



**The Growth of Wood Carving Industry in Ghana and its  
threat to selected tree species**

**Master's Thesis**

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## **ABSTRACT**

Promotion of tourism has become a government policy for the past two decades as a means to diversify exports; the woodcarving industry offers one of the prospective enterprises. The industry has gained a huge local and international market in recent years and expansion of the market has increased the use of the tree species for carving. The carvers and the traders of the carved products have taken advantage of the government's promotion of the non-traditional products to become the leading export commodities in the country by expanding the industry. However, the stock of some of the tree species used, i.e. preferred species are now declining at an alarming rate with little or no attempt to re-plant them. The risk this poses to the diversity of the forest has not been given the necessary recognition, because the carving industry is not seen as a major contributor to deforestation in Ghana. Individual tree species contribution to forest diversity cannot be underestimated; this calls for concerted efforts to bring all the partners in the industry to work together for a common good. Collaboration between the carvers, traders, and government agencies has thus become imperative as a way to avert the potential threat this poses to forest diversity. Re-planting of the endangered used tree species, diversifying the tree species used, technological improvement in operations and education seem to offer some hope for revival to enhance both socio-economic and ecological benefits.

# I. INTRODUCTION

## Background of the Study

Forests are essential for health of the planet. They help to control the climate, recycle water and oxygen, prevent soil erosion and provide homes for the most of the world's species of plants and animals. In spite of these benefits, human activities are rendering the forest incapacitated to offer such service to the planet. Notwithstanding decades for environmental campaigning and international action, the richest forests continue to be depleted at an alarming rate (UGI, 1998/99). According to Park (1992) the developing world lost 2 million km<sup>2</sup> of forest between 1980 and 1995, most of the loss was tropical rainforest. However, the UN's Food and Agriculture Organisation (FAO) reported in its State of the World Forest Report in 1999, that annual losses in the developing world seemed to decrease i.e. from 15.5 million hectares a year during the 1980s to 13.7million hectares between 1990 and 1995. It is estimated that even at this rate, an area in the size of Greece was being lost every year (UGI, 1998/99).

The total land area of Ghana 238,539 km<sup>2</sup>, had 34% originally rainforest coverage. Today less than 11,000 km<sup>2</sup> is covered by forest (Frempong Manso, 2000). Since the colonial era, the exploitation of timber for commercial purposes has been part of Ghana economy. It is only since the start of the Economic Reforms Programme (ERP)<sup>1</sup> in 1983 that deforestation has become a serious concern because of the over-exploitation of the forest resources. Forest resources in Ghana are being depleted at a faster rate than before compared to other developing countries. Since 1981, the average annual rate of deforestation in Ghana is estimated at 2.0% compared to 0.9% for all tropical forest, 0.6% for Zaire, and 0.6% for Brazil (WRI, 1990). The effort of the government to reduce deforestation have yielded limited success, primarily because many of the initiatives were misguided and /or failed to deal with deforestation as a complex, dynamic and interwoven process.

A recently held African Regional workshop in Accra (Ghana) on the underlying causes of deforestation identified indirect and direct causes for the problem. The direct causes identified in Ghana were extraction of firewood, charcoal burning (fuel production), timber production, misguided government policies, difficulty of obtaining permits, distribution of royalties, bribes and other benefits, forest fires and agriculture. Indirect causes identified were

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<sup>1</sup> This was economic curative strategy that was intended to generate sustainable growth and development: stabilization, rehabilitation and liberalization of the economy.

population growth, poverty, Structure Adjustment Programme (SAP) and foreign aid (Boateng, A; Adomako, 1998). Many environmentalists reckon extraction of timber that was for sometime the third highest exported commodity in Ghana, as the main source of deforestation. In 1993 alone, about 983, 000 m<sup>3</sup> timber was sold, which was a 29% increase of the 1992 sales (TED Case). Meanwhile, the quantity of wood extracted by illegal chainsaw operators who cut and sell to local craftsmen and small-scale industries is not known, but forestry officials in Ghana estimated that as much as USD 50 million of wood is illegally exported from Ghana per year (Myers, 1992).

The economic reforms and trade liberalisation schemes initiated by the World Bank in the 1980s under its SAP/ERP for the developing countries has transformed some of the traditional pastime and culture into economic prospects, e.g. the woodcarving which is a component of the handicrafts<sup>2</sup> industry in Ghana. It is now a major economic sector in countries like Indonesia, which exports about USD100 million of carvings a year, India about USD 65 million and is important also in some African countries e.g. South Africa, Kenya, Zimbabwe (CIFOR, 2002).

Woodcarving industry has been with the people of Ghana for centuries, with the profession being transferred from generation to generation informally through the family lineage system. It is seen as a means to express people's thoughts, beliefs and way of life through symbols designed to communicate specific messages. Carving is a profession for people in the forest areas i.e. southern Ghana where, the tree species mostly used, "Sese" (*Holarrhea wuifsbergii*) and "Twenedua" (*Cordia millenii*) and Mahogany (*Khaya ivorensis*), are in abundant supply. Carvers used to log trees from farms and the surrounding villages and carve into mortars, combs, wooden cooking utensils, drums and other traditional products like stools and *Oware* (a traditional game). Annual income for carvers in the past was derisory, because the local market was small and there were no external market for the products. Also, carving was not a full time job for most of the carvers, but leisure-timework to supplement income from their farms.

The 1980s saw the industry take a new face with the exposure of the culture of Ghanaians to the western world and beyond through the organization of national cultural festivals, trade fairs and participation in international trade and culture fairs. It was the 1<sup>st</sup>

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<sup>2</sup> These are indigenous products manufactured by local craftsmen e.g. carving, basket, beads clothes etc.

Pan-African Historical Theatre Festival (PANAFEST)<sup>3</sup> organised in 1992 with the theme “The re-emergence of African Civilization” which established the carving industry in Ghana on the international scene. One of its objectives was to establish the truth about the history of African and the experience of its people using the vehicle of African arts and culture. The success of this re-organization brought hope to the government that, marketing it could sustain and promote the culture of the people as well as becoming a new economic powerhouse that could salvage the demise of the traditional export commodities (gold, cocoa and timber) on the world market. From the mere USD 60,000.00 sale of handicraft in 1989, by 1996 Ghana was selling more than USD 3,000,000.00 worth of handicraft (mostly wood carvings). The development has sensitised the local people and since then, they have been participating and identifying themselves with its use more than before. The government has placed it second to United Nations Educational Scientific and Cultural Organisation (UNESCO) listed World Heritage Centres in Ghana (European castles, forts, game parks etc.) in its bid to promote tourism to being leading export industry within the economy. The government’s 15-Year Tourism Master Plan (1996-2010) essentially calls for development and promotion of the industry’s internal and overseas markets. It is this development that has brought unprecedented depletion of the stock of the used tree species since wood carving industry activities became documented in Ghana. Woodcarving industry has thus become a key player in the deforestation in Ghana, and therefore its activities need to be investigated.

### **Statement of the problem**

Woodcarving represents the permanence and continuity of the nation (Busia, 1954) since it is the embodiment of Ghanaian culture. However, tourism promotion for the last two decades has seen the carving industry growing to become a major economic powerhouse in the country. This has raised a lot of questions on the threat the carving poses to the used tree species. The government view the growth as a way to shed off some of its unemployment problems and boost the country’s tourism potential. The carvers, the traders and the communities where carvers work also view this as opportunity that must be utilised to its maximum. Woodcarving provides significant household income for about 300 000 dependants in Kenya, and in South Africa and Central Valley area of Oaxaca, Mexico it contributes around USD 500-2000 and USD 2500 per year respectively (CIFOR, 2002). In

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<sup>3</sup> It is a major cultural event dedicated to the enhancement of the ideals of Pan-Africanism and the development of Africa continent. It is organised–biennially for Africans and people of African descent as well as all persons committed to the well-being of Africans on the continent and in the Diaspora

Ghana, it is estimated that about 20-30,000<sup>4</sup> people are engaged in the business with some individual ventures making about USD 62,500.00 a year e.g. example Yenok Wood Product Ltd. Environmental Groups (People and Plants, WWF etc.) and UN's United Nations Educational Scientific and Cultural Organisation (UNESCO) have drawn the attention to the governments about the danger associated with continuous exploitation of the preferred tree species for carving. All major research work on deforestation in Ghana has been focusing only on timber production, agriculture and other known causes, while little is known about the role of woodcarving. The problem this study seeks to address is: Has the growth of the woodcarving industry in Ghana contributed to deforestation and the decline of the species used for the carving?

### **Objectives of the study**

The broad objective of the study was to establish links that exist between wood carving industry and used tree species. The immediate objectives of the study were:

- 1.To establish relationship between growing carving industry and its effect on the stock of selected tree species.
- 2.To determine factors that influences the growth of woodcarving industry.
- 3.To find alternative ways to sustain the industry through ecological and economic balance of resource used.

### **Assumptions**

The following assumptions were set up for the study:

1. Depletion of tree species is caused by indiscriminate felling of trees for wood carving.
2. Depletion of tree species is caused by the expansion of the wood carving industry.
3. Depletion of tree species is caused by lack of re-forestation.

The study also seeks to answers the following questions:

1. Does the growth of woodcarving industry really affect the tree species?
2. Which are the direct and indirect factors causing the depletion of the species?
3. What factors influence the wood carving industry?
4. What are the possible ways that could lead to sustenance of the industry?

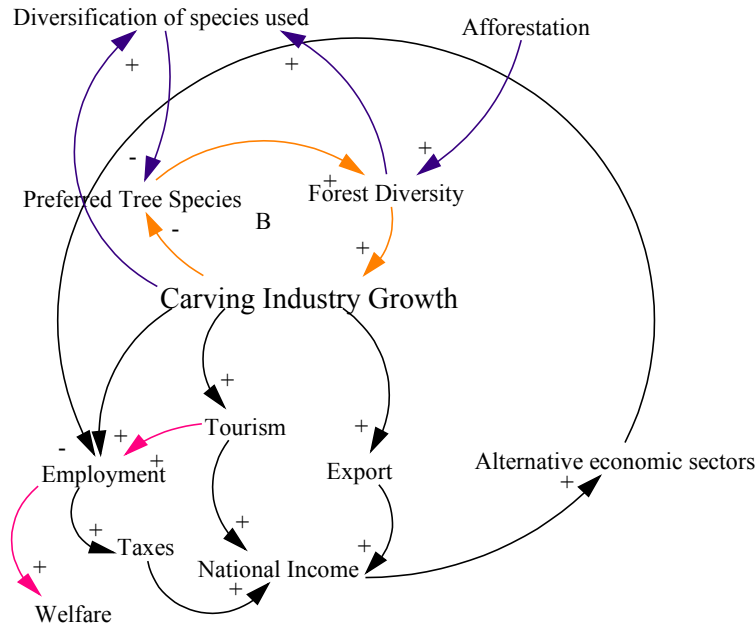
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<sup>4</sup> This was based on estimated number of carving centres in Ghana (Personal Experience)



**Conceptual framework**

The basis of this study was built on the notion that the wood carving industry has a potential to lead the tourism industry to take over the traditional export commodities as the leading export sector in the country. This must be based on plantation and diversification of the used tree species to stimulate the ecological, economic and the social interlinks of the industry. It postulates that continuous species-specific harvesting not only will see the extinction of those species but also will affect the industry, diversity of the forest and other species that depend on these used tree species. The current cutting rate of the used species far exceeds the natural regeneration rate, and plantation and diversification of the tree species seems to hold the key to over turn the fortunes of the industry. Such development will have socio-economic impact especially on the rural people where carving is their pastime work and also as a source of income. This will have a trickledown effect since the country will benefit from increased export to support the other socio-economic sectors.



**Fig. 1. Conceptual framework of the study in the form of Causal Loop Diagram**

**Case study areas**

The study was conducted in three areas in the southern part of Ghana where woodcarving is predominant i.e. Aburi, Accra and Takoradi. The area is in the close forest zone where about two thirds of the country’s human population and most of the country’s economic activities, including timber, cocoa and mineral production are concentrated. One of the major carving

centres is Aburi, about 30 km from the capital, Accra a well-known tourist destination and a centre of excellence for woodcarving. Accra, which is a commercial city, has more shops and stalls that sell woodcarving products than any place in the country. Its capital status makes it entry point to all tourists who come into the country. There are also a number of carvers who ply their trade along the major roads. Finally, Takoradi that is about 350 km west of the capital is also the centre for timber industry in Ghana and export route for Ghana's timber products. It is the single most important town in the country in terms of timber production and harbours some of the companies that use advanced technology to produce carving products.

## **Methodology**

### *Research Design*

The research design used for this study was field survey. This approach appears to be the appropriate method, since the unit of analysis of the study is the individual as suggested by Babbie (1989). It was to collect primary data that describe the population and the topic under study. According to Smith (1976), this method has an advantage of providing large amount of data at relatively low cost in a short period.

### *Target population*

The target population of the study was the three categories of carvers that can be identified in the southern part of Ghana; (i) Individual carvers: - these are carvers who set up their individual sheds and carve without any control from any authority on their source of wood supply. They form the majority of the carvers (50%) in Ghana (ii) Group Carvers: - these are a well-organised groups of carvers who carve as individuals but gathered at one area to coordinate their activities to attract customers and ensure high productivity. They constitute about 40% of the carvers in Ghana. Their sources of wood supply are only partially controlled by the forestry department since the group buy in bulk and store in their warehouse for the individual carvers to purchase them when needed. They sell their product mostly to the exporters and other individuals who buy in bulk to sell or single products for personal use. (iii) Industrial carvers: -these companies use advanced technology to carve wood products. They combine cultural and traditional methods with technology to satisfy all types of wood product requirement. The forestry department indirectly controls their source of wood supply since it mostly comes from waste from the timber firms whose activities are controlled by forestry department. They form 10% of the carvers and their products are mostly for export.

### *Study population*

The study population consists of carvers and sellers of carving products in the southern part of Ghana particularly Greater Accra, Eastern and Western Regions. Institutions responsible for forest policy and management and promotion of woodcarving in Ghana were also incorporated in the study.

### *Sample size*

In total one hundred carvers and sellers of woodcarving products from Aburi, Takoradi and Accra were studied. The Chief Plantation Officers of Forestry, Deputy Director of Ghana Export Promotion Council (GEPC) and the Chief Administrator of Timber Export Development Board (TEDB) were also interviewed by the virtue of their positions in the industry.

### *Sampling technique*

The sampling techniques used for selection of the study population were purposive sampling, proportionate stratified sampling and simple random sampling. Purposive sampling was used to select the Chief Plantation Officers of Forestry, Deputy Director of GEPC and the Chief Administrator of TEDB. According to Blalock (1979) purposive sampling is appropriate when one wishes to interview persons who are in good position to supply information. The administrators were selected by this technique because they are the only people who have control over the woodcarving business and can take policies that can affect changes in the industry. The proportionate stratified sampling technique was used to select 80 carvers because of the heterogeneous nature of the carvers. They were sub-grouped and units were selected from each stratum randomly based upon their number. Based on these 40 individual carvers, 32 people from the group carvers and 8 people from the industry carvers were selected. Simple random sampling was used to select the 20 sellers from the three areas. They were picked at random from the sellers visited. This was used because it is very simple to use and has a high degree of representation (Babbie, 1989).

### *Research instrument*

A prepared questionnaire and interview schedule methods were used to collect data from the respondents. The questionnaire was used to collect similar information (data) from the carvers in the three regions, and the interview schedule was used to obtain similar information from

the policy makers and administrators in the industry. The study design took into consideration the fact that some of the population are either illiterate or made up of people who may, for some reason, not feel disposed to fill in the questionnaire themselves. The administration of the questionnaires thus took the form of interviews, as opposed to self-administration. In-depth interviews were also carried out with the Chief Plantation Officers of Forestry, Deputy Director of GEPC, the Chief Administrator of TEDB who by virtue of their work, are well informed about the subject of the study.

#### *Analysis of the data*

The data would be analysed using simple tools like pie charts, bar graphs and line graphs to make the communication of the result of the study simple and in non-technical manner.

#### **Limitation of the study**

The main problem of the study was that little has been done on this field in Ghana so it was difficult to find related literature to support the evidence gathered. In addition, there are no documented figures on quantities of trees that are used yearly by carvers in Ghana, because most of the informal economic sectors do not have documented data. In some cases analysis has to rely on similar data and statistics from other developing countries e.g. Kenya. Also because of time constraint all carving regions and centres in Ghana were not visited but only those very near and accessible.

#### **Significance of the study**

Even though this study is limited in context to traditional woodcarving, because the sector is deemed an informal economic sector and most of their activities are not documented, it would draw attention to policy makers and researchers on the threat the wood carving industry poses to forest diversity. It would also help them to acknowledge the other side of woodcarving as a key player in Ghana's rapid deforestation problem, and not only the key player in economic development. In addition, study of this nature would help the carvers and policy makers to develop Kenya's type of "good wood" policy which have seen their carvers changed from the use of hardwoods which have become vulnerable e.g. "muhuhu" Mahogany (*Brachylaena hillensis*) and "impigo" Ebony (*Dalbergia melanoxylon*) to other alternatives such as Neem (*Azadirachta indica*), Mango (*Mangifera indica*), Grevillea (*Grevillea robusta*) and Jacaranda (*Jacaranda mimosifolia*), which have very high regeneration rate (Obara, A. O et al. 2002). Ghana forests are endowed with some of these alternatives and many more others exotic

species like Teak (*Tectona grandis*) and Cedrele (*Cedrele odoranta*), which could be used rather than the traditionally preferred species.

Suggestions and recommendations from this study could be very useful to promote the woodcarving industry growth to help the government to achieve its 15-Year Tourism Master Plan and sustenance of the industry. Finally, the study would also contribute to the building of a theoretical model representing the interface between ecological, economic and social networks within the industry in further studies.

## II. EXPERIENCES FROM LITERATURE

Only a few research works have been done on the woodcarving industry as a factor to deforestation and loss of species used for the carving. As a result the literature review is limited to few experiences drawn from countries where woodcarving has contributed to deforestation and rapid decline of the used species e.g. Kenya.

### **The State of the Forest**

FAO defines deforestation, as depletion of canopy cover to less than 10%, thus disregarding forest cover loss from about 90% to 15% and individual species loss (UGI, 1998/99). Individual species contribution to forest and species diversity cannot be underestimated and hence their continuous depletion ought to be a matter of concern. According to Park (1992) the developing world lost 2 million km<sup>2</sup> of forest between 1980 and 1995 and most of the loss was tropical rainforest. However, deforestation appears to have decreased slightly from 155,000 km<sup>2</sup> a year in 1980-1990, down to 137,000 km<sup>2</sup> a year in 1990-1995.

Already, of the 16 tropical countries which have lost over 90% of their original forest cover, 11 of them are from Africa i.e. Benin, Cote d'Ivoire, Ethiopia, Gambia, Ghana, Kenya, Nigeria, Rwanda, Sierra Leone, Togo and Zimbabwe (WCMC, 1994). Frempong Mensah (1998) in contributing to Forestry Inventory Proceeding in Ghana stated that:

“At the turn of the century Ghana had over 8.8 million hectares of forest...only 4.2 million hectares remained by 1950. Estimates for 1980 put productive forest area to 1.9 million hectares. This means Ghana has lost over 75% of its tropical forest within this century due to inefficient agriculture practice (shifting cultivation) and overexploitation.”

This is a manifestation of how human activities in the last century have decimated the forest, which is our source of life.

### Species-Specific Harvesting

Although it is estimated that about 60% of the forest is lost to agriculture settlement, the attention has always been on the economic activities, which are more directed to species-specific exploitation from the forest. Data available from TEDB indicates annual increase in extraction of some individual (preferred) species for export than less preferred species. Table 1 shows lopsided exploitation some of the exported timber species, which are also used for woodcarving.

**Table 1: Selected timber species commercially traded in Ghana-Volume (m<sup>3</sup>): 1985- 2000**

Species/Year	1985-1988	1989-1992	1993-1996	1997-2000
<i>Cedar</i>	50,290	28,442	322,569	259,592
<i>Iroko</i>	140,788	146,417	179,227	154,378
<i>Mahogany</i>	40,386	67,100	79,678	76,175
<i>Teak</i>	45	8,875	139,110	71,678
<i>Ebony</i>	-	-	-	-
<i>Cordia</i>	-	-	-	7,879
<i>Akasa</i>	4,631	3,456	5,505	5,033
<i>Alstonia</i>	-	4	42	147

Source: Timber Export Development Board

NB: Ebony was not commercially traded between 1985 and 2000

Out of over 126 different forest tree species that grow to timber size, about 50 are currently considered merchantable, 23 of which commercially traded (Francois, 1987). Of these, ten species accounted for 79% of the total volume extracted in 1991 with two species Wawa (*Triplochiton scleroxylon*) and “Odum” Iroko (*Melicia excelsa*) contributed 53% i.e. 41% and 12% respectively (FPIB data). These species exported yearly according to TEDB does not include what carvers’ use. Alder (1989) as cited by Laing (1994) in Ghana Environmental Action Plan stated that most of these exploited species resource life years are currently below 25 years.

### The Expectations

The unprecedented growth that the carving industry is experiencing in Ghana is exacerbating the rate of exploitation and its effect in future forest wood supply. UNESCO (1999) noted that the industry in Kenya uses 7,000m<sup>3</sup> wood per annum, which is about 50,000 trees a year and

only few species particularly “muhuhu” Mahogany (*Brachylaena huillensis*) and “impigo” Ebony (*Dalbergia melanoxylon*) are preferred. According to the report wood now has to be imported from Tanzania, as Kenyan supplies are insufficient. Kigomo, Savill and Woodell, 1990, 1991; Kirubi, Wamicha and Laichena 2000; Mathooko and Kariuki 2000 have identified the preference for and selective harvesting of these species contribution to a serious decline of their population in forest and woodlands throughout Kenya.

Additionally, Hamilton and Schmitt (WWF) revealed a similar trend that according to them, is posing major conservation problems - degrading forest habitat and leading to the loss of nest sites and shelter for rare and forest – dependent animals.

It is also estimated that the yearly consumption of 9 indigenous preferred tree species in Zimbabwe for carving production is over 1200m<sup>3</sup> yr<sup>1</sup> (or more than 700 trees with dbh >50cm) in 7 craft markets in the same area (37 000 ha<sup>-1</sup>) indicating that the carvers will face severe resource supply in the near future (CIFOR, 2002).

Although the number of trees felled for carving in Ghana is not known, Dei (1990) asserted that wood species that are lost as a result of carving are many, and their extinction would affect habitat growth and other pharmaceutical raw materials derived there from.

### **III. DEVELOPMENTAL INDICATORS**

Handicrafts and other non- traditional products<sup>5</sup> have been accorded unparalleled attention by the government since the implementation of the ERP. This commitment was necessitated by the worsening terms of trade for the country’s major/traditional exports (Addo et al. 2000). The government export diversification drive has increase the trade in wood carving products, especially in the Eastern, Ashanti, Western, Greater Accra, Brong Ahafo and Central Regions, where productive resources and infrastructure are available. The socio-economic and political indicators of development within the carving industry aimed to help the government effort to resuscitate the economy could be identified within the parameters of the socio-economic and political structures in the country.

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<sup>5</sup> Products other than the major /traditional products for export e.g. pineapple, mushroom, handicraft etc.

## **Socio-economic indicators**

USAID has recognised the continuous growth of tourism in Ghana as a viable economic development option. Tourism is now Ghana's third largest foreign exchange earner, after gold and cocoa, with USD 342 million in foreign exchange receipts in 1999 (more than triple the amount eight years before). Current trends suggest that tourism may surpass cocoa in a few years and, given tourism's current 12% growth rate, it has the potential to become Ghana's top foreign exchange earner. The principal constituents of the tourism sector are the UNESCO listed Heritage Centres followed by handicrafts, which have woodcarving as a principal component (USAID, 2001).

Even though on national scale there is no reliable data on the number of people employed in the carving industry, it is estimated that between 20-30 thousands people are engaged in the industry. Trade liberalisation, instituted by the government through its economic reforms has opened up the economy to accommodate many exporters to trade and participate on the international market. The Three-Year Non-Traditional Export Development Plan, 1988-1990 (the 3-year NTEDP, 1988-1990) and the Five Year-Year Medium Term Plan for Non- Traditional Export Development, 1991-1995 (the 5-year MTP-NTED, 1991-1995) set up by GEPC led to the establishment of Export Production Villages which was jointly financed by the government of Ghana and the UNDP. The objectives of the villages are to (i) plan and coordinate rural-based exports production and marketing (ii) to create a regular and guaranteed market for rural export production (iii) to ensure availability of supplies for sustainable export markets (iv) to develop, improve and sustain entrepreneurship, production efficiency and quality consciousness among rural producers and finally (v) to create and enhance employment and income opportunities in rural areas thereby improving the standard of living of rural producers (cited in Addo et al., 2000). The long-term objective of the two plans was to realize an increase in the relative share of the non-traditional exports in total exports earnings from 5% in 1988 to 15% in each subsequent year. These structures and policies put in place have helped to revitalise the carving industry as a strong economic competitor.

The organization of national exhibition and participation of the exporters in international exhibitions has raised the image of the carving industry. Ghana Export Promotion Council instituted the 1st Annual Handicraft Exhibition in Ghana in 1989, after 6 years it was given international recognition. In 1997, the 1<sup>st</sup> Ghana International Handicraft Fair (GIHAF) was



organised to exhibit handicraft and art works, and since then it has become an event held every 2 years to promote handicraft in Ghana. Apart from this event, exporters have been participating in other trade fairs in Ghana and the sub-region e.g. ECOWAS Trade Fair and International Fairs. In 1999, handicraft was third to agriculture and manufacturing sectors in the non-tradition product with over USD 3.5million turnover (IMF Staff Country Report, 2000). The promotional policies have seen the industry witnessing increase internal use of carving product among all the social-economic levels of the people of Ghana.

### **Political indicators**

According to Addo et al. (2000) the political commitment made by the government to the non-traditional export sector within the context of the ERP in 1983 was a major shift in focus, emphasis and pattern of economic development policy in Ghana. This led to the introduction of new policies and programmes to eliminate bottlenecks that have disorientated the sector. In addition, structural changes within the Ministry of Trade and Tourism were initiated to facilitate export administration and to meet the needs of rural producers and exporters. In 1993, the government established a Ministry of Tourism to underscore its commitment to tourism development in the country. The government tourism promotion drive was assisted by United Nation Development Programme (UNDP) and World Trade Organisation (WTO), which have seen the drawing up of 15-Year Tourism Master Plan (1996-2010) for the country aimed to develop the tourism industry. It has a goal of nurturing the tourism sector, which the wood carving industry is a major sub-sector, to become the leading foreign exchange earner by the year 2010. As an indicator, the carving sector has been placed under the Export Promotion Council (GEPC), which is the focal institution responsible for the overall planning of the Non- Traditional Export Sector. In 1989, the government, on the recommendation of the Bank of Ghana, established the Export Finance Company (EFC) to provide financial and non- financial support to producers and exporters of non-traditional products (Ephson, 1988; GEPC, 1987, 1989; Ghartey, 1989; Nunoo, 1991). The political drive has seen Ghana move from the seventeenth position in 1985 to eighth in 1998, and currently among top 20 leading tourism revenue - earners in Africa (WTO, 1999).

## IV. RESULTS FROM THE CASE STUDY AREAS

The study to find the effect of the increase trade in wood carving on used tree species was conducted in three regions i.e. Eastern, Western and Greater Accra regions. This chapter looks at the result of the study. The results has been classified under the following:

Characteristics of the Respondent

Tree Species for Carving

The Carving Industry

Problems facing the industry

Suggestion to improve the industry

### Characteristics of the Respondents

To understand the category of people who engaged in the wood carving industry, the background of the study group was sought for. This was to assess the socio- economic class level they belong to in Ghana.

In table 2, out of the 80 carvers in the industry interviewed, majority (81%) were male and (19%) being female. The sellers were, however, different with the females (60%) forming majority and the male (40%) being minority.

**Table 2: Sex of the Respondent (Carvers and Sellers)**

Sex	Carvers	Percentage	Sellers	Percentage
Male	65	81	8	40
Female	15	19	12	60
<b>Total</b>	<b>80</b>	<b>100</b>	<b>20</b>	<b>100</b>

In table 3, the age distributions of the study population were grouped into four in line with developmental stages. The majority of the carvers (95%) fall within the active working group (26-35, 36-45) and early adulthood (16-25). The sellers' distribution was not different from the carvers and this reflects one of the characteristics of the working population in Ghana.

**Table 3: Age Distributions of the Carvers**

Age Distribution	Carvers	Percentage	Sellers	Percentage
16-25	27	34	1	5
26-35	34	42	7	35
36-45	15	19	9	45
46+	4	5	3	15
<b>Totals</b>	<b>80</b>	<b>100</b>	<b>20</b>	<b>100</b>

The educational background of the study group was also investigated. Though the mode of learning the skills is informal, the new educational reforms that lay emphasis on creative skills and self-employment put the industry to test.

**Table 4: Educational Backgrounds of the Carvers**

Qualification	Carvers	Percentage	Sellers	Percentage
No Formal Education	18	22.5	1	5
1 <sup>st</sup> Cycle Institution <sup>6</sup>	42	52.5	6	30
2 <sup>nd</sup> Cycle Institution <sup>7</sup>	20	25	9	45
Higher Education	-	-	4	20
<b>Totals</b>	<b>80</b>	<b>100</b>	<b>20</b>	<b>100</b>

It could be seen from the table 4 that majority (52.5%) of the carvers were 1<sup>st</sup> Cycle<sup>6</sup> school leavers with 2<sup>nd</sup> Cycle<sup>7</sup> leavers contributing 25%. The carvers with no formal education were 22.5% of the study population and none of the carvers had higher academic education. The sellers, however, had majority (45%) having 2<sup>nd</sup> Cycle education followed by 1<sup>st</sup> Cycle (30%) and higher education (20%) and with only 5% being uneducated.

To assess the possible transfer of this indigenous knowledge to future generation, the marital status of those studied were sought. The married among the carvers were the adult groups (26-35; 36-45; 46-55 and 55+). Among this group 70% have children but only 20% of this have their children learning the profession.

<sup>6</sup> 1<sup>st</sup> Cycle are the elementary institutions comprises of Primary, Middle/Junior Secondary schools

<sup>7</sup> 2<sup>nd</sup> Cycle are the Secondary and Technical institutions

## Tree Species for Wood Carving

This section of the data analysis constitutes the focal point of the study. It seeks to find the tree species use for the woodcarving, where they are cut from and efficient and sustainable use of it.

From the Table 5 it could be seen that each carver use more than one tree species. 80% of the carvers studied used “Sese” *Holarrhea wiufsbergii*, and “Twenedua” *Cordia melenii* whilst 60% used “Sinuro” *Alstonia boonei* and *Cedrela* (*Cedrela odoranta*). Substantial number of the carvers (52.5%) also uses Mahogany (*Khaya ivorensis*) and only few uses “Odum” Iroko (*Melicia excelsa*) 12.5% and other species (7.5%).

**Table 5: Types of tree species use for woodcarving in Ghana**

Species	No. of studied carvers using each species (80)	Percentage (100)
<i>Holarrhea</i>	64	80
<i>Cedrela</i>	48	60
<i>Cordia</i>	64	80
<i>Khaya</i>	42	52.5
<i>Melicia</i>	10	12.5
<i>Alstonia</i>	48	60
<i>Others</i>	6	7.5

There are over 126 different tree species that grow to the size capable to be used for all wood working purposes in Ghana (Francois, 1987), but only few ones are traditionally preferred for carving. The preference of these species is based on their durability, workability and customers demand (table 6). Twenty-four of the carvers (30%) were of the view that these species are durable and are able to withstand bad weather and insect attack. The majority of the carvers (57.5%) also said it is easy to work with these wood materials compared with others and only 12.5% based their preference on customers demand. The sellers on the other hand based their preference on customer demand (65%) and durability (35%) since they are there to satisfy the customers.

**Table 6: Preference Criteria**

Criteria	Carvers	Percentage	Sellers	Percentage
Durability	24	30	7	35
Workability	46	57.5	-	-
Customer Demand	10	12.5	13	65
<b>Total</b>	<b>80</b>	<b>100</b>	<b>20</b>	<b>100</b>

For possible sustainable alternative species that could be used for carving, it may well be seen from the table 7 that majority (36%) of the carvers mentioned *Tectona grandis*, which is an exotic species as a very good substitute. Other traditional species were also acknowledged *Nesogordonia papaverifera* (15%), *Funtumia elastica* (12%), *Mangifera indica* (10%), *Corapa procera* and *Xylopia staudtii* (9%), *Cola nitida* (4%) and other unknown minor species making the 5% of the rest.

**Table 7: Sustainable alternative Species for woodcarving**

Species	Carvers choice	Percentage (100)
<i>Mangifera indica</i>	8	10
<i>Tectona grandis</i>	29	36
<i>Nesogordonia papaverifera</i>	12	15
<i>Funtumia elastica</i>	10	12
<i>Corapa procera</i>	7	9
<i>Cola nitida</i>	3	4
<i>Xylopia staudtii</i>	7	9
<i>Others</i>	4	5
<b>Total</b>	<b>80</b>	<b>100</b>

From the table 8 it could be seen that majority (57.5%) of the carvers get their supplies from the forest (unreserved) and 30% of the wood supply coming from farms. Woodlot<sup>8</sup> supply was 7.5% and plantation and minor sources contributing 2.5% each.

<sup>8</sup> This is a patch of land planted with trees for the purpose of supplying the fuel and timber needs of a rural community.

**Table 8: Sources of Supply of used tree species to carvers**

Source (s)	Forest	Woodlot	Farms	Plantation	Others	Totals
<b>Carvers</b>	46	6	24	2	2	<b>80</b>
<b>Percentage</b>	57.5	7.5	30	2.5	2.5	<b>100</b>

Of the 80 carvers studied, 55% of them had to travel distances between 60 km and beyond to get their wood supply (table 9). Also 35% of them also go between 20-60km to buy wood and only 10 % get theirs in the nearby farms up to a distance of 20km

**Table 9: Covered Distance for Wood Supply**

Distance (km)	0-20	20-40	40-60	60-80	80+	Total
<b>Carvers</b>	8	12	16	24	20	<b>80</b>
<b>Percentage</b>	10	15	20	30	25	<b>100</b>

Looking at the efficiency in the use of the felled trees, it could be observed from table 10 that majority (60%) of the carvers use between 1-25 % the felled trees with substantial number of them (27.5%) using 25-50 % of the felled trees. Also 10% are able to use between 50-75%, but unfortunately only 2.5% of the cavers maximized the use (75-100 percent of felled trees).

**Table 10: Percentage of felled trees used for Wood Carving**

%Usage	1-25	25-50	50-75	75-100	Totals
<b>Carvers</b>	48	22	8	2	<b>80</b>
<b>Percentage</b>	60	27.5	10	2.5	<b>100</b>

The Department of Forestry confirmed that the used tree species could be planted. Unfortunately, none of the people studied carvers own plantation as an individual (table 11) but as a group, the carvers in Aburi owns four acres of teak plantation. Timber firms, which the industrial carvers depend for supply, also have plantations of Teak and other species.

**Table 11: Plantations of the tree species**

No. of Acres	1-5	5-10	10-15	15-20	20-25	25+	Total
<b>Carvers</b>	-	-	-	-	-	-	<b>80</b>
<b>Percentage</b>	-	-	-	-	-	-	<b>100</b>

## The Carving Industry

The industry as is being operated in the study areas now is what was sought for in this section of the research work.

**Table 12: Divisions of labor within the industry**

Division	Actual Carvers	Sandpapers	Painters	Local Sellers	Exporters	Total
<b>No. of People</b>	50	17	13	12	8	<b>100</b>
<b>Percentage</b>	50	17	13	12	8	<b>100</b>

According to economists, division of work into smaller sections lead to increase of productivity and efficiency. This was one of the characteristics observed among the carvers especially among the group and the industrial carvers (table 12). The studied people had 50 people (50%) as the actual carvers and 17 (17%) and 13 (13%) respectively being the sandpapers and painters of the carved products. The local sellers were 12 (12%) of the studied group and the exporters were 8 (8%).

Of the 80 carvers studied, (61%) forming the majority had been in the profession between 6-10 years. The distribution of the number of years in the profession among the study group for the rest is 0-5 years (22%), 11-15 years (9%), 16-20years (5%) and 20+ years (3%).

The majority of the product carved (60%) is handy-products mostly for export, whilst furniture takes 17.5% of it. Local household utilities, stool and drums constituted 12.5% and 7.5% respectively with other minor uses contributing 2.5% of the products carved (table 13).

**Table 13: Types of product carved**

Product	Handy-products	Household Utilities	Furniture	Stool and Drums	Others	Total
<b>Carvers</b>	48	10	14	6	2	<b>80</b>
<b>Percentage</b>	60%	12.5%	17.5%	7.5%	2.5%	<b>100</b>

For efficiency in their work, types of tools used for the carving by the carvers were also sought for. From table 14, it could be observed that tools used by 60% of the studied group were local made hand tools (*asikuma*: - cutlass, *asino*: - big axe and *soso*: - a long stick where a round gorge is attached) the efficiency rate of which is very low. Also twenty percent of the carvers used modern machinery (i.e. the industrial carvers) for their work and 22.5% using both (group and the industrial carvers).

**Table 14: Tools used for Carving**

<b>Tools</b>	Traditional Tools	Machines	Both	<b>Total</b>
<b>Carvers</b>	48	14	18	<b>80</b>
<b>Percentage</b>	60	17.5	22.5	<b>100</b>

Marketing of the product used to be on the local market but recent development has shifted the attention onto foreign markets. Of the study people, 55% market their product both on the local and international market. Of the 45% who market their product locally, 75% market them in towns and cities.

The majority of the carvers (32.5%) earn between 15-20 million cedis<sup>9</sup> annually, (table 15) with the lowest and highest earners constituting 5% of the study group. The traders who export the product earn four times more than those who sell locally because of the high exchange rate due to the depreciation of the local currency.

**Table 15: Annual earnings of the Carvers**

<b>Earnings (¢)</b>	<b>Carvers</b>	<b>Percentage</b>	<b>Sellers</b>	<b>Percentage</b>
1-10 million	20	25	2	10
10-20 million	26	32.5	4	20
20-30 million	20	25	6	30
30-40 million	10	12.5	5	25
40 million+	4	5	3	15
<b>Total</b>	<b>80</b>	<b>100</b>	<b>20</b>	<b>100</b>

The study tried to find out the sort of assistance that the carvers and sellers were getting from the government. It was reveal that only 30% of them do get support in the form of loans for machinery and marketing of the product. The traders are also given some tax exemptions and they are allowed to keep 30% of the sales in foreign currency.

### **Problems facing the industry**

Even though the industry is growing its plagued with numerous problems. These cut across socio-economic and political spectra.

<sup>9</sup> Cedi is the legally tendered currency of Ghana. Exchange rate to a USD\$ 1: ¢ 8,500.00 (14<sup>th</sup> Nov. 2002)



**Table 16: Problems facing the industry**

Problems	Carvers	Percentage	Sellers	Percentage
Finance	24	30	10	50
Marketing	14	17.5	5	25
Wood /Product Supply	28	35	3	15
Patronage	4	5	2	10
Land for Plantation	10	12.5	-	-
<b>Totals</b>	<b>80</b>	<b>100</b>	<b>20</b>	<b>100</b>

The majority of the carvers (35%) identified wood supply as the major problem facing the industry (table 16). Also the bulk of the sellers (50%) and significant number of the carvers (30%) reckoned finance and marketing 25% and 17.5%, respectively, as a problem. Patronage was not a major problem for the study people but the carvers (12.5%) were of the view that land for plantation has become a problem that the industry is facing.

### **Sustaining the Carving Industry in Ghana**

The views of the study population were sought on how the industry could be improved and sustained for a long period to be in line with the government long-term goal.

The majority (30%) of the carvers and even the sizeable number of the sellers (25%) consider establishment of plantation for the sustenance of the industry (table 17).

Diversification of the used tree species and financial help was also seen by a considerable number of study group 45% and 40% respectively, as a way forward. Furthermore, mechanisation of the industry and collaborative work with the Forestry department was also recommended by 22.5% and 17.5% in that order.

**Table 17: Suggestions for sustenance of carving industry in Ghana**

Suggestion	Carvers	Percentage	Sellers	Percentage
Plantation	24	30	4	25
Mechanisation	10	12.5	2	10
Diversification	20	25	5	20
Collaboration	6	7.5	2	10
Finance	8	10	6	30
All	12	15	4	25
<b>Total</b>	<b>80</b>	<b>100</b>	<b>20</b>	<b>100</b>

## **V: DISCUSSIONS**

In this chapter the findings of the studies are discussed under the following headings.

Characteristics of the Respondent

Species for Carving

The Carving Industry

Problems facing the industry

Suggestion to improve the industry

### **Characteristics of the Respondents**

The majority of the carvers (81%) in the industry were found to be males. This means that carving, by its nature, is seen in the Ghanaian community as profession for the men. On the other hand in terms of selling of the products, it was revealed that majority (60%) are females which also typical of Ghanaian women dominance in buying and selling on the local and international market.

It was realised from the study that most of the people (95%) in the industry are in economically active age group with 34% of the carvers within the early adulthood and the bulk of them in the middle adulthood age group. It was also found from the study that it is the high unemployment rate in the country (20.3%) that has increased the number of the economically active age group in the industry. The World Bank/IMF conditions for releasing funds to implement the economic reforms in the 80s demanded institutional reforms that lead to retrenchment of labour in the formal economic sectors (Baden, 1993). The onus then fell onto the shoulders of the government to revitalise the informal sectors to supplement the formal sectors in job creation. This explains the reason why the active working groups are dominant in the industry.

It is also evident from table 2 that in terms of education most of the people in the industry are not academic achievers. Majority of the carvers (52.5%) are 1<sup>st</sup> Cycle school leavers and 25% in the 2<sup>nd</sup> Cycle are those who did not qualify to enter higher institutions. The rest (22.5%) had no formal education. The dominance of early school leavers and uneducated is a characteristic of the non-formal economic sectors which was, in the past, reserved for the uneducated until recently. The sellers, however, have majority (45%) of them completed 2<sup>nd</sup> Cycle institution and 20% of them being higher school leavers who are mostly

exporters. Majority of sellers are women who did not qualify to enter high institution and thus have taken trade as a profession.

The study also discovered that 70% of the subjects were married with children but only 20% of them have their children learning the profession. Of these 20% most of them fall into the category of carvers who themselves did not have formal education. Most of them preferred “white collar” work (office work) for their children instead of carving and selling of its products. This is a new phenomenon in Ghana with parents encouraging their children to learn more western style of earning living rather than following the traditional uphold professions and values. It could be an explanation to why most of the carvers do not want their children to learn the profession. The 40% who don’t have children are mostly those in the age group 26-35 who have just married or want to improve their standard of living before having children.

### **Tree Species for Wood Carving**

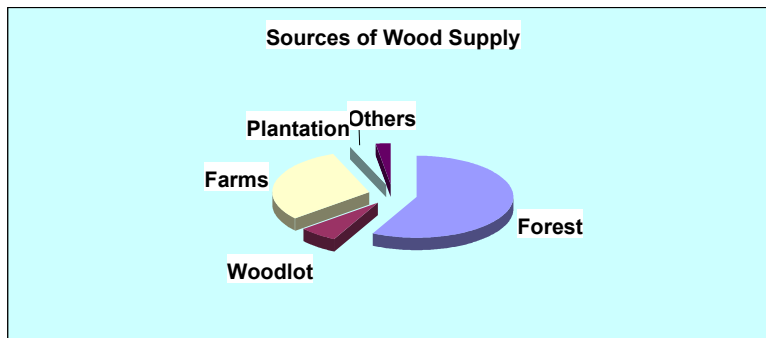
Critical analysis of table 5 indicates that the most of the carvers use more than one tree species for their work. Of the many tree species, the most used ones by the carvers are “Sese” *Holarrhea wiuvsbergii*, (80%) and “Tweneboa” *Cordia millenii* (80%), two species known to have been use for carving for many years. It was also observed that *Cedrela odoranta* and “Sinuro” *Alstonia boonei* are widely used by 60% of the study group. In addition, it was revealed that hardwoods (Mahogany *Khaya ivorensi* and Iroko *Milicia excelsa*) users represent 52.5% and 12.5% respectively. Other carvers (7.5%) also confirmed that they use other less known species other than the well known ones. This was in line with Dei (1990) who acknowledged some of these used tree species for carving as “Odwen” *Baphia nitida*, “Ogyapam” *Canthium hispidium*, “Kwakuobese” *Corapa procera*, “Onyina”, *Ceiba pendradra*, “Bese” *Cola nitida*, “Funtum” *Funtumia elastica* and “Duanan” *Xylopia staudtii*. This means the carvers know of other useful species that could be used for carving but because the preferred ones are available, they do not use them. Until the attention of the carvers is drawn to the fact that the used species are threatened they will continue to exploit it till the last tree is fallen.

It was exposed in the study, as can be seen in the table 6 that the carvers and sellers use some preference criteria to select the species they use. The carvers based their preference for the most used species i.e. “Sese” *Holarrhea wiuvsbergii*, and “Twenedua” *Cordia millenii*,

*Cedrela odoranta* and “Sinuro” *Alstonia boonei* on workability, durability and customers demand. The majority of the carvers (57.5%) were of the view that the preferred species are easy to work with looking at the sort of tools they use. 28% of the carvers also based their preference on the durability of these species. According to them, the species are able to withstand pest and insect attack and unfavourable weather conditions. Customers demand for the carving products was not a major factor to the carvers for species preference, but a majority of the sellers (65%) placed it higher in their preference criteria than durability (35%) and workable. This trend may perhaps be explained by the fact that customer satisfaction is the bedrock for profit oriented business people.

The study established the existence of many traditional and exotic species that could be used as alternatives to the traditionally preferred species. Table 7 identified seven of these species with majority of the carvers (36%) acknowledging Teak (*Tectona grandis*), which is an exotic species, as an unsurpassed alternative. This species, which was introduced into Ghana between 1900-1910 (FAO, UNEP, 1981) has since acclimatized well and has been widely grown in both industrial plantation and small community woodlots. According to the carvers, it has all the characteristics needed from a quality wood useful for carving. Other species identified by the carvers according to their quality for carving were “Danta” (*Nesogordonia papaverifera*) 15%, “Funtum” (*Futimia elastica*) 12%, Mango (*Mangifera indica*) 10%, “Kwakuobese” (*Corapa procera*) 9%, “Duanan” (*Xylopia staudtii*) 9%, “Bese” (*Cola nitida*) 4% and 5% for other minor ones, which are all native species. Most of these species according to the estimates from GHAFOSIM (Alder, 1989) have long resource life years and could be planted and harvested within 20-year period.

The sources of wood supply to the carvers were also established in the studies. Different sources identified are represented in the pie chart in fig. 2. A majority of the carvers (57.5%) get their wood supply from the forest (fig. 2). Trees in farms contributed to 30% of the supplies, and these are trees that are left after the forests have been cleared for agriculture activities. Woodlots established by communities also contributed significantly (6.25%) to the wood supply especially to the rural carvers. Wood supply from plantation made marginal contribution to the volume of wood needed. The study had 2.5% of the carvers who get their supplies from bush lands and the waste of other industry wood users e.g. timber firms.



**Fig. 2: Sources of Wood Supply to Carvers in Ghana (Table 8)**

The dependence on forest for supply of the preferred species is the fears being highlighted by WWF, UNESCO and Royal Botanical Gardens Kew, UK, in their mouthpiece *Plants and People*. This was based upon several years of research work on the use of Mahogany or Muhuhu (*Brachylaena huillensis*) and Ebony or Impigo (*Dalbergia melanoxylon*) from Arabuko- Sokoke forest reserve, Karura Forest and Nyeri/ Abederas for carving. A recent inventory carried out in these forests in Kenya confirmed a declining resource of these used species. What makes the use of the forest more alarming according to CIFOR is that as the species becomes scarce, new forest areas are earmark for harvesting which is a threat to biodiversity and forest degradation.

It could be observed in the table 9 that majority of carvers (72.5%) travel distances, which are not less than 40 km to buy their wood and with some going more than 80 km for supplies. The rest have to travel other distances up to 40 km to get supply. This is as a result of scarcity of the preferred species in their locality due to its depletion. This was not the case previously and to find out what this mean to them, 51 (67%) of the respondents acknowledged the fact that it is an indicator attesting to the decline of the used tree species. Ghana's carving experience seems to follow the path of Kenya's as Obara et al (2002) identified shortages of supplies and increases prices for the preferred species in Kenya lead to an expansion of imports from Tanzania (and possibly as far away as Mozambique) and Uganda (wood originating mostly from the Democratic Republic of Congo). This jeopardizes the industry's future and hence the need for realistic action to salvage the industry and the species as well.

Table 10 is an indicator of wood use efficiency by the carvers. A majority of the carvers (60%) utilised only 1- 25% of felled trees, but 27.5% of them also utilised 25-50% of the felled trees. Also 10% are able to utilise between 50-75%, however, only 2.5% of the carvers

could make use of 75-100% percent of the felled trees. This was attributed to transport costs which makes it difficult for the carvers to convey cut pieces to their workshops and, the use of local primitive tools thus a lot of waste is generated by their operations. CIFOR (2002), acknowledged a common feature of the woodcarving sector, which is the usage of only part of the tree (e.g. stem) for the production of carvings. Also during harvesting, up to 80% may be left behind in the form of the crown, stumps and branches. This waste of raw materials is potentially suitable for the production of small items but is only used when wood becomes scarce. The habit of carvers felling trees and not maximised its use has lead to indiscriminate felling of these used tree species and this trend of waste generation is directly causing the declining of the preferred used tree species.

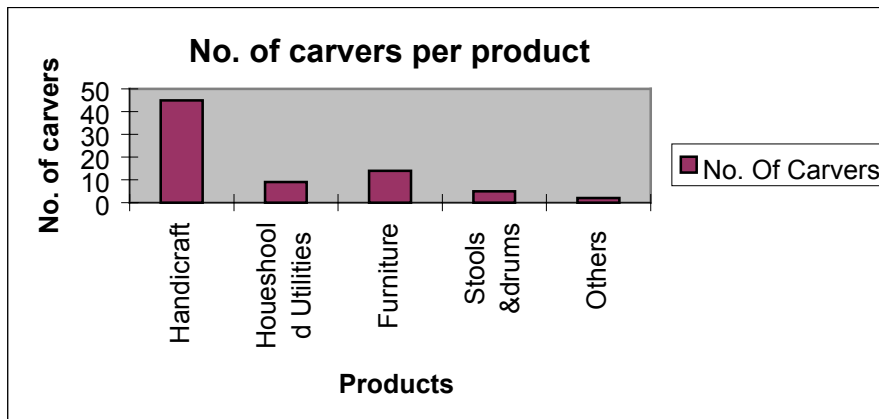
It was discovered that none of the study group had a personal plantation farm. This could be observed on the table 11, and it was found out that there is no motivation to go into plantation. Land tenure has been identified as one of the major considerations in the effective conservation, restoration and management of any land-based eco-system (Biswas, 1987; Blaikie, 1985). This true in the case of Ghana because, land is in the custodian of the whole family, and leasing of land for such long-term investment is not encouraged. Also the youth do not find plantations an attractive investment because of the long recovery years. Furthermore, despite substantial efforts committed towards the establishment of native species plantation, high incidence of insects and disease pest contributed to make the story non-successful. For example operational native monoculture plantations of major economic species such as Iroko, the African mahoganies and other species have been unsuccessful due to the activities of insects e.g. gall-forming *Phytolyma lata*, which were largely unrecognised in the natural forests (Cobbinah, 1996). Besides, the failure of the planters to recognise the important ecological characteristics of the native species selected for plantation has been a major problem to the success of these projects. However, the exotic species plantation e.g. Teak and *Cedrela* has been successful and this is attributed to their escape from specialised pest in their region of origin (East Asia and South America i.e. *Hyblaea puera* and *Dihammus cirvinus* of Teak and the shoot-borer moth *Hypsipyla grandella* of *Cedrela* (ITTO, Newsletter). It was discovered that some of the group carvers have plantations e.g. carvers in Aburi have four acres of teak, and some are negotiating with their community leaders for lease of land to start plantation projects. Looking at the rate of exploitation of the used species and the rate of plantation, it leaves a big question mark on how long these species can last.

## **The Carving Industry**

For efficiency and productivity, the activities of the industry have been divided. There is allocation of labour, which ensures that each worker specialises in one or more functions in the production process. Within the industry, the carvers who do the actual carving of the products constitute more than 50% of the workers (table 12). The sandpapers whose job is to smooth the products and painters of the finished product support their work. The products are then sold either on local or foreign market by the carvers themselves, the local market women or exporters. This division of the labour, according to Adam Smith, improves labour productivity, acquisition of skills and saves time, and this accounts for the growth that the industry is experiencing.

The number of years that the study group has spent in the industry was also investigated. It was found out that the carvers and sellers who have spent 6-10 years in the industry constituted the majority (61%). These years were the early years of the implementation of the ERP/SAP where many workers in the formal sector became redundant. This coupled with the government inability to provide employment for the emerging labour force has created a large pool of unemployed persons who have naturally gravitated to the informal sector (Hormeku, 1998). Even though the situation has improved in recent years, more people are moving to the sector with those who have been in the industry between 0-5 years representing 22%. Only 3% of the study group has been in the industry for 20 years or more. This attests to the fact that the current socio-economic situation of the country is the catalyst that is moving a lot of people into the industry.

It was found in the study that different types of products are carved; most of this portrays traditionally adored symbols and designs for communication. Table 13 reflects some of the types of product carved. From the graph in fig.3, handicrafts are carved more than the other products and constitute 60% of the carved products because the foreign market value was higher than the other products. Considerable amount of furniture, stools, and drums are exported, but the household utilities and other minor products are for local consumption.

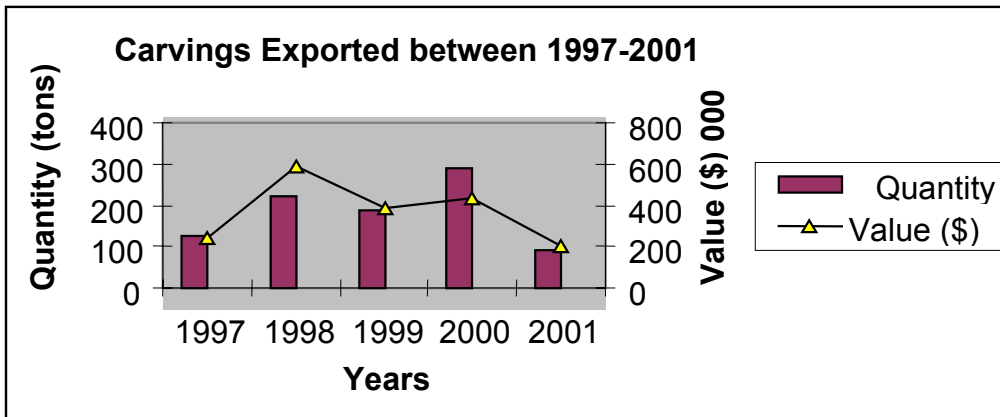


**Fig.3 Types of products carved by carvers in Ghana**

The types of tools used by the carvers were also identified in the studies. From table 14 it is clear that majority of the carvers (60%) work with traditional and primitive tools i.e. cutlass, axe, knives, local made chisels etc. According to them it is difficult to work with these tools and leads to the generation of a lot of waste from the felled tree. Mechanisation was eminent only among the industrial carvers who made up 17.5%, and those who used both traditional tools and machines formed 22.5%. The industry carvers who used mechanisation made more money than the traditional carvers due to the efficient use of resources that ensured high productivity.

It was gathered from the study that in the past the carving products were for the local market, but since the introduction of the SAP/ERP, the foreign market has embraced it and has expanded rapidly. Accordingly, 55% of the studied carvers marketed their product both in local and foreign market through trading partners and also participate in trade fairs (local and international). The remaining 45% sold their products to the sellers in bulk and in pieces to sellers and individual customers respectively in towns and cities. According to the Ghana Export Promotion Council, the number of registered and unregistered exporters of carved handicraft has increased tremendously for the past years and the quantity exported has also increased. As could be seen in the chart in fig 4, the quantity and value of the exported woodcarving products decreased in 2001. This, according to the officials, was a result of increased local market for the carving product, illegal trade and unstable local currency - cedi.



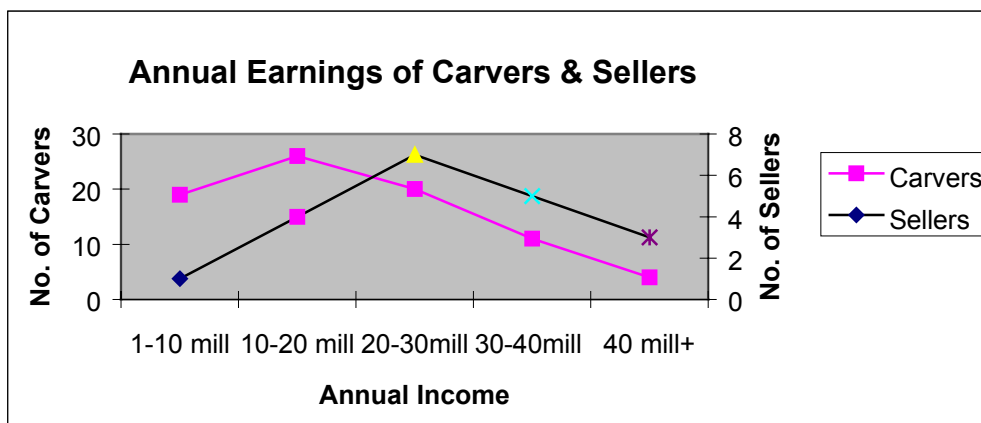


**Fig 4 Exported Carvings in Ghana (1997-2001)**

Other problems (table 16) highlighted by the carvers seem to contribute to the downward trend of exported products that was registered in 2001. Despite this development, the trees felled purposely for carving has not been reduced, but rather the demand for them has skyrocketed.

The study reveals that the earnings of the carvers and sellers have increased immensely. As could be seen in fig.5, the majority of the carvers earn between 1-30 million cedis annually with only few earning between 30-40 million cedis (table 15).

The sellers, however, generally earn between 20-30 million cedis annually. It was also found that most of the carvers who earn more than 30 million cedis are the industrial carvers and the sellers too are those who export the products.



**Fig. 5 Estimated Annual Earnings of Carvers and Sellers in Ghana (¢ 000,000)**

## **Problems facing the industry**

It was manifested in the study that the carvers and sellers face numerous challenges in the industry. Table 16 shows that wood supply is the biggest problem facing most of the carvers and this was a widely held, by 35% of the carvers. This is affecting the quantity of products that can be carved, and hence the supply of carved products to the sellers. This puts Ghana's carving industry in the same category as the Kenya's carvers. The distances that carvers have to travel to get wood supply as we saw in table 9 emphasizes this assertion.

Even though the government has established the Export Finance Company (EFC) to provide financial and non- financial support to producers and exporters of non-traditional products, financial support according to the carvers is difficult to come by due to the demand of collateral securities before the financial institutions grant loan facilities. In addition, since the launch of EPC in 1990, it has been facing financial problems and this has caused the suspension of three important schemes – the export credit guarantee, export insurance, and export refinance (Addo et. al, 2000). For instance, the number of exporters who benefited from EFC disbursement was initially 73 in 1990, and this increased to 283 in 1992, but declined to dismal number of only 5 exporters in 1993 as a result of low budgetary allocation and foreign assistance. It was not surprising that in table 16, 30% of the carvers and 50% of the sellers considered finance as the major problem. This is affecting the expansion of the industry, and hence unemployment and revenue generation from the industry. Due to this, some of the carvers have taken their own initiative to set up credit cooperatives to offer assistance to needy carvers e.g. Aburi Industrial Centre Credit Cooperative.

There was revelation from a substantial number of the carvers that acquiring land for plantation has become a problem, as they seek land for plantation in line with the decline of the used tree species (table 16). In spite of this effort, landowners do not lease their land to those who want to enter into plantation because economically valuable tropical trees tend to have long production periods. Teak (*Tectona grandis*) is one of the fastest growing tree species in Ghana, yet the minimum production period provided by some land owners is 10 years (Owubah, et al 2001). This makes those who have comprehensive rights to their land the only people with a higher probability of establishing forest plantation. This calls for cooperation between the carvers, sellers, landowners, the traditional chiefs who are regents of the land, politicians and support of the government (the Forestry Department) for success in the plantation projects.

Even though the government has liberalised trade thus paving the way for market economy, there are still some bottlenecks within the trade and industry sectors regarding exports, which hold back smooth marketing of the products outside the country. Bureaucracy associated with export transactions, disagreement between politicians on terms of trade, policy formulation and plan implementation is still plaguing marketing of the products. According to Addo et al, (2000) there is the need for GEPC and EFC to engage in more strategic planning from a problem-avoidance perspective instead of continuing with the present comprehensive planning from problem solving perspective.

Patronage however, has not been a major problem since the industry promotion started. The study had only 4% of the study group who were of view that patronage of their products is a problem (table 16), because they have not been participating in fairs and other exhibitions to expose their products to potential customers.

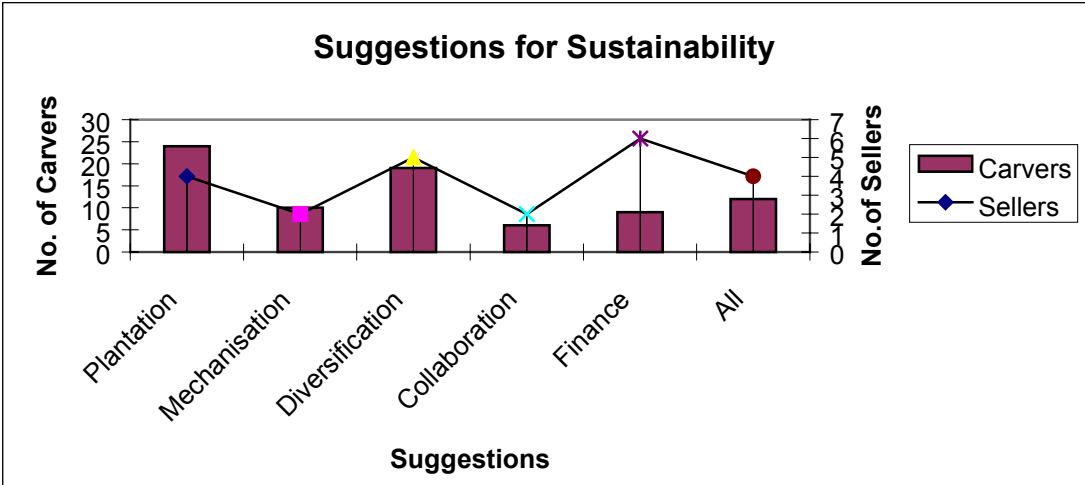
### **Sustaining the carving industry in Ghana**

Finally, the study tried to seek the views of the respondents on the possible ways to sustain the industry and promote it to achieve the short-term set target within the 15 Year Tourism Development Plan. From table 17 and fig.6, it could be seen that the carvers recommended that plantation should be given a priority if the industry is to thrive. The sellers hold similar sentiments, but they were of the view that the channel to all this is financial support to those in the industry.

The carvers have come to the realisation that its time for them to diversify the tree species used to remain in business. As observed in table 7, they have identified some species that are also good and have all the qualities needed to carve quality products. Among these were Teak (*Tectona grandis*), Mango (*Magnifera indica*), “Danta” (*Nesogordonia papaverifera*), “Frumtum” (*Funtumia elastica*), “Kwakuobese” (*Corapa procera*), “Duanan’ (*Xylophia staudtii*) and “Bese” (*Cola nitida*). Some of these species could be planted and harvested within 10-20 year period and are resistance to insects and pest attacks, and also unfavourable weather condition. It is believed that diversifying the used species could relieve the pressure from the preferred used species.

To some of the carvers and the sellers, mechanisation of the industry and collaboration with relevant stakeholders seem to be the approach to the sustenance of the industry.

A number of carvers have already taken to slight mechanisation of the industry, and this was found to promote efficient use of wood as compared to the traditional method. Furthermore, they identified collaboration with the stakeholders in industry as major way forward for the industry leap. The major stakeholders identified were The Forestry Department, The Forest Product Inspectorate Bureau (FPIB), The Forest Research Institute of Ghana (FORIG), and other traditional authorities.



**Fig. 6 Suggestions for sustenance of carving industry in Ghana**

Again finance was not left out in their suggestion for sustenance of the industry and prevention of the decline species to go extinct. Operation of EFC was decried by the carvers and sellers as inefficient, and hence needs restructuring and focus in direction. A majority was of the view that government should encourage private sector participation in the activities of GEPC, and also encourage domestic banks to offer more direct assistance to the Non-Traditional Export Sector (NTES). The assistance should be backed by favourable credit guarantee scheme operated by the Bank of Ghana. They call for fairness and equity in the granting of loans and other financial assistance to the carvers and the sellers.

## VI: CONCLUSIONS AND SUGGESTIONS

The continued growth and economic success of the carving industry has added more pressure to the forest resources, which is being over-exploited due to various economic activities. According to recent forest inventory carried out, the exploitation of the preferred wood species has resulted in these species decline and there is expansion into new harvest areas (ODA). The current growing stocks of most of these indigenous tree species preferred for the production of carving does not allow sustainable extraction rate. The extraction rate of the hard woods for timber export is very high. It is believed that the growing carving industry will exacerbate this extraction rate, thus creating resource supply problem in the future.

Currently, there is no available data on volume of tree species cut a year for carvings in Ghana. However, it is estimated that about 75% of the wood volume come from *Holarrhea wuifsbergii*, *Cordia millenii*, *Cedrela odoranta* and *Khaya ivorensis* species. The preference for these species has contributed to the decline of their stock in the forest, farms and woodlands, where these species are mostly found throughout the southern part of Ghana (Dei, 1990). Even though the total volume of wood use for carving in Ghana is insignificant in comparison with the volume for timber products exported (1,649,000m<sup>3</sup> a year in 1998), and use for fuel (20,678,000m<sup>3</sup> a year in 1998) and other purposes, the carving industry contribution to the declining of tree species is enormous because of species-specific harvesting (State of the World Forest Report, 2001).

### **Where lies the threat?**

Between 1980-1982, the FAO/UNDP Forestry Inventory Team carried out systematic sample of volume increment of all species in some sample Forest Reserves. The result estimated the volume increment of all species at about 2.34m<sup>3</sup>/ha/annum. With Ghana's productive forest area approximate to be 1.18 million ha, annual total volume increment was estimated at 2.77million m<sup>3</sup>. Of this, 1.024 million m<sup>3</sup> was contributed by the 40 currently commercial species of which some used for carvings are included, and a further 0.551million m<sup>3</sup> by the 20 marginally commercial species, also which some carving tree species included. This means estimated total annual growth of currently and potential marketable species to be 1.58 million m<sup>3</sup> (Silviconsult, 1985). The research made an allowance for the growth for losses that may occur due to natural causes, fires and illegal harvesting, thus reducing the annual growth or increment to 1.104 million m<sup>3</sup> for these traded species. This resultant figure 1.1 million m<sup>3</sup> is

frequently cited as the volume of tree species that can be cut, but only few species and diameter classes were represented in the sample trees from which the growth rates, hence permissible annual cut, were derived (Laing, 1994). In 1993 alone 983, 000 m<sup>3</sup> of timber was sold and this figure was exclusive of what was felled for woodcarving and other domestic use. Although there may be uncertainties in their studies, it is well documented that the removal rate far exceeds the estimated safe annual allowable cut. What makes it more threatening is that selective harvesting of the preferred species has a severe impact on forest structure and species composition and renders the populations of these species vulnerable as increasingly smaller and immature trees are being cut. Ironically, the Forestry Department has not been able to break the jinx surrounding their inability to re-stock some of the native used species in their plantation programme.

### **The missing link**

The threat that the declining of the species used for carving poses to biodiversity, forest degradation and forest dependent species in Ghana has never been measured. It was estimated that the resource life of some the tree species use for commercial timber export and carving is less than 20 years for most of the hard woods (Alder, 1989). This was because Iroko (*Milicia excelsa*) for instance, which is under IUCN Red list and close to qualify for “vulnerable” takes more than 200 years to reach commercially valuable size (Hocker, 1979). The growing carving industry has exacerbated the degradation of the forest areas, due to increased demand on wood species. This is generating a situation where rare, forest dependent species on these woods, e.g. the Sokoke Scops owl and mammals such as curious, golden-rumped elephant shrew in Kenya are losing their shelters- hollow logs (CIFOR, 2002). It is also known that the world’s richest bird life is found in the rainforest since birds use the trees, as nesting sites, hence, over extracting will have synergistic affect on the birds. A study on forest elephants in some Ghanaian rainforest posited that selective logging system, as a result of expanding international market for tropical wood uses, have deeply altered forage availability for elephants in commercial forest reserves (Dudley, Mensah Ntiamoah and Kpelle, 1992). These conditions gives a scenario of the negative ecological impact that carving industry can have on the forest resources which are already under pressure, from the timber industries, and other domestic use. The situation is likely to worsen with more people coming into the industry. It was concluded that the carvers never consider the link between the declining of the species they used, and the survival of other species that depend on these used species.

## Progress of planting and stocking of tree species

The natural regeneration system has been found to be inadequate for wood supply, and thus industrial forest plantation is needed to supplement production from the natural forest and to raise productivity of harvestable produce (Laing, 1994). Attempt has been made since 1940s to plant some of the native and exotic species in the forest zones to support the natural growth of the species, but the story has not been all that successful. Based on projections made in the late 1970s on indigenous consumption of timber and industrial demand, it was estimated that 550,000 ha of viable industrial plantation would need to be established within the 50-year period 1980-2030 (Laing, 1994). Almost passing half the 50-year period, little above 1/10<sup>th</sup> of this target has been realised, due to improper policymaking and lack of resources for the establishment.

Currently, there are over 20 species that are planted in Ghana by the Forestry Department. The most successful ones that could be used for carving are Teak (*Tectona grandis*), and *Cedrela odoranta*, which are exotic species and *Khaya ivorensis* (native species). As could be seen from table 6:1<sup>a</sup>, the plantation for Teak and *Cedrela* has been more successful than *Khaya ivorensis* in the five forest regions of Ghana. It could be observed from the table 6.1<sup>b</sup> that of the 49,976.3 hectares of plantation by the Forestry department, teak plantation alone make up about half of it. *Cedrela* plantation has also been successful and *Khaya ivorensis* being the most successful native species planted.

**Table 6:1<sup>a</sup> Plantation of species that could be used for carvings in Ghana**

Species/Regions	Ashanti	Eastern	Western	Central	Brong Ahafo
<i>Tectona</i>	A	B	B	-	A
<i>Cedrela</i>	B	A	B	B	A
<i>Khaya</i>	A	C	C	B	-

Status code:

A=successfully established

B= poor stocking

C= failed

**Table 6.1<sup>b</sup> Area of plantation for successful planted species in Ghana**

Species	Plantation (ha)	Plantation Period
<i>Teak</i>	16,882.9	1942-2000
<i>Teak &amp; others</i>	15,612	1942-2000
<i>Cedrela</i>	4,286	1970-2000
<i>Cedrela &amp; others</i>	3,749.6	1947-2000
<i>Khaya &amp; others</i>	2,419.4	1976-2000
<i>Others</i>	7,026.4	1946-2000
Totals	49,976.3	

Source: Forestry Department of Ghana (Plantation Division)

This puts the two exotic species at the forefront of the search for alternative species. Additionally, a report by the FAO in 1987 on area of total forest plantation in the country quoted 76,460 hectares of plantation for different purposes i.e. timber, protection plantation and woodlots. Of these, teak plantation was 38,560 hectares, which made up of 31,560 hectares for timber production, 4000 hectares for protection plantation and 3000 hectares for woodlots (FAO, 1987). This data could be completely misleading as a measure of successful established plantation as it has often not been possible to carry out needed maintenance and tending, and as a lot of them were damaged during the 1983 fire season. In spite of this teak plantation in Ghana has been the most successful planted tree species. A suggestion is to increase the policymaking and resource allocation for plantation and reforestation of needed species.

### **The socio-economic problems foreseen in a long-term perspective**

#### *Employment*

The current development trend of the industry, which does not commensurate with the regeneration rate of the trees, has a long-term socio-economic implication. Where it could affect most is the unemployment level, which has current rate of 20% (est.2001). The government educational reforms in 1987, which laid more emphasis on skills training and self-employment have seen more school leavers taken carving and other self-employed skills as their profession after graduating from the Junior Secondary School. The number of people employed in the sector has increased more than 100% since the industry was commercialised. The carvers employ workers who are not permanent carvers, on a temporary basis to sand



paper and paint the carved products. The number of shops where handicraft mainly made of wood are sold in Ghana, has rose from a handful at the beginning of the 1980s to over 200 in 2000 throughout the whole country, concurring with tourism boom. It is estimated that the industry employs between 20,000 - 30,000 workers through its chain in Ghana.

A conclusion drawn from this is that with current trend of development, which has seen the industry, been threatened because of increased depletion of the resources, the fate of its continued cushioning the unemployment problem in the country is very uncertain? The carving industry and its indirect or induced economic activities would all dwindle if the situation were not addressed. The long-term perspective also foresees the shops and the exporters in towns winding-up their businesses which will affect over 100 - 150 000 people whose household income depends on the industry. This conclusion additionally supports the need of plantation and reforestation in a longer-term perspective.

#### *Revenue generation*

Even though quantity of carvings exported and income generated in Ghana is less than what countries like Indonesia, India, Kenya and South Africa, it still contributes significantly to the economic development. Indonesia, for instance, exports USD 100 million of carvings a year, and with India exporting over USD 65 million (CIFOR Inforbrief 2002). Revenue generated from the carving industry are tax from the carvers and exporters, 65% foreign exchange retention of all exports and other induced economic sectors. In addition to these, individuals, groups and companies, both local and foreign participating in any organised handicrafts fairs by the Ghana Export Promotion Council and Ghana Handicraft Association have to pay participation and promotional fees. Furthermore, the number of tourists coming into the country to experience the arts and craft of Ghanaian artists has grown in recent years. It is common these days in Accra to see many tourists visiting souvenir shops and stalls that sell carvings, and hardly anyone leaves these shops without a carved material.

Resource depletion, which is likely to change the shape of the industry if the necessary remedy policies are not taken, is going to have an effect on the revenue generation. Then the inflow of tourists into the country will be reduced and hence the 15-year goal of promoting tourism to become the leading export commodity in the country will not be materialised.

### *Disintegration of social way of life*

Carving has been embodied in social way of life of the people of Ghana from the rural folks to those in towns and cities irrespective of their socio-economic level. The expression of these is more predominant in the rural areas than in towns and cities. Nationally, carving product like stools symbolise power, thus the presidential seat of Ghana was carved and all traditional chiefs sit on carved stools. The traditional chiefs symbol of political power and religious authority are the “black stools” and contain the spirit of the ancestors, the stool the chiefs sit on, the palanquin’s they ride in and the linguist’s staff are all carved from woods i.e. Mahogany (*Khaya ivorensis*), “Sese” (*Holarrhea wuifsbergii*) and other species. In every household in the rural areas farming tools, cooking utensils, household decorations to traditional regalia are carved, which signifies their way of life. It was also revealed from personal interviews both in Sweden and UK, that at least one woodcarving product could be found in every Ghanaian household that one visits.

The wood carving industry represents the permanence and continuity of the nation according to Busia (1954) and the declining of these used species and its future extinction could wipe out this unique social way of life of Ghanaians that has been uphold for centuries.

### **The way forward**

The socio-economic benefit that Ghana is enjoying from the growth of the wood carving industry must be balanced with the ecological limits that the preferred species can offer. Currently, the used tree species exploitation is very high due to market demands for carving products both home and abroad meanwhile the stock regeneration rate is very slow. It is in this vein that this study postulates that:

- There should be measures to contain the situation, and stop further decline of the preferred tree species from the forest and other sources e.g. Certifying wood use.
- There is the need for political commitment on the part of the government to make progress and this calls for policies that are capable to restructure the sector and laws to regulate the activities of the carvers in the country.
- In addition, the general public needs to be educated on how their way of life affects the forest and its resources. The carvers, sellers and the customers must be educated on the line of Kenya’s “good wood policy” which is now being accepted by all the

carvers and their customers to avoid the extinction of the traditionally preferred tree species for carving.

- Also, species used should be diversified as it was found that there are both exotic and less known native species that could serve the same purpose as the preferred species but are more sustainable to use than the current preferred species.
- Besides, it is being recommended that the government should encourage private investors to form an integral part of the carving industry development. Private investors going into plantation should be given incentive and all the necessary support in terms of funds, seedlings and tax exemption to encourage the youth to be part of the crusade.
- Furthermore, the custodians of the land must be encouraged to lease land to those who want to go into plantation and also encouraged to establish their own plantation since they have comprehensive rights to the land.
- Finally, the Department of Forestry (the plantation division) should ensure that seedlings that are resistance to pest are provided to potential planters and should be in position to give technical advice to the farmers and carvers who need their directions.

FORIG is currently involved with the implementation of an International Tropical Timber Organisation (ITTO) project, Development of Genetic Resistance in the Tropical Hardwood Iroko to the Damaging Insect Pest: *Phytolyma lata* (PD 3/95). This is a follow up on previous project, Conservation and Provenance Planting and Integrated Pest Management to Sustain Iroko Production in West Africa (PD 75/90). This project and other plantation projects have led to the identification of genotypes that are less susceptible to pest and have considerable promise for the future of afforestation in Ghana. The country is in the process of certifying its wood use and it is believed that the Forest Certification Bill, which is in its final stages and the success of the plantation projects, could change the current trend in wood use. Kenya has certified its woods for carving and has embarked on a broad-based educational approach on its “good wood” policy from the carvers through to the sellers and the tourists which is working well for the industry.

It is accepted fact that the preferred species for wood carving in Ghana are declining in the forest and other sources but is it due to the growth of the carving industry? This needs to be established and this call for further research on contribution of other factors that contribute to the decline of the traditionally preferred tree species for carving.

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## **APPENDIX:**

### **Questionnaire**

#### **(A) Personal Characteristic**

1. Sex:    Male ● Female ●
  
2. Which age group do you belongs?
  - a. 15-25
  - b. 26-35
  - c. 36-45
  - d. 46-55
  
  - e. 55+
  
3. What is your educational level?
  - a. Uneducated
  - b. 1<sup>st</sup> Cycle (primary-middle school/ primary-J.S.S)
  - c. 2<sup>nd</sup> Cycle (secondary/technical/SSS)
  - d. Tertiary (post-sec/poly/university)
  
4. What is your marital status?
  - a. Single
  - b. Married
  - c. Divorced
  
5. Do you have children?  
Yes ● No ●  
If Yes how many are carvers?
  - a. None
  - b. One
  - c. Two
  - d. Three
  - e. Four

#### **(B) Species for Carving**

6. Which type of tree species do you used for carving?
  - a. Sese
  - b. Tweneboa
  - c. Cedar
  - d. Mahogany
  - e. Iroko
  - f. All
  - g. Other (specify).....
  
8. Which are the preferred tree species for carving?
  - a. Sese
  - b. Tweneboa
  - c. Cedar
  - d. Mahogany
  - e. Iroko
  - f. All
  - g. Others

9. Which of the tree species offer the best alternatives?
- Funtumia elastica*
  - Magnifera indica*
  - Cola nitida*
  - Corapa procera*
  - Tectona grandis*
  - Nesogordonia papaverifera*
  - Others (specify)
11. Any reason for not using alternative species?
- Customer preference
  - Carvers preference
  - Durability
  - All
12. Where do you get your supply?
- Farms
  - Forest Concession
  - Woodlots
  - Plantation
  - Other (specify)
13. How long do you have to travel to get your wood supply?
- 0-20 km
  - 21-40-km
  - 41-60km
  - 61-80km
  - 81km+
14. Why do you have to go such distance to get wood supply?
- The type of woods needed is not available here.
  - Is expensive to buy here
  - We have finish the stock here
  - Tree here are small too small to cut
  - Other (specify)
15. What does this mean to you?
- Resources are depleting
  - Overexploitation
  - Industry threatened
  - Affect income
  - Resources are becoming scarce
16. What percentage of the wood cut do you use for carving?
- 0-30%
  - 30-50%
  - 60-80%
  - 80- 100%
17. Do you have to obtain permit before cutting your trees?  
 Yes ● No ●  
 If Yes from who grant the permit?.....  
 If No is there any reason?
- We buy from landowners
  - There are no forest guards



- c. We do not cut from the forest
  - d. We try to avoid them
  - e. Grease their palms (bribe)
18. Are you able to transport the entire felled tree from the forest?  
 Yes ● No ●  
 If Yes what type of transportation?.....  
 If No what happens to the rest?
- a. Sell to charcoal burners
  - b. Left in the forest
  - c. Use as firewood
  - d. Other (specify)
19. Which of the used species can be planted?
- a. Sese
  - b. Mahogany
  - c. Iroko
  - d. Tweneboa
  - e. Cedar
  - f. All
20. Do you have plantation?  
 Yes ● No ●  
 If No how do you see the future of the industry without plantation?  
 If Yes how many acres do you have?
- a. 1-5 acres
  - b. 6-10 acres
  - c. 11-15 acres
  - d. 16-20 acres
  - e. 20+

**(C) Carving Industry**

21. Do you carve?  
 Yes ● No ●  
 If No what do you do?
- a. Sandpapering
  - b. Panting
  - c. Sell product
  - d. Sell food
  - e. Other (specify)
22. How long have you been carving?
- a. 0-5 years
  - b. 6-10years
  - c. 11-15years
  - d. 16-20years
  - e. 20+
23. What type of product do you carve?
- a. Handicrafts
  - b. Household Utilities
  - c. Furniture
  - d. Stool and drums
  - e. Others (please specify)

24. What implement do you use to carve the products?

- a. Local implement
- b. Machines
- c. Both

25. Where do you market your product?

- a. Local
- b. External
- c. Both

If both what is the percentage you export?

26. What is your average annual income?

- a. 1-5 million cedis
- b. 5-10million cedis
- c. 11-15million cedis
- d. 16-20million cedis
- e. 20million+

27. Do you get assistance from the government?

Yes ● No ●

If No why

If Yes what kind of assistance?

- a. Subsidy
- b. Loan /Machinery
- c. Organisation of fairs
- d. Tax exemptions
- e. Other (specify)

#### **(D) Problems**

28. Do you encounter problems in the carving industry?

Yes ● No ●

If Yes what is a major problem?.....

How do you rate the following problems?

- a. Finance ●
- b. Marketability ●
- c. Wood supply ●
- d. Lack of local patronage ●
- e. Land for plantation ●

#### **(E) Recommendation**

29. What do you think can be done to sustain the industry?.....

30. What role do you think the Forestry Department could in this?

31. Is mechanisation answer to efficient use of resources used?.....