Journal of Sustainable Development in Africa (Volume 11, No.1, 2009)

ISSN: 1520-5509

Clarion University of Pennsylvania, Clarion, Pennsylvania

TRADITIONAL CRAFTS AND RURAL LIVELIHOODS IN MANICALAND'S SEMI-ARID AREAS: IMPLICATIONS FOR BIODIVERSITY AND ENVIRONMENTAL SUSTAINABILITY

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ABSTRACT

This study set out to examine the contribution of traditional crafts to sustainable rural livelihoods, their impacts on biodiversity, as well as to assess the effectiveness of the local level natural resource management institutions and environmental legislation in achieving environmental sustainability, in the light of MDG 7, in Chimanimani and Chipinge Districts, Zimbabwe. A questionnaire survey and semi-structured interviews were used as complementary research methods. A sample population of 51 roadside craft makers and traders was studied. The study found out that the majority of the craft traders were out of formal employment and fell within the most economically active group, and were married with at least an Ordinary Level education. Research results also revealed that woodlands perform important ecosystem and socio-economic functions. In addition, the study showed that craft activities are responsible for biodiversity loss, particularly due to the selective harvesting of Adansonia digitata (baobab), Afzelia quanzensis (chamfuta, pod mahogany), and Hyphaene petersiana (lala palm) in the study area. It was also found that both indigenous community-based and modern state-based natural resources management institutions exist in the study area. However, these institutions are largely ineffective due to weak monitoring and enforcement mechanisms. Ineffective natural resource management institutions have resulted in environmental degradation which is being aggravated by land shortage and declining crop yields. The research also revealed that the major factors driving unsustainable resource use were poverty, unemployment, and the weak

resource management institutions. Partnership and collaborative work between strengthened and autonomous community-based natural resources management institutions and a more active Environmental Management Agency will ensure sustainable resource management and help conserve biodiversity. Irrigation agriculture should be expanded in dryland areas and more peasants resettled on underutilized farms, to reduce pressure on woodland resources and to partly address both the economic and unemployment crisis in Zimbabwe.

Key Words: biodiversity, climate variability, drought, ecological vulnerability, ecosystem and socio-economic functions, forest and woodland resources, livelihood, semi-arid /dryland areas, sustainable rural livelihoods, traditional crafts

BACKGROUND TO THE STUDY

In Sub-Saharan Africa, where there is a heavy reliance on natural resources for livelihoods, 61% of the population lives in ecologically vulnerable areas characterized by a high degree of climatic variability and sensitivity, as well as a low degree of resilience (UNEP, 2002). Climate variability in Southern Africa, evidenced by year to year rainfall variability ranging between 30 and 35%, means that livelihoods in dryland (or semi-arid) areas of the region are not only precarious but often unsustainable. Rainfall in the region in the early 1990s was 20% lower than that of the 1970s, with significant droughts in the 1980s, early 1990s, and in 2002 (Chenje and Johnson, 1996; Hirji et al., 2002). Climate variability in the region is increasingly influenced by El Nino/Southern Oscillation (ENSO) events associated with the periodic warming of the tropical Pacific Ocean and related shifts in atmospheric circulation systems (Cane et al., 1994; Hulme, 1996). Dryland zones in Southern Africa can be classified into semi-arid and arid areas. Semi-arid areas constitute about 15%, while arid areas make up approximately 28% of the land area (McCullum, 2000). Whereas, the rain-fed agricultural growing season varies from 76 to 120 days in the former, it averages less than 76 days in the latter (ibid). Due to the seasonal variations and unreliable rainfall increasingly related to endemic drought, coupled with increasing demand for food to feed growing populations, threats to biodiversity and environmental sustainability are increasing. Cereal production in Southern Africa, for instance, declined by 34% during the 1994-1995 seasons due to drought (SADC, 1996). The 1991-1992 droughts, for example, resulted in a fall in agricultural production of 45% and a decline in the aggregated Gross Domestic Product (GDP) of 6% in Zimbabwe; while cereal harvests in Namibia fell by 70% (Hirji et al., 2002). These trends mean that rural communities in the semi-arid zones or dry land areas will be forced to depend more on natural resources for their livelihoods, posing further threats to biodiversity.

Biological diversity has been defined as the variability of living organisms in terrestrial, marine, and other aquatic ecosystems, and their supporting ecological complexes (UNEP, 1995). Biodiversity incorporates genetic, species, and ecosystem components. While genetic diversity refers to variations within and between populations of organisms, species diversity relates to the total number of species in a given area (McCullum, 2000). Ecosystem diversity is a measure of the variety of the component species and is also a reference to the different habitats within which species occur (ibid). Forest and/or woodland biodiversity is a crucial issue in Southern Africa because of the critical ecological and socio-economic functions it performs. One ecosystem function that forests and woodlands perform is regulation of macro and microclimates, as well as acting as carbon sinks. Forests or

woodlands also protect watersheds by stabilizing the land surface, thereby reducing soil erosion, runoff, and compaction (Masundire and Matowanyika, 1993; Mushove et al., 1996; McCullum, 2000). They are also crucial in nutrient cycling through storage, internal cycling, processing, and acquisition of nutrients. Furthermore, they help in recovering mobile nutrients, as well as in the removal or breakdown of excess nutrients and compounds. Another ecosystem function that forests and woodlands perform is provision of habitats for both resident and transient animal populations (ibid).

Apart from ecosystem functions, forests and woodlands also offer a variety of socio-economic benefits. Woodlands sustain both Southern Africa's rural human populations and livestock. Agricultural systems depend on forests and woodlands to varying degrees; for instance, soil nutrient transfer and providing nutrients from *termitaria* and from livestock manure, since livestock graze and browse in forest or woodland areas. For rural communities and the urban poor in Southern Africa, forests and woodlands are the primary energy source in the form of wood fuel, or charcoal. Fuel wood demand in the region is on the increase due to a variety of factors which include escalating global oil prices, rapid population growth, rapid urbanization, persistent poverty, and lack of realistic energy alternatives (McCullum, 2000). The most frequently used firewood species are *Julbernardia globiflora* (munondo), *Colophospermum mopane* (mopane) and *Brachystegia boehmii* (mupfuti) (Grundy et al., 1993). In Southern Africa, forests and woodlands are also an important source of timber for construction and furniture making purposes, and for traditional crafts for both household implements and curios. They are also the source of commercial timber hardwoods. The main commercial hardwood timber species include *Pterocarpus angolensis* (kiaat), *Afzelia quanzensis* (chamfuta), *Dalbergia melanoxylon* (African blackwood), *Combretum imberbe* (leadwood), *Diospyros mespiliformis* (African ebony), and *Khaya anthotheca* (red mahogany) (McCullum, 2000).

Many rural communities in Southern Africa depend on locally made household implements like axe and hoe handles, pestles and mortars, cooking sticks, plates and bowls, ox yokes, ox-carts, drums, and hunting tools. Preferred species include *Julbernardia paniculata* for axe and hoe handles, *Terminalia sericea* for ox yokes, and *Swartzia madagasciarensis* (snake bean) for hunting tools (ibid). Choice species for furniture and curio making include *Dalbergia melanoxylon* (Afican blackwood), *Afzelia quanzensis* (chamfuta, pod mahogany), *Swartzia madagasciarensis* (snake bean), *Pericopsis angolensis* (Afrormosia), and *Spirostachys africana* (tamboti) (Matose et al., 1996). There are a variety of other uses of forest and woodland resources in Southern Africa. Tough

flexible branches are used for weaving animal pens and granaries. Reeds and the leaves of the species *Phoenix reclinata* (wild date palm), *Hyphaene petersiana* (lala palm), and *Borassus aethiopium* (African fan palm) are used in rural areas for weaving handicrafts like baskets, hats and mats, while rope fibre from *Adansonia digitata* (baobab) is woven into baskets and mats (Campbell and Brigham, 1993). Species like *Brachystegia boehmii* (mupfuti) and *Brachystegia spiciformis* (musasa) are also preferred for fiber rope, especially for roofing purposes (McCullum, 2000).

Forest and woodland biodiversity also plays an important role as a source of food for many rural communities, particularly in the semi-arid and arid areas of Southern Africa, especially in the dry season and the early part of the rainy season before the crops ripen. Edible nuts, meat, and by-products from game, fowl, birds, reptiles, fish, and insects, as well as mushrooms constitute important sources of protein either in their fresh state or as dried food. Caterpillars and termites also provide much needed protein. The caterpillar species *Imbrasia belina* and *Gynanisa maia* (mopane worm) found in mopane woodlands, has a higher energy, protein, fat, carbohydrate, and calcium content than beef, chicken, and milk (Moruakgomo, 1996). In its dried state it can be stored for up to six months and is often sold at food markets. Mushroom species in either their fresh or dried form provides an important source of food, especially before the first crops mature. Some species, like *Chantharellus* (Chanterelle), has export potential, due to its seasonal availability.

Wild fruit also forms an important supplementary source of protein, calcium, iron, nutrients, and vitamins. Species that are crucial in this regard include *Parinari curatellifolia* (mobola plum, mobura), *Sclerocarya birrea* (marula), *Adansonia digitata* (baobab), *Tamarindus indica* (tamarind), *Ziziphus mauritiana* (masawu), and *Strychnos spinosa* (monkey orange). Some fruit is used to make beer or wine, for instance *Sclerocarya birrea* (marula) and *Ziziphus mauritiana* (masawu); while others are used to make porridge, for example *Parinari curatellifolia* (mobola plum, mobura) and *Adansonia digitata* (baobab) (Grundy et al., 1993; FAO, 1995; McCullum, 2000). The current skyrocketing global food prices due to poor harvests resulting from climate change, rising demand for biofuels, and market speculation (Development and Cooperation, 2008), means that rural communities in Southern Africa will become more dependent on forest/woodland food sources.

Indigenous forest and woodland biodiversity is also an important source of honey and beeswax, especially in areas where nectar producing tree species, like *Acacia*, *Brachystegia*, *Julbernardia*, *Syzygium* and *Combretum*, grow (Njovu, 1993). Other forest and woodland products that rural communities harvest include tannins, dyes, oils, raisins, and gums. Forest and woodland biodiversity also has non-consumptive spiritual and cultural functions. Some are considered sacred places used for the performance of rituals, like rain making ceremonies, while others are burial sites. The

foregoing analysis serves to underline the importance of forest and woodland biodiversity to sustainable rural livelihoods in the Southern African region and indeed elsewhere in rural Africa.
Although forest and woodland resources are essential for sustainable rural livelihoods, the collection, use, value, and marketing of such resources is differentiated by age, gender, wealth, and ecological setting. It would appear that poorer rural households are most dependent on forest and woodland resources. In Chivi District in Zimbabwe, for instance, the top 20% of households derive just 2.6% of their total annual household income (of about US$570) from woodland resources, the bottom 20% of the households derive 18.5% of their total annual household income (of about US$50) from such resources (Cavendish, 1996). The largest source of forest/woodland based income for poorer households are labor and income-based activities like carpentry, carving, roof mending, thatching, and removing termitaria. Such activities are usually dominated by the poorest in rural communities who, due to their low educational levels and limited skills, sell their unskilled labor for wages (Dewees, 1993). Some low return activities like selling thatching grass, wild fruit, and vegetables are largely done by women, partly reflecting female-headed households among the rural poor (McCullum, 2000). Access to forest and woodland resources could, therefore, be crucial for survival for such households. It is very likely, though, that due to the deep economic crisis Zimbabwe finds herself in today, more rural households, regardless of the differences outlined earlier, are now dependent on forests/woodlands for their livelihood.

However, there are some activities whose importance rises with income. Carpentry activities for making large items like carts, doors, furniture, mortars, and tables fall into this category because they require greater capital investment for tools, call for higher skills, and need more time. In contrast, the importance of similar activities on a small scale declines as income rises. Making axe and hoe handles, cooking sticks, ox yokes, and plates, for instance, requires limited skills and fetches low returns. Therefore, poorer households who are unable to access more lucrative opportunities engage in these activities. Forest and woodland biodiversity is not only important for its life supporting ecosystem functions, but is also critical for rural incomes, welfare, and, therefore, for sustainable livelihoods.

In spite of their crucial ecosystem, socio-economic and cultural functions, forest and woodland resources in Southern Africa face increasing pressure that poses serious threats to biodiversity. Land clearance mainly for agricultural purposes has caused habitat loss and habitat fragmentation arising form cultivation, forestry activities, settlement, as well as the effects of fire and pollution (McCullum, 2000). Loss of biodiversity in the region is, ironically, also partly related to adherence to

international conventions, like the Convention on International Trade in Endangered Species (CITES) and the Convention on Biodiversity. The ban on ivory trade, to satisfy one of the requirements of CITES, has resulted in increasing populations of species like the African elephant, causing woodland destruction, especially in areas where habitats are being compressed (Dublin et al., 1990). Biodiversity threats in the region are also related to over-exploitation of resources. Logging activities have reduced some preferred species to unsustainable levels. Poaching and over-hunting of species, like the black rhino, giant sable, black faced impala, lechwe and the Cape mountain zebra, have drastically reduced their populations (ibid). Biodiversity loss is also associated with the deliberate or accidental introduction of alien species, particularly invasive species. In Zimbabwe's Eastern Highlands, for instance, the introduction of the Australian *Acacia* and *Pinus* species now threatens the survival of indigenous species, like *Restio*, Heather (Erica) and *Protea*. Populations of species, like the wild dog, cheetah, leopard, and hyena, have been drastically reduced through deliberate eradication, creating pest problems.

In Zimbabwe although dependency on forest and woodland resources is characteristic of all rural communities, it is greatest in semi-arid areas where the dry savannah vegetation is dominated by *Colophospermum mopane* (mopane). Mopane woodlands are dominant in the Zambezi and Save Valleys. In the light of deepening poverty levels in the SADC region, particularly in Zimbabwe, forests and woodlands have a crucial role to play in poverty reduction and in achieving sustainable rural livelihoods. The livelihoods of the majority of Zimbabwe's population have been severely eroded by major shocks on the national economy over the last two decades. These include recurrent droughts, failed structural adjustment programs of the 1990s, the disbursement of unbudgeted cash payments to liberation war veterans in 1997, the costly and indefensible military involvement in the Democratic Republic of the Congo in 1998-2000, the badly implemented land reform program – especially the very controversial farm seizures of 2000-2006, recurrent drought, the negative impacts of the HIV/AIDS epidemic, rampant corruption, and the prevailing hyperinflationary environment (ILO, 2005; UN Habitat, 2005; Rukuni et al., 2006) The cumulative effect of these developments has been to deepen poverty and increase the vulnerability of the poor, especially those communities resident in ecologically vulnerable areas characterized by a high degree of climatic variability and sensitivity, as well as a low degree of resilience. It has been estimated that more than 80% of Zimbabwe's rural inhabitants live below the poverty line (of less than US$1 a day) (Sunday Times, 2008). It is, therefore, imperative that woodland resources in Zimbabwe's semi-arid areas are exploited sustainably.

An important socio-economic function of mopane woodlands in Zimbabwe, especially in the Chimanimani and Chipinge Districts where this study was done, is traditional crafts for both curios and household items. Traditional crafts in Zimbabwe are contained in the material culture and beliefs of the indigenous people (Katherine, 1989). Due to the lack of viable agricultural opportunities and a formal labor market in rural communities found in areas with mopane woodlands, such woodlands are a valuable source of various products. Consequently, many roadside craft markets have emerged along major highways, like the Bulawayo-Victoria Falls, Kamativi-Binga, Mutare-Masvingo, and Mutare-Chipinge highways. Traditional crafts in Zimbabwe are currently of importance for rural livelihoods since more than 80% of the country's economically active population is unemployed (Ncube and Phillip, 2006).

The major items sold at such markets include domestic implements and small furniture pieces, curios, ritual items, as well as textiles from the indigenous forests. Common domestic implements and pieces of furniture sold at roadside markets include axe and hoe handles, bowls, cooking sticks, ladles, mortars and pestles, plates and spoons, stools, and small tables (Katherine, 1989). Curios and ritual items found at such markets include a variety of decorative carvings, cultural artifacts like small traditional axes, spears, and shields made by craftsmen who claim to be responding to an ancestral call (Sithole, 1995). Wood with certain attributes, like durability, flexibility, form, and density are preferred for these items (Gwaze and Murunda, 1998). Therefore, selective deforestation of preferred species like *Julbernardia paniculata* for axe and hoe handles; as well as *Dalbergia melanoxylon, Afzelia quanzensis* and *Pericopsis angolensis* for household utensils, furniture items, and curios occurs. Roadside markets also sell forest or woodland based textiles. Traditional bark fiber blankets, hats, and mats made from the inner bark of *Adansonia digitata* and treated with natural red, grey, and brown dyes are common in dryland areas (Scoones and Matose, 1993). Hats, mats and wicker, winnowing, laundry, and needlework baskets made from reed, as well as from the species *Hyphaene petersiana, Phoenix reclinata,* and *Borassus aethiopium* are additional articles found at roadside markets in the semi-arid mopane woodlands of Zimbabwe (Sithole, 1995; Chigudu and Tichagwa, 1998; McCullum, 2000). As a result of continued selective harvesting of preferred species, there is considerable biodiversity loss, especially as some species become depleted. Conservation of biodiversity in these ecologically fragile areas needs an integrated approach involving local communities in collaboration with national environmental management institutions.

Current forest and woodland resources management is influenced by four pieces of environmental legislation. The Forest Act of 1948 (amended in 1990) authorizes the Forestry Commission to protect and conserve indigenous forests and regulate the harvesting of trees on both private and communal

land. The Communal Lands Act of 1982 (amended in 1985) places communal land under the control of Rural District Councils (RDCs) rather than under traditional chiefs (Scoones and Matose, 1993). This has created conflict between communal traditional institutions and state institutions in the management of forest and woodland resources. Another piece of legislation pertaining to the management of forest and woodland resources is the Communal Lands Forest Produce Act of 1987. It vests authority over the commercial utilization of forest and woodland products in the communal lands in the hands of RDCs, while allowing the subsistence use of such products by local communities. The most recent legislation on indigenous forests and woodlands is the Environmental Management Act (Government of Zimbabwe, 2002). It deals with environmental issues across all sectors, including basic environmental management principles and sustainability considerations in natural resources management. The Act provides the legal framework for achieving environmental sustainability.

This research set out to examine the contribution of traditional crafts to sustainable rural livelihoods, investigate the impacts of craft making and trade on woodland biodiversity, as well as the effectiveness of environmental legislation in achieving environmental sustainability. Of particular importance is the role of local level practices in the attempt to achieve Millennium Development Goal (MDG) 7 whose main targets aim to integrate principles of sustainable development into country policies and programs and reverse the loss of environmental resources (UN, 2000a). This is crucial in view of the fact that we are now halfway to the target date of 2015!

Description of the Study Amy Peepsrea

The study area is located along the southern Chimanimani district and northern Chipinge district border area. It is found in the lower Odzi and upper Save River valleys of the South Eastern Lowveld, between the 70 and 120 kilometer pegs from Mutare along the Mutare-Chipinge/Masvingo highways (Figure 1). While Chakohwa is located along the fringes of agro-ecological region IV, Nyanyadzi and Birchenough Bridge are in agro-ecological region V. Altitude ranges from 480 to 630 meters above sea level (Vincent and Thomas, 1960; Waterhouse, 1994). The mean daily maximum temperatures are often as high as 35°C, with average rainfall of about 400-500 mm per annum. Rainfall is not only low, but also erratic and therefore unreliable. Surface water is limited with many river flows being sub-surface during the dry season. Ground water availability is poor except in the alluvial deposits along the Save River (Campbell et al., 1989; Waterhouse, 1994). Soils are mainly coarse grained, granite derived sands, with clay loams in lower lying areas. The

vegetation is open woodland characterized by riverine thickets, *Colophospermum mopane* open woodland, *Combretum* open woodland and scrub mopane, with *Adansonia digitata, Afzelia quanzensis* and *Hyphaene petersiana* as common species (ibid).

The area's potential for dry land agriculture is severely limited by the low and erratic rainfall and the generally poor soils. The main crops are drought resistant sorghum and millet grown in rain fed conditions; with maize, beans, and tomatoes as irrigated crops in the small irrigation schemes found in the area. Yields of the dry land crops are very low. Livestock populations are high in spite of the low carrying capacity. The low agricultural potential means that crafts provide an important source of income for many households.

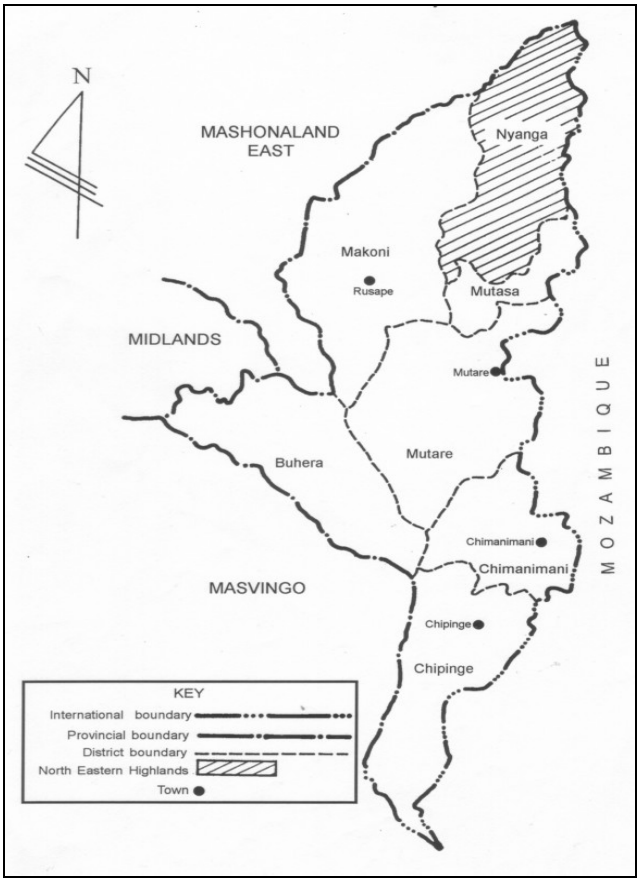

Figure 1: Manicaland Province - Districts

RESEARCH METHODOLOGY

A descriptive research design was selected using a questionnaire survey and semi-structured interviews as complementary research methods. The researchers also relied on observation to verify some of the questionnaire and interview findings. The target population was all the roadside craft market traders, many of whom were also weavers and craft makers in their own right. It was established after two initial visits that there were altogether 51 regular craft market traders at the three main sites: 11 at Chakohwa, 25 at Nyanyadzi, and 15 at Birchenough Bridge. Since the target population was quite small, the researchers decided against sampling and studied the whole population. However, it was decided to select 10% (5 craft traders) of the population through stratified random sampling for the semi-structured interviews.

The researchers kept the proportion of the sample interviewed small in order to reduce the subjective element associated with face to face interviews. While one craft trader each was interviewed at Chakohwa and Birchenough Bridge, three were interviewed at Nyanyadzi. This meant that the remaining 46 craft traders were served with questionnaires. The interviews were done after a preliminary assessment of the questionnaire survey results. The interviews were, therefore, meant to focus on grey areas revealed by the survey results.

The questionnaire document was pre-tested on a small group of craft traders (4 traders) at a site between Nyanyadzi and Birchenough Bridge. It was assumed that all of the respondents were literate since marketing craft items to motorists and bus passengers requires a good working knowledge of currency figures (an assumption proved correct by the survey results). Therefore, the questionnaire was distributed in the afternoon and collected the following morning at all three study sites. This strategy was adopted partly to reduce collusion among the respondents if they were to fill in the document while at the trading site. Another reason was that the researchers were trying to reduce interference with the traders' normal business routine. The interviews at all three sites were conducted over a single day. Observation was done both during the two preliminary visits and on the days when the survey and interviews were carried out. In addition, the researchers also devoted one and half days to take walks into the woodlands near the trading sites to rapidly assess the impacts of crafts on the woodland vegetation.

RESULTS AND DISCUSSION

Survey and interview results were analyzed to assess the biodiversity impacts of craft activities and the effectiveness of local level resource management practices in achieving environmental sustainability. In addition, the findings were also examined to assess the contribution of crafts to sustainable rural livelihoods.

Table 1: Age and Sex of Craft Traders

Age (years)	Frequency (Male)	Percentage (Male)[1]	Frequency (Female)	Percentage (Female)[1]	Total Frequency	Total Percentage
<20	0	0	1	2	1	2
20 – 39	12	26	6	13	18	39
40 – 59	8	17	10	22	18	39
60+	6	13	3	7	9	20
Total	26	56	20	44	46	100

NB : (Male)[1] / (Female)[1] – rounded off figures

Most of the craft traders (56%) were male (Table 1). The results also show that 39% each for both females and males were in the 20-39 and 40-59 age categories. Therefore, the majority of the respondents (78%) were aged between 20 and 59 years, with 20% aged 60+. Craft activities in the study area, therefore, involve the most economically active population. This result is a reflection of the economic importance of crafts for livelihoods in the area.

Table 2: Marital Status and Educational Levels

Educational level	Single	Married	Divorced	Widowed	Total Frequency	Total Percentage
Primary	0	6	1	4	11	24
Lower secondary	0	2	0	1	3	6
O Level	2	13	1	3	19	41
A Level	1	3	0	0	4	9
Tertiary	2	7	0	0	9	20
Total	5(11%)	31(68%)	2(4%)	8(17%)	46	100

Table 2 shows that the majority of the craft traders (68%) were married, with a significant proportion (17%) being widowed. This is an indication of the importance of crafts in the area since most of those involved are people with dependants. While 41% of the respondents had an O Level education,

24% had primary education, and 20% had tertiary education. Nine percent of the remaining craft traders had an A Level education and 6% lower secondary education. The vast majority of the respondents (76%) had either secondary or post secondary education, with 69% having obtained Ordinary or higher level of education. Therefore, craft activities in the study area are dominated by individuals who would normally be in formal employment. This finding confirms the depth of Zimbabwe's current economic problems where more than 80% of the country's economically active population is unemployed (Ncube and Phillip, 2006). Until such a time when Zimbabwe's economy is 'back on its feet', it is most likely that traditional crafts will continue to make an important contribution towards sustainable rural livelihoods, particularly in the dry areas with limited alternative economic opportunities.

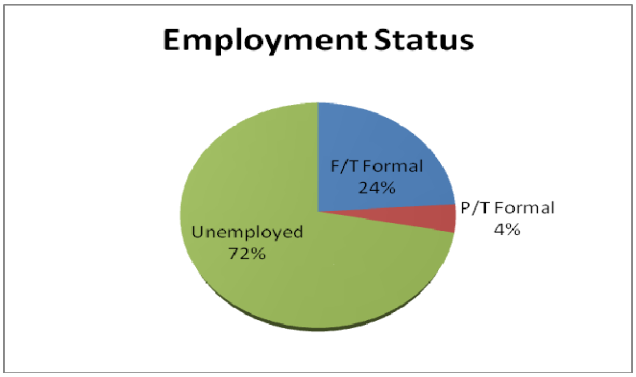

Figure 2: Employment Status of Craft Traders

The research also sought to find out the employment status of the sample population. Most of the craft traders (72%) were unemployed or out of formal employment, while only 24% were in full time formal employment, with the rest in part time employment (Figure 2). Research results have already revealed that the majority of the respondents are in the economically active age group and possess at least an Ordinary level education (Tables 1 and 2). Therefore, findings on employment status show an acute employment problem in the study area which simply mirrors the national employment crisis.

Since resource ownership status affects management practices, the study also sought data on the issue of natural resource ownership in the area.

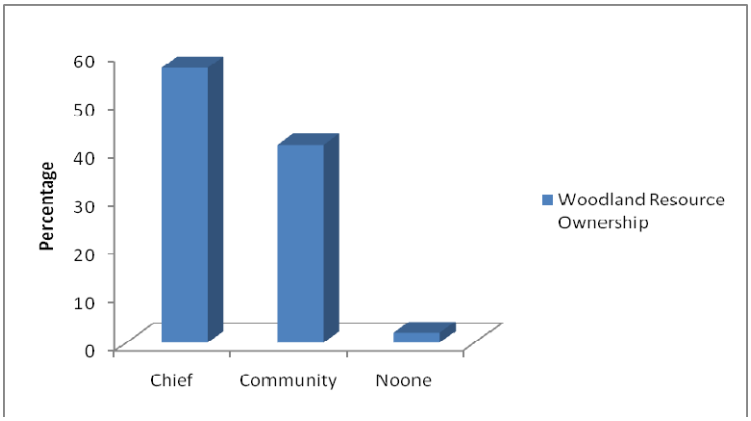

Figure 3: Views on Woodland Resource Ownership

Fifty seven percent of the craft traders considered the chief to be the owner of woodland resources, while 41% viewed the community as the owners (Figure 3). It would appear that there is confusion concerning woodland resource ownership in the area. This could be due to the weakness of both community-based and modern state-based natural resource management institutions. Particularly, where there is no monitoring mechanism on compliance to resource management regulations, the ownership aspect becomes blurred. Such a state of affairs fosters conditions for resource degradation. The questionnaire survey requested respondents to rate the various uses of woodland resources in terms of importance as shown in Table 3.

Table 3: Percentage Ranking of Benefits/Uses of Woodland Resources

Benefit/Use	Very Important	Important	Limited importance	Not Sure	Not important	Total
Food	59	20	4	13	4	100
Income	31	33	17	19	0	100
Employment	37	29	4	19	11	100
Firewood	35	28	7	13	17	100
Livestock forage	33	24	11	17	15	100
Medicine	26	15	20	24	15	100
Scenic beauty	57	33	4	6	0	100
Erosion control	74	20	2	4	0	100

It is interesting that the results in Table 3 show scenic beauty and erosion control as the highest ranked uses of woodland resources in the study area. The explanation could lie in the level of education of the respondents and perhaps the effects of agricultural extension work in the areas, both of which could have raised awareness levels about aesthetic and ecosystem functions of woodlands. This result confirms the findings of other researchers (Masundire and Matowanyika, 1993; Mushove et al., 1996; McCullum, 2000). The craft traders (79%) also considered woodlands as an important source of food. As argued by other researchers (Grundy et al., 1993; Njovu, 1993; FAO, 1995; Moruakgomo, 1996; McCullum, 2000), woodlands provide an important source of foodstuffs for rural communities.

The sample population viewed other socio-economic functions of woodlands: employment, income, firewood, and livestock forage as quite important (as shown in Table 3). Interview results revealed that the harvesting, processing, and marketing of woodland resources were seen as providing informal employment and a source of income. Interviewees also indicated that income was generated not only from the sale of craft items, but also from selling wild fruit, mushrooms, honey, and firewood. Interviewed craft traders could not furnish exact figures to measure the income levels from their activities. They explained that income from the sale of craft items has become unreliable due to the prevailing harsh economic environment. It emerged from the interviews that before 2002, their traditional craft items were popular with both foreign tourists and local motorists and bus passengers travelling between Mutare, Masvingo, and Chipinge. On the one hand, the souring of relations between the Zimbabwean government and Western governments in the wake of the bungled 2000-2004 fast track land reform program has drastically reduced the inflows of foreign tourists into the study area. On the other hand, the relentless meltdown of the national economy since then has also seriously eroded the buying power of local travelers. These results are in agreement with research findings on the socio-economic functions of forests and woodlands (Campbell and Brigham, 1993; Grundy et al., 1993; Sithole, 1995; Matose et al., 1996; Chigudu and Tichagwa, 1998; McCullum, 2000). The medical importance of woodlands in the study area was ranked lowest, perhaps partly due to the availability of nearby clinics and the scarcity of medical herbs as suggested by interviewees. These findings serve to underline the importance of woodland resources for sustainable rural livelihoods in Zimbabwe’s dryland areas.

The sample population was also asked to indicate the prevalence of the use of three species in craft making in the study area: *Adansonia digitata* (baobab), *Afzelia quanzensis* (chamfuta, pod mahogany), and *Hyphaene petersiana* (lala palm). Figure 4 shows the results.

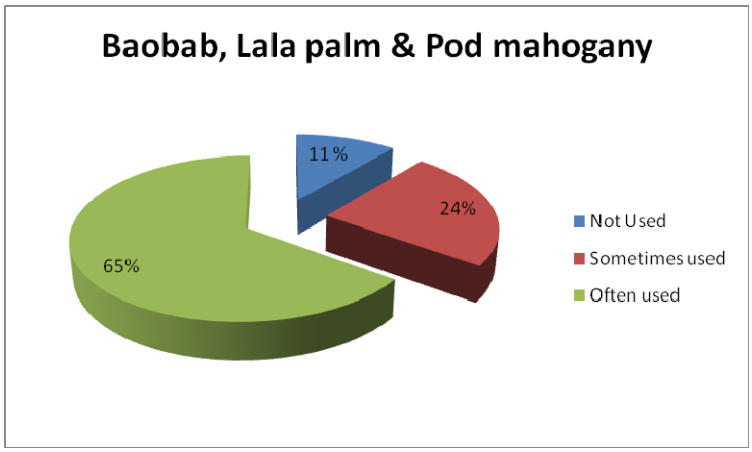

Figure 4: Prevalence of Use of Baobab, Lala Palm and Pod Mahogany

It is evident from the results in Figure 4 that baobab, lala palm, and pod mahogany are preferred species in the making of craft items in the study area. Selective harvesting of these species is bound to negatively impact woodland biodiversity in the area. The craft traders were asked to state the most commonly observed negative effects of the selected harvesting of the three vegetation species. Table 4 shows their views.

Table 4: Effects of Selective Harvesting of Baobab, Lala Palm and Pod Mahogany

Impacts of selective Harvesting of baobab, lala palm & pod mahogany	Strongly agree	Agree	Don't know	Disagree	Strongly disagree	Total Percentage
Decrease in tree density	58.7	30.4	2.2	6.5	2.2	100
Fewer raw materials and fruit	10.9	21.7	10.9	33	23.5	100

Table 4 shows that while 89% of the sample population viewed selective harvesting of the three species as leading to a decline in tree density, only 32% thought such selective harvesting results in

fewer raw materials and less fruit. The most likely reason why the respondents did not think that selective harvesting will deplete resources from these species is that debarking of baobab for fiber rarely results in drying of the tree. The craft traders were also asked to identify the most prevalent environmental problems in the area and state the extent of such problems. Table 5 shows the results.

Table 5: Extent of Environmental Problems

Environmental Problems	Very Severe	Severe	Not Sure	Not Severe	Total
Woodfuel shortage	33	50	4	13	100
Water scarcity	20	26	6	48	100
River siltation	24	42	17	17	100
Declining crop yields	52	30	11	7	100
Soil erosion	41	24	15	20	100
Land shortage	39	39	7	15	100
Loss of vegetation cover	37	57	0	6	100

Table 5 shows that the vast majority of the respondents (94%) considered loss of vegetation cover as the most pressing environmental problem in the study area. This is not only an indication of the effect of craft activities on woodlands, but also of woodland destruction for other purposes, like fencing materials, as shown by the interview results. The results also show that wood fuel shortage, declining crop yields, and land shortage are also viewed as acute environmental problems in the area. It would appear that many households in the study area did not benefit from the fast track land reform program of 2000-2004. This confirms findings by Rukuni et al. (2006) that many of the intended beneficiaries of the controversial fast track land reform program lost out to urban dwellers, bureaucrats, and politicians. River siltation and soil erosion are also seen as serious problems. It is interesting that water scarcity was not cited as a major environmental problem in this semi-arid area. The explanation lies in the fact that the communities studied have boreholes within walking distances, with canal irrigation water also available for those households close to the micro-irrigation schemes. Interview results showed that it was taking longer for villagers in the study area to harvest woodland resources, with most of the products, like fruit, becoming increasingly scarce.

The research also sought to find out whether or not local level natural resource management institutions existed in the area of study. While 76% of the sample population was aware of the existence of local level traditional natural resource management institutions, 85% expressed ignorance of the existence of regulations controlling the exploitation of natural resources in the area.

The craft traders were also asked to rate the effectiveness of monitoring and enforcement mechanisms, if resource utilization rules existed. Figure 5 shows the results.

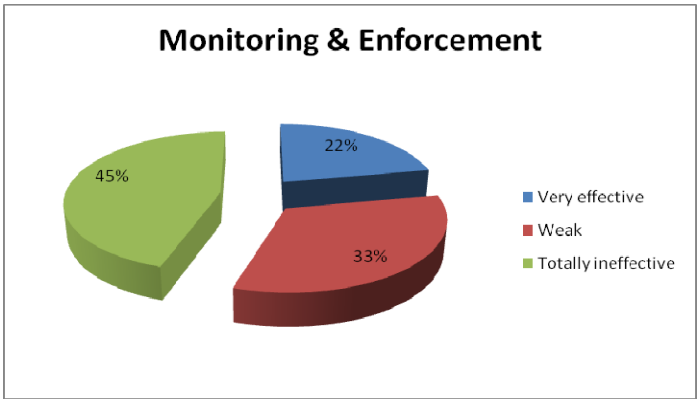

Figure 5: Monitoring & Enforcement of Natural Resource Regulations

Although the research findings indicate the existence of community-based natural resource management institutions in the study area, Figure 5 shows that natural resource management regulations are largely weak or completely ineffective. This confirms research findings on the state of community-based natural resources management institutions in many parts of the developing world, where such institutions have been weakened by a variety of factors. These factors include large scale nationalization and privatization of common property resources, defective land distribution policies (Jodha, 1991; Lynch and Alcorn, 1994; Murombedzi, 1994; Singh, 2000), as well as lack of tenure security (Murphree, 1995).

It would appear that in the study area the major negative influence on the effectiveness of local level natural resource management institutions has been the imposition of modern resource management legislation and institutions. Legislation like the Forestry Act (1990) regulates the harvesting of forest and woodland products in both private and communal land forests and woodlands. The Communal Lands Act (1985) places the communal lands under the control of RDCs rather than traditional leaders. In addition, the Communal Lands Forest Produce Act (1987) vests power over commercial exploitation of forest and woodland products in the hands of RDCs while allowing subsistence use of some forest and woodland products to locals. Such legislation and institutions not only weaken local level resource management institutions directly, but also create conflict between traditional and state authorities. This conflict negatively impacts natural resource management institutions in Zimbabwe's rural areas.

The research also set out to investigate factors that hinder sustainable utilization of woodland resources and the strategies that could be adopted to manage such resources more sustainably in the study area.

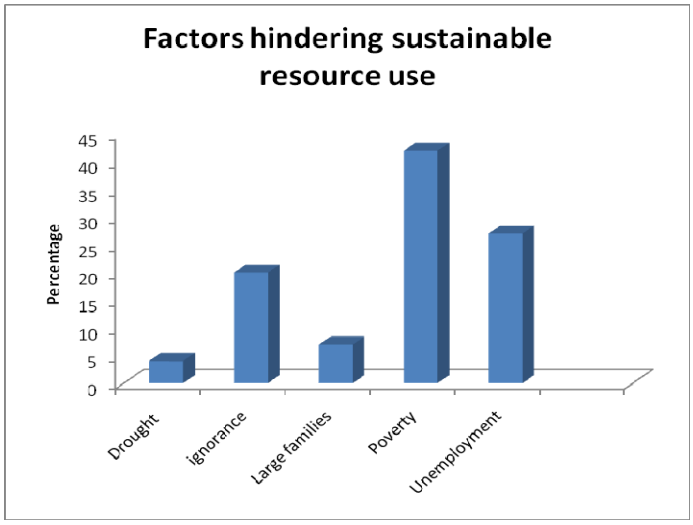

Figure 6: Factors Hindering Sustainable Woodland Resource Use

Respondents to the questionnaire survey were asked to list factors that contribute towards unsustainable woodland resource use in their area. Most of them (42%) cited poverty as the reason for unsustainable woodland resource use (Figure 6). In the interviews, the craft traders defined poverty in terms of income - where a household has insufficient cash income to meet basic needs like maize meal, cooking oil, salt, relish, soap, clothing, and children's school fees. While twenty-seven percent attributed unsustainable woodland resource use to unemployment, 20% gave ignorance as the reason. Very few of the craft traders cited large families and drought, 7% and 4%, respectively, as causes of unsustainable woodland resource use in the area.

Asked to list measures they would recommend to ensure sustainable woodland resource management in their local area, the sample population suggested several strategies. Fifty-three percent advocated greater enforcement of environmental regulations, while 30% were for greater job creation at both local and national levels. Eleven percent thought that environmental awareness campaigns would help, with the rest suggesting regular food hand outs. Although the majority of the respondents were in favor of more enforcement of environmental regulations, there was no mention of either the Environmental Management Act or of the Environmental Management Agency (EMA) (or even of

the old Natural Resources Board). Yet it is EMA which has a direct responsibility for the dissemination of information on environmental management matters and for enforcing regulations. There was no reference either to the Rural District Council, but to the police and traditional leaders. This suggests that enforcement of environmental regulations has been done by the police instead of either EMA or traditional authorities. There is also an indication of the existence of local level natural resource management institutions. That 30% of the respondents gave job creation as a prerequisite for sustainable woodland resource management underlines the employment crisis facing Zimbabwe today.

CONCLUSIONS AND RECOMMENDATIONS

Several conclusions can be drawn from the research findings. Woodland resources in the study area perform important ecosystem and socio-economic functions like in other dryland areas of Zimbabwe. The prevailing harsh economic climate and the resultant employment crisis in the country has driven the most economically active population in the area, regardless of marital status and educational level, to traditional crafts as a survival mechanism. Therefore, craft activities are playing a key role in household livelihood strategies since they are dominated by those who in normal economic circumstances would be in formal employment. Selective harvesting of species like *Adansonia digitata* (baobab), *Afzelia quanzensis* (chamfuta, pod mahogany), and *Hyphaene petersiana* (lala palm) represents biodiversity loss and threatens environmental sustainability in the area. Research findings also show that environmental problems experienced in the area are not confined to those related to woodland biodiversity loss, but include land shortage and declining crop yields, all of which pose a further threat to environmental sustainability. Although community-based natural resource management institutions exist in the area, they are weak and largely ineffective in ensuring sustainable resource utilization. This is mainly due to the erosion of traditional authority as a result of conflict with modern state-based environmental management institutions. The findings of the study also led the researchers to conclude that the provisions of environmental legislation are not implemented in the area. In addition, key environmental management players like EMA are not visible on the ground, evidenced by the fact that they are virtually unknown in the study area. This does not augur well for the achievement of MDG 7 by the year 2015 at the local level. It is clear from the research findings that tackling poverty and unemployment in the study area, and indeed other semi-arid areas of Zimbabwe, will be key in achieving environmental sustainability.

On the basis of these conclusions, several recommendations are suggested to tackle environmental problems, reduce biodiversity loss, and ensure environmental sustainability, but at the same time ensure sustainable rural livelihoods in the study area and other dryland areas of Zimbabwe.

- The state needs to define the legal framework that will empower community-based natural resource management institutions and organizations. Currently, the legal environment strengthens the power of the state and RDCs to manage natural resources in communal lands. Through the District Councils Act, the district administrator can override the interests of communities in natural resource management. Therefore, legislation that empowers communities is crucial for sustainable natural resource management.
- In line with one provision of the Environmental Management Act, EMA should organize and coordinate environmental education and awareness programs to increase community capacity to effectively tackle environmental issues, and foster development of 'values, attitudes, skills, and behavior consistent with sustainable environmental management'. (Environmental Management Act: Part II, Section 4, sub-section (d)).
- There is need for an integrated approach, involving EMA, environmental NGOs like Environment Africa, relevant government departments, local authorities, and communities in semi-arid areas of Zimbabwe, to effectively address environmental issues. This will not only ensure environmental sustainability, but sustainable rural livelihoods as well.
- As Kanehe (2008) points out, communities should be allowed to own, use, develop, and control the resources they possess by virtue of traditional ownership, with full legal recognition and protection from the central government. This will hopefully encourage sustainable resource use and ensure sustainable rural livelihoods.
- Ministries of Small to Medium Enterprises and Environment and Tourism should assist craft traders to access larger markets for their products in the country's major resort areas, urban centers, and abroad. This will ensure a more reliable source of income for the craft traders. There would, however, be the need to ensure that this will not translate into over-exploitation of woodland resources, especially preferred species like *Adansonia digitata* (baobab), *Afzelia quanzensis* (chamfuta, pod mahogany),and *Hyphaene petersiana* (lala palm).
- Irrigation infrastructure and facilities could either be set up or expanded in dryland areas of the country with a potential for irrigation-based agriculture. The small irrigation schemes in the study area could be expanded, through government and donor funding, by

drawing more water from four major rivers in the area (the Mvumvumvu, Nyanyadzi, Odzi, and Save). This will not only reduce dependency on woodland resources, but will partly address the unemployment problem, and help achieve sustainable rural livelihoods through the higher and more reliable food and income from irrigation agriculture.

- To address the land shortage issue there is need by central government to resettle more people from the study area and other semi-arid areas of the country. The scope for further resettlement exists since land audits in 2006/2007 revealed multiple farm ownership. Many of these farms are reported to be grossly underutilized. Resettling land-hungry peasants from the dryland areas of Zimbabwe will make much economic sense by making underutilized land more productive. This strategy will partially tackle the unemployment crisis and enhance rural livelihoods.
- It is important to point out that the success of measures derived from the recommendations hinges on the resolution of the current political and economic crisis in Zimbabwe.

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