THE WOODCRAFT INDUSTRY OF THE BULAWAYO-VICTORIA FALLS ROAD

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THE WOODCRAFT INDUSTRY OF THE BULAWAYO-VICTORIA FALLS ROAD

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Abstract

A study was conducted along the Victoria Falls to Bulawayo Road to document the woodcraft industry. One of the objectives was to analyze the rules and regulations governing wood use in the industry and the institutional arrangements around these. Secondly, the study aimed at documenting the contributions that carving makes to the local economy. Thirdly, the study focused on the ecological impact of the industry on the local woodlands. A total of 24 markets were counted between Victoria Falls and Bulawayo with major concentrations around the tourist resorts of Hwange National Park and Victoria Falls. Monthly incomes of carvers ranged between $42 and $4000. A total of 940 beneficiaries from seven markets were counted. Marketing strategies are mostly dependent on the flow of tourists along the road. There was little evidence for damaging impact on local woodlands resulting from the carving activities. The amount of wood used by the carvers is equivalent to a small proportion of the "waste" of commercial logging companies. The study calls for the support of this budding industry and establishing mechanisms to enhance the status and incomes from this activity on a sustainable basis.

Introduction

This study was conducted to describe the nature of the wood carving activities along the Victoria Falls to Bulawayo road. The study was initiated through the demands and concerns raised by the Indigenous Resources Division of the Forestry Commission, the Victoria Falls Publicity Association, the Hwange Rural District Council, the Matetsi and Gwaai Intensive Conservation Areas (ICAs) and the wood carvers themselves.

The aim of the study was to document and analyze the nature of the woodcraft industry along the Victoria Falls to Bulawayo road. The study covered:

a) the distribution of vending sites, the quantity of sales of sculptures per month, the sources of wood for sculpture and the nature of marketing structures;
b) rules and regulations pertaining to wood use in the industry;
c) the value of the industry to local communities;
d) the total quantity (in m^3) of wood carvings at each of the sampled markets;
e) the extent of deforestation attributable to wood carving activities by the selected markets and the costs to the environment; and
f) the production processes employed in the industry

Methods

The study was conducted from March to June 1995. Out of a total of 24 markets along the Victoria Falls to Bulawayo Road, four large markets (in terms of the number of pieces at the market) were selected for the study. The main justification for this choice was that major deforestation is more likely to be observed around the larger markets than smaller markets. Thus, Mbizha, Mabale, Ndhlovu and Kusile-Kweja, being the markets with the largest number of sculptures, were studied. Five other small markets were then selected for study to provide a contrast with the large ones. At both the large and small markets, interviews, discussions and Participatory Rural Appraisal (PRA) exercises were held with the carvers and, where feasible, local leaders were also included. PRA techniques used included: seasonal calendars for seasonal variation in sales, wealth-ranking and pair-wise ranking for determining the status of carving in relation to other income generation activities; diagrams to explore the rate of increase of newcomers to the industry; and availability of wood and volume of sales per person since 1991 in relation to five years in the future. Discussions and interviews were also held with authorities in the area and owners/managers of shops within the Victoria Falls urban area who are likely to be affected by the road-side woodcraft industry.

At each market all carvings were classified subjectively into three categories, namely, small, medium and large. A random sample consisting of pieces from the small size category was chosen and

Table 1: Sampling intensities (%) at the four large markets*.

	Small size	Medium size	Large size
Kusile-Kweja	3.5	25.0	52.9
Ndhlovu	2.3	13.9	64.3
Mbizha	4.7	6.7	19.8
Mabale	4.8	12.5	32.1

* A sampling intensity of 3.5% for the small pieces at Kusile Kweja means that 3.5% of all the small pieces at that market were actually measured.

the individual pieces were weighed using a 50 kg spring balance and the piece type (e.g. walking stick) and tree species were recorded. The volumes of individual pieces were determined using the specific gravity values for the respective species according to Goldsmith and Carter (1981). For the medium and large size categories, random samples were taken and the individual pieces sampled were assessed for an equivalent middle diameter and total length of piece. The volume was then calculated treating the piece as a cylinder characterised by the middle diameter and total length. The sampling intensities used at the different market places and for the three categories of carvings are presented in Table 1.

To estimate the extent of deforestation around the market place, a square equal to 1 km^2 in area, with the market place as the centre of such square, was studied. Four belt transects each 30 metres wide, 1 km long and 210 metres apart were traversed in such a way that all transects crossed the Bulawayo-Victoria Falls main road. All tree stumps within the transect were identified to species and the basal diameter measured using calipers or a diameter tape at 25 cm above ground level. Notes were also made regarding natural regeneration and any observable indicators of on-site carving activities. In order to distinguish between trees felled for carving and those felled for other purposes, the research team was always accompanied by at least two members from the respective market place.

Individual tree volumes were estimated using the volume equation for *Brachystegia spiciformis* used by Mushove (1994):

$$y = e^{(2.34 + 2.9\ln S)}$$

where y = above-ground timber biomass (m^3, over-bark);
S = stump diameter (m, over-bark, measured at 25 cm above ground level).

All monetary values are in Zimbabwe dollars, which at the time of the survey (mid 1995) was US\$1.00 = Z\$8.50

Location of the markets

There are 24 road-side woodcraft markets on the road between Bulawayo and Victoria Falls (Figure 1). The driving force which led to the markets is the presence of a ready demand due to the movement of tourists on the road. The initiation of the Economic Structural Adjustment Programme which in the first five years has had a negative impact on employment levels and real wages, has also played a role in the boom of roadside markets. Most of the markets are concentrated between the 245 and 305 kilometre pegs around Hwange National Park, and between the 399 and 428 kilometre pegs, near Victoria Falls, with the latter having a greater concentration. This distribution is influenced by closeness to a tourist attraction, such as the Hwange National Park area and the Victoria Falls. Both tourist areas are serviced by airports. All the major vending markets are located near communal areas from which the vendors come.

The seasonal trend in volume of sales mainly depends on the South African school holidays and, to a lesser extend, the movement of overseas tourists (Figure 2). Most sales are recorded around the Christmas festive season. They are lowest between February and June, excluding the Easter holiday period, and between September and November.

The curio shops and cooperatives in Victoria Falls largely depend on the international tourists for their sales. Since some of the shops in Victoria Falls are well established they are able to sell to a particular niche of tourists, who often want their sculptures freighted. The shops also have an advantage in that they accept credit cards and foreign currency. The cooperative market in Victoria Falls town and the roadside vendors do not have the authority to accept foreign currency or credit cards.

Nevertheless, the emergence of roadside woodcraft markets has had an impact on the wood curio business of established shops in Victoria Falls. Some shop owners/managers reported that they had to shift their business to T-shirts in order to maintain their profits. Others have recorded reductions of as much as 35% in business.

The Hwange Rural District Council is not completely against the woodcraft industry but it would like to ensure an orderly development. Four sites have been proposed for locating woodcraft markets in the Hwange district. The sites are at the 397 km, 404 km, 416 km and 425 km pegs. The sites currently only have 23 percent of the total number of vendors. Two sites that are excluded at the 265 and the 400 km pegs constitute 22 percent of all vendors along the road. The Council hopes that by concentrating markets, it can ensure more

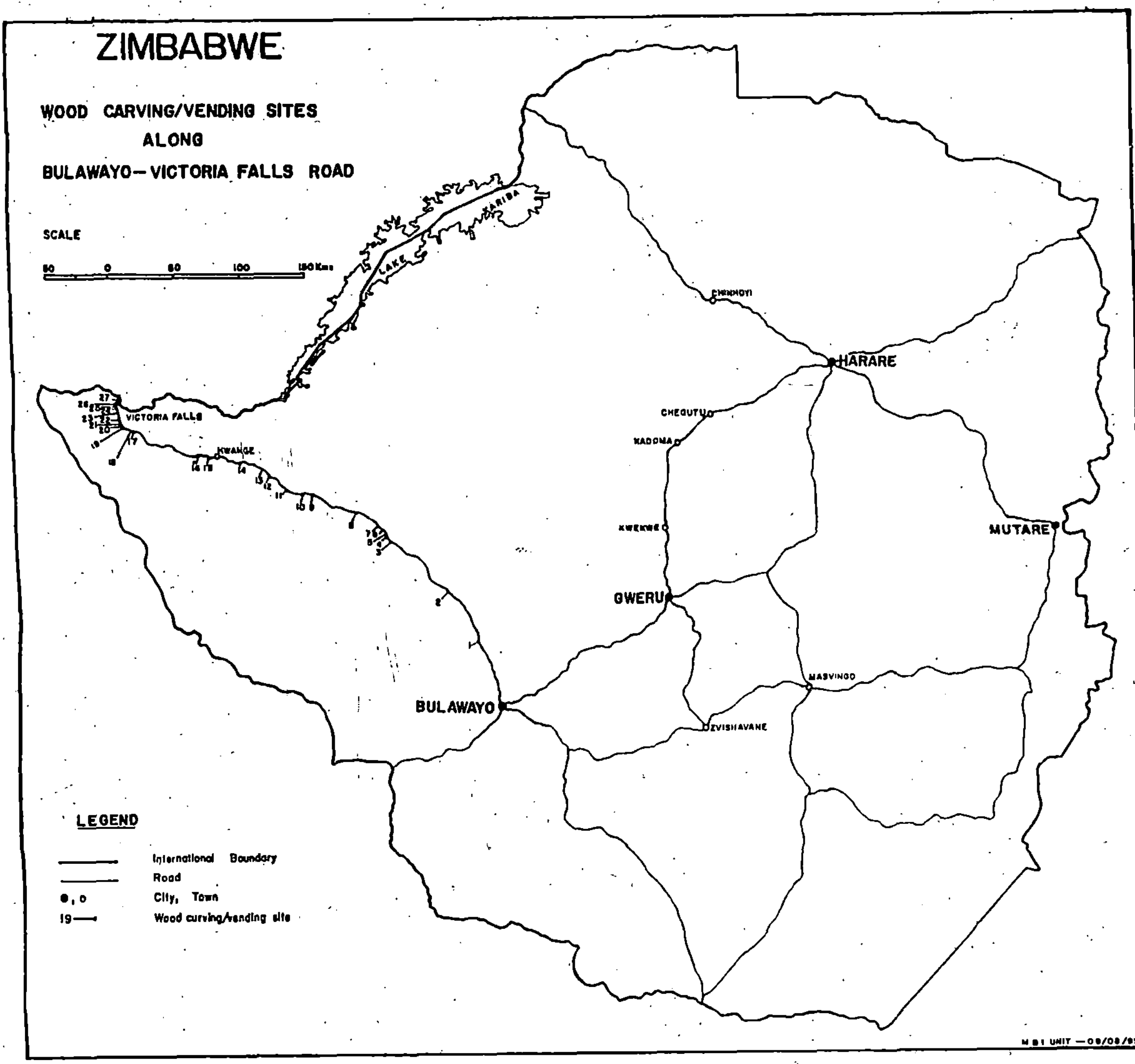

Figure 1: Woodcarving/vending sites along Bulawayo-Victoria Falls road

systematic provision of amenities such as toilets and marketing stalls, while at the same time enabling it to collect rates from those involved. The Planning Committee of the Council is working on the finer details of how to implement the plan.

Only the vendors located at the designated sites are happy about the idea. Such vendors are already receiving recognition from council. Chairpersons of these markets are invited to fora where the council discusses issues related to the woodcraft industry. The vendors from the four proposed sites also paid levies of $150 per year to the Council up to 1992/93. Thereafter there was a proliferation of markets and they have not paid the levy because the Council has not developed any infrastructure.

The majority of the vendors located at sites other than the four designated sites are against the relocation of their market places. Their argument is that moving their marketing site would increase the distance they would have to walk daily. Already some of them have to walk more than 20 km to and from the market each day. Vendors even take turns to monitor the markets in order to reduce the burden of walking to the market. People might not be able to go back to their homes at the end of each day, if the markets are relocated. Some vendors indicated that they were satisfying multiple functions while working or selling their woodcarvings. For example, members of the Siyalinda Club (413 km peg) said that they set up

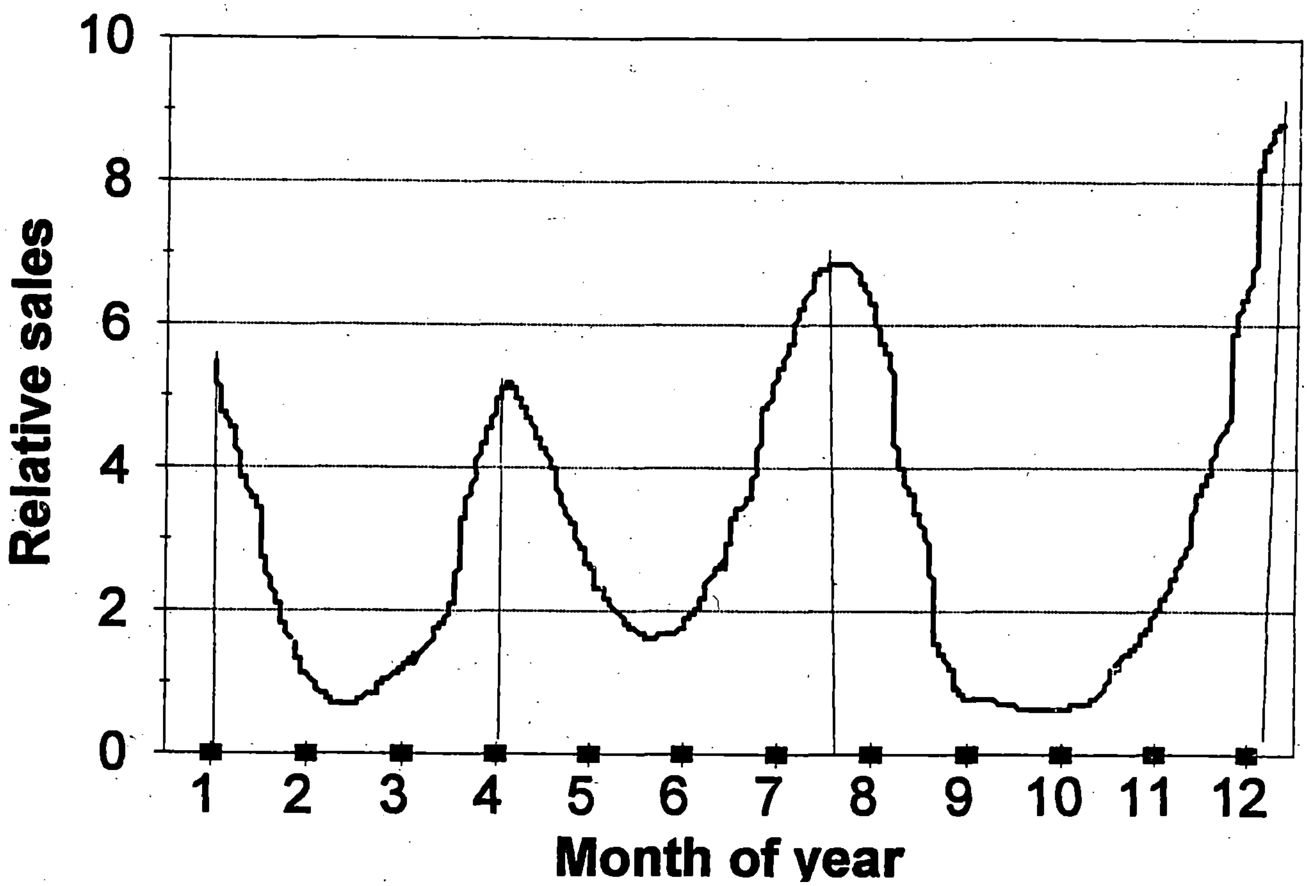

Figure 2: Seasonality of sales at Mabale Craft Centre

their market after realizing that their crops in the fields were being destroyed by wild animals (baboons, elephants etc). When they are manning the site they are also scaring wild animals from crossing the road from the Forestry Commission area into their fields. Once they are removed from this location they would not be able to carry out this function. Also, once moved, transporting pieces to the market will be difficult due to increased distances.

Contrasting views were expressed regarding who should be responsible for the provision of shelter. Mbizha and Mabale were in the process of building their own marketing sheds. Others, for example Kusile-Kweja, whose members had been paying levies to the council, believed that it is the role of council to construct sheds and toilets, and to supply water. Qhubekani Club have raised their joining fees from $150 to $350 since the market was initiated in 1992. The club would like to build a shed and toilets. The plan for the shed had already been prepared at this club.

The land-use rights for market sites differs from one market to another and are often not clear. The Mabale Society members at the 265 kilometre peg seemed to be confident of their right to use the land since they had the support of the local councillor. However, a society such as the one at Mbizha was facing problems from both council and Ministry of Transport. The Mabale group were moved from their original site because it was on a road servitude. Their present site is at a place where the road makes a sharp curve. This prompted officials from the Ministry of Transport to suggest that it would be dangerous for motorists to stop at such a market. Consequently, the vendors are hesitating from constructing permanent structures due to lack of security

The woodcraft marketing chain

Pieces sold on the road side are carved by the vendors themselves, or by carvers from local villages who do not sell on the road. In addition some pieces are bought from the carvers in

Victoria Falls. Some vendors depend on purchasing pieces, others only sell what they carve themselves, while others depend on both purchases and some own carving. Internal trade of woodcarvings among members was said to exist because the vendors wanted to ensure that even those who could not carve were given the opportunity to make a living from the industry.

Purchasing of pieces from Victoria Falls is more prevalent in markets close to Victoria Falls because of the lower transport costs to Victoria Falls and the higher concentration of carvers. At the Qhubekani Club (416 km peg) there are 12 women members who sell both wood and cloth pieces. The wood pieces are purchased from carvers around the Victoria Falls airport. Other carvers in the local villages who do not sell at the road markets sell directly to curio shops in Victoria Falls. At Mabale, around 10% of the pieces on sale at each individual's stall had been purchased from other carvers. When pieces were sold among members of the woodcraft industry such pieces were often exchanged in a rough and unfinished form. The purchaser then has to work on the piece quite extensively. This involves smoothing with sandpaper and shining with shoe polish.

The major buyers of the finished woodcraft are tourists. South Africans who travel by road constitute the bulk of the buyers for the roadside vendors. Other tourists to Victoria Falls and Hwange National Park are handicapped by a number of factors. For example, they are unable to carry heavy loads due to baggage restrictions on airlines, and many tourists normally use credit cards, which are unacceptable to vendors. International tourists are not as exposed to the roadside markets as the South Africans, as most of them do not travel by road independently. Zimbabweans form a very small component of the buyers.

Most vendors did not have any idea about what happened to the pieces once they had been bought. At Mbizha the vendors indicated that they were aware that some of their pieces were being sold in South Africa. Most vendors said that they were aware that higher selling prices were achieved for their pieces in South Africa. For example, pieces which they would have sold for $200 at Mbizha might end up being sold for as much as $1200 in South Africa. Stone sculptures are also being sold at many of the markets. The sculptures are brought in semi-finished form by women traders from Mashava. The vendors have to pay cash to obtain the semi-finished pieces. Stone sculptures are more prone to breakage, thus increasing the risk of revenue loss.

The number of vendors and value of the benefits

Interviews and discussions with councillors, a chief, village leaders and the carvers and vendors revealed that the marketing of the wood sculptures had become an important source of income for many villagers in the study area. Generally the vendors have no hard feelings that the numbers of vendors are increasing and that this is having an adverse effect on the demand for their business. The quality of pieces was also reported to be increasing due to increased competition. Some of the participants in the industry are people who were recently retrenched. The rest were unemployed before they ventured into this industry. Nearly all the people participating in marketing are from the adjacent communal areas. The exception was at Qhubekani and Mabale where some participants came from the airport compounds adjacent to the markets. Nearly 1000 people are participating in the 24 markets along the road (Table 2). The people come from at least nine wards. Since each ward has at least 600 households which, with an average household size of seven, translates to a population of 37 800 inhabitants, approximately 3% of the population is involved in the markets. The industry also employs other people in the marketing chain since some people just carve, without selling their produce on the road market, while others collect and sell wood to carvers.

A councillor in ward 3 (Kachechete) of Hwange Rural District Council estimated that 25 - 30% of all households were involved in the woodcraft industry. According to him, "all young able-bodied men" from his ward were engaged in the trade. While council had hoped that the

Table 2: Number of participants per market, and % of women vendors

Market	Kilometre peg	Number of participants	Women (%)
Mbizha	399.5	130	9
Qhubekani	416	58	38
Mabale	265	81	0
Ndhlovu	404.5	60	0
Siyalinda	413	64	31
Kusile-Kweja	425	50	46
Mugharayi	246	10	0
Kokekeke	201	12	0
Lupote	277.5	16	0
Rest of markets*		459	20
All markets		940	18

* computed from value of 5 small markets.

Table 3: Characteristics of the wealth strata in Mbizha Area

Characteristic	Rank Group I	Rank Group II
Percentage of population in stratum	53	47
Age	Youthful	Old people
Indicators	Poorer, depend on casual jobs and house construction for payment. Carvers are found in this group	Quite a number have no fields, others are handicapped or widowed or aged and helpless. The majority survive on sale of cattle

industry should only benefit the unemployed, currently even formally employed people were involved. Some people even suspected some councillors have people vending at some markets on their behalf.

To establish whether the people taking part in the woodcraft industry were better or less well off than the rest of the community, a wealth ranking exercise was conducted. For a village where the largest number of participants at Mbizha came from all the households were listed. A group of four men and a woman, composed of a VIDCO chairman, VIDCO secretary, a headman and two ordinary villagers took part. They were requested to place the cards with names of each member of the village into groups to represent differences in wealth in the village. The group only split the village into two wealth strata (Table 3). The carvers were ranked in the poorer strata.

Attempts to conduct similar exercises elsewhere did not yield anything, because farmers felt they could not place people into categories since it might prejudice certain persons. It was evident that farmers were afraid of being accused of having denied drought relief supplies to some people or being accused of betraying the wood carvers. It was evident that the wood carving business was politically sensitive. However, what the people were stressing was that those participating in the carving industry were not necessarily any better than the rest of the community. Even when compared to the other sources of income in the village, the woodcraft industry did not emerge as the activity on which the greatest proportion of the population depended.

Pair-wise ranking exercises[1] were done with the woodcarvers to determine the relative dependence of the villagers on various income generating activities. Other activities such as poultry production for marketing, cattle herding, beer sales, gardening or selling vegetables were important activities (Table 4). Other groups reported that there were very few options for them to raise cash. For example the Siyalinda group indicated that their fields are on sandy soils which do not give much in terms of crop output. Woodcarving, as an income generating activity, provides "medium" incomes to most of the communities involved. Selling beer, poultry projects and market gardening provided greater incomes to a larger number of people per given community, hence the ranks of 1 or 2.

All vendors argue that the selling of woodcarvings is the most reliable income-generating opportunity. Formal employment can no longer be depended upon since many companies have retrenched workers in the last few years. Some of the vendors were victims of retrenchment. At Mbizha, it was actually after retrenchment that the chairman and secretary encouraged others to form a club and start selling woodcarvings. Besides, the whole area lies in Natural Region IV and is characterised by low and unpredictable rainfall. In recent years most households have not been able to produce enough food for home consumption, let alone any produce for sale.

Participation of women

The percentage of women taking part in the carving and/or marketing of woodcraft was very low (Table 2). Only at the Qhubekani market,

Table 4: Ranking of sources of household income

Activity	Mugharayi	Kokekeke	Ndhlovu
Wood carving	4	4	4
Farming	N.A.	6	N.A.
Basket making	4	N.A.	N.A.
Carpentry	N.A.	3	N.A.
Herding cattle	6	6	1
Poultry	1	4	7
Vegetable vending	2	1	5
Selling:			
Goats	2	N.A.	6
Beer	N.A.	1	2
Cattle	N.A.	N.A.	2

[1] The exercises involved the comparison of two activities at a time in order to determine the one with ranked highest.

Table 5: Estimated value of wood pieces per market (Z$ in thousands)

Market	km peg	Small Z$'000	Medium Z$'000	Large Z$'000	Very Large Z$'000	Total Z$'000
Mbizha	400	13.7	22.1	31.7	61.8	129.3
Mabale	265	39.7	12.2	11.6	4.1	67.6
Ndhlovu	405	12.7	20.1	31.3	3.7	67.8
Kusile-kweja	425	9.2	21.4	32.9	12.1	75.6
Qhubekani	416	17.7	9.5	11.0	0.8	39.0
Siyalinda	413	4.9	5.9	7.6	0.7	19.1
Mugharayi	246	1.7	1.2	2.9	3.9	9.7
Kokekeke	201	1.9	3.0	7.8	6.3	19.0
Lupote	278	5.1	3.3	4.1	0.4	12.9
Rest of markets*		93.9	68.7	100.2	36.3	299.1
Total (all markets)		200.5	167.4	241.1	130.1	739.1
	%	27.1	22.6	32.6	17.6	

* Computed from average of five small markets

pieces required to start a market stall one needs as much as $800 per vendor.

Market sizes and values of pieces

The total value of the pieces for all markets is nearly $0.75 million (Table 5). A third of the value is from the large pieces. It is noteworthy that markets tend to specialise in different sizes of pieces. Carvers at Mabale and Qhubekani tend to specialise in small pieces while those at Mbizha and Ndhlovu specialise in large pieces.

where most of the participating women came from the airport compound, was the proportion of women high. Several reasons were given for the non-participation of rural women. The distances which people had to travel from the homestead to the market were quite long. People were walking distances of 30 kilometres per day. In some cases the vendors actually boarded buses to get to the market. In such instances, the vendors took turns to look after the market stands. After a week they would then go back home. Given the other chores which women were expected to perform at the homestead, it was very difficult for married women to sell wood carvings. The vendors were of the opinion that if a household decided to take part in the woodcraft industry, it was better for the husband to become active rather than the wife. However, going through the villages it was clear that, where the carving was conducted at the homestead, the wives helped in various ways, such as in smoothing and polishing of sculptures.

Membership

To raise money for improving infrastructure, all markets are organised either as societies, clubs or cooperatives. For one to become a member, membership fees are usually charged. The fees range from $150 to $350 per year; the high fees are a deterrent to newcomers. The small and new centres do not charge any joining fees, probably because members of such clubs were relatively new to the industry. Monthly subscription fees are sometimes charged, for example $25 per month for the Qhubekani United Society. To purchase the

Pricing

The vendors found it difficult to give a fixed price for sculptures. Their financial position dictates that they charge lower prices when they were desperate for cash. As a result prices were sometimes slashed by half to ensure a deal. Most of the vendors had resorted to woodcraft vending due to lack of formal employment and had families to support. They are usually in a weak position to negotiate for better prices since they are desperate to satisfy basic household needs.

To determine prices for sculptures, vendors indicated that they consider the time it takes to make the piece. From the seven carvers we employed during the study we estimate the value of their labour at Z$4.50 per hour. This wage was arrived at through a negotiation process with those carvers who had expressed a willingness to give up their carving and work with us for the day. When vendors purchased their pieces from carvers, the selling price was determined by the price which they paid plus the extra labour and inputs such as polish used on the piece. For example, at Ndhlovu market, vendors indicated that a pieces purchased at $100, when completed could sell at $700.

The buyers do not normally pay in cash. In most cases the bulk of the payment is made in kind. Items such as secondhand clothes, shoes, radios, watches, blankets etc. are used in transactions. Through scoring it was established that as much as 51% of the value of the wood carvings was paid in kind.

The use of clothes for payment made it difficult for the vendors to know whether they were getting a fair deal or not. The clothes are of varying sizes and qualities. Re-trading of second hand clothes obtained at the market was very common. By so doing, the vendors indicated that they ended up recovering the value of their wood carving and at times they made much more money than what they would have obtained had they been paid cash. Nevertheless, vendors were not happy about barter deals, but often had no option.

Income flows

Figures about incomes derived from the industry were rather low, as most carvers were insecure about what would be done with such data. Carvers were afraid that the income data would be used against their families benefiting from drought relief programmes. Most vendors were not prepared to give up the activity for formal employment. Woodcarving was argued to provide a more secure source of income than employment in the present economic situation, where retrenchment can occur at any time.

Figure 3 indicates that the average cash income from carving is around $400 per person per month. Figures obtained from members of the Mbizha Cooperative indicate that the average monthly income is only $42, while for Ndhlovu, it is $390 and Qhubekani, $200. Over the twelve month period, May 1994 - April 1995, for Mbizha, the highest incomes were obtained in May when an average of $79 was achieved. While the mean is low, there is also high income variation among members. The vendors at Mabale estimated that, individually, they made around $4 000 per annum in cash while the same value was also received as payment in kind. Across all markets, sales through barter deals were reported to be increasing. Items such as clothes, shoes, watches, radios and cameras are exchanged for a piece of sculpture. In most cases such payment constituted half of the total value of the sale while the remainder may be paid in cash.

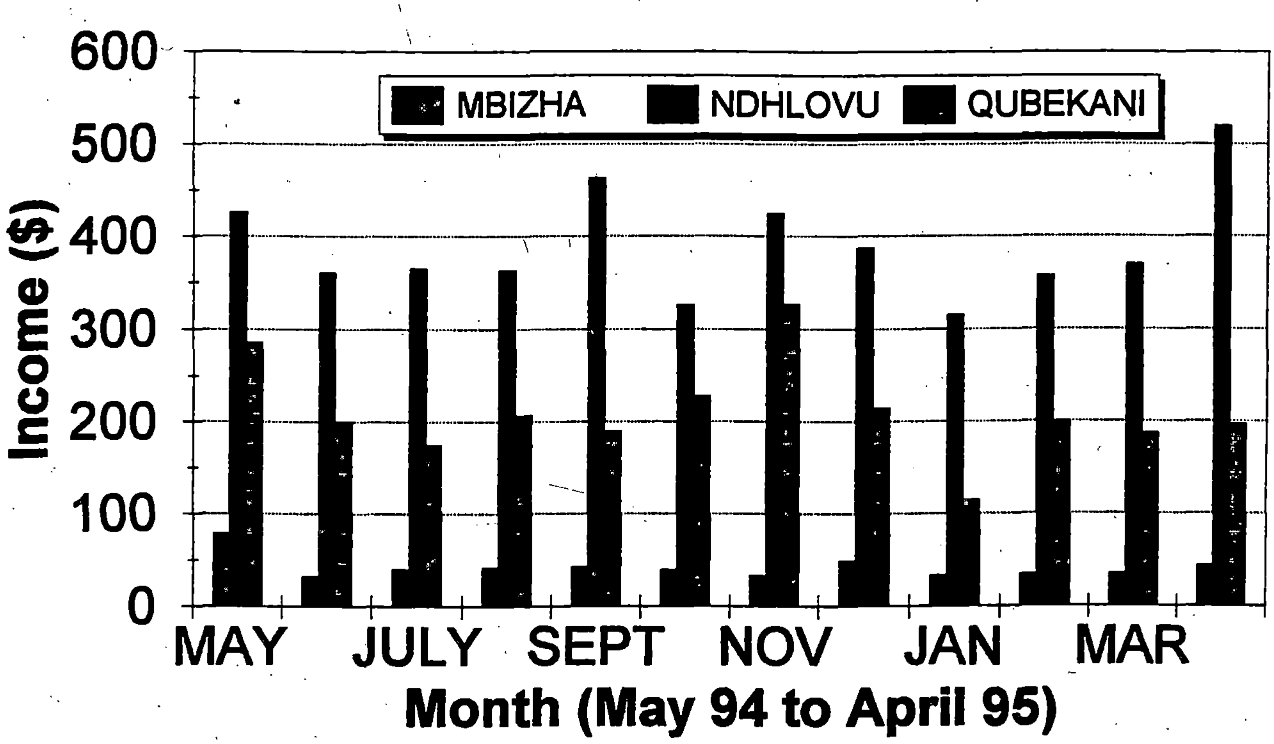

Figure 3: Average monthly cash income from wood carving

Table 6: Relative frequency of species use in sculptures of different sizes. The numbers are % of pieces and, in brackets, % of volume within a size class.

Kusila-Kweja market	Small	Medium	Large	Overall
K. acuminata	25 (11)	7 (5)	0 (0)	11 (5)
P. angolensis	20 (23)	23 (17)	0 (0)	14 (13)
B. plurijuga	5 (4)	7 (6)	34 (47)	15 (19)
C. imberbe	25 (29)	13 (7)	0 (0)	13 (12)
A. quanzensis	25 (33)	40 (52)	44 (42)	36 (43)
S. rautanenii	0 (0)	10 (13)	22 (11)	11 (8)
Ndhlovu market	**Small**	**Medium**	**Large**	**Overall**
K. acuminata	29 (11)	29 (21)	11 (4)	23 (12)
P. angolensis	29 (31)	29 (20)	11 (5)	23 (19)
B. plurijuga	5 (15)	14 (10)	28 (35)	16 (20)
C. imberbe	10 (8)	0 (0)	0 (0)	3 (3)
A. quanzensis	22 (34)	21 (41)	11 (14)	18 (30)
S. rautanenii	0 (0)	7 (8)	0 (0)	2 (2)
D. melanoxylon	5 (1)	0 (0)	0 (0)	2 (0)
G. coleosperma	0 (0)	0 (0)	39 (42)	13 (14)
Mbiza market	**Small**	**Medium**	**Large**	**Overall**
K. acuminata	46 (52)	11 (8)	24 (16)	27 (25)
P. angolensis	17 (7)	17 (27)	0 (0)	11 (11)
B. plurijuga	12 (14)	44 (41)	61 (70)	39 (42)
C. imberbe	4 (1)	0 (0)	5 (8)	3 (3)
A. quanzensis	21 (26)	22 (22)	5 (4)	16 (17)
S. rautanenii	0 (0)	6 (2)	0 (0)	2 (1)
G. coleosperma	0 (0)	0 (0)	5 (2)	2 (1)
Mabale market	**Small**	**Medium**	**Large**	**Overall**
K.acuminata	71 (56)	12 (14)	5 (1)	29 (24)
P.angolensis	4 (8)	0 (0)	5 (4)	3 (4)
C.imberbe	4 (14)	0 (0)	11 (12)	5 (9)
A.quanzensis	8 (20)	37 (42)	68 (76)	38 (45)
D. melanoxylon	13 (2)	0 (0)	0 (0)	4 (1)
G. coleosperma	0 (0)	6 (8)	0 (0)	2 (3)
S. birrea	0 (0)	45 (36)	11 (7)	19 (14)

Wood sources and local arrangements for wood trade

All carvers indicated that they only used dead and very dry wood, mainly for two reasons: (i) fresh and wet timber would crack soon after carving thus resulting in a poor piece; (ii) for those who used electrical bits, the bits get clogged by fresh wood. The carvers sometimes got offers of wet wood, which were rejected. However, using the presence of cracks on pieces as evidence that a piece was carved out of fresh wood, it was evident that some of the very large pieces were made from fresh wood.

Carvers stated that wood was mostly obtained from the communal areas. Even carvers in Victoria Falls got regular supplies from people in communal areas.

Discussions with officials from the District Council, Department of Natural Resources and Forestry Commission indicated the existence of strategies and mechanisms to control wood utilisation in communal areas of Hwange District.
These include:

- The prohibition of the cutting of fresh wood for the purposes of carving and fuelwood.
- The use of Statutory Instrument 166, sub-section 181 (Communal Land Act (Land use and Conservation) By-Laws) as a guideline for wood utilisation. Defaulters are made to pay a fine for felling a tree illegally.
- Permission for cutting trees is granted by the village head, VIDCO chair or by the councillor.
- The use in each ward of resource monitors employed by the council whose role is to monitor resource utilisation at the local level.
- The engagement of two council employees to ensure that there was no illegal

Table 7: Breakdown by species (m^3)

Sizes	Kusile-Kweja	Ndhlovu	Mbizha	Mabale
Small pieces				
mean volume	0.003	0.003	0.002	0.002
total volume	1.54	2.31	0.93	0.95
Medium pieces				
mean volume	0.018	0.025	0.042	0.029
total volume	2.16	2.52	11.34	3.71
Large pieces				
mean volume	0.113	0.128	0.225	0.132
total volume	1.91	3.58	23.85	7.39
Total all sizes	5.61	8.41	36.12	12.05
Species				
G. coleosperma	-	1.17	0.36	0.36
A. quanzensis	2.41	2.52	6.14	5.43
B. plurijuga	1.07	1.68	15.18	-
D. melanoxylon	-	0.02	-	0.12
K. acuminata	0.28	1.01	9.03	2.89
P. angolensis	0.73	1.60	3.97	0.48
S. birrea	-	-	-	1.69
C. imberbe	0.67	0.25	1.08	1.08
S. rautanenii	0.45	0.16	0.36	-
Total	5.61	8.41	36.12	12.05

selling of wood in Victoria Falls. The employees had been placed at the National Parks gate on the outskirts of the town.

- Some clubs reported that they police each other to ensure that fresh timber is not used (Sebele, pers. comm. 1994).

While these mechanisms were intended to ensure the sustained utilisation of wood from communal areas, implementing the mechanisms has been slow due to a number of factors. First, and probably most important is political interference. A few words such as "trees are supposed to make people survive" from political leaders, leads carvers to often disobey local rules and regulations. Second, local leaders realize that carving generates much income for the families involved, and in the face of persistent drought are reluctant to implement the rules. In communal areas, people have rights to clear trees for the purpose of cultivation.

Some trees are felled under the pretext of cultivation. Local authorities have also observed that people get around the rule of not cutting fresh wood by ring barking the trees first then felling them once they looked dry. Given the relative lack of law enforcement and the loopholes exploited by the carvers, live trees will continue to disappear in the communal areas, especially now that most people indicate that dead wood is fast running out.

Whereas the felling of trees for carving is prohibited, it was reported that at times people cut trees from their fields to reduce shading of crops by trees. The species currently left in fields are suitable for carving, but will presumably be cut over time for carving. At Mabale, vendors reported that trees in fields were sometimes sold for as little as $10. On other occasions the owner of the tree would merely demand a portion of the money obtained after the crafts obtained from the trees were sold. The carvers indicated that in some cases they used dead wood remaining from the destruction of trees by elephants, trees which died after the extraction of honey or wood left by companies collecting timber under concession.

While communal areas are located on the north side of the road, the Forestry Commission controls most of the woodlands on the south side. In some instances, the woodlands of the Forestry Commission stretch some 5 km onto the northern side. These are used as a buffer against timber poachers. Authorities indicated that the buffer zone had been very effective. The authorities in the Commission and the vendors were of the opinion that there was adequate dry wood in the forests for use by the carvers.

In the past, the Commission used to sell timber to the carvers at $100 per cubic metre. The arrangement was that the carvers would get permits to go into the forest where they would cut and stack dry wood. The wood was then collected by the commission employees and the carvers were charged for the timber and transport. However, due to administrative problems, the commission suspended this scheme. Carvers at Kusile-Kweja and Qhubekani were confident that when they require the timber from the Forestry Commission, arrangements could be made. At Mabale, the vendors reported that the Forestry Commission had strict laws which did not allow anyone to collect or purchase timber from state forests. It was alleged that the Forestry Commission did not even allow people to collect thatching grass from the forest. The major contention, by forest managers, was that it was difficult to identify those who were working with permits and those who were not.

Poaching of wood from the Forestry Commission area seems to occur at times. Instances have been reported where the Forestry Commission security officers have burnt sculptures in an effort to discourage poaching of wood from its forests. This has resulted in poor relations between the Forestry Commission and the wood carvers.

Species selection and volumes at selling points

At the time of conducting the ecological impact study, Mabale market had the least number of small carvings (500) and Ndhlovu had the most (796). In the medium category Ndhlovu had the least (101) while Mbizha had the most (270). For the large category Ndhlovu had the least (28) and Mbizha had the most (106). Kusile-Kweja and Ndhlovu specialise in small and medium sized carvings while Mbizha and Mabale concentrate more on the large and medium size carvings

Nine tree species are used by the carvers. These are; *Kirkia acuminata, Pterocarpus angolensis, Baikiaea plurijuga, Combretum imberbe, Afzelia quanzensis, Schinziophyton rautanenii, Dalbergia melanoxylon, Guibourtia coleosperma* and *Sclerocarrya birrea.* The relative usage of these species by size categories at the four large markets is shown in Tables 6.

At all four sites, *K. acuminata* was the most frequent species among the small carvings, generally followed by *P. angolensis.* In volume *A. quanzensis* is also important. Both species have a decorative grain and are easy to work.. *A. quanzensis* is the most utilised species for medium size carvings, followed by *P. angolensis, K. acuminata* and *B. plurijuga.*

In the large category, *B. plurijuga* was the most utilised species, followed by *A. quanzensis.* The extent to which a species is used to produce large carvings appears to be directly related to the abundance of large specimens of that species in the area surrounding the market place.

Overall, *A. quanzensis* was the most used species, by volume, at Kusile-Kweja, Ndhlovu and Mabale Markets. At Mbiza, *B. plurijiga* was the most used species.

It was estimated that about 62 m^3 of wood carvings were on sale at the four markets (Table 7). Mbizha alone accounted for 58% of that volume, Mabale accounted for 19% while Kusile-Kweja and Ndhlovu shared the remaining 23%. Over all four markets the three species with the highest volume are *B. plurijuga, A. quanzensis* and *K. acuminata*

Volumes of wood removed around markets

Vendors had mixed perceptions about the sustainability of wood extraction. While at Kokekeke it was reported that wood procurement was not a problem, at Kusile-Kweja vendors reported that wood was getting scarce and could only be sourced from fields. At Qhubekani, even though the vendors are aware that wood is getting scarce, the carvers have currently accumulated reserves from the supplies they were getting from Forestry Commission. The vendors are also confident that if these reserves were to run out they would approach Forestry Commission again for more supplies.

At Mabale it was reported that the distances to the wood sources were increasing with time as timber close to the market was running out. Vendors are now going as far as 17 km away. All carvers are fully aware of the council regulations which prohibit them from cutting live trees. However, vendors regard their survival to be paramount and therefore did not see any problem in them cutting trees to create fields. Cutting live trees in the council area is reported to be going on under the pretext that they are clearing their fields. The research team did not establish whether there was genuine need to cut the wood for the clearing of fields.

Observations in the sample area surrounding Kusile-Kweja indicated that for 34% of the trees cut, carving of the rough outline of the piece took place at the stump. In 39% of the cases the crown was left behind unutilized initially but in half of these cases carvers had started revisiting the same stumps for the crown wood. At both Kusile-Kweja and Mabale all the secondary processing and final touches take place at the market place. At Mbizha and Ndhlovu processing takes place at homesteads, far from the market place, and the finished carvings are transported by ox-drawn carts to the market.

The transect approach used to determine the extent of wood extraction for carving only recorded large volumes being extracted around Kusile-Kweja (Table 8).

To estimate the amount of timber extracted per year by the whole industry we first estimated the mean value of each cubic metre of carving at each of the four large markets, using the figures in Table 5 and 7. The values obtained are \$3580 m^{-3}

Table 8. Estimated rate of timber extraction ($m^3\ ha^{-1}$) around the four large markets.

Species	Rate of timber extraction			
	Kusile Kwenja	Ndhlovu	Mbizha	Mabale
A. quanzensis	2.16			
P. angolensis	0.31	0.06	0.01	0.01
B. plurijuga	0.02		0.25	0.05
G. coleosperma	0.26			
S. rautanenii	0.08			
K. acuminata	0.07	0.13		
Totals	2.90	0.19	0.26	.06

$7867 m^{-3}; $9417 m^{-3}; and $6595 m^{-3}, respectively for Mbizha, Mabale, Ndhlovu and Kusile-Kweja. These figures give a weighted value of $8134 m^{-3}. The monthly income range is $300 to $500 per person, with an average of $400 per person per month, or $4800 per person per annum. This puts the total annual income for the 940 beneficiaries in the industry at $4 512 000. Dividing this amount by the unit value of a cubic meter of carving, we get 657 m^3 of timber extracted and converted into saleable wood carvings per year. If we further assume a recovery rate of 25% in the whole woodcraft production process, then the total volume of timber harvested amounts to about 2600 m^3 per year. By comparison, the individual timber logging companies that harvest *P. angolensis* and *B. plurijuga* extract on average 5000 m^3 of millable timber per year, with a 'recovery' rate of about 30%, which means that each of these loggers, of whom at least five are currently operating, cuts down the equivalent of 16600 m^3 of timber, of which 11600 is left to waste at the stump. Thus the amount used by carvers is only a small proportion of the "waste" of the commercial logging companies.

However, it is clear that the utilisation intensity is much higher in the communal area than in the State Forest where the timber is being harvested illegally. As a result of illegal activity in State Forests, recovery rates are very low in those areas. The other factor determining recovery rates is log size: the upper portion of the main bole and selected large sized branches are preferred to the lower portions of the bole or to the smaller branches.

Most of the timber harvested for the production of large carvings is coming from old trees left standing in agricultural fields, thus imparting a significant option value to leaving trees in fields. In the case of Mabale, it was quite clear that the carvers use mostly deadwood. The exact location of timber sources for Mbizha and Ndhlovu carvers is difficult to determine but it is very likely that the carvers penetrate into the State Forest area, far away from the main road.

Conclusions

The study revealed that the woodcraft industry is complex and dynamic. The industry has recently flourished and there are a host of different stake holders. Woodcarving provides a source of livelihood to nearly a thousand households in a dry part of the country. The households participating in the industry get around $400 a month. The number of participants in the industry is likely to increase due to increasing unemployment, recurrent drought and increases in the number of tourists visiting the region. Although carvers argued that the welfare derived from the activity is surpassed by other income generating activities like beer brewing and selling, and market gardening, woodcarving still remains a source of living for a substantial number of families.

The three most used species are probably *B. plurijuga*, *A. quanzensis* and *K. acuminata*. The estimates of timber sold by carvers, at 700 m^3 per year for the whole Bulawayo-Victoria Falls road, from both state and communal lands, is sizeable by comparison with the 5000 m^3 sold to each logging company for the furniture industry.

Given the contributions of the woodcraft industry to the families involved the recognition and support of this new form of wood utilisation is needed. Recognition and support would have to be followed by a number of steps being taken to ensure sustainability.

Recommendations for action

1. A wood-supply system that is not detrimental to the woodlands and ensures a constant supply of wood to the carvers needs to be established. Lessons can be learnt from the firewood supply system being implemented between the Department of National Parks and Wildlife Management and Tangenhamo Cooperative in the Victoria Falls urban area and the system that used to operate between the Forestry Commission and vendors at Mabale and around the Victoria Falls airport. The Forestry

Commission, National Parks and other private landholders, have dead/dry timber on their lands. The timber could have accumulated as a result of timber concessions, natural deaths, elephant damage and fire.

2. Wood-use monitoring mechanisms that involve the carvers themselves need to be established, as previous mechanisms did not involve the carvers. With the mistrust that exists between the council and the vendors, any external monitoring mechanism will be frustrated by the local people. Politicians also need to be educated on the issues involved in wood-use and the mechanisms in place. For example, the gate-keeper system at the entrance to Victoria Falls was dissolved after political interference, and yet the system had been effective at stopping the movement of fresh wood into Victoria Falls urban area from neighbouring communal areas.
3. Developing the marketing system, possibly with the participation of the local government structures is required. This should aim at marketing the carvings more widely, and increasing their value. There is also the issue of allowing carvers to handle foreign currency at their sites. Carvers, vendors and the government should look at mechanisms to allow vendors to accept foreign currency. However, this would entail offering some education for the vendors on the value of foreign currency and exchange processes.
4. There is need to conduct an economic analysis of the various uses of species in the carving industry in order to recommend the most viable options. There is need to compare and contrast the furniture and wood carving industries with a view to analyzing which of them realizes the most economic returns to labour and woody resources.
5. There is a need for imparting skills to carvers to improve their recovery rates and utilisation efficiency in processing wood.
6. It was evident that the number of people going into the woodcraft industry is increasing rapidly. If the national economic situation does not improve the trend is set to continue. Presumably, the situation will stablise at some point as dictated by the balance of supply and demand. The industry needs support given the use of otherwise unutilized species like *S. rautanenii, C. imberbe, K. acuminata and D. melanoxylon,* or the possible use of parts of trees discarded by the furniture industry.

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