WOODLAND RESOURCE USE, ATTITUDES AND CONSERVATION PRACTICES: EVIDENCE FROM THREE COMMUNITIES IN BUSHBUCKRIDGE MPUMALANGA PROVINCE, SOUTH AFRICA

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ABSTRACT

This study adopted a mixed-method approach to examine the uses, attitudes, and conservation perceptions of rural people from three communities in Bushbuck ridge, Mpumalanga Province South Africa. The study revealed that rural communities attached a high premium value on the forest as socially, economically, and culturally, both to the country and individuals. It also revealed that people rely heavily on woodland resources for cooking, building materials, food, and medicines. The results indicated that the overwhelming majority of respondents possessed positive attitudes and practices towards forest/woodlands conservation. However, their socio-demographic characteristics except, for the level of education does not influence people's attitudes and practice of forest/woodland conservation. The people are willing to participate in the conservation of forest resources through the adoption of alternative resources and strategies. It is, therefore, recommended that attitude and practice of conservation should be sustained and enhanced through community-based environmental education, which will continue to sensitise as well as encourage them on the importance of conservation.

Keywords: Woodland, attitude, practice, conservation, environmental education, Bushbuck ridge

INTRODUCTION

Background of the Study

Perhaps since human appears on the planet earth, human has explored the resources of the environment for livelihood and survival. Forest and all therein, more than any environmental resources, have to serve humanity in various ways. People have harvested fuel wood, fodder, and hunted wild animals for meat in forests (Olarewaju *et al.,*2017). Millions of households in developing countries, depend on forest resources, which were harvest, process, and trade in to generate income (Tewari, 2012; Dokken, & Angelsen, 2015). The immense contribution of forests to economic, political, socio-culturalas well as environmental development of the society have been well documented. The dependence on forests and non timber forest products by rural households in developing countries to meet Livelihood and subsistence needs is widely acknowledged and documented. Rural communities use forest resources in a wide range of purposes, timber for domestic use, fuelwood for energy, honey, fruit, mushrooms, bushmeat for food and medicinal plants for traditional healing, and NTFP harvesting complements the subsistence economy of poor (Sunderlin *et al.,* 2005; Vedeld *et al.,* 2007; FAO, 2018; Angelsen *et al.,* 2014). The vast majority of rural Africans interact with forests and woodlands daily, through exploitation and utilisation of timber and nontimber forest products (Shackleton *et al*. 2006; Shackleton *et al*., 2007; Kamanga *et al.,* 2009; Lepetu and Oladele, 2009; FAO, 2018). Furthermore, several studies carried out in the Southern African Development Community (SADC) indicated that forest resources contribute significantly to the households' economy in this region. Within most communities, forest resources are extensively exploitive and used for several purposes (Twine, 2005; Shackleton *et al*., 2007; Kamanga *et al.,* 2009; Meilby *et al.,* 2014; *Lepetu, &*

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Garekae (2015).

In rural South Africa, like other rural communities in sub-Saharan Africa, woodland resources are an integral part of their Livelihood. Although, numerous studies have demonstrated that there is a nexus between forests and livelihoods of rural households, providing fuel, medicine, food, and building materials. However, the continuing degradation of woodland resources has caused it to remains in the front burner of international discourse and research, emphasising the fact that effective conservation of natural resources is possible only with an understanding of the attitudes and perceptions of people living within the fringes. Based on this that this research set out to (i) assess the importance, attitudes and practices of forest resources conservation, and the exposure to environmental education among the rural inhabitants in rural communities in the Bushbuckridge district, Mpumalanga Province, South Africa. (ii) examine the relationship between the people's socio-demographic characteristics, importance, attitudes, and practice towards forest resources conservation.

Method

Study Area: Bushbuckridge, Mpumalanga Province, South Africa

The study areas Timbavati, Khokhovela (Islington) and Hluvukani, are located in the Bushbuckridge district of the Mpumalanga Province of South Africa (Figure 1). The municipality is one of the two constituents of Bohlabelo District Municipality, and is located at 31°00'–31°35'E; 24°30'–25°00'S on the south-eastern side of the Mpumalanga Province and forms a border with the Mpumalanga Province in the north-east. It lies between the Sabie River to the south and Klaserie-Orpen road to the north. To its west is the Drakensberg escarpment, while the National Park-Kruger and Sabi-Sand Game Reserve form its eastern border (Shackleton *et al.,* 2000). Bushbuckridge has an area of 435 km^2 that includes 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 province. The population of the Bushbuckridge Municipality, according to the Community Survey (Statistics South Africa (2007), is 509, 970 individuals. 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 homeland, the area is densely populated with between 150-300 people per km^2.
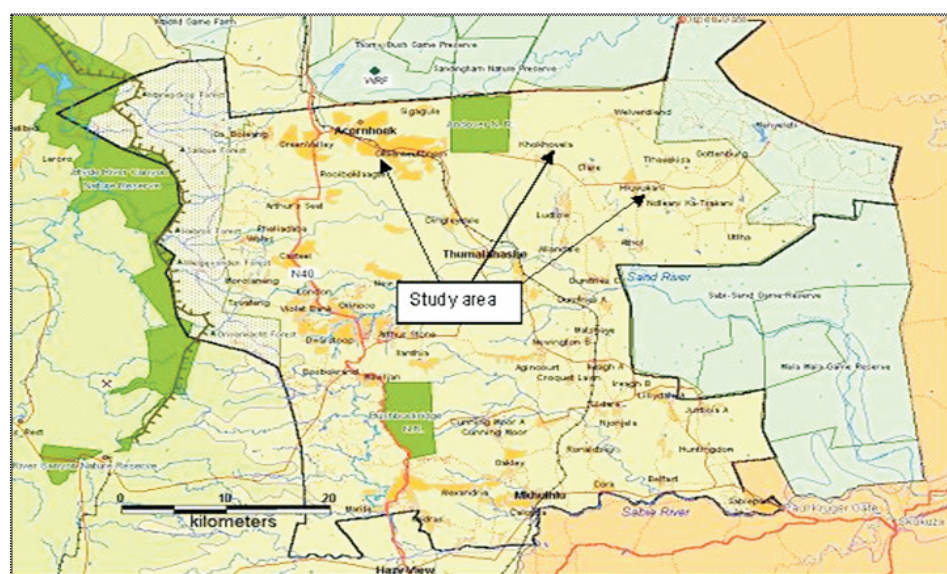

Figure 1: Location of the study communities in Bushbuckridge, South Africa

Data collection

The study employed a mixed-method approach. Quantitative data were obtained through questionnaires with the Likert scales, while qualitative data gathered through focus group discussion (FGDs) and in-depth interviews were used to collect data. Six focus groups identified for the data collection based on gender and age. Each group comprised of not more than 12 individuals.

The instrument forest resource conservation and environmental education Questionnaire (FRCEEQ) was a twenty-five (25) items, Likert scale structured instrument, which consisted of five sections. Section A sought demographic data of the subjects; section B covered the awareness of forest/woodlands resources, while Section C made up of items 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. The questionnaire was validated, and a reliability coefficient of 0.72 obtained for the instrument using Cronbach's coefficient.

Data Analysis

The data from the questionnaires were analysed using SPSS, version 20 (IBM, Chicago, IL, USA). Descriptive statistics, such as means and standard deviation, were calculated for continuous variables, and percentages calculated for categorical variables. The focus group discussion (FGDs) and in-depth interviews (IDIs) were audiotaped and complemented with written interview notes. Tables supported by illustrative quotes used to present the results.

Nominal values for data entering were assigned to the items according to scales. The items on the importance of forest resources 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 from 5 through 4, 3, 2 and 1 for "Strongly Agree" (S.A.), "Agree" (A), "Undecided" (U.D.), "Disagree" (D) and "Strongly Disagree" (S.D.); "Very Acceptable" (V.A.), "Acceptable" (A), "Don't Know" (D.K.), "Not Acceptable" (N.A.) and "Very Unacceptable" (VUA) respectively. The scoring pattern reversed for the negatively worded items. Statistically, the level of knowledge, binary partitions for knowledge (low/high), and behaviour index (negative/positive) were determined. The partitioning value of items determines the maximum of each of the nominal values divided by N. Thus, the upper limit of knowledge put at 2.00; importance put at 2.50; attitudes and practices at 3.00. For purposes of data interpretation, mean values of 2.50 and above deemed to indicate 'important' and values below 2.50 regarded as implying 'not important'. Mean values of 3.00 and above considered for agreement and acceptance of items, mean values below 3.00 indicates disagreement and non-acceptance concerning items on the attitudes and practices of the respondents. A standard deviation greater than 1.00 taken to indicate high variability among respondents. 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) used.

Results and Discussion

The socio-demographic characteristics of 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, while fewer people were in the 55-64 and over-65 age ranges. 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. The educational distribution shows that half of the respondents are secondary school graduates. The majority of those who claimed to possess secondary school education had reached grades 10 or 11. A few had only primary school education;

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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. The average number per household was six – the same as the national average for South African rural communities. More than half 60% of the households sampled, one person makes their Livelihood from forest resources; 23.7% make their Livelihood from forest resources.

Importance of Forest/Woodland Resources
Mean scores as bases for interpretation show that seven aspects of life have mean scores above the value 2.25, which is the upper limit to determine the level of importance placed on forest resources by the respondents (Table 1). The overall mean score of 3.37 suggests that a high premium placed on forest resources among the people of the study areas. The country's economy rated as the most important (3.72), with wealth, household economy, quality of the environment, quality of life, the survival of other life forms, and recreation following in that order. The conclusion is that forests are socially, economically, and culturally valuable both to the country and to individuals. This result is consistent to 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 (Kamanga *et al.,* 2009; Lepetu *et al.,* 2009; Meilby *et al.,*2014; Lepetu *et al.,* 2015). This result indicates that a high level of importance is attached to forests/woodlands. People's opinions about the relative importance of the forest to household economies and the national economy became evident when asked to choose between the two economies. The majority felt that the household economy is much more important than the country's economy.

Table1: Percentage, mean, and standard deviation of the 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

The numbers in parentheses are percentage responses ** Mean score above 2.25.

Some comments of participants at the FGD and informal conversation demonstrate 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 suffering. 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 house the cattle. Forests protect our houses from strong wind. We get wild fruits like tintoma and tintshigin in order to survive, and our livestock gets 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 not only to the government but also some people in the surrounding 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 people cannot afford to buy electricity to use for cooking, so they rely on fuelwood. And some people 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 been 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.

Forest/Woodland Use
The percentages of reported utilisation of forest resources among rural households are summarised in 2. Numerous forest resources are harvested and used for various purposes in the study area. A list of nineteen forest/woodland resources was given to respondents and asked to say which of these resources they and others use in their communities. The results reveal that people rely heavily on woodland resources for cooking, building materials, food, and medicines. They collect and use both tree and non-tree products extensively to meet their daily needs. Forest products such as fuelwood, fodder, medicinal plants, edible wild vegetables and insects, and other forest products are utilised. Most of these forest products are collected for subsistence purposes - very few are processed for income generation. This finding is consistent with those of Twine et al., (2003); and Shackleton (2004) indicated that people in rural South Africa depend heavily on forest resources for their livelihoods.

Table 2: Percentage distribution of forest resource utilisation

Forest resources	%	Rank
Fuelwood	98.0	1st
Indigenous poles for construction	92.0	2nd
Reeds for construction	85.0	3rd
Wood for household utensils	84.0	4th
Grass and trees for livestock	84.0	4th
Edible wild fruits	80.0	6th
Reeds for weaving mats	79.0	7th
Grass and twigs for sweeping	79.0	7th
Wild herbs	74.0	9th
Medicinal plants	73.0	10th
Edible insects	67.0	11th
Thatch grass	66.0	12th
Seed for rattles or decoration	61.0	13th
Wild animals (bushmeat) for food and income	58.0	14th
Mushrooms	57.0	15th
Wood for furniture	56.0	16th
Wood for carving	56.0	16th
Honey	51.0	18th
Bird eggs	42.0	19th

Of the 300 households sampled, 98% used fuelwood for cooking. Only 2% said they used other sources of energy. This result is consistent with the findings of Shackleton *et al.,* (2002),; Twine (2005); Timko *et al.,* (2010).

Some 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 reason 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 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 at 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 and to sell to tourists.*"(One of the Indunas).

Between 66% and 85% of the households sampled in the study areas used thatch grasses, reeds, and grass. 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 used it. The traditional rondavels (circular huts with a conic thatched roof) are constructed from poles. Most of the fences and kraals for the livestock are constructed from poles. 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. Only about half (58%) of the households surveyed responded to use bushmeat, while 42% of the households collect bird eggs.

To some groups, this is seen as bad, while others say they do it for survival. An older 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.*"

"*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 or kill 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 protected.*" (Participant at the FGD)

The variety of wild fruits and vegetables collected and consumed by households was discussed at interviews in the communities. 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. Among the commonly eaten wild fruits are Strychnos spinosa (Green monkey orange or Masala) Sclerocarya birrea (Marula/Nkanyi), Diospyros mespiliformis (Jackelberry/Ntoma) and Carissa edulis (Tinthuguri).

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. The problem with traditional medicine is that it is seen as part of the traditional religious belief system. Some people claimed to be using traditional medicine, which they had bought from the sagoma or inyanga. Medicinal plants are not collected as extensively as food plants, with many households claiming that they prefer to consult medical clinics. A significant proportion of the households surveyed do collect medicinal plants for home use, but some buy them from traditional healers.

Attitudes towards Forest Resources

Participants 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.

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Table3: 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 regenerating 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/woodland resources.	152 (50.7)	125 (41.7)	7 (2.3)	13 (4.3)	3 (1.0)	4.37*	0.81
It is the government's responsibility alone to protect and conserve the forest/woodland 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:S.D.- strongly disagree; D - disagree; D.K.- don't know; A - agree; S.A.- 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 in 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 would regenerate themselves whether we care or not. To 73% of respondents, it is 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. We should not deny the right. 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)

> "*If we say God gave us the right 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. The government should come in to take control.*"(A participant at an 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 the 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 level of unemployment, I agree to protect the jobs of people rather than the lives of animals.*"(Participant at FGD)

From these statements, it can be seen that people's attitudes towards forest/woodland vary. While some express positive feelings, others hold negative attitudes towards the government's actions to protect the resources. This is expected because of the level of unemployment among the people. The reason for positive attitudes derives from the direct and indirect benefits accruing to the people from tourism activities going on in the area and the expectation of improved and better livelihoods, which might come from the conservation in the future. Although the people in the study areas have positive attitudes towards forest/woodland, this has not been translated into environmentally-friendly action or practices. Due to their high dependency on forest/wood and lack of alternatives, people are not able to change their present resource-use patterns. It is important to recognise and foster these positive attitudes to engender better human-environment relationships in the area.

Practices of Forest/woodland Resource Conservation

Table 4 shows the frequencies, percentages, and mean scores relating to the 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 practice 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 (V.A.), acceptable (A); don't know (D.K.), not acceptable (N.A.); very unacceptable (VUNA) respectively. The scoring pattern was reversed for the negatively worded items. With the overall mean score of 2.81 as bases for the interpretation, it could be concluded that people from the study areas agreed that forest/woodland resource conservation was unacceptable to them. The first three statements express 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 are negatively formulated. Thus the low scores correspond with the symmetric high scores that represent inappropriate forest/woodland resource conservation practices.

Table 4: 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	V.A. (%)	A (%)	D.K. (%)	N.A. (%)	VUNA (%)	Mean score	S.D.
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 concerning 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. From the aggregate responses, the majority accepted forest conservation practice. Such as natural regeneration of harvested areas (82%), clumps of trees to protect wildlife (78%), closing the forest roads to control illegal felling (80%). However, inadequate forest management planning (64%), loss of protected land to urban expansion (52%), lack of protection for old-growth forest/woodland (76%), and construction of oil pipeline across forest (60%). Eighty-five per cent (85%) of respondents found the practice of not planting trees to replace the ones cut unacceptable, while 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. People's reactions further illuminated by some comments from the participants at the FGD and interviews:

"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 them 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 to cut poles for fences." (An induna of one of the villages)

"Look; indeed, 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 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 have been conserved that they can 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 start killing 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 some people tried to ensure that the forest resources are preserved by engaging in environment-friendly practices. At the same time, there are others whose activities are bad and threaten the forest's resources.

"I cannot say that people's attitudes and practices towards forest/woodland resource conservation are good or bad. Some people try not to chop the trees, or burn the veld or kill animals, but these are few. Many people do bad things in the forests. When people are permitted 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 practices." (Headman)

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 (5). 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

Table 5: Pearson correlation coefficients between respondents' socio-demographic characteristics and importance, attitudes, practices, awareness, knowledge, and interest.

Gender	Age	Religion	Occupation	Educational Background	No per Household	No. making Livelihood from forest	Importance	Attitude	Practices	Knowledge	Awareness	Interest
1												
-0.10	1.00											
-0.18(**)	0.21(**)	1.00										
0.04	0.37(**)	0.11	1.00									
-0.09	-.032(**)	-0.19(**)	-0.27(**)	1.00								
0.03	0.25(**)	0.15(**)	0.05	-.019(**)	1.00							
0.03	-0.02	0.05	-0.06	-0.05	0.07	1.00						
0.00	0.00	0.02	-0.05	0.03	-0.01	-0.02	1.00					
0.03	0.07	0.01	0.09	-0.12(*)	0.01	0.06	0.23(**)	1.00				
0.00	0.00	0.06	0.02	0.01	0.06	0.02	0.08	0.15(*)	1.00			
-0.05	-0.08	-0.07	-0.11	.12(*)	-0.09	0.10	0.10	0.15(**)	0.11	1.00		
-0.06	-0.13(*)	-0.06	-0.19(**)	0.27(**)	-0.11	-0.05	0.20(**)	-0.03	-0.08	-0.01	1.00	
-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

icant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Although there are several positive correlations observed between the variables, most of them were weak. 'Educational background' was found to have a significant positive 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).

Awareness of Environmental Education

Data on environmental education and awareness conducted among the people was measure with three quantitative questions and heavily complemented with more probing questions during the interview and focus group discussion sections. When asked whether they have heard of environmental education (E.E.), the majority of the respondents openly expressed their lack of awareness of environmental education. Only 25% had heard of E.E.

Respondents were asked to identify from a list of their primary sources of information on environmental education (Table 6). These sources include 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 highest percentage of respondents said they had never heard of E.E. (70%) and those that had learned of it at school or college (10%). Approximately 6% of respondents heard of it from government environmental workers.

Table6: 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	20	0.7
Government Officers	18	6.0
Don't know	210	70.0
Total	**300**	**100**

Few have heard of E.E. through radio and television (8.3%), newsprint (5%) and conferences, seminars, and workshops (0.7%). Accordingly, the majority of the respondents (77%) claimed they have not participated in any training on environmental education. It is only 23% of the respondents that confirmed ever attended training in E.E. These suggest that there are short E.E. and awareness of forest resource conservation. Although the forest policy explicitly recognised environmental education as one of the strategies for ensuring sustainable forest resource conservation.

Conclusions and Recommendations

This study has explored some of the issues related to attitudes, practices, and the importance of forest resource conservation. The findings of the study revealed that woodland resources are essential to the survival of rural South Africans like any other rural people in sub-Saharan Africa. It is the leading source of energy for cooking and heat for the locals in the study area. The people reflected positive attitudes. The results, in general, appear to confirm findings in previous environment-behaviour and forest resource utilisation literature.

The results have some practical implications for policymaking in the field of environmental conservation in general and forest resources in particular. It points out the need to consider a paradigm shift from top-bottom to bottom-top approach in the formulation and implementation of the policy. It is also clear that the issue of poverty must be addressed, as people cannot be expected to display an attitude or behaviour above the condition of the environment. It requires the employment generation and the provision of alternative sources of energy. Environment education and awareness campaigns must be developed and brought to the grassroots.

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