die. ……

11. Awon ara ile re meloo ni o nri onje oojo won nipase igi inu igbo ati awon alumoni inu igo miran…….

Apa Keji: Imo nipa idabobo alumoni inu igbo.

	Beeni, mo ni fe si dada	**Rara nko ni fe si**	**Ko daju**
12. Nje o nife si eto ti o jemo ki a ma daabobo igi ati awon alumoni inu igbo			
	Beeni	**Ko to nkan**	**N ko mo**
13. Nje o mo nipa eto idaabobo igi ati ohun alumoni inu igbo ni orile ede yi.			
14. Nje o mo anfani ti o ro mo idaabobo ohun alumoni ati igi inu igbo ni orile ede yii			

15. Bawo ni igbo nla ati awon igi ti se pataki si igbesi aye eda ni ileto re? (fi ami (√) si inu apoti ti o se pataki si o).

Ibe Aye	**O se pataki gan**	**O se pataki**	**O se pataki bakan**	**Ko se pataki**
Oro				
Igbafe				
Oro aje idile				
Didarasi igbesi aye				
Didarasi Ayika				
Idagba soke				
Igbesi Aye eda miran				
Oro Aje Orile ede				

16. Kinni ohun ti iwo tabi awon eniyan ileto re ma nfi awon ohun alumonu inu igbo se? (fi ami (√) si ibi ti o ba to).

Ohun Alumoni	
Igi Idana	
Opo ibile ti a fi nkole, se ogba ati ogba eran	
Igi ti a fi nse ohun elo ine ile bi sibi, eku aake and beebe lo	
Igi aga	
Igi ti a fi ngbe ere fun tita fun awon arinrin ajo sibi aje	
Ogun lile	
Eso jije	
Olu	
Oyin	
Awon kokoro to se je	
Eran Igbe fun onje	
Eyin eye	
Egbo igi fun iwosan	
Koriko fun orule	
Iko ti a fi hun nkan	
Koriko/igi fun ohun osin	
Eso fun eso ile	
Kooko fun awon agbale	

17. Bawo ni o se ri igbo kijikiji at awon alumoni re si?

	Beeni	Beeko	Ko dami loju
Inu igbo kijikiji ni a tile ri igi nla, eranko, kokoro to pojulo lagbaye.			
Eweko ati igi nla nla ti ko wulo ni o gbarijo wa ninu igbo kijikiji			
Igbo kijikiji le wulo ni awon orile ede miran, ko ni iwulo kankan nihin			
N ko tile bikita nipa igbo kijikiji ati awon alumoni to wa nibe			

Apa Keta: Iha kiko si idaabobo ohun alumoni inu igbo.

18. Awon gbolohun wonyi se afihan ihuwasi awon eniyan kan si idaabobo awon ohun alumoni inu igbo ni agbegbe won. Jowo lo amin (√) lati toka si bi ti se faramo tabi a ko faramo gbolohu naa si.

Gbolohun	Mo fara mo dada	Mo faramo	Ko tile yemi	N ko faramo	N ko faramo rara
O ye ki a ma daabobo awon igbo kijikiji ki awon eranko, eweko ati igi nla ti o wa nibe le ni ilera.					
Awon ohun alumoni inu igbo ni ona ti won maa ngab fi ara won ropo					
Didaabobo ise awon asogbo se pataki ju didaabobo awon ohun elemi ti o wa ninu igbo					
Ohun ti o se pataki julo fun ajo ti o nmoju to igbo ati ohun alumoni ni lati se daabobo ayika wa.					
Gbogbo wa lo ye ki a mu idaabobo bo igbo nla ati awon ohun alumoni lokunkundun.					
Ojise Ijoba nikan ni lati setoju ati lati daabobo igbo nla ati awon ohun alumoni					
Olorun ni o fun wa ni igbo ati ohun alumoni fun lilo wa won ko gbodo fi eto yi dun wa					
Ti a ba fe ki awon eranko inu igbo dagba, o pon dandan lati tun ibi ti won ngbe se.					

19. Apa Kerin: Asa idaabobo ohun alumoni inu igbo.

Lo amin (√) lati toka si bi ase idaabo bo igbo ati awon alumoni se je itewo gba re.

	Mo fowo si dada	Mo fowosi	Ko tile yemi	N ko fowosi	N ko fowo-si rara
Ki a ma fi ile ti a fi ndako sile lati lora lai fi ajile oyinbo si					
Ki a fi awon igi inu igbo sile gegebi ibugbe awon eranko					
Titi ona ti o ba wo igbo kijikiji pa lati dekun gba gige igi lona ti ko bofin mu					
Isakoso igbo kijikiji ti k'ogboju owo					
Pipadanu ti a idabobo fun eto sogbe digboro					
Ai si idaabo bo to peye fun igbo kijikiji					
Riri omi ero gba inu igbo kiji kiji					
Gige igi ki a ma gbin omiran ropo					

	Mo fowo si dada	Mo fowosi	Ko tile yemi	N ko fowosi	N ko fowo-si rara
Ki a maa sun oko nina bi o se wuwa					
Asa ki a ma gegi ki o je kari aye ni sinsin yii					

Apa Karun: Imo nipa Eko Ayika

	Beeni	Beeko	Ko dami loju
20. Nje o ti gbo tabi ka nipa eko ayika siwaju iwe ibeere yii			

21. Ti o ba je beeni, nibo ni o ti gbo nipa re? (Lo amin (√) lati toka ninu awon ona wonyin)

Ona	
Asoromagbesi / Amohunmaworan	
Iwe iroyin	
Ile iwe / Ile eko giga Oluko ni agba	
Ibi idanileko	
Iwe ilewo / Panfuleti	
Ni adugbo / nipase ore	
N ko tile mo	
Ona miran (se alaye)	

	Won se dada	Won gbiyanju	Won ko se dada
22. Bawo ni o se ri akitiyan ijoba lori idaabo bo ohun alumoni inu igbo si			
23. Bawo ni o se ri akitiyan awon eniyan lori idaabo bo ohun alumoni inu igbo ni ileto yii si			

24. Tani o ye ki o ma se amoju to igbo kiji kiji? Fi amin (√) toka eyi ti o faramo ninu awon yii).

Ijoba nikan	
Oloye / Oloori nikan	
Oloye / Oloori ati awon alakoso ileto	
Ijoba ati awon Oloye / Oloori	
Ijoba, Oloye, ati awon alakoso ileto	

25. Daba ona koriya meta ti o le mu ki awon eniyan ileto yii maa se itoju ati idaabo bo igbo kiji kiji ati awon ohun alumoni inu re.

a ……
b ……
d ……

E seun fun iranlowo yin.

Appendix A: Tsonga Version of the Questionnaire

Diputsiswana mabapi le Tsireletso/hlatloso ya dimela tsa tlhago le Thuto ka tsa tlhago

Madume

Ke moithuti wa lengwalo leo le bitswgo "Doctorate" go la Universiting ya Witwatersrand (Wits) motseng wa Johannesburg, Gauteng nageng ya Afrika Borwa. Ken a le diputsiswana mabapi le dimela tsa tlhago tseo di sireletswago/ disomiswago e bile setshaba se rutwa ka tsona. Yona ke thuto yeo e tseago karolo mo metsaneng e kgethilweng nageng tsa Nigeria le Afrika Borwa. Yona ke karolwana ya dinyakwa tseo dinyakegago go fetsa lengwalo le la Doctorate go la Universiting.

Ka ge re go tshepisa gore dikarabo tseo o tla di fago ga din a khuetso efe kappa efe mo motsaneng goba lefaseng la geno. Re go kgopela gore o arabe dipotsiswana tse ka botshepegi. Tsebo yeo re tlago go e humana mo e tla somiswa ke University sephiring fela. Re ka leboga tshomisano le thuso ya gago.

Wa Gago wa Potego
Ayodeji Ifegbesan

KAROLO A: Tsibiso ka ga bodudi

Nepokgolo: Ka botshepegi, tlatsa goba tshwaya ka (√**)**

1. Naga……
2. Poroventshe…..
3. Munisipaliti wa kgauswi
4. Motse
5. Bong: Monna …….. Mosadi …….
6. Mengwaga: (a) ka fase ga 24, (b) 25-34, (c) 35-44, (d) 45-54, (e) 55-64, (f) 65 go ya godimo
7. Religion, (a) Mokresete, (b) Moislamiki, (c) Modumedi was tsa Setso
8. Maemo a mosomo ……...
9. Tsa Thuto:
   (a) Hlokego ya dithuto tsa maleba
   (b) Poraemari
   (c) Memphatong ya godimo
   (d) Thechnical/ Boithutela go ruta
   (e) College ya tsa thuto
   (f) Universiti
   (g) Tse dingwe (tsitsinkela) ……
10. Nomoro ya batho ka lapeng la geno : Badulela sa ruri …… Baeti/ Ba-nakwana……
11. Na ke batho ba bakae ka lapeng la geno bao ba ephidisago ka themo ya hlago/ mehlare?

.....

KAROLO B: Tshedimoso/ Tsebiso mabapi le hlatloso le tshireletso ya dimela tsa tlhago.

	Ee, kudu ka maatla	**Aowa, le ga tee tee**	**Ga ke na bonnete**
12. A na o na le kgahlego ka tsa tshomiso ya dimela tsa tlhago?			

	Ee	**E seng ka kudu**	**Ga ke tsebe**
13. A na o tseba ka ga tshedimosetso mabapi le tlhatloso ya dimela tsa tlhago?			
14. O tseba bohlokwa bja dimela tsa tlhago mo nageng?			

15. Na dimela tsa tlhago di bohlokwa ga kaakanego ye ngwe le ye ngwe ya ditho tsa bophelo tse latelago motsaneng wa geno? (Tshwaya/ maraca ka (√) mo o swanetsego wean)

Ditho tsa bophelo	Bohlokwa kudu ka maatla	Bohlokwa	Bohlokwa ka tsela e ngwe	A e bohlokwa
Bohumi				
Boithabiso				
Ditseno tsa ka lapeng				
Seemo sa bophelo				
Seemo sa tlhago				
Go sireletsega ga tse dingwe diphidi				
Ditseno tsa naga				
Tse dingwe (tsitsinkela)				

16. Ke mabaka a mafeng ao a direго gore batho mo setshabeng sa geno ba somise tsona di tiriswa go tswa mo dimeleng tsa tlhago? (Maraka ka (√) kae kappa kae mo go nepagetsego)

Ditiriswa	Tshomiso	Kgobaketsa ka bo-wena	Reka go ba bangwe	Rekisa go ba bangwe
Dikgong				
Dikota/dihlaka tsa di ntlo, malapa, masaka				
Dilo tsa ka lapeng go swana le mafehlo, maho, malepola, diswaro tsa dilepe, etc				
Fenitshara ya le lapa				
Go betla dithekiso go baeti				
Dihlare				
Diforutse tse di jegago				
Mushrooms				
Mamapo				
Diphedi tse di jegago				
Diphoofolo tsa naga goba nama ya tsa naga go dira dijo				
Mae a dinonyane				
Mehlare ya kalafi				
Puno ya bjanye				
Bjanye/mehlare ya diruiwa				
Peu go ditiriswa goba go botsefatsa				
Bjanye/dithatana tsa ba feyedi				
Tse dingwe (hlalosa)				

17. O bona dimela tsa tlhago bjang ka kakaretso?

	Ee	Aowa	Ga ke na bonnete
Dimela tsa tlhago di na le			

KAROLO C: Beikemo go tlhatloso ya dimela tsa tlhago

18. Dingwalwa tse latelago di hlalosa maemo a batho ba bangwe go tlhatloso ya dimela tsa tlhago mo setshabeng. Ka kgopelo, laetsa/ tshwaya seemo sag ago sa tumelo goba kganetso ka ga se sengwe le se sengwe sa dingwalwa tse ka go maraka ka (√) mo lepokisaneng le le swanetsego.

Sengwalwa	Dumela ka kudu	Dumela	Ga ke tsebe	Ga ke dumele	Ga ke dumele le ga tee tee
Dimela tsa tlhago di swanetse go sireletswa le go tlhatloswa ele gona go kgonthisisa hlweko ya merafe/mehlape ya diphidi, mehlare le diphoofolo tsa naga					
Dimela tsa tlhago di na le tsela/mokgwa wa go itsosolosa re di hlokomela goba re sa di hlokomele					
Tshireletso ya basomedi ba mosomo wa industeri ya dimela tsa tlhago e bohlokwa go feta tshireletso ya diphidi tse mo kotseng					
Bohlokwa bja kakanyo kgolo go hlokomelo ya dimela tsa tlhago e swanetse go ba go sireletsa tlhago ya diphidi ka moka					
Mang le mang o swanetse go ba le kamano le gona go dira eng kappa eng go sireletsa dimela tsa tlhago					
Ke maikarabelo a mmoso fela go sireletsa le go hlokomela dimela tsa tlhago					
Modimo o re file dimela tsa tlhago go di somisa go khumana di hlokwa/nyakwa tsa rena, ka fao a se ra swanelwa go ganetswa maloka a a tlhago					
Ge re nyaka diphidi tsa naga di phologa re swanetse go hlokomela tlhago yeo di dulago go yona					

KAROLO D: Tiro ya hlokomelo ya dimela tsa tlhago

19. Ka kgopelo, maraka tsela yeo tiro ya hlokomelo ya dimela tsa tlhago e amogelegang ka gona go wena. (Maraka (√) ka lepokisaneng le swanetsego e ngwe le e ngwe ya tsona)

	Amogeleg a ka kudu	Amogelega	Ga ke tsebe	Ga ya amogelega	Ga ya amogelega le ga tee tee
Mafapha ao a bunnwego a swanetse go dumelelwa gore a itsosolose ka bo ona					
Tlogela mathata a diphidi mo tulong ya tsona					
Tswalelo ya dimela tsa tlhago go hlola tsela ya go laola go rengwa ga mehlare ntle le molao					
Polane e sa lokelago hlokomelo ya dimela tsa tlhago					
Tobo ya naga ye e sireletsegilego lebaka ele go godisa di naga-sekgoweng					
Hlokego ya sireletso ya dimela tsa kgale tsa thlago					
Hlolego/tiro ya diphaephe tsa oile magareng a dimela tsa tlhago					
Go se bjale mehlare go emela yeo e remilwego					
Go se fapaganye phiso ya lesoka					
Tiro ya themo ya mehlare					

KAROLO E: Hlokomelo/tsebo ya thuto ya tsa tlhago

	Ee	Aowa	Ga ke na bonnete
20. O kile wa kwa goba go bala ka ga thuto ya tsa tlhago pele ga diputsiswana tse?			

21. Ga e ba go bjalo, ke eng seo se o feleng taetso/tsebo ka ga se? (Ka kgopelo, swaya ka (√) mo go ye ngwe ya tse latelago

Selaetsi	
Seyalemoya/ thelebishene	
Pampiri/makazini	
Barutisi ba sekolo/college	
Kopano	
Phamfolete/Phoustara	
Babereki ba tsa tlhago ba mmuso	
Moagisane/mogwera	
Ga ke tsebe	
E ngwe (hlalosa)	

	Ga botse	Kaone	Bohlaswa
22. Na kakanyo ya gago ke e fe mabapi le maiteko a mmuso go sireletsa dimela tsa tlhago motsaneng o?			
23. Na kakanyo ya gago ke e fe mabapi le boikano bja batho go hlatloso ya dimela tsa tlhago mo motsaneng?			

24. Ke mang eo a swanetsego go ba le maikarabelo a go hlokomela dimela tsa tlhago? (Ka kgopelo, maraka ka (√) go ye ngwe ya tse latelago)

Mmuso fela	
Kgosi/Hlogo ya setshaba fela	
Kgosi/hlogo ya setshaba le mafapha a mangwe a motse	
Mmuso le Kgosi/hlogo ya setshaba	
Mmuso, Kgosi, le mafapha a mangwe a motes	

25. Ka boripana, e fa mekgwa e mehlano yeo batho mo motsaneng o ba ka eletswa go tiisa ka tsa tiro ya hlatloso/tshireletso ya dimela tsa tlhago.

……
……
……

Ke leboga thuso ya gago.

Appendix B: Focus Group Discussion Guideline

The following steps and questions have been developed to serve as guide in the conduct of group discussion and to ensure that the participants feel confident and comfortable to express their views.

Welcome and introduction of the research and each participant.

Brief introduction of the study and outline of the discussion

Discuss the landscape and natural resources of the community and the country. (a) How will you describe the landscape of your community? (b) What are the natural resources available?

Discuss the concept of forest/woodlands (a) what do you understand by forest/woodlands resources?

Discuss the importance of the forest/woodlands resources including the non-timber forest product (NTFP). (a) What are the various uses and services the community derives from the forest/woodlands? (b) What are the non-timber forest products in your community and what use(s) are they put to?

Discuss management and conservation. Who should be responsible? (a) What do you understand by the term management/conservation of natural resources? (b) In what way(s) do the people of the community try to manage/conserve the forest/woodlands resources? (c) Are there any individual or group of individual charge with the task of managing/conserving this resources?

Has there been any efforts on the part of the government to trained or educate members of this community on the policy and conservation strategies?

Appendix B: Tsonga Version of Focus Group Guideline

Tselana ya Tsheka-tsheko magareng ga dihlopha-kgethei

Tselana tse latelago le diputsiso di hlamilwe go ba keletsi go kama-kamana le tsheka-tsheko mo dihlopheng tse kgethilweng le go kgonthisisa gore badirisi/baithaopi ba be boiketlo le tokologo go hlagisa di kakanyo tsa bona.

Madume le matseno a resetshe le baithaopi

Matseno a ma kopana a resetshe le taetso ya tseka-tsheko

Tshekatsheko ya seripa sa naga yeo le didiriswa tsa tlhago tsa motsaneng le naga. (a) O ka hlatholla seripa se sa naga ya mo motsaneng wo bjang? (b) Ke didiriswa tsa tlhago di feng tse di leng gona?

Tshekatsheko ya moela wa dimela tsa tlhago (a) O kwesisa eng ka didiriswa tsa tlhago?

Tshekatsheko go bohlokwa bja didiriswa tsa tlhago. (a) Ke tshomiso le di sevise di feng tseo motsana wo o ikanang ka tsona? Bjalo le bjalo…

Tshekatsheko go hlokomelo le tshireletso. Ke mong yo a swanetsang go ba le maikarabelo? (a) O kwesisa eng ka ga hlokomelo/tshireletso ya didiriswa tsa tlhago? (b) Ke tsela e feng yeo batho mo motsaneng ba theraya go hlokomela/tshireletsa didiriswa tsa tlhago? (c) A gona le motho goba sehlopha sa batho bao ba laeditsweng go hlokomela/tshireletsa didiriswa tse?

Go kile gwa ba le maiteko mo mphatong wa mmuso go treina goba gona go ruta badudi ba motsaneng wo ka ga pholisi le mekgwa ya tshireletso?

Appendix C: In-depth Interview Guide

Background Information

Date:…….

Province/State:……..

Municipal District:……

Name of Village……..

Position held in the community:…….

How long have you been in this position?

Language:……

Age:……...

Occupation (Primary):……..

(Secondary):……

Are you a member of this community? Yes No

How long have you lived in the community?.....

How long have you been involved with agricultural and natural resources activities?.....

Can you explain your understanding of forest resources?

How important are the resources to the people of this community?

What in your view are the various uses people in this community put the forest/woodlands resources to?

If you look back, how will you describe the position of forest resources in this community, has there been any changes?

What are the causes of such depletion or reduction?

What environmental issues do you think are of most concern to your community?

In your own view how can these problems be addressed?

What effort are the people in the community doing to arrest the depletion of forest resources?

Is there any project in the community directed at increasing environmental awareness and forest resource conservation? If yes elaborate.

If No, will you like to see such project introduced into the community?

How do people participate in natural resource management in your community?

What things are happening to the forest/woodlands resources of your community that you do not like? Why?

What is your feeling about forest/woodlands resource conservation in your community? Why?

Are you satisfied with government activities to address conservation needs of your area? Yes/No, Why

Have you heard of Environmental education? If Yes, where and what do you understand by it. If No, why

Do you know of any policy concerning forest/woodlands resource conservation in your province? If Yes, what is it all about? If No, why?

As an individual would you be willing to participate in a program on forest resource conservation? If Yes/No why

Who do you think should organize the programme? (i) Government,

(ii)Non-governmental oganisation (iii) District office

(vi) other (specify)

What is your feeling about people coming to talk or teach you about conservation of natural resources?

What information about conservation of the environment would you like to be provided to the community?

Whose responsibility do you think should it is to look after the forest resources or natural resources?

Is there anything I have not asked you about the issue we are discussing that you would like to say?

Thank you for your time and cooperation.

Appendix C: Tsonga Version of In-depth Interview Guide

Taetso e tseneletseng ya diputseswana

Tshekatsheko ya Tsebo

Letsatsi kgwedi:…….

Porovense/Naga:……

Karolo ya Masepala:……..

Leina la Motse:……..

Sekgoba se o se swereng mo motsaneng:…..

Na o bile mo sekgobeng se nako e kaakane?

Leleme/Polelo:……

Ngwaga:…….....

Maemo a mosomo (A motseng):…….

(A ka ntle):……...

Na o yo mongwe wa motsana wo? Ee Aowa

O dutse motsaneng wo lebaka le le kaakane?.....

Ke nako e kaakane o na le kamano go tsa temo le ditiriswa tsa tlhago?.....

O ka hlalosa tsebo ya gago mabapi le dimela tsa tlhago?

Na ditiriswa tsa tlhago di bohlokwa go kaakane mo bathing ba mo motsaneng?

O akanya gore ke dife di tshomiso tseo batho mo motsaneng ba di beago go ditiriswa tsa dimela tsa tlhago?

Ge o lebelela morago, o ka hlaloso seemo sa ditiriswa tsa dimela tsa tlhago bjang mo motsaneng, a o na le diphapano?

Ke eng sehlola sa yona tshenyego goba phokotso mo tlhagong?

Ke maiteko afe ao batho ba a tseago mo motsaneng o fedisa tshenyego ya dimela tsa tlhago?

O na le di projeke mo motsaneng tse lebisitsweng go hlagolosa tsebo ya tsa tlhago le hlatloso/tshireletso ya dimela tsa tlhago? Ga eba go bjalo, tsitsinkela.

G e ba aowa, o ka rata go bona tsona diprojeke di hlagisitswe mo motsaneng?

Na batho ba amana bjang le hlokomelo ya dimela tsa tlhago mo motsaneng wa geno?

O direga dilo dife go ditiriswa/dimela tsa tlhago motsaneng wa geno tseo o sa di ratego? Ka lebaka le fe?

Maikutlo a go ke a fe mabapi le hlatloso/tshireletso ya dimela tsa tlhago motsaneng wa geno? K lebaka le fe?

A o kgotsofetse ka mesebetsi ya mmuso ya go latela di nyakwa tsa hlatlo so ya tsa tlhago mo o dulago? Ee/Aowa, ka lebaka le fe?

O tseba ka ga pholisi e fe kapa e fe mabapi le hlatloso ya ditiriswa tsa dimela le thuto ya tsa tlhago mo porovenseng ya geno? Ga e ba go bjalo, ke efeng le gona e bolela ka eng? Ga e ba aowa, lebaka e le eng?

Maikutlo a gago ke a fe mabapi le batho go o boledisa goba go o ruta ka ga hlatloso/tshireletso ya ditiriswa tsa tlhago?

Ke tsebiso/tsebo e feng ka ga hlokomelo/tshireletso ya tlhago o ka ratang go e fa motsana wa geno?

O nagana gore ke maikarabelo a mang go hlokomela dimela tsa tlhago? Ka lebaka lefe?

Na mafapha a mmuso le mekgahlo ya go ipusha e ka dira eng go thusa dikhomionithi/metsana go ba kudu le seeme mo go direng ga diphetho mabapi le hlatloso ya dimela tsa tlhago?

Na kamano ya motsana ka tsa hlaboloso le theo ya pholisi ya tsa tlhago le tswetso pele ya hlatloso ya tsa tlhago e ka thusa bjang?

Na o na le se sengwe seo ke sa go butsisang ka sona ka ga se re se ahlaahlilego seo o ka ratang go se bolela?

Ke leboga nako le tshomisano ya gago.

Appendix D: Letter of Introduction and Informed Consent Form

School of Education
University of Witwatersrand,
Private Bag 3, Wits 2050,
Johannesburg, South Africa
Email: ifegbesan@yahoo.com

……..

…….

Sir,

Information Sheet

I write to seek your permission to use your community as one of the sample area for my research.

My name is Ayodeji Ifegbesan a doctorate degree student at the University of the Witwatersrand, South Africa. I am conducting research on comparative study of environmental education and forest/woodlands resource conservation in rural Africa using some selected rural communities in South Africa and Nigeria. It is part of the requirements for the award of the doctorate degree. The aim of the study is to find out their knowledge, attitude and practices of forest/woodlands resources conservation and environmental education in the community and compare to see whether there can be any lesson(s) to share between the two countries (Nigeria and South Africa). My activities among your people with the assistance of one/two research assistants would involve the administration of questionnaire; interview and focus group discussion. The focus group discussion and interview would the audio-taped for translation and transcription which will be destroyed after the completion of the study to protect the subject in the study. My study has no economic or legal implication whatsoever for individual and the community in general. It is hope that the findings of this study will serve as a baseline for appropriate intervention programme in future. I will be willing to share my findings with you.

Thank you for your understanding and cooperation,

Yours sincerely,

Ifegbesan Ayodeji
Researcher

Prof. Shirley Pendlebury
Supervisor

Prof. H Annegarn
Supervisor

Informed Consent Form

I……the chief/ or headman of ……community having read the information sheet as well as the attached research instruments agree to participate and allow the researcher……. to conduct his study among my people.

Name…….

Signature……..

Date…….

Appendix D: Tsonga Version of Letter of Introduction and Informed Consent Form

School of Education
University of theWitwatersrand,
Private Bag 3, Wits 2050,
Johannesburg, South Africa
Email: ifegbesan@yahoo.com

Lephepha la Tsibiso

Ke ngwala go kgopela tokollo ya go somisa motsana wa gago bjalo ka wo mongwe wa ditsopolwa tsa resetshe ya ka.

Leina la ka ke Ayodeji Ifegbesan, moithuti wa le ngwalo la Doctorate gola Universiting ya Witwatersrand, Afrika Borwa. Ke kamakana le resetshe ka ga dipapantsho thuto ya dithuto tsa tlhago le hlatloso/tshireletso ya dimela tsa tlhago mo magaeng a Afrika ke somisa metse magae ao a kgethilwego mo Afrika Borwa le Nigeria. Ye ke karolo ya dinyakwa tsa awate ya lengwalo la Doctorate. Nepokgolo ya resetshe/thuto ye ke go khumana tsebo, boikgokgomosa/maiteko le ditiro tsa bona ka ga tsa tshireletso ya dimela tsa tlhago le thuto ka ga tsa tlhago mo motsaneng ke bapantsha go bona ga eba o ka ba le dithuto tse ka arogantshwago magareng a di naga tse tse pedi (Nigeria le Afrika Borwa).

Maikemisetso a ka magareng ga batho ka thuso ya o tee goba ba babedi bathusi ba resetshe a amana le go aroganya diputsiswana, go bolela/botsisana le batho le go kama-kamana le dihlopha tse kgethilwego. Kamakamano/tshekatsheko ya diplopha tse le diputsiso di tla atiswa ka theipi-kgatiso go tla go hlatholla, mafelelong di tla senywa ge resetshe e sa tso fela go tshireletsa bao ba ithaopileng go thusa mo resetsheng. Resetshe ya ka ga e na kamano le tshelete goba tsa semolao le e seng go batho le motsana wo ka kakaretso. Tshepo ke gore dikhumanwa mo resetsheng ye di tla bonagala bjalo ka thankgollo ya di phorograme tsa maikemisetso ao a kgetheileng mo bokamosong.

Ke tla ba le kgahlego go shera dikhumanwa tsa ka le wena.

Ke leboga kwesiso le tshomisano ya gago
Wa Gago wa Potego

Ifegbesan Ayodeji
Mo dira resetshe

Prof. S. Pendlebury
Mothekgi

Prof. H Annegarn
Mothekgi

Tumelo e tletsego

Nna…….kgosi/hlogo ya setshaba sa ga…….ke setseng ke badile lephepha la tsibiso le ditiriswa tse kgomareditsweng ke a dumela go ithaopa le gona go dumelela mo dira resetshe e lego……...go dira resetshe magareng ga batho ba motsaneng wo.

Leina……

Tshaeno……

Le tsatsi-kgwedi……