THE POTENTIAL FOR GHANA'S WOOD/WOOD PRODUCTS IN THE U.S. MARKET

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Those organizations with interest in wood and wood products include all national and international associations, federal and state government agencies, companies and entities who are involved in sales, trade (imports and exports), marketing, production, processing, regulating and organizing activities which affect and influence market conditions. In this appendix, 87 members are listed.

A number of these organizations retain and collect vital statistics regarding wood and wood products trade, manufacturing, sales, processing and production; among them are the U.S. Department of Agriculture, U.S. Census Bureau, U.S. Department of Commerce/Bureau of Census and the International Hardwood Products Association. Such organizations produce monthly and annual reports that include valuable information for all constituencies who participate in the wood and wood products industry.

Appendix 3: Contact Points in Federal and State Organizations and Universities

For future reference and inquiry, a list of technical points of contact is provided in this appendix. Individuals listed are those who hold positions of responsibility in areas that range from wood/wood products processing, production and marketing to regulation, management and administration.

Appendix 4: Profile of U.S. Firms with Interest in Tropical Hardwood

This appendix presents a profile of major U.S. firms involved in tropical hardwood/wood products. The profile lists: (a) name and address of the firm, (b) telephone and fax number, (c) contact persons, (d) type of business (importer or exporter), (e) species of hardwood imported or exported and (f) types of products imported or exported. A total of 47 firms are included in the profile.

Appendix 5: Ghanaian Firms with Interest in Wood and Wood Products Exportation to the United States

This appendix lists those Ghanaian firms with interest in trade with the United States. Eighteen businesses were contacted and interviewed onsite by the marketing consultant and the Ghanaian local expert; an additional 19 companies were identified by the networking consultant. Information reported includes company's name, address, telephone and fax numbers and name/title of company contact person. All companies listed in this appendix have either expressed interest in exporting wood products to the United States or are doing so already.

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This appendix contains a selected list of Ghana-based hardwood product suppliers to U.S. manufacturers, as well as a corresponding list of U.S. importers/manufacturers.

Appendix 7: European and U.K. Companies Trading in African Wood/Wood Products to the U.S. Market

Trade of wood/wood products from Africa to the U.S. market often involves one or more European agents and/or buyers. Since Europe and the United Kingdom, in particular, have longstanding trade relations with Africa, marketing of African wood products is usually initiated and financed through European intermediaries. Hence, as part of networking and market data collection efforts, a brief list of European and U.K. buyers and agents is provided.

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Appendix 9: U.S. Companies Registered in Ghana with the Timber Export Development Board

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A list of 15 import/export agents for U.S. wood and wood products who are currently in operation is presented here. These agents could play a major role in acting as intermediaries between the United States and African wood products manufacturers.

1. INTRODUCTION

As the world enters a new century, the United States is poised to enter a new era in its economic relationship with Africa. The Lugar-Leahy African Growth and Opportunity Act offers opportunities for a range of trade investment and reform initiatives. Senator Lugar has emphasized that "we must move into an era in which African nations are our trading partners to the benefit of both sides of the Atlantic." In support of the Lugar-Leahy Act, U.S. Deputy Treasury Secretary Lawrence Summers commented that, "the key to unlocking Africa's potential will be helping it to achieve high levels of trade and private investment." In fact, trade and investment are the instruments of choice to bring about economic reform, trade liberalization and promotion, investment liberalization, private-sector development and infrastructure growth in Africa. Under the Partnership for Economic Growth and Opportunity in Africa Initiative, launched by President Clinton at the White House on June 17, 1997, several countries in Africa, including Ghana, seem well positioned to derive significant benefits from this and other trade and investment initiatives.

On the other side of the Atlantic, economists, politicians and various member of the private sector have declared that increased trade and investment between the United States and African countries will be critical to economic growth in sub-Saharan Africa. This was reinforced at the African–African-American Summit held in Zimbabwe during the week of July 21, 1997.

At present, only 1 percent of U.S. trade is with Africa, while slightly less than 1 percent of U.S. direct overseas investment is in Africa. Ghana exports approximately a dozen wood products to several countries around the world, including the United States. These products include air-dried lumber, kiln-dried lumber, sliced veneer, rotary veneer and plywood.

During the first six months of 1997, the value of Ghana's major wood/wood products exports totaled $59.7 million. These products included air- and kiln-dried lumber, sliced veneer, rotary veneer and plywood. About $5.48 million (9 percent) of the total exports went directly to the United States, mostly as air-dried lumber and rotary veneer. These two products were valued at $5,027,000 and constituted 92 percent of Ghana's total export to the United States.

Ghana was one of the ten leading countries exporting veneer, plywood and mahogany lumber to the United States in 1997. Ghana's share of the U.S. market for (a) veneer and plywood sheets, (b) rough mahogany lumber and (c) mahogany lumber not otherwise specified, were 4.91 percent, 3.28 percent, and 20.55 percent, respectively, while the country ranked sixth, fourth, and second, respectively, among the countries of origin for these products.

In exploring the potential of certain subsectors of the Ghanaian economy for expanded trade and investment, the forestry resources subsector shows immediate promise. USAID/Ghana, through its nontraditional export program, recognizes forest products as one of the major agricultural subsectors with potential for export trade. Consequently, this subsector has the potential to play a major role in expanding trade and investment between Ghana and the United States.

The subsector also has linkages with many sectors of production in the Ghanaian economy. Production in the forest industry has both direct and indirect impact on employment and income in other parts of the economy (Kolison and Busby, 1992). Furthermore, the raw materials upon which the sector depends are sustainable, if appropriate, environment-friendly management strategies and policies are followed.

Although the United States is a primary manufacturer and exporter of wood products, most African wood and wood products are considered rare and exotic (and include species of wood not grown in the United States); consequently, there is no conflict in promoting or encouraging increased wood products from Africa to its markets. Expanded trade and investment in African wood products by the United States would not only satisfy specific consumer tastes and preferences but would also increase exposure of African wood products manufacturers to new technologies, thus providing new market opportunities for U.S. makers of forestry and wood processing equipment.

The U.S. market for wood and wood products is growing. According to recent estimates by the U.S. International Trade Commission, U.S. annual imports of wood products such as furniture and components during the early 1990s totaled over $3 billion and is expected to increase further at an estimated annual rate of 3 percent over the next few years. This trend bodes well for exporters in developing countries and could expand market segment shares in doors, flooring, picture frames and kitchenware. Taiwan, for example, accounted for roughly 25 percent of the U.S. furniture and components market in 1990. Although competition is strong from domestic producers and well-established foreign suppliers, other exporters in developing countries can take advantage of growing opportunities by offering suitably priced items that meet appropriate quality, style and material specifications. Regardless of the fact that significant export opportunities exist in the U.S. market, most African exports of logs, processed wood and wood products remain targeted to the European market, particularly Italy, as European demand regarding quality has traditionally been more flexible. Anecdotal evidence suggests also that most African saw millers are either unfamiliar with U.S. product specifications or lack the technology to meet them. However, a trend analysis of exports from Ghana to the United States suggests that Ghana's exports of wood/wood products have been increasing over the last four years.

The Importance and Role of Forests in the Ghanaian Economy

Ghana's long-term development goal is to become one of the community of nations whose standard of living qualifies them as middle-income countries. Ghana's "Vision of 2020" includes two major objectives for the Ghanaian agriculture sector: (1) to ensure that exploitation of renewable land-based natural resources—soil, water, forests, wildlife and fish stocks—becomes and remains sustainable and (2) to promote multiple use and management of land and forest resources, appropriate to each ecological zone and incorporating community participation. Ghana's 1992 constitution established a Natural Resources Commission that oversees use of minerals, forests, wildlife and fisheries; a commission for water resources was created in 1997.

Each commission is responsible for "the regulation and management of the utilization of the resources and the coordination of policies in relation to them."

The nation of Ghana covers an area of 23.9 million hectares and spans two major ecological zones. The high forest zone is confined to the southwestern third of the country, while northern and coastal savannah cover the rest. Within the savannah zone, 1,052,000 hectares are in wildlife reserves. The high forest zone includes 1.76 million hectares that are permanently protected—1.634 million hectares in forest reserves and 126,000 hectares in wildlife reserves. There are 216 forest reserves in the high forest zone, while wildlife reserves include seven national parks, six resource reserves, three wildlife sanctuaries and one strict nature reserve. Ghana also has five coastal wetlands (Ramsar sites) and two national zoos (Ministry of Lands and Forestry, 1995).

In 1948, the Ghanaian government first adopted a forest policy, which was revised and expanded in 1994 to serve principles of sustainable resource management, including the need for soil and water conservation, conservation of biological diversity, and the environment.

The forestry sector is the fourth largest earner in the Ghanian foreign exchange, contributing about 8 percent of the country's gross domestic product and 11 percent of total export earnings. Direct employment by the sector has been estimated at 100,000 persons: approximately 12 percent of the total Ghanian population depends on the forest for their livelihood. Another non-timber resource provided by the forests is tourism, as increasing numbers of tourists visit Ghana in order to enjoy the natural beauty of its woodlands. Finally, the forest supports wildlife, a host of useful and medicinal plants, and numerous rivers, lakes and streams. An inventory of Ghana's national forest lists 680 species of trees, while primary or virgin high forest contains 1,360 species. In the rainforest and savannah, 3,600 plants have been identified. The wealth of Ghana's biodiversity is vast and almost untouched.

It is clear that sustainable management, development and use of Ghana's forests must respond to more than the needs of the timber industry. Medicinal plants, for example, which timber exploitation tends to destroy, possess significant economic value. Specific examples include *Griffonia simplicifolia* (a climbing plant) and *Voacanga africana* (small plants) whose seeds are prized both in Europe and the United States. The prices of these seeds range from $6–12 per kilogram, far above the price of seed of any timber species or cocoa. Traditional ethnobotanical knowledge provides many herbal cures to the Ghanaian population. An international trade in such herbs could lead to the development in Ghana of appropriate technology for screening of hundreds of species and their parts (root, bark, fruit, seeds), as well as the manufacture of medicines. The identification of such plants and accompanying analysis of their chemical constituents could enhance Ghana's non-traditional exports (NTEs). A certain sector of the Ghanian economy already engages in cultivation of these plants; were such activities to increase, they would provide greater incomes and thus make protection of the plants a higher priority.

Objectives

The objectives of this paper are to:

1. examine the long-term availability of certain timber species in Ghana.
2. identify three or four specific wood products in the U.S. market with medium- to long-term potential.
3. identify and evaluate the export marketing and distribution options available to African exporters in this sector.
4. identify and analyze the constraints faced by Ghanaian wood processors in exporting to the U.S. market.
5. recommend strategies to alleviate constraints to export of these products to the U.S. market.
6. identify potential U.S. importers and distributors of African/Ghanaian wood/wood products, as well as Ghanaian exporters.

Methodology

To ensure the broadest possible data and opinion coverage for a comprehensive analysis, this study made a serious attempt to include:

1. analysis of secondary materials on woods and wood products in the United States and Ghana.
2. analysis of U.S. market potential and those areas of greatest importing opportunity.
3. assessment on timber availability, production, processing and marketing of woods and wood products in Ghana (including an investigation of current technological processes in use).
4. site visits and interviews with Ghanaian saw millers, processors and exporters to assess obstacles they face in exporting products to the U.S. market.

The scope of work for the study is presented in Appendix 1.

A team of three—a team leader with overall responsibility for coordination, a marketing specialist and a networking specialist—carried out field assessment and marketing analysis in both the United States and Ghana. A local forest economist also assisted the team assessment and marketing analysis in Ghana. Eighteen manufacturers of wood products and related organizations and several carpenters in Kumasi, Sunyani, Berekum, Takoradi and Accra participated in the study. Fourteen participants were wood products manufacturers (nine of whom constituted 24 percent of Ghana's leading forest products companies and exporters); the remaining five represented either public agencies or private organizations. While in Ghana, the team met with the Executive Committee of the Ghana Timber Manufacturers Organization (GTMO), attended the annual meeting of foresters and talked with several furniture manufacturers.

The team's goal was to develop a networking group of U.S. and Ghanaian private firms interested in forming joint ventures to explore trade and investment opportunities in wood/wood products. The team therefore identified and generated profiles for such firms. Data were collected by (1) accessing scientific databases; (2) surfing the Internet; (3) reviewing published reports; (4) visiting sites in Ghana; (5) visiting selected public and private U.S. organizations

with interest in trade and investment in tropical hardwood; and (6) interviewing resourceful individuals. Most data were gathered through a series of interviews with individuals whose expertise and background are relevant to the study, such as governmental officials, field officers, technical points of contact, scientific scholars in forestry and wood marketing, import and export promoters and marketing personnel. For a list of firms, organizations and individuals contacted, please see Appendices 2–8.

Overview

After the introduction presented in Section 1, Section 2 of the paper discusses the pre-processing and sustainable supply issues that confront the forestry subsector of Ghana. Key issues presented include: (a) forest production; (b) sustainable forestry management; (c) availability of desired species of timber; (d) land and forest tenure issues; (e) forestry ownership; (f) long-term financing and sustainability; (g) green certification and labeling; (h) forest inventory; (i) improved methods of extraction of forest resources; and (j) the long-term supply of timber. Primary constraints to trade and investment, and possible interventions, along with recommended actions, are summarized in this section.

Section 3 assesses the U.S. market for Ghanaian wood/wood products and explores opportunities for exporting primary, secondary and tertiary wood products. Subjects addressed include: (1) the current values, types and specifications of wood/wood products exported from Ghana to the United States and other markets; (2) identification of those wood products possessing medium- to long-term potential in the U.S. market; (3) competition in the U.S. market from domestic and foreign producers; and (4) identification of market sectors that present opportunities for Ghana's wood/wood products.

Section 4 concentrates on trade patterns, marketing practices and options for selling Ghanaian wood products. Discussion covers Ghana's history of trade in wood and wood products, the use of private and public marketing intermediaries, global demand for wood products, capacity of the wood products industry in Ghana, access to U.S. market information by Ghanaian manufacturers, competitiveness of Ghanaian wood products in the United States and the wood-processing technologies used by other developing countries that export products to the United States.

Section 5 analyzes the constraints that Ghana faces in processing and marketing its wood products. Primary issues include problems with costs, policy, infrastructure, technology, credit/investment, access to information, moisture content compliance and trade. This section provides recommendations for overcoming each problem.

Section 6 profiles various public and private organizations with potential interest in trade and investment in tropical hardwoods, as a basis for developing a networking group that includes Ghanaians and Americans.

Finally, Section 7 discusses the opportunities that could be provided by the forestry subsector in enhancing Ghana's economic growth.

2. PRE-PROCESSING AND SUSTAINABLE SUPPLY ISSUES

In order to enhance Ghanaian competitiveness in exporting wood/wood products and increase trade and investment opportunities between Ghana and the United States, several issues concerning the pre-processing of wood/wood products must be addressed. These issues may be headed under: (a) forest production; (b) sustainable forestry management; and (c) availability of certain types of Ghanaian timber.

Forest Production Issues

Tropical timber had become an important commodity by the time the United Nations began to help negotiate commodity agreements between consumers and producers over twenty years ago. The African Timber Organization (ATO) was established to regulate the African timber trade in 1976, and by 1986, both consumer and producer nations had ratified the International Tropical Timber Agreement (ITTA).

Ghana participates in ITTA and ATO meetings and is highly aware of forest production issues. Concerns raised by NGOs regarding environmental biodiversity and sustainability have helped promote sustainable forest management, along with trade in woods from sustainably managed forests. However, sustainable forest management involves making provision for forest regeneration and maintenance—a responsibility ignored by those who follow a policy of "cut and get out." Investment in regeneration can be an expensive undertaking and one that increases timber costs since sustainability regulations limit the number of trees that may be felled per hectare.

The heterogeneity of Ghana's natural forests means that suppliers of tropical timber have few ways to decrease their operating costs. Ghana's forests contain approximately 680 different species of trees that can reach timber size—of these, only 35 species are regularly exported, while one species, *wawa* (also known as *obeche*), supplies 50 percent of this volume. Of enormous importance to the Ghana timber industry, then, is the regeneration of the country's forests.

Ghana's Forestry Department relies primarily on natural regeneration of the forests, which are not state-owned but rather are held by the chiefs and their subjects. Although the department regularly pays silvicultural fees as well as tree royalties, many GTMO members feel that the department has not invested adequately in the forests, particularly their regeneration, either because funds are lacking or because the government remains unaware of the need for prompt regeneration and rehabilitation of exploited forestlands. This situation is not likely to change soon if the government continues to be solely responsible for the regeneration of Ghana's forests. Consequently, members of the GTMO have expressed their concern about low levels of investment and have offered to take up the challenge of rehabilitating some 400,000 hectares of forestland.[1]

[1] Personal communication with GTMO and National Union of Tree Growers' Associations (NUTGA) members during the field study.

Hundreds of farmers and growers have thus formed associations and are now undertaking to rehabilitate plantations of teak, cedrela, wawa and emire, while the National Union of Tree Growers' Associations (NUTGA) has been established to represent their interests. So far, very little direct funding by donor governments has been channeled into tree growing through private entrepreneurs or their associations. Funds that enter the economy are used to finance government institutions rather than forest regeneration, although some external credits help finance the importation of wood extraction and manufacturing equipment.

Sustainable Forestry Management Issues

A growing number of countries agree that materials used in the international wood/wood products trade should be harvested from sustainably managed forests, whether tropical, temperate or boreal. According to the United Nations Environment Program (UNEP, 1996), sustainable forestry development should combine concepts of both economic growth and environmental conservation. The primary sustainable forestry management issues are discussed below:

Land, tree and forest tenure issues

Much logging in Ghana can still be described as "cut and run," according to Friends of the Earth (FOE), who report that donor money has been misused to fund illegal logging (Arbor Vitae, 1997), that chainsaw operators are invading the forests of Ghana and that, consequently, a third of all Ghanaian logs are harvested illegally. This so-called "bush-cut" lumber is sold openly at local timber markets for very low prices, although this is regularly reported in Ghanaian newspapers and causes concern across a wide swathe of Ghanaian society, from environmental NGOs, churches, chiefs and GTMO leadership, to the President of Ghana and his cabinet. At current rates of exploitation, according to the U.K. Forestry Commission, Overseas Consultancy Services, and the Ministry of Lands and Forestry's Development Master Plan 1996–2020, the 12 most popular tree species will be commercially extinct by the year 2006. For the last two years, the President of Ghana has indicated in his sessional address that his nation may have to import timber.

The primary principle of sustainable forest management requires that land be set aside exclusively for forestry purposes. In Ghana, the land has traditionally been owned collectively, with common control, management and use. Absolute ownership of land is vested in the chief (called the "stool" for his throne) or community leaders in trust for the community as a whole. The basis of land acquisition within a community, therefore, is through settlement, occupation and use by individual family members.

While this tradition exists in most West African states as well, some countries, like Nigeria and Côte d'Ivoire, have brought most of their lands under state control. In Ghana, however, the creation of forest reserves as part of the nation's permanent forest estate does not change the ownership status of the land. In colonial times, Ghanaian chiefs would grant timber rights to a licensee, and this would be confirmed by the government and the courts.

In 1962, the government passed the Concessions Act, which vested all trees in the President's office, to hold in trust for the landowners. Since then, however, politicians have abused this trust by allocating tracts of forests to their supporters. For example, timber rights were leased from the Minister, with the Minister on behalf of government acting in trust for the chief. It is thus the public officials of the Lands Department and Forestry Department who exercise control over timber resources rather than the true owners. Unfortunately, in cases such as these where communally owned resources become "nationalized," a certain degree of alienation tends to develop, and citizens do not show interest in the protection of resources.

The Ghanaian constitution of 1992 states that "all stool lands in Ghana shall vest in the appropriate stool on behalf of, and in trust for, the subjects of the stool in accordance with customary law and united states." However, the draft Timber Rights Bill retains sections of the 1962 Act that vest trees in the state. The draft Bill exhibits undue dislike for leaseholders who claim ownership of a lease or concession: "It has been decided that, instead of granting timber leases to the users of the production forests, the rights to harvest and utilize timber would be awarded in the form of a timber utilization contract. The resource user will no longer 'own' a lease or concession but will enter into a contract with Government to utilize and manage the timber resource." The bill has not yet entered Parliament for debate. The above tenure issue may have profound consequences on the investment and management of Ghana's forest resources.

Forest ownership, long-term financing and sustainability

The Ministry of Lands and Forestry's Development Master Plan 1996–2020, along with statements by Ministry staff and other statutory agencies, reflect the fact that forestry in West Africa has been dominated by the philosophy of "single ownership, single manager and single seller"—which is anti-competitive and inhibits effective development of resources. This doctrine seems increasingly outdated when compared to other areas where plural ownership of forestlands has proved highly successful for the forestry sector, as well as consistent with current commercialization trends (UNEP and CIFOR, 1997).

According to the Master Plan 1996–2020, private entities consist of the landowners (stools, skins and communities) on whose behalf the government manages forest and wildlife resources. The sector's performance has been declining since the 1970s, due to socioeconomic exploitation and inadequate monitoring and enforcement of resource allocation. The Plan, however, proposes that the government undertake plantation development by inviting bids from qualified contractors. Payments to contractors would be made from grant funds; after three years, successfully established plantations would then be divested to interested parties, who would be financed by mortgages through a special sector loan.

However, the president of the GTMO pointed out during the annual general meeting in July 1997 that it is not the business of government to invest in forestry to feed the industry. "The State has privatized cocoa, oil palm, coffee and cassava plantations. The Workers Brigade and the State Farms are no more. Even under the Water Resources Commission Act 522, water rights are to be privatized. There is therefore no justification for the Ministry of Lands and Forestry to advocate for the use of grant funds to set up plantations and later on carry out a divestiture exercise."

If investment in sustainable forest development and management is therefore to be undertaken by the private sector, then certain conditions should prevail. Sustainability applies to more than just timber production and utilization, which means that the proposed timber rights bill has obvious shortcomings. The timber utilization contracts limit: (a) duration (expected to be 40 years); (b) comprehensiveness (contract limits licensee to the use of one specific attribute of the land, i.e., timber); and (c) transferability and divisibility (not allowed; therefore the holder cannot reallocate resources to uses and users as circumstances change). These limitations on users' rights restrict the ability of their holders to invest, manage and utilize resources to best advantage for themselves and for society as a whole. The structure of rights envisaged in the draft bill is biased against environmental resources such as wildlife and water. The timber rights holder has no right to these resources and is thus not encouraged to develop and market them.

Two concerns that have so far been noted are: (a) the weak incentives for silvicultural improvement investment by concession holders and (b) the difficulty of balancing non-commercial values against timber benefits. Both issues raise questions about the fundamental structure of forest property rights. Holders of forest concessions/agreements/contracts/licenses on stool lands typically decline silvicultural opportunities because their rights do not provide sufficient assurance that any benefits will accrue to them. This contrasts with the situation of freeholders, who can expect to enjoy any benefits that may accrue, know how long they will enjoy them, and know the extent to which they must share economic gains with the stools. Moreover, notwithstanding the apparent security afforded by the long terms (20–40 years) and provisions for renewal and utilization contracts, concession-holders perceive their rights as being insecure, since political interventions might obliterate returns on silvicultural efforts.

Clearly, if private enterprises are to be effective stewards of stool forests, their rights must be strengthened so that the perceived financial advantage is more consistent with the public interest in forest enhancement. Timber licenses and leases provide the desired exclusiveness, but on all the other criteria, they fall short. These combined shortcomings cause the holders to balk at long-term investments to enhance forest productivity.

Most fundamental is the underlying quality and security of the property rights. The security afforded by even long-term management/utilization contracts is inadequate to induce licensees to voluntarily invest in silviculture in their concession area. Property law suggests a variety of legal arrangements capable of providing grater security and hence stronger interest in resource enhancement than a timber utilization contract or the existing lease/license. For example, even with the stool or the state retaining ownership of the land, it is possible to create a separate proprietary interest in the land's forest production that has the quality of a fee simple interest. By providing legal security comparable to that of private ownership, such arrangements would go a long way toward ensuring comparable incentives for sustainable forest management. And, with careful attention to their design, these arrangements can incorporate all the other characteristics of property rights that promote efficient management and use of resources.

Green certification and labeling

The team's visits to several organizations, including producers, the GTMO secretariat, the Forestry Commission, the Forestry Department, the Forest Products Inspection Bureau, the Wood Industry Training Center, and the Timber Export Development Board, revealed that certification has been a subject of interest for some time. Politicians, professional institutions and the industry have discussed it, and the desirability of having Ghana's Forest certified is gaining rapid acceptance. Contacts with UK, German, Dutch and Swiss buyers have made exporters aware of buyers' moves such as the "1995 club" formed by the World Wildlife Fund; the Dutch government's threat to ban importation of tropical timber; the Swiss government's law requiring tropical wood products to be labeled; and the actions of environmental NGOs such as Greenpeace and Friends of the Earth. One company, Intex Limited (owned by a German group), reported that some German local councils have passed legislation banning the use of tropical wood in the execution of official building projects. Several exporters have been approached by buyers prepared to pay certifiers should forest auditing and chain-of-custody of wood and wood products take place.

The GTMO is fully aware of ITTO's Target 2000, which states that the year 2000 will usher in an era of sourcing wood from only sustainably managed forests. The organization is therefore urging the Forestry Department to ready itself for forest management audit by qualified certifiers. The department has been issuing certificates of sustainability at the request of various importers, but, due to neutrality questions, some environmental NGOs are demanding independent third-party certification. Unfortunately, efforts by producers and buyers to conduct independent audits have been discouraged by the Forestry Department, and no certificates have yet been issued by a third party.

Ghana has been involved in a number of initiatives, including:

- The African Timber Organization's (ATO) Green Label, aimed at establishing criteria and indicators to buttress certification of forests and labeling of wood products of member countries.
- The Forest Stewardship Council (FSC) Country assessment, as well as Ghana's participation in the Founding Assembly in Toronto in 1993.
- The World Wildlife Fund–European Union workshop in Kumasi in June 1996 on the theme, "Forest Certification and Other Market-Based Instruments in Ghana" and a regional workshop in November 1996 in Accra on certification.
- Public consultation on environmental impact assessment of proposed natural resource management project, held at Kumasi in September 1997.

Currently, a National Technical Committee on Certification operates under the chairmanship of the technical director of the Ministry. The Ghanaian government is awaiting donor funds to continue with the establishment of a secretariat at the Ministry to handle the process. While the timber industry is aware of the need for good forest management and the potential role of certification as a tool for it, the prominent role of government as the manager of the forests, as well as its involvement in the certification process, dictates that industry wait for the government

to act. However, the GTMO is under pressure from the market to meet the 2000 target and therefore plans to sponsor workshops and various committees to expedite action. By doing so, the GTMO intends to establish an industry-wide initiative.

Accessibility to national forestry inventory report

The first national forestry inventory was begun in 1985, completed in 1993 and covered forest reserves in the high forest zone, providing data for use in forest management planning. Also inventoried regularly are the 600 one-hectare permanent sample plots (PSP) located in the high forest zone. The PSP program was initiated in 1969, revisited in 1988 and is re-inventoried every five years (Forestry Department, 1995). Results of these studies, financed by the government of the United Kingdom, have not yet been published in full as an official document.

While the Forestry Department is not legally required to publish its inventories, the Forestry Commission has the power to request the Department to officially publish inventory results and make them freely accessible, particularly to district assemblies, landowners and the timber industry. In other countries, this kind of information is made public knowledge. For example, in the United States, the Forest and Rangeland Renewable Resources Planning Act of 1974 ([RPS], P. L. 93 - 378, 88 Stat. 4765 as amended) requires that inventories be conducted and published at 10-year intervals, with five-year updates. Forest resource growth, harvests and land use conversions can change inventories and significantly influence the future performance of resources. Therefore, periodic surveys provide information needed to assess the current status and performance of resources and to estimate their future condition (USDA Forest Service, 1993).

Based on the results of the Ghana inventory studies, certain recommendations have been made that will affect the future availability of Ghanaian timber. Interpretation of the inventory by various consultants (the U.K. Forestry Commission, for example) has served as a basis for some policies that may have to be reviewed, especially a policy restricting annual allowable cuts to 1 million m^3. This recommendation implies that the size of the milling industry, which is estimated at 2 million m^3, should be reduced. However, demands on the forest are clearly increasing, while sustainable forest management recommendations are reducing fellings—both of which ultimately lead to higher prices for wood products. It is the market that determines patterns of change in the exploitation of wood and wood products. The interaction of market forces creates opportunities and challenges for the private sector in managing the forest resource for timber production.

Improved methods of extraction of resources from the forest

Based on the volume of wood harvested in Ghana, it is estimated that about 40 percent is left as logging residues—materials removed from growing stock in the harvesting process and left at the harvest site. Although these residues are currently considered uneconomical to remove and are left in the woods, they may become a source of raw material in the future as products, prices of raw materials or the economics of manufacture change.

The USDA's Forest Service estimates that Ghanaian logging residues total 10–18 percent, which contrasts with the Ghanaian government's estimate of 40 percent. The interpretation of the inventory does not take into consideration the interplay of demand and supply forces as a result of reduction of the cut. Therefore, the 40 percent logging residue as a potential source of supply has been overlooked. Also overlooked is the large volume of various species of wood known variously as "lesser-used," or "lesser-known," which are rarely removed from the forests.

Finally, the use of very high diameter limits in estimating the volume of wood available to the industry may call for revision. Data from other West African countries indicate that Ghana's limits are unjustifiably high (UNEP and CIFOR, 1996). See Table 1(a). The Ghanaian government's anxiety that Ghana may have to import wood appears less justifiable, if appropriate extraction management strategies are developed and implemented.

Table 1(a). Felling diameter limits in four West African countries

Species	Minimum Felling Diameter (cm)			
	Cameroon	**Ghana**	**Côte d'Ivoire**	**Liberia**
Khaya grandifolia	80	110	60	100
Khaya anthotheca	80	110	60	70
Khaya ivorensis	80	110	60	—
Pericopsis elata	100	110	50	—
Triplochiton scleroxylan	80	110	60	90
Lophira alata	60	70	60	80
Mansonia altissima	80	70	60	80
Guarea cedrata	80	70	60	80
Guarea thompsoni	80	70	—	80
Lovoa trichilioides	80	70	60	70
Afzelia bipindensis	80	—	—	—
Afzelia africana	80	70	60	70
Afzelia pachyloba	80	—	—	—
Diospyros crassiflora	50	—	—	—
Terminalia ivorensis	60	70	60	70
Terminalia superba	60	70	60	70
Milicia excelsa	100	110	60	80
Entandrophragma candollei	80	110	60	90
Entandrophragma utile	80	110	60	100
Entandrophragma angolense	80	110	60	90

Species	Minimum Felling Diameter (cm)			
	Cameroon	Ghana	Côte d'Ivoire	Liberia
Entandrophragma congoense	80	—	—	—
Entandrophragma cylindricum	100	110	60	90
Nesogordonia papaverifera	50	70	50	60
Teighamella africana	60	—	—	—
Teighamella heckelli	—	110	60	100
Aningeria spp.	60	110	50	—
Turraeanthus africana	60	70	60	80
Mitragyna cilata	60	70	—	80
Guibourtia ehic	60	70	60	60
Sterculia rhinopetaka	60	70	—	—
Distemonanthus benthamianus	60	70	60	—
Canarium schweinfurtii	60	70	60	80
Antiaris africana/toxicaria	60	70	60	60
Nauclea diderrichii	60	110	60	—
Piptadeniastrum africanum	60	90	60	80
Ceiba pentadra	60	110	60	90
Celtis zenkeri	60	70	60	—
Alstonia boonei	60	110	60	70
Daniella ogea	60	90	60	70
Albizi fetruginea	60	70	60	—
Pycnanthus angolensis	60	70	60	70

Species	Minimum Felling Diameter (cm)			
	Cameroon	Ghana	Côte d'Ivoire	Liberia
Pterygota macrocarpa	60	110	60	60
Amphimas pterocarpoides	—	60	70	—
Mammea africana	60	70	60	—
Bombax brevicuspe	—	70	60	—
Heritiera utilis	—	70	50	60
Antrocaryon micraster	—	50	—	—
Brachystegia leonensis	—	—	—	90

Improved wood utilization technology, combined with increasing real prices for wood, always results in substantially improved efficiency in using wood. Much less material is left in the forest, while sawmills will produce twice as much usable lumber and other products per log input. Most importantly, when the Forest Products Inspection Bureau (FPIB) is no longer the agency determining what grades and products can be put on the export markets, the yields from the mills will rise.

More efficient engineering standards and designs can reduce the volume used per square meter of space in a building. For example, instead of specifying floor and window frames at 2 inches by 6 inches, these frames can be specified at 2 inches by 4 inches—a reduction of 33 percent. Another measure is using kiln drying and preservative treatments to substantially extend the service life of wood. Both of these measures can reduce the area (volume) of annual cut by thousands of hectares.

To heighten the efficiency with which wood products are utilized in the field, at the mill, and in end-product applications, tree royalties per m^3 should be charged not on logs removed, but on total volume of wood in the tree. This could help reduce logging residues.

Timber trends studies: A planning tool

For long-term planning purposes, Ghana could benefit from several U.S. practices. The U.S. Forest Service has had a long-standing policy of periodically reviewing the U.S. timber supply, demand for timber, and future of the industry in the United States. Section 9 of the McSweeney-McNary Forest Research Act of 1928 directs the Secretary of Agriculture to cooperate with states and agencies "in making and keeping current comprehensive survey of the present and prospective requirements for timber and other forest products in the United States, and of timber supplies, including a determination of the present and potential production of forest land therein,

and of such other facts as may be necessary in the determination of ways and means to balance the timber budget of the United States. . ..”

In 1983, the U.S. Forest Service published a document titled *An Analysis of the Timber Situation in the United States, 1952–2030* (Forest Resources Report No. 23). The study describes a number of economic and management alternatives; foreign sources of timber; foreign markets for U.S. products; projection of future demands for timber in the United States, and indications of market potentials under a range of economic and price assumptions. Projections of timber supplies point to prospective and potential availability of wood products with alternative levels of forest management and utilization and alternative price trends. These projections of timber demands and supply potentials from domestic and foreign sources are compared in order to identify prospective developments of timber prices, potential supply problems in the wood products industries, and potential impact of changes in forestry policies and programs.

Availability of Certain Ghanaian Species of Timber

The National Forest Inventory has revealed that Ghana’s forests contain more than 680 species that grow to timber size. A volume of 102 million cubic meters (m) is estimated for trees 70 centimeters (cm) in diameter and bigger. Given the annual allowable cut established by the Forestry Department of 1 million m, and assuming that new tree growth will be offset by losses through disease and natural death, Ghana possesses enough standing trees to last more than 100 years. Over the medium term, rare and exotic species suitable for the manufacture of high-value products will be available for harvesting. However, long-term supply will require continuous investment in forest regeneration activities such as seed production through the use of tissue culture, improved tools, increased human capital (technical skills and management), and infrastructure, such as roads, bridges and vehicles.

Ghana’s supplies of valuable traditional woods are becoming more limited. A study conducted by the International Institute for Environment and Development (IIED, 1995) estimated that supplies of the most valuable red woods—awiemfosaminam, edinam, kokote, sapele, utile, black hyedua, mahogany, odum, kusia and emire—will drop by half within five years.

Candollei, Afromosia and makore woods may have already reached commercial extinction. Fortunately for Ghana, the large industrial markets have become more interested in light-color woods, which are abundant in the country. (From January–July 1997, wawa [a white wood in plentiful supply] lumber exports totaled 91,935 m^3, or 5 percent of total exports [AMEX International, Inc., 1995].) Also, newer technology finishes are best used over a light underlay that will not show through or darken the final surface. Many of Ghana’s white woods, such as wawa and ceiba, are excellent with these new surface finishes. Because supplies of light-colored hardwoods, such as maple and birch, are becoming limited in the United States, the U.S. market is likely to be more interested in white woods from Ghana than it has been in the traditional red woods.

Resource and production potential

The following information about on-reserve forests is from the Forest Inventory and Management Project (FIMP) paper, "Timber Yields from the Forest Reserves of Ghana" (March 1995).[2]

Area of Forest Reserves	Hectares
Timber production area	762,400
Permanent protection	352,500
Convalescence	122,000
Conversion	127,200
Not inventoried (conversion)	270,000
Total reserve area	1,634,100

Source: Forestry Department/FIMP (1995).

Permanent protection areas in Ghana consist largely of hill sanctuaries but also include swamp sanctuaries, shelterbelts, special biological protection areas, intact forest sanctuaries, provenance and fire protection areas. Of these areas, 69 percent is inaccessible for logging (except at very high cost) and 16 percent is degraded; only 15 percent (protected because of its genetic diversity) is well stocked, accessible and therefore represents timber foregone. The convalescence areas are those with reduced stocking but considered capable of rehabilitation within one felling cycle. Conversion areas require planting, and the FIMP paper places non-inventoried areas into this category.

Taking into account the need to retain seed trees, protect individuals of particularly rare species, limit the sizes of gaps that are created, protect stream banks and steep slopes and protect small patches of good forest in otherwise degraded areas (known as "fine-grained protection" as opposed to the "large-grained protection" afforded through the delineation of permanent protection areas), 762,000 hectares of land are thus available for timber production. Annual yields from these areas were calculated using the interim yield formula and are as follows.

[2] Taken from *Policy Recommendations for Sustainable Management of the Forest Resources in Ghana* by the Forestry Commission Overseas Consultancy Service, 1995.

Annual sustainable yield from reserves

Type of Wood Species*	Stems	Volume (m^3)
Scarlet	5,460	115,900
Red	15,300	208,700
Promotable pink	38,660	358,500
Total	**59,420**	**683,100**

Source: Forestry Department/FIMP, 1995.

* Note: *Scarlet* species are those species under imminent threat of economic extinction. *Red* species are those for which current rates of exploitation present a significant danger of economic extinction. *Pink* species are those species that are significantly exploited but not enough to cause concern for their economic future. *Promotable pink* species are those species considered suitable for increased exploitation on grounds of their ecology, abundance and economic potential. (Other pink species are of lesser potential because of their low numbers or because their ecology makes them unsuitable for exploitation.)

In summary, there exist in Ghana just over 760,000 hectares of on-reserve forest suitable for timber exploitation. A sustainable level of production from reserves of the 32 scarlet and red species currently favored by the industry would be no more than 0.3 million m^3 per year of promotable pink species, assuming that not all available trees are harvested. Thus, the total on-reserve harvest could be 0.5 million m^3 per year.

Information about off-reserve forest areas is sparse; Ghana's forest policy states that there are 400,000 hectares of off-reserve forest remaining in the country, but the International Institute for Environment and Development (IIED, 1993) suggests the area may be less. It seems likely that the actual area of off-reserve forest is likely to range between 300,000 and 400,000 hectares, and it is now recognized that most of the off-reserve harvest comes from farmland. In addition to this, there are 50,000 hectares of plantation, including large numbers of smallholdings, which typically produce teak. At present, these apparently yield some 50,000 m^3 per year, which is expected to increase when clear felling begins in about 10 years time. Based on these data, it can be concluded that sustainable harvest levels total roughly 1.0 million m^3, broken down thus:

Estimate of sustainable level of annual harvest	**Million m^3**
On-reserve plantation	0.5
Off-reserve plantation	0.5
TOTAL	**1.0**

While the on-reserve data are soundly based, off-reserve volumes are only approximate and may well be overestimated. These figures do not include species presently considered of minimal economic potential.

Proposed Interventions

Ghana's last several decades of poor forest management have led to deforestation without replanting, which has turned much of unfarmed land into brush that can contribute little to future forestry revenues. Sustaining timber exports requires substantial efforts to manage forests more effectively, replant degraded areas, market available species and improve efficiency of wood processing industries to reduce wastage in domestic processing.

One possible intervention is to improve farmer incentives to enhance forest production and marketing. Current arrangements for timber resource management in Ghana (including trees on agricultural land) leave farmers, chiefs and district assemblies with little authority and revenue from the forests. As an incentive for farmers, chiefs and others with usufructuary rights to land, a program could be established for agro-forestry that would include planting, owning and managing trees for timber on all non-reserve land.

Ghanaian reforestation has also been hindered by a lack of adequate silvicultural information on all tree species currently being harvested. An intervention here would be the establishment of a research program providing more information on silviculture, particularly for the indigenous species, as needed.

Recommendations

1. Much of Ghana's legacy of poor forest management can be traced to inappropriate policies that did not establish a basis for people to own land and manage trees and other resources over the long term. To improve forest management, it is recommended that the Ghanaian government establish policies allowing that trees raised for timber or fuel on individual holdings be considered crops, so that farmers can plant, manage, own and harvest them in the same way that farmers manage other tree and annual crops (MOFA, 1997).
2. USAID should encourage and assist collaboration between GTMO and Ghana's Ministry of Lands and Forestry to establish principles and criteria for good forest management and the implementation of a certification scheme.
3. Private Ghanaian companies employing professional foresters and social scientists should be encouraged to work towards being registered as certifiers.
4. USAID/Ghana, the Ghanaian government and the private sector should support collaborative research between U.S. and Ghanaian scientists in the area of tropical silviculture and reforestation.
5. For the purposes of long-term planning, it is recommended that the Ministry of Lands and Forestry adopt a law similar to the McSweeney-McNary Forest Research Act of 1928 that could yield benefits such as a detailed study of local demand and production of wood

products (particularly by small-scale carpenters who constitute a critical component of local supply) and the true state of the forest resources and wood manufacturing industry.

6. It is also recommended that the Forestry Commission collaborate with the Forestry Department to officially publish the *National Forestry Inventory Report* and make it accessible to both public and private entities.

3. POTENTIAL FOR GHANA'S WOODS/WOOD PRODUCTS EXPORTS TO THE UNITED STATES

Primary and Secondary Products

Ghana exports about a dozen wood products to several countries around the world, including the United States. These products include air-dried lumber, kiln-dried lumber, sliced veneer, rotary veneer, plywood, moldings and furniture parts (FPIB, 1996). The various timber species used in manufacturing these products are listed in Table 1(b).

Table 1(b). High-value species used to manufacture selected products

Product	Species (trade names)
Lumber	odum, wawa, mahogany, ofram, koto
Sliced veneers	asanfona, mahogany, makore, sapele, koto
Rotary veneer	ceiba, otie, ogea, koto
Plywood	ceiba

Table 2 lists the wood products and their volumes exported during 1990–1997. It is clear that exports of kiln-dried lumber, sliced veneer, rotary veneer, moldings and plywood substantially increased during 1992–1996. Based on these data, it is anticipated that these trends will continue through 1997.

Table 2. Volume (in cubic meters) of major wood products exported from Ghana during 1990–1997

Product	Jan–June 1997	1996	1995	1994	1993	1992	1991	1990
Lumber (air-dried)	73,658	140,297	194,068	188,624	188,896	82,456	146,320	200,517*
Lumber (kiln-dried)	55,205	84,919	80,464	60,217	35,017	28,972	14,934	—
Lumber (over land)	4623	13,387	11573	9670	15279	21025	21390	—
Sliced veneer	14137	27882	27486	20858	15544	15726	13034	13032
Rotary veneer	14997	25524	18429	14181	9580	7903	6325	4308
Moldings	5392	9609	7476	4509	3023	3574	1950	1936
Furniture parts	1339	1472	2874	2450	2668	1981	1984	2754
Curls	68	166	565	955	873	640	472	458
Dowels	444	1227	798	756	—	—	—	—
Plywood	13826	18888	3600	964	2408	1502	1370	1801
Layors	288	337	291	399	527	259	88	
Profiles	162	178	270	835	429	642	473	500
Flooring	1666	3413	4892	5493	2776	2136	1134	960

*** Aggregated**

Source: FPIB.

The growth in rotary veneers for export to the United States is a recent phenomenon. U.S. imports increased dramatically from 1,030 cubic meters in 1993 to 12,554 cubic meters in 1996—a jump of 1,118 percent. This increase is unlikely to be sustained, however, because rotary veneers are used as raw material for the production of plywood, which is in great demand domestically as well as in other Economic Community of Western African States (ECOWAS) countries and in Europe. Because of the huge demand for plywood, many companies that produce rotary veneers for export are now installing facilities for gluing pressing veneers into plywood for added value, and about 90 percent of rotary veneer production goes into locally produced plywood. It is expected that the rotary veneers export market will decline but that the plywood export market will increase steadily in the future.

Approximately 80 percent of all rotary veneer imported into the United States is manufactured from ceiba, a species also available in Brazil. Table 3 displays the volumes of rotary veneer exported from Ghana to the United States and other countries from 1990 to mid-1997. Other major importers were Italy, Egypt and Germany.

Table 3. Ghana's rotary veneer exports (in cubic meters) to selected countries for selected years

Destination/ Importer	Jan–June 1997	1996	1995	1994	1993	1992	1991	1990
United States	8,579	12,554	7,150	3,863	1,030	—	—	—
United Kingdom	—	15	59	119	54	7	20	1,862
Germany	1,292	2,056	2,826	4,873	3,096	2,858	2,085	853
France	758	2,045	3,164	2,628	3,510	3,652	3,276	1,458
Belgium	31	535	1,830	753	790	25	—	15
Egypt	1,286	1,975	1,027	—	—	228	—	—
Italy	2,296	4,975	751	251	226	126	—	—

Source: FPIB.

During the first six months of 1997, the value of Ghana's major wood/wood products exports, which included air- and kiln-dried lumber, sliced veneer, rotary veneer and plywood, totaled $59.7 million.[3] About $5.48 million (9 percent) of these exports went directly to the United States. Of these, the primary types of wood product imports were air-dried lumber (see Table 4) and rotary veneer (see Table 8). These two products were valued at $5,027,076 and constituted 92 percent of Ghana's total export to the United States. No plywood and minimal levels of sliced veneer and kiln-dried lumber were exported to the United States (Tables 5, 6 and 7).

Saudi Arabia, Germany, Italy, Holland and Ireland are the five major importers of Ghana's air-dried lumber (by volume). In terms of value, Saudi Arabia, Ireland, Holland, Germany and the United States are the major leading importers, respectively (see Table 4). The United States imports mainly mahogany and a small volume of teak, Hong Kong primarily teak for flooring and Germany mainly wawa.

Table 4. Air-dried lumber exported from Ghana during January–June 1997

Destination	Volume (in cubic meters)	F.O.B.[4] price per cubic meter	Value
United States	5,303	$473.63	$2,511,680
Ireland	6,636	$480.35	$3,187,625
Italy	8,171	$272.34	$2,225,299
Germany	9,364	$273.07	$2,556,994
Saudi Arabia	12,175	$322.22	$3,923,032
United Kingdom	4,932	$396.13	$1,953,732
Holland	7,133	$428.05	$3,053,300
Hong Kong	1,840	$580.20	$1,067,560
France	3,998	$303.56	$1,213,648
Portugal	2,039	$324.72	$662,107
Spain	4,177	$307.74	$1,285,445

[3] Compiled from Tables 4–8.

4 "F.O.B." means "free on board," and it signifies that the seller is responsible for placing the goods, in appropriate packaging, on the ship or airplane for shipment. The buyer is then responsible for obtaining insurance, moving the goods to the United States, clearing U.S. Customs (and paying the duty), and arranging for the inland shipment to the final destination.

Destination	Volume (in cubic meters)	F.O.B.[4] price per cubic meter	Value
Belgium	1,410	$284.65	$401,354
Yugoslavia	2,372	$314.69	$746,442
Tunisia	1,188	$235.90	$280,255
Total	**70,738**	**$4997.25**	**$25,068,473**

Source: FPIB.

According to Table 5, the major importing countries (by volume) of Ghana's kiln-dried lumber include France, Germany, the United Kingdom and Hong Kong. The United States imports primarily mahogany, Hong Kong mainly wawa and Ireland mainly odum. The F.O.B. prices per m^3 in Tables 4 and 5 are influenced by the species and grade of the product and therefore do not represent the average price for all dried lumber. When buying sliced veneer, Italy is the major market for Ghana, followed by Germany, the United Kingdom and France, while the U.S. market is insignificant (see Table 6). The major markets for Ghana's plywood are Germany, the United Kingdom and Belgium. The United States did not import plywood directly from Ghana in 1997 (see Table 7).

Table 5. Kiln-dried lumber exported from Ghana during January–June 1997

Destination	Volume (in cubic meters)	F.O.B. price (per cubic meter)	Value
United States	918	$472.85	$434,073
France	9,814	$298.57	$2,930,160
Germany	9,216	$327.50	$3,018,248
Hong Kong	7,159	$270.49	$1,936,407
United Kingdom	7,242	$325.57	$2,357,789
Taiwan	4,798	$92.81	$445,301
Italy	1,705	$358.75	$611,668
Japan	1,435	$459.72	$659,694
Holland	1,488	$400.05	$595,270

Destination	Volume (in cubic meters)	F.O.B. price (per cubic meter)	Value
South Africa	3,029	$303.57	$919,527
Ireland	2,526	$540.93	$1,366,400
Total	**49,330**	**$4,176.38**	**$15,274,537**

Source: FPIB.

Table 6. Sliced veneer exported from Ghana during January–June 1997

Destination	Quantity (in square meters)	F.O.B. Price (per square meter)	Value
United States	45,497	$0.58	$26,388
Italy	9,897,832	$0.47	$4,670,962
France	1,718,355	$0.72	$1,288,655
UK	2,222,543	$0.50	$1,111,675
Germany	2,902,207	$0.45	$1,301,816
Greece	1,169,070	$0.46	$538,241
Spain	1,842,894	$0.55	$1,006,691
Holland	1,101,061	$0.53	$585,241
Belgium	967,924	$0.56	$538,535
Singapore	170,820	$0.70	$119,909
Total	**22,101,203**	**$5.52**	**$11,188,681**

Source: FPIB.

Table 7. Plywood exported from Ghana during January–June 1997

Destination	Volume (in square meters)	F.O.B. Price (per square meter)	Value (in US$)
United States	0	$0	$0
Germany	3,328	$389.5	$1,296,370
United Kingdom	3,236	$381.7	$1,235,475
Belgium	2,730	$348.9	$952,523
Israel	592	$456.7	$270,371
Niger	2,002	$238.5	$477,507
Total	**11,888**	**$1,815.3**	**$4,232,246**

Source: FPIB.

Table 8. Rotary veneers exported from Ghana during January–June 1997

Destination	Volume (in cubic meters)	F.O.B. Price (per cubic meter)	Value
United States	8,579	$293.20	$2,515,396
Italy	2,296	$215.91	$495,740
France	758	$325.18	$246,488
Egypt	1,286	$204.77	$263,330
Germany	1,292	$299.99	$387,586
Total	**14,211**	**$1,339.05**	**$3,908,540**

Source: FPIB.

Analysis of U.S. Department of Commerce (USDC) and Forest Products Inspection Bureau (FPIB) 1991–1996 data indicates that the three major wood products exported to the United States from Ghana were rotary veneer, rough mahogany lumber and mahogany (unspecified) lumber. Despite the increase in local demand for rotary veneers, accompanied by competition

from Brazil, it is likely that the U.S. market could be sustained and even increased should a partnership or joint venture be developed.

Products With Medium- to Long-Term Potential in the U.S. Market

Most of Ghana's wood product exports are rough-sawn lumber, rotary, veneer and sliced veneer. A review of several advertisements in *Imports/Export Wood Purchasing News* illustrates the U.S. demand for tropical hardwoods, many of which are found in Ghana. The most commonly advertised tree species are sapele, afromosia, mahogany, iroko and teak.

Ghanaian tertiary woods/wood products with medium- and long-term potential for expanded use in the U.S. market include carved doors, door and window frames, flooring and decking materials, and semi-finished furniture and furniture components. Sliced mahogany veneers are now being exported from Ghana directly to the United States, although the companies involved are German, and it likely that much of the mahogany veneer shipped to Europe ends up in the United States. According to the ITTO January–March *Tropical Timber Market Report*, mahogany veneer is used on particleboard in the manufacture of dining tables, bed headboard, and bedroom dressers, while it is also used in making office furniture.

It is clear that, before they reach their ultimate markets, rotary veneers and rough-sawn lumber imported from Ghana by U.S. buyers must undergo further processing by U.S. industry. The potential increase in use of these Ghanaian wood products by the United States is therefore heavily influenced by the ultimate product markets and the ability of Ghanaian firms to satisfy those markets.

Current Competition in the U.S. Market

Imports of rare and exotic species of timber into the United States do not present serious competition for U.S. domestic producers for several reasons: a) exotic woods cannot be grown or produced locally; b) most of these species are expensive and cannot substitute for cheaper domestic woods; and c) timber production on federal lands—a major source of affordable timber in the United States—has declined considerably since the late 1980s. Timber harvested from federal lands in the Pacific Northwest, for example, declined from 26 million cm in 1988 to 7 million cm in 1992 and led to the closure of many mills in the region. This reduced supply of raw material, along with additional reductions of timber sales on other federal lands, has significantly affected the domestic supply of raw material for the wood products industry. Industry professionals expect imports from Canada and other countries to compensate for loss in domestic production (USDC, 1994).

According to the American Hardwood Export Council (AHEC), 43 percent of U.S. timber growing stock is hardwood. Of 200 million hectares of timber land, 126 million hectares is hardwood. The United States is a big importer of wood and wood products, and exporting accounts for only a small part of total U.S. industry. Ghana, on the other hand, exports the bulk of the lumber it produces. Its rotary veneer goes mainly into plywood production, and the bulk of this plywood is sold either locally or in ECOWAS countries. Some volume of rotary veneers is

exported to the United States, primarily for plywood core. The U.S. market for mahogany lumber products and mahogany sliced veneers (used in covering particleboard) is a niche market for foreign producers.

Table 9 lists the top ten countries exporting these products to the United States. The competition faced by Ghanaian manufacturers in the U.S. market from other foreign suppliers was assessed using market share information and comparing the per-unit prices of the products in the United States by country of origin. Also listed in this table are the volumes exported to the United States by each country and the market share each country holds. Using the data on volume and values in Table 9, the unit prices for the products in the United States were derived using the formula: *unit price = (1/total volume) x (CIF), where CIF is the cost of the produce insurance and freight*. It should be noted that the unit price takes into consideration the cost of shipping or freight (see Table 10).

Based on these data, in 1996, Ghana was among the ten leading countries exporting veneer, plywood and mahogany lumber to the United States. Ghana's share of the U.S. market for (1) veneer and plywood sheet, (2) rough mahogany lumber, and (3) mahogany lumber, not otherwise specified, were 4.91, 3.28, and 20.55 percent, respectively. Also, for these products, Ghana ranked sixth, fourth, and second, respectively, among the countries of origin for the products. The average unit price in the United States for imported veneer and plywood sheet was $1.48 per square meter. Unit prices for rough mahogany wood sawn lengthwise and the mahogany wood (nesoi) sawn lengthwise were $618.43 and $599.23 per cubic meter, respectively.

The unit prices for the nonconifers veneer and plywood sheet, the rough mahogany wood sawn lengthwise, and the mahogany (nesoi) wood sawn lengthwise originating from Ghana were $1.09, $481.77, and $498.05 per cubic meter, respectively. Upon comparing the unit prices for Ghanaian products to the prices for products originating from other sources, the former were found to be lower. To demonstrate, the unit prices for the veneer and plywood sheet, the rough mahogany wood sawn lengthwise, and the mahogany (nesoi) wood sawn lengthwise originating from Ghana were below the average unit prices for all sources by 26, 22, and 17 percent, respectively. Assuming that quality is constant among all sources, Ghanaian manufacturers have a safe margin in which they can increase their prices without pricing themselves out of the U.S. market. Unfortunately, export prices of timber in Ghana are determined by the FPIB and do not necessarily reflect production cost or current market conditions.

Table 9. Top exporters of selected tropical wood products to the United States in 1996

Product/Commodity Code	Country	Volume	Value (in US$)	Share of Total Import
Nonconifers veneer and plywood sheets/ nesoi/440890080	Brazil	28,736,160	$22,692,127	34.70
	Canada	5,159,206	$6,583,009	10.07
	Germany	1,372,660	$4,825,727	7.38
	Ivory Coast	4,918,743	$4,508,688	6.89
	Italy	991,250	$3,897,073	5.95
	Ghana	2,957,127	$3,210,082	4.91
	Fiji	4,258,380	$2,514,137	3.84
	Paraguay	3,313,779	$2,340,701	3.58
	Congo Brazzaville	2,644,352	$2,250,758	3.44
	Chile	2,275,949	$1,862,011	2.84
	Other	6,080,999	$10,711,962	16.38
Rough mahogany wood sawn lengthwise/ 4407240025	Bolivia	41,037	$31,298,423	46.14
	Brazil	28,059	$9,853,527	29.27
	Peru	10,775	$8,182,488	12.06
	Ghana	4,619	$2,225,282	3.28
	Guatemala	2,325	$1,501,517	2.21
	Nicaragua	2,449	$1,422,734	2.11

	Mexico	1,738	$1,129,295	1.66
	Ivory Coast	1,308	$613,603	0.90
	Belize	1,425	$544,545	0.80
	United Kingdom	300	$217,747	0.32
	Other	1,316	$833,274	1.22
Mahogany wood sawn lengthwise nesoi/ 4407240030	Brazil	4,566	$3,268,267	31.00
	Ghana	4,354	$2,168,502	20.55
	Indonesia	1,873	$1,048,970	9.94
	Bolivia	1,294	$1,027,572	9.74
	Nicaragua	1,476	$840,060	7.96
	Chile	6,388	$444,811	4.21
	Mexico	954	$430,484	4.08
	Peru	413	$333,789	3.6
	Guatemala	474	$287,500	2.72
	Philippines	266	$286,911	2.72
	Other	943	$415,071	3.93

Sources: U.S. Department of Commerce and the International Hardwood Importers Association.

Table 10. The per-unit value of selected tropical wood products imported into the United States

Product/Commodity Code	Country	Value (in US$)
Nonconifers veneer and plywood sheets/nesoi/ 440890080	Brazil	0.79
	Canada	1.28
	Germany	3.52
	Ivory Coast	0.92
	Italy	3.93
	Ghana	1.09
	Fiji	0.59
	Paraguay	0.71
	Congo Brazzaville	0.85
	Chile	0.82
	Other	1.76
	Average	**1.48**
Rough mahogany wood sawn lengthwise/4407240025	Bolivia	762.69
	Brazil	707.56
	Peru	759.40
	Ghana	481.77
	Guatemala	645.81

	Nicaragua	585.44
	Mexico	649.77
	Ivory Coast	469.12
	Belize	382.12
	United Kingdom	725.82
	Other	633.19
	Average	**618.43**
Mahogany wood sawn lengthwise/ nesoi/ 4407240030	Brazil	715.78
	Ghana	98.05
	Indonesia	560.05
	Bolivia	794.11
	Nicaragua	569.15
	Chile	69.63
	Mexico	451.24
	Peru	808.21
	Guatemala	606.54
	Philippines	1,078.61
	Other	440.16
	Average	**599.23**

Identification of Market Segment Niches

Market share analysis of Ghana's tropical hardwood exports reveals that they occupy a significant share of the U.S. market and are competitive (see Table 9). However, two of these products are mahogany-based, which has attracted controversy between government and the private sector on how to interpret regulations regarding supply and sustainability. Mahogany lumber, hardwood veneer and plywood appear therefore to be the wood products market segment that Ghanaian firms should target for the greatest opportunity and value.

Plywood from tropical hardwood has been the primary wood product imported and consumed by the United States (Smith et al., 1995). In 1993, for example, the United States imported or consumed $533 million worth of tropical hardwood products, with plywood from tropical hardwood accounting for 76.9 percent ($412 million) of total consumption. Researchers also estimate that 90 percent of the total volume of this plywood originated in Southeast Asia, while the remaining 10 percent was produced in South America and Africa. During field visits to Ghana, it was found that more than 60 percent of the rotary veneer exported from Ghana was for the U.S. market. If the 1993–1997 growth trend continues (see Table 3), this will be a major opportunity for trade between Ghana and the United States.

Based on Ghana's export data, the United States accounted for about 44 percent ($33,348) of wood marquetry, inlaid wood and wood cases exported by Ghana during the first quarter of 1996. The United States also accounted for 39 percent ($48,236) of other wood products exported by Ghanaians during this same period (*Ghana Export Bulletin*, January–March, 1996). The significance of these particular products is that they are produced by small businesses. Although the current number of exports cannot compete in value with veneer sheets and other lumber products, they represent an opportunity for small- and medium-sized wood products businesses in the secondary and tertiary wood processing subsectors.

Based on the timber resources of the forests, Ghana is in a position to process timber for the following products:

Lumber products—Principal high-value uses might include: (a) interior joinery, especially doors, stairs, furniture; (b) flooring; (c) transport industry uses (e.g., railroad ties); (d) construction uses (e.g., marine works); and (e) carved doors. Tropical timbers are generally used in these areas because they possess the specific attributes required by the end user, namely, natural durability, aesthetic qualities, and good machining properties.

Plywood—Potential uses include: (a) interior joinery and shopfitting; (b) furniture; (c) caravans and freight containers; (d) doors; and (e) special or specialized construction uses. Generally, tropical plywoods are preferred in these areas because of their high strength-to-weight ratio, decorative qualities, and lower price when compared with temperate hardwood plywood.

Sliced veneers—Sliced veneers, produced from logs as well as curls, are used in furniture and panel overlaying, since their primary qualities are decorative. "Rare and exotic" species from

Ghana that can be used include mahogany sepele, edinam, makore, hyedus, mansonia, asanfora, emire and koto.

The two major obstacles that prevent Ghana from taking advantage of these opportunities are:

1. Inadequate information about the U.S. market.
2. Out-of-date processing technologies.

Small-scale enterprises in Ghana already produce these items, but these firms lack the equipment, quality control and organized cooperative effort that would allow them to export to the United States. Larger Ghanaian companies must also update their technology, quality control and knowledge of U.S. specifications, and their strategies for entering the U.S. market. One solution is the creation of joint ventures that provide access to markets, access to designs and specifications, and shared knowledge between U.S. companies and their Ghanaian counterparts.

Tertiary (Value-Added) Wood Products

The furniture market

The U.S. market for wooden furniture is the world's largest and offers attractive possibilities for Ghanaian producers of both furniture and wood products. While imports of hardwood residential furniture and parts to the United States are increasing rapidly, it is Taiwan and, increasingly, mainland China who are the major suppliers. Ghana is not yet a significant player in this lucrative market. The shipment values for the major sectors of the U.S. wood furniture market for 1993 are shown below.

The U.S. Wooden Furniture Market in 1993 (US$ million)

Wood Products	Shipment Values
Wooden household furniture, excluding kitchen cabinets	$8,400.1
Wooden kitchen cabinets	$5,183.5
Upholstered wooden household furniture	$6,216.4
Wooden TV and radio cabinets	$446.4
Wooden office furniture	$2,088.6
Wooden partitions and fixtures	$3,241.1
Total:	**$25,576.1**

Source: USDC Bureau of Census Annual Survey of Manufacturers, Value of Shipments for Product Classes. Economic and Statistics Administration, Washington, DC, 1993.

Wooden household furniture is the largest sector of the U.S. furniture and fixture industry, with shipments valued at US$8.4 billion in 1993 and RU$8.0 billion in 1992. The sector is highly fragmented, with thousands of manufacturers, none of whom dominates the market. The small, single-plant operations that are typical of this sector purchase most of their solid wood materials from lumber wholesalers, brokers, or, increasingly, component manufacturers.

The principal categories of wooden household furniture and shipment values for 1992, along with changes in those values since 1987, are presented below.

Wooden Household Furniture Value of Shipments in 1992 (US$ millions) and Changes in Those Values Since 1987 (percent)

Wooden Household Furniture Products	1992 Value	Percent Change
Wooden living room, library, family room and den furniture	1,620.8	8
Wooden dining room and kitchen furniture, excluding wooden kitchen cabinets	1,587.6	7
Wooden kitchen cabinets	4,763.7	13
Wooden bedroom furniture	2,478.3	9
Infants' and children's wooden furniture	316.2	16
Wooden outdoor furniture, unpainted and ready to assembly (RTA) furniture	1,082.2	34
Wooden household furniture, no specified kind	891.2	(21)
Total wooden household furniture:	**7,976.4**	**7**

Source: USDC Bureau of Census, *Annual Survey of Manufacturers, Value of Shipments for Product Classes*, Economy and Statistics Administration, Washington, DC, 1993.

Although wooden kitchen cabinets showed the highest volume of shipments, it was wooden outdoor furniture, unpainted and ready to assemble (RTA) furniture that showed the greatest increase in consumer interest during the five-year period. The RTA furniture market represents high-quality products, and the use of wood veneer and hardwood lumber is associated with this better quality.

Some individual product groups within this sector performed spectacularly during 1987–1992. Rocking chair sales jumped by 179 percent; other dining room and kitchen furniture, including junior dining sets, increased by 100 percent; RTA wooden furniture, unpainted or finished, sold in kits up 89 percent; and conventional waterbed sales went up 87 percent.

Kitchen cabinets are a large market for hardwood lumber. An estimated one million m^3 of hardwood lumber was used to construct kitchen cabinets in 1991, making it roughly equal to the hardwood flooring, millwork, railroad sleeper and timber segments combined (AMEX International, Inc., 1995). Market demand for kitchen cabinets is closely tied to the new housing, remodeling, and repair markets, and wood is the material of choice for 80 percent of all kitchen and bathroom cabinets. Currently, imports possess relatively little advantage in the U.S. cabinet industry because U.S. firms have achieved significant advances in technology, lower distribution costs and shorter times. However, a rise in the popularity of RTA cabinets may encourage competition from overseas, as RTA products can significantly lower shipping costs.

Upholstered wooden household furniture is one of the biggest-selling areas in this sector. While this sector saw strongest growth in rocking chairs, including swivel rockers at 87 percent, sofas, davenports, settees and loveseats represent the second fastest-growing category at 31 percent. The physical properties most valued in this furniture are nail holding ability and structural strength. Yellow poplar and red alder have traditionally been the preferred species in North America for these items—this market could be a good opportunity for lesser-known Ghanaian woods having similar properties.

Wood office furniture consists mainly of desks, chairs and storage units. Furniture for use with computers and associated equipment is a category that is growing rapidly with the explosive increase in the use of computers. This is an important specialized market category, production for which is highly automated and very competitive.

The market sectors likely to be of greatest interest to Ghanaian manufacturers are wooden household furniture, kitchen cabinets and upholstered wooden furniture (AMEX International, Inc., 1995). Among furniture manufacturers in a 1990 survey, the availability of raw materials was the third most often mentioned "greatest concern," behind the economy and the availability of skilled labor. It is likely that this concern will grow in importance in coming years. Although annual hardwood harvest levels in the United States remain far below annual growth levels, and large tracts of hardwood forests are becoming mature, economic and societal barriers limit their availability, and many mills find it difficult to get enough lumber.

Hardwood Dimension Stock and Furniture Parts

There is a large U.S. market for blocks of wood cut to specific sizes, intended for further processing by the buyer. Such pieces made from hardwood lumber are called "dimension stock" and are used in a wide range of products, such as broom and tool handles, toys, golf club heads, kitchen utensils, and so on. Stock intended for furniture are typically called "furniture parts." These pieces may be rough-sawn blocks of wood, semi-finished parts, or completely finished parts ready for assembly by the buyer.

As in wooden furniture, the strong preference in dimension stock is for domestic hardwoods, particularly oak. However, many woods are associated with specific uses—for example, hickory is preferred for tool handles and baseball bats, while maple is the wood of choice for cutting blocks and other kitchen utensils. Furniture parts, of course, must be similar to the woods used in

wooden furniture. In 1992, these woods were represented in the following proportions: red oak, 32 percent; white oak, 18 percent; yellow poplar, 10 percent; beech, 2 percent; mahogany (lauan), 2 percent; and the remaining hardwoods (including most imports), 14 percent (Smith et al., 1995). Despite the furniture industry's significant share of tropical hardwood product consumption, however, this share represented a relatively insignificant portion of the furniture industry's total usage by volume. During 1989–1992, an average of only 1.2 percent of all hardwood lumber used by the furniture industry was of tropical origin.

Most manufacturers of furniture and other wood products buy wood as shop lumber and process it themselves. Small- and medium-size shops are more likely to obtain their dimension stock and furniture parts through wholesalers who order for them from several suppliers, whereas high-volume users, such as large-door manufacturers, usually have purchasing departments that order directly from the dimension and part producers. Large-scale furniture and cabinet companies buy directly from suppliers on large, continuing orders. Increasingly, they tend to purchase finished parts, or part assemblies, and merely assemble their furniture in distribution centers located in or near large metropolitan areas. Importers/wholesale companies that sell parts and stock to users typically bring imported dimension stock and furniture parts into the United States. Large-volume users may have purchasing departments staffed to import their needs directly from overseas suppliers.

Imports of wooden furniture parts (9402907000) into the United States increased by 36 percent from US$132,143,103 in 1990 to US$179,05,424 in 1994 (USDC Bureau of Census, 1995). Canada was the leading supplier, followed by Taiwan, Mexico, Germany, mainland China, Malaysia, Italy, Indonesia and more than 27 other countries. No furniture parts were imported from Ghana during this four-year period—Nigeria was the only African representative, exporting to the United States furniture parts worth US$33,325 in 1991 and US$15,000 in 1993 (USDC Bureau of Census, 1995).

Wooden Doors

Wooden doors were a US$2.8 billion business in the United States in 1993. Two thirds of sales were residential doors, and the remaining third were "other," which includes garage doors, screen and storm doors, louvered and bi-fold doors (mostly for closets and storage spaces), sliding and swinging patio doors, and so on. There are three types of residential doors: panel; flush with hollow cores; and flush with solid cores. Panel doors are constructed using several pieces of wood that have been doweled and glued together with inset panels or glazed openings. The two pieces along each side are called "stiles": together with the pieces forming the top and bottom of the door, or "rails," they are the most difficult to construct.

Flush doors with hollow cores are the most common doors for interior use in homes and offices. Flush doors with solid cores are also used for exterior entrances and for interior openings, where they can provide an effective barrier to the spread of fire. Originally, the solid cores consisted of solid wood residues laminated together. Because of the labor involved in the laminating, these were gradually replaced by low-density fiberboard, where applications permit. Decorative

molding or “plantons” are often attached to the face of flush doors with solid cores to add interest to their appearance.

A garage door is necessary on almost every new single-family home built today. This has created a market for almost one million doors per year. Most garages today use a door 240 x 488.32 cm in thickness, which may be flush or panel in construction. Construction of the door sections is similar to those for residential use.

Most doors are made from conifer woods, but some buyers prefer hardwoods. In 1992, Douglas fir and western pines were used in 78 percent of all panel doors shipped. Other species used include other conifers, such as spruce and fir, as well as hardwoods. Eighty-two percent of flush doors had hardwood faces.

Doors come in two grades—paint grade and stain grade. Many of the doors sold with hardwood faces are actually lauan and are intended to be painted, which creates a less expensive product. Customers will pay more for stain grade doors, because they want to stain them and enjoy the beauty of the wood. Stained doors are expected to match stained door and window frames, moldings and other trim in the house. Oak is the hardwood preferred for stained doors in the United States.

As with other items of wooden furniture, the market for wooden doors is perhaps more ideal in Europe than it is in the United States, since the wood used in panel doors and on the faces of flush doors is more compatible with the furnishing, trim, and door/window frames in Europe. However, there will always be a strong U.S. market for high-quality, hand-carved panel doors, where volumes might be low but the value added quite high. Paint-grade doors of Ghanaian white wood are very price competitive, but thin profit margins would not carry the high shipping costs from Ghana (AMEX International, Inc., 1995).

Table 11 lists the value of doors, their frames and thresholds of wood (C.I.F. value basis) imported into the United States in 1994.

Table 11. The value of doors, their frames and thresholds of wood (C.I.F. value basis) imported into the United States in 1994

Country	Value in US$	Percent
Canada	49,069	30
Mexico	19,070	12
Malaysia	18,605	12
Brazil	18,161	11
Indonesia	10,540	7
Chile	9,702	7
Costa Rica	8,028	5
Republic of South Africa	5,822	4
Philippines	4,887	3
Taiwan	4,519	3
Other countries	12,778	8
Total:	**161,181**	**100**

Source: USDA Bureau of Census, U.S. Imports of Merchandise: General Imports Report, IM145, 1994.

The top five countries listed above supply 72 percent of all imported doors to the United States, with Canada alone accounting for 30 percent. The Republic of South Africa was the only African country shipping a relatively significant number of doors to the United States in 1994. Many countries supply small quantities of doors to the United States each year—together, they make up only eight percent.

Hardwood Flooring

Flooring in the United States is chiefly constructed from hardwoods, such as oak and maple, and the harder softwood species, such as Douglas fir, western larch and southern pine. In 1992, hardwood flooring shipments of US$656.5 million comprised 98 percent of the wooden flooring market, compared to a meager US$12.2 million, or two percent, for softwood flooring (USDC Bureau of Census, 1994).

Wooden flooring has faced growing competition in recent years from other residential floor coverings. Carpeting, ceramic tile and various plastic surfaces have gained widespread acceptance. These materials are applied directly over a particle board underlay, completely eliminating wooden flooring. Yet the value of shipments of hardwood flooring in the United States increased by 311 percent during 1977–1992. U.S. homeowners still like hardwood flooring, preferring oak to any other species. Oak accounts for over 80 percent of all hardwood flooring, as shown below.

Hardwoods Used in Flooring in the United States in 1992.

Wood Species	Thousand m^3	Percent
Oak	807	80
Maple	36	4
Truck and R.R. decking (mostly oak)	107	11
Other hardwoods	34	3
Hardwood flooring, no specified kind	31	2
Total:	**1,014**	**100**

Source: USDC Bureau of Census Annual Survey of Manufacturers: Value of Shipments for Product Classes, Econ. & Stat Admin., Washington, DC, 1994.

The United States imported US$23.5 million worth of hardwood flooring in 1994, with Malaysia, Canada and Brazil supplying 68 percent of this total. Nigeria and Benin were the only African suppliers.

Value of Imports of Hardwood Flooring into the United States in 1994 by Country (in US$)

Country	1994 Value
Malaysia	77,504
Canada	4,263
Brazil	3,931
Indonesia	1,768
Paraguay	931
Thailand	909

Country	1994 Value
Australia	733
Mainland China	612
Singapore	526
Mexico	504
19 other countries	2,072
Benin	3
Nigeria	2

Source: USDC Bureau of Census, U.S. Imports of Merchandise: General Imports Report IM145, 1995.

For decks, domestic hardwood species such as maple remain popular, but imported hardwood decking has also become a significant supply source. Trailer manufacturers commonly purchase decking in the form of kits, supplied by domestic and foreign contractors, that have been pre-cut and bored to precisely fit a trailer bed. In Ghana, hardwood species make the best candidates for truck and container decking. Various woods that would otherwise qualify are commercially extinct, like makore, while supplies of edinam, odum, sapelewood and utile are being rapidly depleted and are expected to drop by 50 percent within five years. Residential flooring species, such as papao, afromosia, hyedua, and ekki (or kaku) are too dense to be ideal for truck and container decking, where excess weight is a problem.

Ghanaian exporters can sell truck and container decking to the U.S. market through importers/stocking wholesalers and large retailers of building materials. Manufacturers' representatives who handle hardwood molding can also sell hardwood flooring to the same customers. Producers should plan to provide shiplap decking in pre-cut and pre-bored kits. Laminating should not be necessary in Ghana to produce decking in widths of approximately 20.32 cm. Hardwood flooring, molding, and wooden furniture and parts can all be imported into the United States from Ghana free from tariffs and duties under the Agreement of General Systems and Preferences for developing countries (AMEX International, Inc., 1995).

Truck and container decking would also appear to offer better prospects for marketing Ghanaian hardwood flooring. Next to expensive oak, apitong (or keruing) is the favorite, imported from Malaysia, Indonesia, and other southeast Asian countries. More than 70 species of *Dipterocarpus* make up this group, and they are marketed collectively (Chudnoff, 1984). Timber from Malaysia includes a large number of these species. Ghanaian woods with similar properties as apitong (i.e., durability, average availability, and a density range of 550–650 kg/m^3), would be as follows:

Species	Density (kg/m^3)	Durability	Availability
Emieri (*Terminalia ivorensis*)	550	High	Average
Guarea (*Guarea cedrata*)	600	Mod/high	Average
Mansonia (*Mansonia altissima*)	650	Very high	Average
Niangon (*Tarrietia utilis*)	625	Mod/high	Average
Okoro (*Albizia zygia*)	550	Moderate	Average
Teak (*Tectona grandis*)	650	High	Plant

Source: Pleydell, G., *The Tropical Timbers of Ghana*, Timber Development Export Board, Takoradi, Ghana, 1995.

Ghana's wood products industry has good export markets for traditional products and woods. Established buyers in Europe are increasing their orders for more white woods, as declining suppliers of the traditional red woods drive up costs of those woods. Asian buyers from China and other countries are expressing interest in white wood products. Significantly greater penetration into the U.S. market will be based on the plentiful supply of white woods, together with better use of mill residues, and will require modernization of primary and secondary wood processing and of furniture manufacturing.

Wooden Millwork

Millwork is a category of products that add value to lumber, such as cut stock (parts), doors, windows and their frames, moldings and a variety of special products.

Moldings

Wooden moldings add both function and beauty to homes: they cover spaces where horizontal and vertical surfaces meet and overcome deficiencies found in rooms with gaps or unevenly applied dry wall panels, while they add visual interest to flat surfaces and protect delicate wall coverings. There are 350 standard profiles or patterns of wooden moldings, represented in the "WM Series" of the Wood Molding and Millwork Manufacturers Associations (AMEX International, Inc., 1995).

Growth in molding use has been caused by consumer preference for the visual interest moldings can add to a room. Seventy-five percent of moldings are made from coniferous woods, mostly pine from the western United States, and are used extensively in residential housing. Demand has outrun domestic supplies of pine; now other domestic softwood species, as well as imported radiata pine and medium-density fiberboard, are increasingly being used.

The remaining 25 percent of molding is of hardwood, generally domestic oak and imported lauan or mahogany. Hardwood molding is used in more expensive residential housing and in commercial and public buildings such as restaurants, hotel lobbies, banks and casinos.

Value of Wooden Molding Imports Into the United States in 1994 (US$) by Country

Country	Value
Indonesia	15,966
Malaysia	14,916
Canada	8,398
Mexico	5,872
China, Taiwan	2,711
Brazil	1,355
Italy	1,321
Philippines	921
Thailand	467
Singapore	462
24 other countries	2,276
Ghana	10
Total:	**54,665**

Source: USDC Bureau of Census Annual Survey of Manufacturers: Value of Shipments for Product Classes, Economics and Statistics Administration, Washington, DC, 1994.

Miscellaneous Wood Products

Sales of miscellaneous wood products in the United States totaled US$3.9 billion in 1993 (USDC Bureau of Census Annual Survey of Manufacturers). Included in this category are an almost infinite number of articles that are either made from wood or include wood; imports of these products total about 22 percent of domestic sales.

Types of woods used

The woods used for the many products in this category are more numerous than the products themselves. However, there are a few general specifications followed for each product.

- Wood used for frames for paintings and printed media should be soft, uniform, easily worked or embossed, and able to hold a finish. It should resist splitting or splintering.

- Handles for heavily-used tools, e.g., hammers, axes, shovels, rakes, hoes, are always made of hardwood. It is important that handles be of clear, straight-grained wood without defects. In the United States, the best handles are of hickory or ash.

- Wood used for tableware and kitchenware has certain sanitary requirements. It must be relatively dense and not easily cut, scratched, or roughened, to avoid creating a habitat for bacteria. It must be able to withstand constant washing in hot water with detergents without cracking, splitting or checking. It should be odorless and tasteless, to avoid polluting the food. Tableware and kitchenware include such items found in most kitchens as cutting and chopping boards and blocks; knife holders; rolling pins; spoons, forks and other utensils; trays; boxes; bins; racks for spices; and salad bowls. The most common woods for food use in the United States are maple and beech.

- Statuettes and ornaments are normally made from woods available locally to the artisans. The finest carvings are made in dense, fine-grained hardwoods. In South Asia, rosewood (*Dalbergia latifolia*) is the premium wood. The furniture carvers of Kashmir prefer English walnut (*Juglans legina*). East Africans carve their famous animals from East African olive (*Olea hochstotteri*). Ebony (*Diospyros spp.)* was a favorite carving wood in West Africa, when it was available. As good woods have become less plentiful and more expensive, carvers have turned to softer, less desirable woods, which they color black or brown with shoe polish. For the discerning buyer, this greatly detracts from the product's appeal.

- Wooden coat hangers were originally almost exclusively made from beech. Now they are made primarily in China, Taiwan and Indonesia and utilize woods from those areas.

- Tools, tool and broom bodies, and shoe lasts/trees are almost always made from hardwoods.

Values of wood product groups

The values of several major groups of miscellaneous wood products imported into the United States in 1994 are described below.

- Wood frames for paintings and other visual media are often decorated with expensive finishes and decorations. The cost of these non-wood finishes is included in the total value of the product.

- Statuettes and wood ornaments are products that add maximum value to wood, typically being very labor-intensive and a significant source of income for marginal populations. These products often reflect cultural and religious themes and are produced, not only for income but also as a method of increasing and spreading such values. These products are usually made from small, convoluted pieces of wood of little value for anything beyond fuel.

- Wooden clothes hangers still retain a share of market segment in the face of severe competition from steel and plastic. Other assorted wood articles include broom and mop handles, tool handles (both sizable markets), and dowels. Wooden toys would be in here, as would such sporting items as hockey sticks, golf club heads, and tennis and badminton rackets.

Supply routes

Such a diverse group of products obviously follows many routes from producer to user. However, most products will flow through importer/wholesalers who specialize in different product lines. Manufacturers' representatives who specialize in kitchenware, wood carvings and other art work, or wooden toys, etc., sell to retailers. Large retail chains establish direct purchasing links to producers of items that they sell in volume. Industrial items, such as tool handles, move through tool manufacturers. Dowels go through hardware stores, furniture makers, woodworking supply stores, etc.

Country suppliers

In 1994, mainland China was the major supplier of this category of miscellaneous wood products, selling US$160.6 million, or 19 percent of the total. Its most important product segments were statuettes and wood ornaments, wood frames for paintings, tableware and kitchenware. Next came Canada with US$152.8 million worth, mostly in small wood articles. Third was Taiwan at US$118.4 million in tableware, kitchenware and wood frames for paintings, as well as statuettes and wood ornaments. Mainland China and Taiwan together supplied one third of the total in this category.

Thailand was an important supplier of wood frames for paintings, tableware and kitchenware. Indonesia provided tools, tool and broom bodies, shoe lasts/trees of wood, wood frames for paintings, and statuettes and wood ornaments. Mexico was a major source of wood frames for

paintings. These leading six suppliers provided six percent of the total. Other important countries in the top ten were Italy, Malaysia, Brazil and the Philippines. Although these products come from all over the world, and many were imported into the United States through overseas purchases by American tourists, only one African country was identified individually. Imports from Kenya totaled US$1,919,000 for statuettes and wood ornaments—their famous carved animals.

Supply and demand issues

Tropical wood products have traditionally been marketed as a commodity in competition with basic utility timber from other supply sources. It is apparent that the new development emerging in the supply of woods and wood products (e.g., reduced volume of fellings, protection of biodiversity) is leading to increasing competition between the suppliers. On the demand side, for example, the structural changes in the use of building materials, largely due to technological advances, and the substitution of other materials for wood are having a negative effect.

One solution to the demand problem lies in the manufacturing of products for end users or markets that could absorb the higher-cost timber sourced from natural tropical forests. The special characteristics of tropical timber constitute an advantage in competing for such outlets. These specialty markets are also the-high value markets. However, before Ghanaians can enter these markets, they must improve their industrial operation capacity. The identification of and entry into these high-value markets are seen as a potential means for Ghanaian suppliers to meet the increasing competition from other tropical, temperate and boreal woods.

"Rare and exotic species/products" should be targeted for high-value uses, ranging from those uses for which tropical timber (lumber, veneer, plywood and other products) are virtually irreplaceable to those uses where it is strongly preferred to alternative materials (wood or non-wood) for technical, aesthetic or commercial reasons (Cooper, 1991).

Opportunities in U.S. Markets for Hardwood Products from Ghana

Supplies of traditional hardwood timbers are becoming restricted worldwide. Products formerly made from these woods are being made today from materials and components from smaller, more rapidly growing types of trees. Solid hardwood paneling, for example, was initially replaced by plywood with hardwood veneers. Now this hardwood plywood is being replaced by particleboard and medium-density fiberboard in furniture and paneling. Composite paneling is typically covered with wood veneers, plastic films, printed paper or wood-like grain patterns printed directly on the panel surface. These covered or laminated panels can be made to look exactly like any of the hardwoods traditionally favored for fine furniture. Many of their physical properties are equal or superior to the solid woods, they are lower in price, and they are available in any quantities. Most furniture in industrialized nations is now made using these panels. The new, highly automated furniture-making machines, processes and technology are primarily based on the use of such panels (AMEX International, Inc., 1995).

Ghana enjoys a flourishing export trade in wooden furniture parts to Europe: this trade could be expanded to include markets in the United States. Most of the furniture and tertiary wood processing industries of Ghana now have the *machinery* required to increase exports of value-added wood products. For Ghanaian producers to more effectively compete in export markets for value-added furniture and parts, they must acquire more *processing management know-how*, particularly in the following areas: better wood utilization, enhanced efficiency in reducing costs and increasing output volumes, minimizing pollution, promoting worker safety and motivation, improving accounting systems that record and control production and costs, and perhaps most import, focusing on product quality.

In the past four years, heavy investment has led to increased kiln drying capacity, along with installation of molding plants, flooring factories, and 45,000 m^3-capacity particleboard plants. Production of finished (value-added) products such as carved doors, door and window frames, household and office furniture, flooring, garden furniture, toys and educational aids is being undertaken by a large number of small-scale joiners and furniture companies. Their major markets are local and West African regional.

Entering the U.S. Market

Market expansion in these value-added finished or semi-finished products is possible if Ghanaian products can meet the market demand in the United States and other countries. Table 11 lists markets for wooden doors, flooring, household chairs, office and household furniture in the United States, which are currently being explored by developing countries such as Malaysia, Indonesia, Mexico, Singapore and the Philippines. Other exporters are Taiwan, mainland China, Brazil and Chile. Unfortunately, the technologies required to manufacture these value-added products exist on a very limited scale in Ghana. While Ghana's forests abound in rare and exotic species, such as mahogany, sapele, odum (iroko) asanfona, afromosia, mansonia, edinam, utile, niangon and emire, the country has yet to benefit from improved technologies applied to these timber species. However, once this has been achieved, Ghana should be in a position to enter the US$1.9 billion markets for value-added products. The U.S. Machinery Manufacturers of America, located in Philadelphia, could provide assistance in advising Ghana's private firms towards production of finished products for the U.S. market.

Ghanaian producers can best enter the U.S. market with the help of manufacturers' representatives, who now channel 60 percent of the furniture to American retailers. Producers should concentrate on a few items—selecting those products with potential for high growth in sales and doing them well. Good potential products include: rocking chairs, both wooden and upholstered; dining room kitchen furniture, including junior dining sets; and, perhaps most promising, ready-to-assemble wood household furniture sold in kits. Another candidate area of products for export is wooden residential furniture. Wooden dining tables for the kitchen and wooden cabinets designed for permanent installation were the fastest growing product groups during 1990–1994.

Another opportunity for Ghanaian producers is the areas of hardwood dimension stock and furniture parts. A large supply of wood residues, much of it kiln-dried, goes to waste that could

be made into valuable export products. A plentiful supply of white woods could also serve as a source of stock and parts (Government of Ghana, 1995).

Some of Ghana's leading companies are already producing and exporting these products, mostly to Europe. Ghanaian exports of furniture parts from January 1995–July 1995 are listed below.

Destination	Volume (m^3)	Value US$
United Kingdom	1,442	2,615,887
Ireland	179	412,493
Italy	42	57,153
Germany	12	8,660
Total:	**1,675**	**3,094,193**

Source: Government of Ghana Forest Products Inspection Bureau Export Permit Report Accra, Ghana, July 1995.

Table 12. Value (in million $) of selected wooden furniture and furniture parts imported into the United States in 1996

Country	Furniture Parts	Completed Furniture	Office Furniture	Dining Tables	Household seats with wooden frame
Brazil	4.8	0	0	0	0
Canada	78.8	0	195	0	32.4
Chile	6.7	0	0	0	0
China	13.7	252	12	35	0
Denmark	4	52	10.9	0	0
France	0	0	2.7	0	0
Germany	0	0	6	0	0
Indonesia	0	85	0	0	12.9

Country	Furniture Parts	Completed Furniture	Office Furniture	Dining Tables	Household seats with wooden frame
Italy	7.5	0	9	13	29
Malaysia	11.7	70	0	62	110
Mexico	29	0	22.5	0	0
Netherlands	0	0	2.8	0	0
Singapore	0	0	0	2.7	5.4
Slovenia	0	0	0	0	17
Spain	0	0	0	0	8.5
Sweden	8.8	0	0	0	0
Taiwan	48	201	4.5	25	70.6
Thailand	0	61.0	0	10.3	17.6
Other countries	33.6	0	0	10	93.6
Total	**246.6**	**721**	**29.8**	**158**	**397**

Although the shapes, finishes and textiles of furniture may often change, the basic dimensions of chair legs, arms, backs, table legs, tops, etc., generally remain the same; consequently, the rough cuttings of dimension stock are fairly standard. Stock can be ordered in large volumes from supplies and finished to suit the latest style. Finished parts are assembled and sold to the customer within a few days of receipt, while semi-finished parts fall somewhere in between. Because of their location, many manufacturers in Ghana have a greater advantage in exporting dimension stock and furniture parts than they do in exporting completed furniture (AMEX International, Inc., 1995).

Equipment and Skills

The amount of equipment and the skill required of workers varies with the degree to which the product is completed. Most hardwood dimension stock consists of rough-sawn rectangles or long-piece squares in cross section. The stock is probably kiln-dried and may be laminated and/or finger jointed. Assuming that the lumber has been accurately sawn, all that is needed to

manufacture dimension stock are basic rip and trim saws. However, should the thickness of the lumber vary more than specifications allow, it may be necessary to run the stock through a planer to bring all of the parts to a uniform thickness.

For finishing and completing furniture, other equipment is necessary. A finger jointer is a fairly simple machine with two or more rotating cutter heads, a clamping or crowding mechanism and a system for introducing glue on the freshly cut fingers. A glue mixer will be needed, too. Laminating parts can be a basic operation for rectangles and squares. The wood must be kiln-dried to 8–10 percent moisture content, and the two surfaces to be joined must be freshly planed and smooth. Pressure can be applied with simple bar clamps that can clamp several parts at once (these are screw-type tools that are operated by hand). For more complicated lamination gluing, used in making large panels or doors, the pieces of wood are spread with glue, assembled in large steel frames, and pressure is applied with hydraulic clamps. All of these operations are being done in Ghana now, and the equipment is readily available. What is needed is human resources development to enhance the skills of the Ghanaians.

More sophisticated carpentry operations remain unusual in Ghana, however. For example, semi-finished parts may require more machining operations, including partial planing or molding. Boring holes requires a drill press, while making grooves or shaping edges may require a shaper, morticer and tenoner, or a lathe. Although these operations are not yet commonly done in Ghana, two or more small producers could pool their equipment and capabilities and accept joint orders, or a company with the prime order could hire sub-contractors for certain operations—a common practice in industrialized countries.

The construction of finished furniture parts or industrial parts often requires all of the equipment of a large furniture shop, including band saws, joiners, straight line rip saws, automated lathes with rotating cutter heads, multiple-spindle boring machines, hot presses for gluing veneers, and so on. Again, the parts that can be made will depend upon the equipment available in-house or by subcontract. Very skilled machine operators and craftsmen are required.

Opportunities in Exporting to the United States

Despite these difficulties, opportunities exist for Ghanaian manufacturers to supply markets for wooden furniture (especially hardwood dimension stock and furniture parts) in the United States. Upholstered furniture parts in particular is a good area to target. The large Piedmont Company, Ltd., in Ondo state, Nigeria, is doing very good business sawing curved backs for upholstered chairs from sawmill residues and exporting them to the United States (AMEX International, Inc., 1995). Completely fabricated industrial dimension stock is another area of the U.S. market with excellent potential. Other sectors worth investigating include rough industrial dimension stock and wood frames for household furniture, especially upholstered furniture.

Ghanaian producers can enter the U.S. market for hardwood dimension stock and furniture parts by 1) working with importer/wholesalers and manufacturers' representatives and/or 2) visiting the United States and making personal contacts.

Door and window markets

There is a growing niche market in the United States for laminated door and window parts. Since it has recently become more difficult to obtain the long clear pieces of wood required for door stiles and rails, window parts, and door and window frames, the wood products industry has begun using finger-jointed, laminated stock as a core for these parts, with clear veneer laminated on the face, back and edges to produce parts that appear to be entirely clear wood. Parts machined from such materials are now even becoming acceptable in Japan, where the gluing and machining involved in making these parts must be of the highest quality. Again, Europe would probably be the primary market for such material because of its familiarity with Ghanaian woods. At least one company in Kumasi is presently installing equipment to make door and window frames from such material for export to Italy (AMEX International, Inc., 1995).

Molding

The wood industry of Ghana has many firms capable of producing molding to U.S. standards and already exports a substantial amount to Germany and other European countries. Molding exports for January–July 1995 totaled 4,414.79 m^3 and were valued at 3,899,614.14 deutschemarks (about US$2,610.184) (government of Ghana, FPIB Export Permit Report, 1995).

Molding is removed from large logs in long clear strips and must dry and machine well. Wawa, ceiba, and some of the other white woods are excellent for the U.S. molding market. Both the European and U.S. markets are shifting from the expensive and increasingly hard-to-get red woods to white woods. Wawa accounted for 70 percent of the volume and 57 percent of the value of molding exports from Ghana during January–July 1995 (AMEX International, Inc., 1995).

Wawa and ceiba are very similar to yellow poplar (a well-known wood in U.S. markets) in density, texture, and working properties but are lighter and more uniform in color, which make them highly desirable for staining or painting. Clear wawa in 16-foot (4.88-m) lengths should compete well with pine or yellow poplar for stain-grade molding. Paint-grade molding permits minor defects and finger jointing. Finger jointing machines can take small pieces of 9 inches (22.86 cm) or longer and turn them into the desired 16-foot (4.88-m) lengths.

In supplying molding stock to the United States, thickness may be a problem because Ghana uses the metric system in cutting wood, while the U.S. market measures thickness in inches and imports molding stock that is either 3.33 or 3.97 cm thick. Ghanaian manufacturers should address this issue in discussion with the U.S. manufacturers.

Miscellaneous wood products represent a promising opportunity for Ghanaian manufacturers hoping to enter the U.S. market. Fortunately, Ghana's wood products industry is already producing significant numbers of these items. The following products were exported from Ghana during January–July 1995:

Product	Amount in US$
Curls	501,621
Dowels	293,088
Layors	156,531
Broomsticks	70,531
Honeysticks	18,626
Total	**1,039,933**

Source: Government of Ghana, FPIB Export Permit Report, July 1995.

Statuettes and wood ornaments generally sell well in the U.S. market. Wood carvings have a high value-added content, provide income to the artisan, and help foster awareness in other countries of Ghana, its culture and its products. Carving wood into sizes and shapes easily carried in a suitcase can enhance export sales of ornaments and statuettes to tourists. Some Ghanaian companies manufacture and export candleholders to the United States for the annual "Kwanzaa" festival celebrated by African-Americans. Ghanaian producers should approach buyers of these candleholders with carvings, art objects and other wood products that might further their interest in both their ethnic identity and in Ghana.

Sales of wooden dowel rods to the United States should also be expanded, as should exports of closely related broom and mop handles. These handles require woods with a clear straight grain, which come only from large trees and often from white woods, of which Ghana has a large supply. Suppliers should seek opportunities to do more processing of the handles. Square blanks can be rounded using a molder. Ends can be threaded and rounded with the addition of simple equipment. Each additional operation adds value. However, there are some tariffs and duties involved. Plain dowels are duty free, but sanded and grooved dowels carry a duty of 7.1 percent.

4. TRADE PATTERNS, MARKETING PRACTICES AND OPTIONS

Trade Patterns

International trade in wood began in Ghana in 1888. Exports consisted of round logs of choice species that were meant for niche-end uses such as high-value mahogany doors, tables, interior joinery, reproduction furniture, and caskets. Sawmilling to produce lumber for exports did not become common until 1948, with pit-sawing as the local available technology. Early logging was very selective and targeted only a few redwood species (mahogany, sapele, edinam). Power saws did not exist; instead, felling axes were used.

Initially, companies exporting round logs and lumber were British, European and, to a very limited extent, American. These firms represented major importers in the United Kingdom, Germany, Italy and the United States who imported logs and a limited volume of lumber for consumption in their own mills or for sale to other companies for further processing. The representative companies were identified as "resident buyers" to whom Ghanaian loggers sold their logs. Indigenous Ghanaian loggers had no direct access to the international market or to market intelligence and undertook no promotion activities. At this time, multinational and transnational companies were in full control of external markets.

This trade pattern continued until 1972, when the Ghana Timber Marketing Board (GTMB) appointed agents in the major markets of Europe, the United Kingdom, Canada, and United States to market Ghanaian wood products on behalf of the industry in Ghana. This intervention by GTMB opened up the market for Ghanaian exporters. It also disrupted the marketing strategies of most transnationals. Currently, the Timber Export Development Board (TEDB) is responsible for registering buyers with whom exporters can do business. A list of buyers based in United States is presented in Appendix 9, which also lists those companies based outside the United States but which place orders with Ghanaian producers and in turn sell in the United States without revealing details about the U.S. receivers.

The trade in wood products in Ghana is characterized by the presence of a few large-scale producers along with a large number of small-scale producers. The advantages accruing from large size in terms of shipment are not enjoyed by the industry as a whole. The large number of small-scale producers lack the economy of scale in operation and critical mass that is required to realize lower shipping costs. However, if these producers were to form producers/exporters associations that could export on behalf of small companies, they could overcome this obstacle. Differentiating the roles of trading companies and production mills (sawmills, veneer and plymills) could be another way to minimize the constraint of small-scale operation.

Several trade practices were observed by the team during the field study and are described below.

1. Overseas concentration yards, in which one company establishes facilities (particularly in the United Kingdom) to handle sliced veneer and prepare spliced decorative veneer for distribution throughout Europe and United States.
2. TEDB's London office is financed with part of the levy imposed on the F.O.B. value of wood product exports and obtains orders for wood products for export worldwide.
3. Some foreign-owned companies, mainly Italian and German, concentrate their exports to Italy or Germany and distribute throughout Europe and United States. The products are mainly sliced veneers and lumber.

Marketing Practices

In export trading, TEDB and the Forest Products Inspection Bureau (FPIB) register individuals or companies wishing to enter the wood/wood products trade. The various categories of exporters registered include lumber, veneer and plywood, machined products, furniture and joinery manufacturers. TEDB and FPIB also register buyers, and only registered buyers can trade with Ghana. These measures reflect government constraints on wood and wood products trade, to which most companies object, protesting that constraints like these discourage private initiative and place the marketing and distribution of wood and wood products in the hands of an amorphous group of buyers who are incapable of advancing Ghana's share of various markets.

However, research for this paper revealed that a few exporters have established effective marketing and distribution channels. These include subsidiaries of holding companies in Ghana, which are mostly Italian and German and have transfer mill capacities (sawmills, veneer mills and plymills). These subsidiaries move stocks to Europe, from which sales are made throughout Europe and to United States. Marketing and other directives also emanate from the European centers. A few Levantine companies have set up companies in the United Kingdom and Germany that carry out marketing functions. These overseas companies hold stocks of veneers and lumber and also contract for direct shipments to third parties in the United States and elsewhere.

Another group of buyers is composed of del credere agents and buyers[5], typically indigenous Ghanaian companies that rely on TEDB-registered buyers (some of whom are timber agents) in obtaining export orders. Some buyers have local (Ghanaian) representatives who are regularly in touch with producers, while other buyers send their representatives to Ghana. For instance, Japanese and Taiwanese buyers have representatives who regularly visit Ghana (and other West African countries) to contract for goods, arrange letters of credit, carry out inspections and book shipping space.

Still another group of buyers are the European buyers with local offices. A few major European companies with trading links on most continents have registered companies in Ghana and opened offices for the purposes of trading with Ghana. One such company has offices in New York, the United Kingdom and Saudi Arabia. These companies tend to cut off the ultimate markets from

5 An agent who guarantees that the persons to whom he sells goods on behalf of his principal will pay for them. He normally receives an additional commission for this.

the producers who feel the need for greater transparency. Producers would prefer to sell to the ultimate buyers, but the present arrangement whereby buyers are registered by TEDB acts as an obstruction.

Another company to mention is Ghana Timber Sales Limited London (a TEDB subsidiary), which markets wood products worldwide. Although the firm was set up by TEDB, it does not maintain sufficient transparency concerning sales: the company acts as a buyer and does not reveal the ultimate buyers to the producer as expected.

Upon analysis of the companies described above, it can clearly be seen that Ghanaian exporters, while strong in various other areas, are weak in marketing their products. Instead of Ghanaian producers galvanizing themselves to cooperate and pool their efforts, it is the buyers who organize the export sales and thereby gain control over production as well as distribution.

To redress this and protect their interests, some companies have suggested that the GTMO be strengthened. To guarantee market transparency, joint ventures should be encouraged between groups of indigenous producers and selected buyers, particularly in United States.

Most companies analyzed for this paper criticized the TEDB's involvement in deciding which buyers are to be sold export products. FPIB's administrative pricing of all wood exports has also been objected to by GTMO's Executive Council and by individual companies.

The final group of exporters is the Small-Scale Carpenters Association (SSCA), whose membership is concentrated in Kumasi, Accra, Takoradi and Tema. The firms that form this association have received very little attention from both the TEDB/FPIB and the Ministry of Lands and Forestry. Their products are used domestically in housing of all types (i.e., doors, window and door frames, tables, chairs, beds, panels, wardrobes, etc.), while some are also exported to ECOWAS markets.

It is at the level of the small-scale joiners and furniture manufacturers that the greatest degree of value-added production is taking place. When compared to high-quality markets such as the United States, however, there are clear shortcomings in terms of quality and design. Improvement in technical skills, trade, and marketing may present the areas of greatest opportunity for the Ghanaian private sector.

Marketing Options

The wood/wood products trade involves agents, importers and manufacturers. The *agent*, with knowledge of the industry in Ghana and the needs of U.S. importers and manufacturers, matches U.S. dimension and quality specifications with the supplies available from known producers. (S)he guarantees the quality, quantity and timely delivery of goods contracted for by the U.S. importer and/or manufacturer. For this involvement, the agent earns a commission. She/he normally does not hold stocks of wood products, and (s)he periodically visits the producers to acquaint herself/himself with the state of the industry, including log availability, efficiency of

production, future availability of supplies, potential new supplies of value-added products, and promotion of other wood species and products.

(S)he also provides producers with knowledge of the U.S. market, using telex, fax, e-mail, and telephone links regularly to obtain information about readiness of goods for shipment, which enables the importer to book shipping space or confirm acceptance of booking by the producers. The agent performs other duties for the producer, as well. Urgent spares are arranged by the agent who obtains pro forma invoices for producers and ensures that the U.S. supplier ships the spares early. When an order for a wood product requires special equipment, samples or templates, the details and actual samples are arranged and delivered by the agent.

Importers and *manufacturers* may combine their duties with those of an agent. Thus the importer or manufacturer may set up a procurement unit to handle the agent's role. Importers holding stocks of imported sliced veneer, rotary veneer, plywood and lumber play an important role in the marketing chain by ensuring that the producing country's wood products are regularly available in the United States and accessible to the manufacturing sector. Importers guarantee long-term exports for producers and provide them with market intelligence.

Joint ventures of all types are possible with the agent, importer or manufacturer. Further in-depth survey is needed to reveal the roles that any of them can play.

Marketing of Ghanaian Wood Products in the United States

The economic viability of marketing Ghanaian wood products in the United States was assessed in terms of four variables: (1) the demand for wood products in the United States; (2) the capacity of the wood products industry in Ghana to supply the U.S. market; (3) access to U.S. market information by Ghanaian manufacturers; and (4) competitiveness of Ghanaian wood products in the United States.

Demand for wood products in the United States

By 1990, the United States accounted for about 4 percent of all tropical timber products traded globally, consuming some $533 million worth of tropical hardwood products annually by 1993. Roughly 77 percent of this consumption was in plywood, while hardwood lumber and veneer accounted for 19 percent and 4 percent respectively (Smith et al., 1995).

The value of wooden furniture imported into the United States grew from $3.036 billion in 1993 to $4.495 billion in 1996 (28 percent of the entire wooden furniture market in the United States). Given the positive growth experienced by the U.S. economy during the last six years, household consumption of furniture is expected to increase by 19 percent by the year 2005 (International Tropical Timber Organization, 1996). Currently, the leading exporters of wood furniture products to the United States are Canada, Indonesia, Mexico, Taiwan, China, Brazil and Malaysia (USDC, 1994.) In Table 15, the values of selected value-added or secondary wood

products imported into the United States by country of origin are presented. This is a market that Ghana should target, if it aims to become a middle-income country by the year 2020.

Capacity of Ghana's wood products industry

Within the Economic Community of West African States (ECOWAS), Ghana is a leader when it comes to wood products manufacturing, which dates back to the 1940s in that nation. In recent times, improved mills capable of producing particleboard, wood veneer, plywood, and some value-added wood products have helped the industry grow. Goods manufactured by the industry have entered and continue to enter markets in Europe, Asia, the United States, and the Middle East. According to the United Kingdom Forestry Commission's report on Ghana (1995), Ghana's wood/wood products industry is capable of processing 2 million cubic meters of round wood into various wood products annually. In the section dealing with the market situation, many of the products currently being produced by wood products manufacturers in Ghana were presented.

Lumber

The grading rules (quality standards and dimension specifications) for various species were established by the U.S. National Hardwood Lumber Association (NHLA). These rules were adopted by British saw millers in Ghana when the United Kingdom was importing American hardwoods as well as hardwoods from South America—all of which were subject to NHLA rules. When Ghana entered the international market, these rules were applied to its products and have now been in use there for nearly 50 years.

Recently, the FPIB created a committee to examine standards and specifications for all products and to draft new rules. The African Timber Organization (ATO) is endeavoring to harmonize rules for use by member countries; it is not expected that these efforts will disrupt trade between Ghana and the United States. In the meantime, exports to the United States, Europe and elsewhere continue to be based on NHLA rules. If Ghana drafts its own rules, they must of necessity be acceptable to external markets in the light of worldwide competition.

Sliced veneer, rotary veneer and plywood

In exporting veneer and plywood, Ghana uses British standards, which are similar to the U.S. standards drawn up by the International Wood Products Association (IWPA). These standards are included in the contract between Ghanaian producers and U.S. buyers. In addition, some U.S. buyers have appointed representatives in Ghana who supervise, inspect products and sign certificates of acceptability.

Machined Products

Dowels, planed lumber, broom handles and moldings are produced to specifications supplied by U.S. buyers. Samples and templates are often supplied to overseas factories.

Competitiveness of Ghanaian Wood Products in the United States

Tables 4, 5, 6, 7 and 8 presented the per-unit F.O.B. prices for air-dried lumber, kiln-dried lumber, sliced veneer, plywood and rotary veneer, respectively. A comparison of these prices indicates that, when compared with all other countries importing Ghanaian wood products, the United States offers the third best price for air-dried lumber, sliced veneer and rotary veneer, and the second best price for kiln-dried lumber. Tables 9 and 10 revealed that veneer, plywood sheets and mahogany lumber from Ghana are very competitive in the United States. Given the expected U.S. demand for wood products and the competitiveness of Ghanaian veneer, plywood sheets and mahogany lumber, it is clear that marketing those products to the United States is economically viable.

Requirements or Standards for Ghanaian Wood Products in the U.S. Market

Generally, there are no unique requirements or standards specific to manufacturers of wood products in Ghana who ship their products to the United States. There are instead international grading rules for forest products that exporters are required to meet. For lumber exported to the United States, Ghanaian exporters use specification rules based on those established by the U.S. National Hardwood Lumber Association (NHLA). In addition, some U.S. buyers have agents or employees who travel to manufacturers' mills to assess product quality. During an interview with the Penrod Company, for example, the company president mentioned that he has agents in Ghana for quality assurance purposes.

The following lists seasoning specifications for selected products exported to the United States.

Product	Species	Moisture Content (General)	Moisture Content (Specific)
Lumber	redwood	8–10 %	10–12 %
Lumber	wawa	10–12 %	10–12 %
Lumber products	wawa (24S)	6–8 %	10–12 %
Rotary veneer	wawa (24S)	6–8 %	10–12 %

For plywood exported to the United States, the Ghanaian government has established grading rules, based on British rules, which are also identical to rules adopted by IWPA (IWPA is guided by both the American Society for Testing Materials and the American National Standards Institute). The European Union is now in the process of standardizing all specification rules for imports into Europe, so that varying sets of rules will shortly be obsolete. Ghanaian wood products, of course, will have to meet those standards.

When exporting raw materials like sliced and peeled veneers, lumber and plywood to the U.S. market, Ghana has no problem. But when exporting finished, value-added products like doors and moldings, Ghanaian producers must meet standards established by U.S. industry associations. For example, the Wood Molding and Millwork Producers Association (WMMPA) of California includes members in many U.S. states and applies quality standards and specifications established by the American Society for Testing Materials (ASTM), as well as federal specifications. Ghanaian manufacturers have apparently been able to meet the quality specifications for the U.S. market, according to a Ghanaian FPIB official who stated that the number of claims filed against Ghanaian manufacturers by importers for not meeting quality specifications was negligible.

Recently, new standards for imported hardwood plywood were adopted by IWPA. The new standards will supersede the thickness standard of 6mm or 0.236 inches and are expected to take effect on August 1, 1997. Under this new standard, the thickness tolerance will be as follows: 1) wall panel IWPA (5.5mm and thinner): -0/+.2mm; 2) standard IWPA (3.6mm–5.5mm): -.2mm/+.2mm; 3) standard IWPA (9mm and thicker): -.5mm/+.2mm. These new standards are expected to benefit overseas mills exporting to the United States by allowing them to produce thinner panels and utilize raw materials more efficiently (*IWPA News*, March/April 1997).

In addition to various unique requirements and standards, some general requirements must be met by all who import rare and exotic wood/wood products into the United States, including a) restrictions on the importation of certain species and b) the quantity and timely delivery required by U.S. buyers. Certain tropical species, including some species of mahogany and afromosia, have been declared threatened or endangered by the Convention of International Trade in Endangered Species of Flora and Fauna (CITES). Consequently, in order to trade in species listed by CITES as endangered or threatened, a permit must be obtained. In the United States, the USDA Animal and Plant Health Inspection Service (APHIS) enforces the restrictions set by CITES. Tree species that require such permits are restricted to specified U.S. ports of entry, which include Jamaica, NY; Hoboken, NJ; New Orleans, LA; Houston, TX; Nogales, AZ; Los Angeles, CA; Seattle, WA; and Honolulu, HI. The mahogany species (Khaya) exported from Ghana appears to be unrestricted by CITES at this time. However, afromosia exports from Ghana are under CITES restrictions (International Wood Products Association, 1993).

Voluntary standard for sliced decorative wood face veneer

Each flitch of decorative sliced wood veneer provides a unique figure and grain pattern. Ghana's voluntary standard has established requirements for certain properties of sliced decorative wood face veneer produced by horizontal or vertical slicing machines or by the half-round method using a rotary lathe. This standard provides veneer producers, veneer splicers, architects, panel, door and furniture manufacturers and other users with a common basis for understanding certain product characteristics. It is recognized that the veneer thickness requirements of this standard do not apply to all sliced decorative wood face veneer uses. For exceptional applications, the requirements shall be as agreed upon between buyer and seller.

Flitch sampling for sliced veneer

The appearance of the flitch will vary as the individual veneer slices are cut, revealing the inherent decorative pattern created by the growth rings, grain and other wood characteristics. Flitch sampling as described below provides an example of the appearance of the particular log or bolt unless different flitch sampling has been agreed upon by both buyer and seller. A designation (tab, chalk mark or similar mark) of where the samples are pulled should be made on the flitch.

Yield of Log	**Number of Samples**	**Approximate Location Within the Flitch**
Less than 100 sq m (1,075 sq ft)	2	1/3 thru flitch 2/3 thru flitch
100 sq m to 370 sq m (1,075 sq ft to 4,000 sq ft)	3	¼ thru flitch ½ thru flitch ¾ thru flitch
Greater than 370 sq m (4,000 sq ft)	3 or more at mill option	At approximate fractional locations within the flitch in a manner consistent with the above

Veneer thickness

The minimum acceptable thickness of veneers varies with intended use and species. Consideration should be given to processing of very thin veneers in the manufacture of decorative panels and in sanding of panels employing thin-face veneer. The thickness tolerance for a single sheet of face veneer is –0.000 inch, +0.08 mm (+0.003 inch). Standard thicknesses are as listed in the table below. (Thickness tolerances are –0.000 inch, +0.08mm (+0.003 inch) of each thickness when applied to a single sheet of veneer.)

Table 13. Standard minimum veneer thickness

Species	Metric		Inch-Pound			
	Group A	Group B	Group A		Group B	
	(milli-meters)	(milli-meters)	Fraction (inches)	Decimal (inches)	Fraction (inches)	Decimal (inches)
Ash	0.55	0.65	1.45	0.022	1/38	0.026
Birch	0.55	0.65	1/45	0.022	1/38	0.026
Cherry	0.50	0.60	1/50	0.020	1/42	0.024
Hickory	0.55	0.65	1/45	0.022	1/38	0.026
Oak, Red	0.55	0.65	1/45	0.022	1/38	0.026
Oak, White	0.55	0.65	1/45	0.022	1/38	0.026
Oak, Rift Red	0.55	Same as Group A	1/45	0.022	Same as Group A	Same as Group A
Oak, Rift White	0.55	Same as Group A	1/45	0.022	Same as Group A	Same as Group A
Maple	0.55	0.65	1/45	0.022	1/38	0.026
Pecan	0.55	0.65	1/45	0.022	1/38	0.026
Pine, Yellow	0.60	0.65	1/42	0.024	1/38	0.026
Pine, White	0.60	0.95	1/42	0.024	1/27	0.037
Pine, White (knotty)	0.95	Same as Group A	1/27	0.037	Same as Group A	Same as Group A
Walnut	0.50	0.55	1/50	0.020	1/45	0.022
Other	0.55	0.65	1/45	0.022	1/38	0.026

Source: Voluntary Standard for Sliced Decorative Wood Face Veneer, Hardwood Plywood and Veneer Association, January 1996.

Moisture content

Unless otherwise agreed upon by buyer and seller, the moisture content of veneer at the time of shipment from the slicing, cutting, or splicing mill is 12–16 percent for Group A veneer. Moisture content is determined by using at least one of the methods as described in paragraph 5.2.

American national standard for laminated wood flooring

This standard covers requirements for grading, moisture, content and machining. The grades of the veneers for face, crossband adjacent to the face, back and other inner plies used for laminated wood flooring are in accordance with the grade descriptions appearing in Table 14.

Table 14. Characteristics and imperfections allowed in various plies of laminated wood flooring

Characteristics and Imperfections	Face Grades		Crossband Ply Adjacent to Face	Back and Other Inner Plies
	Prime	**Character**		
Bark Pockets	12.7 mm (1/2 inch long, filled and blending	Yes[a]	Yes	Yes
Burls, Tight	Yes	Yes	Yes	Yes
Checks	Slight, occasional	Yes	Yes	Yes
Color Variation[b]	Blending within board	Yes	Yes	Yes
Decay[c]	No	No	No	No
Face Joints	Tight, parallel to 3.0 mm in 200 mm (1/8 inch in 8 inches)	Tight, parallel to 3.0 mm in 200 mm (1/8 inch in 8 inches)	Not applicable	Not applicable
Fillings	Blending	Yes	Yes	Yes
Gum Pockets	No	Yes	No	No

Characteristics and Imperfections	Face Grades		Crossband Ply Adjacent to Face	Back and Other Inner Plies
	Prime	**Character**		
Knotholes	Max. 16. Mm (1/16 inch) diam. open; 6.4 mm (1/4 inch) properly filled	Max. 3.2 mm (1/8 inch) diam. open; 9.5 mm (3/8 inch) properly filled	The diameter of knotholes and other round or elliptical openings shall not exceed 6 times the thickness of the face ply but, in no event, be greater than 19 mm (3/4 inch), as determined by averaging the open dimension of knotholes and openings at the maximum diameter and the open dimension at a 90^{o} angle to the maximum diameter	Max. diam. 50.8 mm (2 inches); sum of diam. 102 mm (4 inches) in any 0.093 square meters (1 square foot)
Knot, pin	Yes	Yes	Yes	Yes
Knot, sound, tight	Max. 25.4 mm (1 inch) average diam.	Yes	Yes	Yes
Laps	No	No	No	No
Mineral streaks	Blending	Yes	Yes	Yes
Rough grain	Slight, Occasional	Yes	Yes	Yes
Ruptured grain and shake	No	Slight	Yes	Yes
Sapwood	Yes	Yes	Yes	Yes

Characteristics and Imperfections	Face Grades		Crossband Ply Adjacent to Face	Back and Other Inner Plies
	Prime	**Character**		
Splits and joints	Filled and blending, cannot exceed 1.6 mm (1/16 inch) wide	Filled and blending, cannot exceed 3.2 mm (1/8 inch) wide	Open max. width 6.4 mm (1/4 inch) but no wider than 4 times the thickness of the face	Yes
Stain and discoloration	Blending	Yes	Yes	Yes
Wormholes	1.6 mm (1/16 inch) open; 6.4 mm (1/4 inch) properly filled	3.2 mm (1/8 inch) open; 9.5 mm (3/8 inch) properly filled	Yes	Yes

[a]"Yes" means allowed without limit.

[b]Board-to-board and block-to-block color variation is permitted.

[c]Incipient decay allowed as long as softening of wood has not occurred and serviceability of flooring is not impaired. Machining shall be in compliance with the manufacturer's specifications for the particular product and shall conform to the requirements appearing in Table 1.

Table 15. Machining requirements and tolerances for laminated wood flooring

	Prefinished Square Edge		Unfinished Bevel and Square Edge and Prefinished Bevel Edge	
	Face Grades		Face Grades	
Characteristics	**Prime**	**Character**	**Prime**	**Character**
Plank and block width tolerance	+/-0.25 mm (+/-0.010 inch)	+/-0.25 mm (+/-0.010 inch)	+/-0.25 mm (+/-0.010 inch)	+/-0.25 mm (+/-0.010 inch)
Overwood	0.31 mm (0.012 inch)	0.38 mm 0.015 inch)	0.51 mm (0.020 inch)	0.76 mm (0.030 inch)
Crook	0.18 mm per linear 300 mm (0.007 inch per linear foot) but not to exceed 0.64 mm (0.025 inch) for any piece in length	0.23 mm per linear 300 mm (0.009 inch per linear foot) but not to exceed 0.89 mm (0.035 inch) for any piece in length	0.18 mm per linear 300 mm (0.007 inch per linear foot) but not to exceed 0.64 mm (0.025 inch) for any piece in length	0.23 mm per linear 300 mm (0.009 inch per linear foot) but not to exceed 0.89 mm (0.035 inch) for any piece in length
End alignment or squareness	0.13 mm per 25 mm of width (0.005 inch per inch of width)	0.18 mm per 25 mm of width (0.007 inch per inch of width)	0.18 mm per 25 mm of width (0.007 inch per inch of width)	0.23 mm per 25 mm of width (0.009 inch per inch of width)

Source: American National Standard for Laminated Wood Flooring, Hardwood Plywood and Veneer Association, 1996.

A combined tolerance of 5 percent is permitted for grading, machining and bond line. The average moisture content of the flooring must be between 5–11 percent at the time of shipment from the manufacturer's plant.

Wood Processing Technology Used by Successful Developing Countries Exporting to the U.S. Market

Developing countries considered to be successful exporters to the United States include Brazil, Indonesia, Malaysia and Taiwan, with success defined when a country achieves a significant share of the U.S. market relative to other exporters, or when a country is ranked among the top ten exporters of wood products to the United States. For example, in 1996 Brazil accounted for about 35 and 29 percent of the U.S. market for imported veneer and plywood sheets, and lumber, respectively. Indonesia accounted for about 10 percent of the U.S. market for mahogany lumber and 4 percent of imported bent-wood furniture, while Malaysia accounted for 47 percent of

wooden dining tables imported into the United States. Taiwan was also a major exporter of wood products to the United States, accounting for 28 percent of the completed wood furniture exported to the United States in 1997 (U.S. Department of Commerce, 1996).

Very little information has been published on secondary and tertiary wood processing technologies being utilized by developing countries that have enjoyed success in the U.S. market. Most of the information available is either inadequate for a serious analysis or is outdated. A visit to some of these countries (Malaysia, Indonesia, Brazil or Taiwan) would facilitate a better understanding by Ghanaian firms of the state-of-the-art technologies being used.

A country's wood-sawing technology is critical to its exporting success because this technology typically determines the amount of recovery or the amount of wood that is wasted. The more wood that is wasted in the sawing process, the less wood is available for processing into other secondary or value-added products. A study conducted by Lochnertz et al. compared the hardwood sawing recovery rates in five tropical countries: Ghana, Brazil, Venezuela, Indonesia and Malaysia (Lochnertz et al., 1996). According to this study, recovery rates for each country were 40, 55, 60–70, less than 50, and 54.5 percent, respectively. Degree of recovery also depends on the species involved, the conditions of the equipment used and the skills of the mill operators. The study indicates that Ghana's low recovery rate results from a lack of skilled mill personnel as well as poorly maintained equipment.

However, the researchers overlooked one factor, which is that the total industry, at the national level, tries to allocate logs to their highest use. Thus, logs with perfect conformation (good diameter, as cylindrical as possible, good grain) are allocated to a veneer slicing or peeling mill, while lower-grade logs (usually tapering and poorly shaped) are allocated to a sawmill. This is particularly the case where horizontal integration is under one roof at a company, where the production planning and programming manager will ensure that the slicers get the best logs, the peeling lines next and the sawmill last.

Another fact that influences sawing yields in Ghana is the constrictive effect of FPIB's restrictions. Certain grades of lumber are not allowed to be produced for export. Therefore, mill owners often must reject materials that could otherwise be recovered for export. Fortunately, small-scale carpenters become the recipients of such "rejected" materials, from which they recover wood for doors, frames, beds, chairs, tables, pallets and moldings. Some sawmillers estimate that the recovery is 30 percent export and 30 percent domestic, rather than the 40 percent mentioned in Lochnertz's study. Often while visiting small-scale carpenters, we discovered finished products made from such "rejected" material, as well as those from lumber obtained from illegal sources.

Among the secondary wood-manufacturing technology necessary for a developing country to successfully export wood/wood products to the United States is wood seasoning (wood-drying) technology. This is important because wood/wood products for export to the United States must be seasoned or dried to specific moisture-content levels for various U.S. regions—to minimize shrinking and swelling of the wood and enhance its durability. Many successful exporters use dry kilns to dry their wood; others may use air-drying methods, although air-dried wood is

generally lower in value. Other essential technology includes finger jointing (joining pieces of wood together), and molding (shaping or carving wood).

While the recovery rate in Ghana is not as high as those of the countries mentioned above, the degree of investment in the Ghanaian wood products manufacturing sector is significant, nevertheless. Ghana boasts the largest number of sawmills in West Africa, and several of them have the capacity to peel and slice logs into veneer and plywood. Some large-scale Ghanaian manufacturers own lumber-drying kilns and manufacture furniture and furniture parts. Many Ghanaian veneer mills are equipped with the same kinds of machinery found in European mills.

Despite these advancements in wood technology in Ghana, a significant sector—the small-scale wood product manufacturing sector—lags far behind technologically. Many of these manufacturers use outdated and inefficient machinery that results in low productivity and less efficient use of raw materials. Generally operating from small sheds or in the open, they also display their products in the open and produce most of the furniture that ordinary Ghanaians can afford. Some of their products are also sold in the markets of neighboring countries, but none is sold in the United States. Because of their substantial numbers, these producers are a serious source of competition with large-scale manufacturers for raw material.

Conversion rates of forest product production in selected tropical countries

The average conversion rate of forest products serves as a good index of both technology and management levels in forest products manufacturing. Various southeast Asian countries have the highest conversion rate in sawn wood production (0.70), Indonesia has the best average conversion rate in veneer manufacture (0.70) and Malaysia has the highest average conversion rate in plywood production (0.70) (ITTO, 1996). Ghana is ranked in the middle among the seven countries in terms of the average conversion rate of sawmills, veneer mills and plywood mills.

Production Capacities and Average Conversion Rates of Forest Products in Selected Tropical Countries

Country	Sawmills		Veneer Mills		Plywood Mills	
	Capacity (1000 m^3)	Average Conversion Rate	Capacity (1000 m^3)	Average Conversion Rate	Capacity (1000 m^3)	Average Conversion Rate
Gabon	96	0.40	15	0.5	115	0.55
Ghana	570	0.43	100	0.55	60	0.50
Indonesia	18,975	0.50	NA	0.70	11,113	0.50
Malaysia	24,800	0.50	NA	0.65	9,480	0.70
Myanmar	878	0.49	NA	NA	10,080	NA

Country	Sawmills		Veneer Mills		Plywood Mills	
	Capacity (1000 m^3)	Average Conversion Rate	Capacity (1000 m^3)	Average Conversion Rate	Capacity (1000 m^3)	Average Conversion Rate
PNG	250	0.25	NA	NA	16	0.40
Philippines	1,408	0.6	NA	NA	485	0.43

Source: International Tropical Timber Organization, 1996.

Wood Processing Equipment and Machinery Used in Indonesia

The wood processing equipment imported by Indonesia includes circular and band saws, sawing machines, hoists, lathes, double-slicers, glue spreaders, cold-pressers, hot-pressers, log rotary machines, finger jointers, molders, planers, sanders, surfaces and trimmers, boring machinery, carving machinery, dovetailers, mortisers, routers, shapers, tenoners, log skidders (used for timber cutting), dry-kilns, and machinery for making veneer, particle, hardboard, blockboard, and medium- and high-density fiberboard.

Indonesia's Import Market Share of Forest Products Machinery in 1993

Country	Market Share (percent)
Germany	33.5
Japan	29.1
Taiwan	16.3
Italy	6.1
Finland	5.5
South Korea	1.9
United States	1.6
United Kingdom	1.5
Netherlands	1.3

Country	Market Share (percent)
China	1.0
Other countries	2.2

Source: Tandun, 1996.

The better plywood mills in Indonesia use four-foot lathes and mechanical debarkers and mechanically remove veneer residues from the peeler. Electric hoists are widely used to lift the logs and feed them to the lather. Most mill lathes are equipped with integral chargers and automatic centering and veneer-handling systems to enhance high-speed production. Some lathes are equipped with telescopic chucks of smaller diameters and operate at a higher speed to improve efficiency in processing small-diameter logs. Most mills also have modern veneer composers that combine guillotining, spot gluing and cutting to size in one operation. Some plywood mills also produce blockboard. In blockboard production, mills use resaws to cut peeler cores into planks, while the lumber core is formed by placing kiln-dried planks into a mold.

Most mills in Indonesia are fully mechanized for furniture production. Modern machinery and mechanized production processes are followed even in medium-sized furniture factories. Machinery used includes molders, finger-jointing machines and composers, copy-routers, multi-borers, and so on. Sanding and spray booths and conveyors are used in the finishing section. Some mills are also equipped with kiln-drying and other treatment facilities (Tandum, 1996).

5. CONSTRAINTS ANALYSIS OF PROCESSING/MARKETING OF GHANA'S WOOD PRODUCTS IN THE UNITED STATES

The major constraints identified in this report that may impede the enhancement of trade and investment in wood products between Ghana and the United States fall within the following categories: 1) the cost of exporting Ghanaian wood products to the United States, 2) policies, 3) technologies, 4) infrastructure, 5) investment/credit, 6) access to information, 7) moisture content compliance and 8) trade.

Cost Constraints in Exporting Ghanaian Wood Products to the United States

Ghana once depended heavily on the export of logs to earn foreign exchange. However, between 1978 and 1995 all log exports were suspended. Admittedly, the export of logs succeeded in introducing Ghanaian hardwoods to the first level of overseas markets. Ghana's initial exports to the United States about a century ago were mahogany logs but, with the cessation of log exports, the U.S. market now demands value-added products from various species.

High-value manufactured products lend themselves to the use of shipping containers. The two major Ghanaian ports, Tema and Takoradi, have undergone extensive rehabilitation to accommodate the use of containers, and shipping companies have responded effectively. Inland transportation is efficient, and timber companies are serviced by haulage companies that move containers between factories and ports. Transit depots near and in the ports are adequate. At present, three major shipping lines link U.S. ports and the major ports of West Africa that handle both imports and exports. Tables 15 and 16 provide details of shipping lines and rates charged for timber cargo.

Table 16. Selected shipping lines that transport wood products from Ghana to the United States

Company	Ghana Agents
Wilhelmsen Lines USA, Inc. 17 Battery Place New York, NY 10004	Liner Associates P.O. Box 210 Takoradi, Ghana
Torn Lines U.S. General Agents Kerr Steamship Company Inc. 200 Plaza Drive Secaucus, New Jersey 07096	Maritimes Agencies Limited P.O. Box 27 Takoradi, Ghana
D.A.A.L.	Delmas Agencies Limited P.O. Box 1076 Takoradi, Ghana

Source: Personal communication with Paul Payne, Shipping Officer, A.G. Timbers LTD, 1997.

Table 17. Costs for shipping wood products from Ghana to U.S. ports by selected shipping lines

Shipper	U.S. Port of Delivery	Freight Rate in Cubic Meters ($)					Container Rate	
		1–99	100–249	250–500	501–1000	1000+	20 feet	40 feet
Wilhelmsen Lines	Houston, New Orleans, Savannah, Norfolk, Baltimore, Philadelphia, and New York	$130.00	$119.00	$100.00	$ 90.00	$ 80.00	-	-
Torn Lines	Houston, New Orleans, Savannah, New York, and Norfolk	$108	$97	$78	$68	$58	—	—
D.A.A.L.	New York, Houston, Philadelphia, Newport, and Savannah	—	—	—	—	—	$2,300	$4,400

The cost of shipping unprocessed wood by sea has recently been escalating, which has encouraged the use of containers for shipping high-value wood products, e.g., kiln-dried lumber, dimension lumber pieces, sliced veneers and plywood. Moreover, when these products are manufactured to meet specific demands for end uses such as doors, flooring and knockdown furniture, there is added advantage for such container use.

U.S. buyers often call for large volumes, or "break bulk" cargo, in order to attract low freight rates. For such cargo, freight rates range from $58–$130 per m^3, depending on cargo size (see Table 18). The issue is resolved when containers are used to transport the highly valued products at less than maximum (uncontainerized) freight rates. Even on a break bulk basis, if exporters book shipping space cooperatively, enough cargo can be organized to attract a low freight rate. Cost constraint can therefore be minimized by containerized bulk shipping.

Ghanaian labor cost is cheap relative to the labor costs in Europe and the United States, because skill levels are low. Low skill levels for producing high-value products result in uncompetitive, and thus costly, products. The skills and capabilities of Ghanaian workers must be enhanced so that they can effectively participate in value-added activities and create products capable of competing globally.

Due to lack of current data, inferences on the economic viability of exporting wood products from Ghana have been based on the study conducted by the U.K.'s Overseas Consultancy Service of the Forestry Commission (OCSFC) in 1995. The OCSFC study reported estimates of production costs for air-dried and kiln-dried lumber, rotary veneer and sliced veneer (provided in Table 14). The study also assessed the profitability of producing kiln- and air-dried lumber, sliced veneer, and rotary veneer from various species. Based on their data presented in Table 15, the profit for exporting kiln-dried odum lumber was 111% of total cost, including royalties. Profits for ceiba rotary veneer, asanfina sliced veneer and wawa air-dried lumber totaled 76, 31 and 12 percent, respectively. These profit margins suggest that production costs were not as constraining as other costs.

Table 18. Production costs associated with selected wood products in Ghana

Costs* per cubic meter				
Product	**Fiber**	**Production**	**Other**	**Total**
Air-dried lumber	$106.96	$54.78	$92.17	$253.91
Kiln-dried lumber	$106.96	$76.52	$92.17	$275.65
Sliced veneer	$141.74	$153.04	$153.04	$447.83
Rotary veneer	$66.09	$21.74	$66.09	$153.91
Plywood	$127.83	$67.83	$26.96	$222.61

Source: Policy recommendations for sustainable management of the forest resource in Ghana, 1995.

*Figures converted to US$ using 1,150 cedis to $1.00 (1995 exchange rate)

Table 19. Profitability associated with export of selected species of Ghanaian wood/wood products

Product	Cost/cubic meter	Royalty/ cubic meter	Revenue/ cubic meter	Profit	Percent Profit
Kiln-dried lumber (odum)	$271.3	$14.24	$602.97	$317.43	111.17
Air-dried lumber (wawa)	$248.24	$10.17	$288.94	$30.53	11.81
Sliced veneer (asanfona)	$442.23	$28.49	$615.86	$145.14	30.83
Rotary veneer (ceiba)	$147.86	$10.17	$277.41	$119.38	75.54

Source: Policy recommendations for sustainable management of the forest resource in Ghana, 1995.

*Figures converted to US$ using 1,150 cedis to $1.00 (1995 exchange rate)

Proposed interventions for cost constraint

Shipping cost could be minimized if economy of scale were realized. For example, a 40-foot container load of 500 doors would incur a freight rate of US$4,400, or $8.8 a door. However, if exporters were induced to combine loads assembled with less frequent shipping, a rebate of 20 percent could be realized from the shipping companies. For example, small-scale producers lack the economy of scale in their operations or the critical mass required to achieve lower shipping costs. This problem could be overcome by forming producers/exporters associations to export on behalf of small companies.

Policy Constraints

One policy constraint mentioned by nearly every manufacturer interviewed is the role of the Forest Products Inspection Bureau (FPIB) in setting minimum export prices for wood/wood products. According to an FPIB official, these prices were based on market studies conducted by the TEDB and appeared to be based on prices gained from market intelligence rather than on production costs in Ghana. An FPIB official stated that the agency's functions include 1) disseminating timber grading rules and ensuring that they are followed when exporting products; 2) examining timber products before shipment in order to prevent fraud; 3) recording all contracts for the export of timber products; and 4) appointing arbitrators to settle disputes between manufacturers and the buyers.

For these services and others provided by both the TEDB and FPIB, exporters were levied a 3 percent tax on the value of their shipments. Most of the manufacturers characterized the FPIB's role as a barrier to the free trading of their products. Some of them pointed out that there were cases in which they found the FPIB minimum prices to be significantly below prevailing world prices.

It is also the public-sector bodies (TEDB and FPIB) that decide which importers may trade with Ghana, even though both agencies are financed 100 percent by the industry. This stranglehold on the industry was condemned by all the firms we visited. Within the entire Ghanaian economy, it is only the forestry sector that is strictly controlled by public-sector agencies. Contracts negotiated between an exporter and a buyer must thus be vetted and approved by the public sector—without such approval, no contract can exist. In addition, contracts are valid for only three (3) months, which will affect the long-term plans of an importer who wants to be sure that he has a contract for 6 months or longer, so that he can in turn commit his/her customers. FPIB also insists upon inspecting goods and issuing certificates before goods can be moved from factories.

Finally, FPIB must issue export permits before goods can be loaded on ships or aircraft. Industry representatives pointed out that the work of the FPIB duplicates the duties of the Customs, Excise and Preventive Service (CEPS) whose staff are found in all the factories and at all seaports and airports. It is CEPS that handles the thousands of Ghanaian imports and exports, as in other countries. Industry recommends that FPIB join CEPS to streamline exports and form one official body, instead of two.

In sum, specific marketing constraints are as follows:

1. The inordinate length of time that must be spent in preparing contracts and getting them approved.
2. Restriction of the length of contracts to three (3) months.
3. Restrictions on the size of contracts.
4. Lack of standards regarding export packaging.

Allowable annual cuts

Due to tree species sustainability concerns, the Convention on International Trade in Endangered Species (CITES) monitors trading in tree species considered endangered. As mentioned earlier, one Ghanaian tree species is listed among the species that have restrictions on cutting. Government concern for forest sustainability has led to reductions in the "annual allowable cut" (AAC)—the amount of timber that can be harvested legally from the forest reserves on an annual basis. The current 1 million cubic meters of timber that is now the legal annual harvest is down from the 1.8 million cubic meters permitted a few years ago. According to many of the manufacturers visited, this means that their access to raw materials has been reduced below the annual needs of the industry (estimated to be 1.8 million cubic meters); consequently, many mills are operating below capacity. However, in his 1997 presentation at the annual meeting of the Ghana Timber Millers Organization (GTMO), the Chief Conservator of Ghana's forests (a position similar to Chief of the Forest Service) stated that the current AAC was intended to help

preserve the forest and was based on scientific studies which took into account the forest's annual growth (1 cubic meter per hectare per year).

Proposed interventions for policy constraints

1. Create opportunities that will lead to a more direct marketing of Ghanaian wood products to the United States by the private sector.
2. Minimize the role of the FPIB in the setting of prices and approval of shipments.

Technological Constraints

Inefficiency in the primary wood-processing sector hinders the sustainability of the raw material, as well as profit maximization or competitiveness. As indicated by Loehnertz, the recovery problem in Ghana's sawmills can largely be attributed to the limited skills of mill operators (Loehnertz et al., 1996). Although Ghana has made significant strides in the wood products manufacturing sector, the technical skills sector needs work. In manufacturing furniture, for example, many large- and small-scale manufacturers lack kilns to dry wood to the moisture content levels required for imported furniture. The technology and the skills to join and carve wood into furniture are both quite limited.

The Wood Industries Training Center in Kumasi offers training sessions in wood processing. However, not every mill owner can afford to send his/her workers to Kumasi for such training. Particularly for small-scale operators, enhancing worker skills must assume a low priority due to the costs involved—both the cost of the sessions and the time lost from work.

Proposed interventions for technological constraints

1. Provide opportunities for regularly upgrading the skills of mill employees.
2. Provide opportunities for regularly upgrading the marketing skills of mill owners and managers.

Enhancing personnel skills is essential to optimize investments made in both secondary and tertiary wood products manufacturing subsectors. The Wood Industries Training Center in Kumasi is an excellent resource in achieving this goal.

Small-scale enterprises in Ghana already produce lumber, plywood and sliced veneer, but they lack the equipment, quality control and organized, cooperative effort that will permit them to export to the United States. Likewise, the bigger companies need to update their technologies, quality control and knowledge of U.S. specifications, as well as devise effective strategies for entering the U.S. market. One clear solution requires that companies develop joint ventures and networks that can provide them with entry to markets, access to designs and specifications, and transfer of knowledge.

Infrastructural Constraints

During the field visit, several mill owners complained of the unreliability of local utilities such as electricity, water and fuel. We also observed that many of the small-scale manufacturers work from small sheds, under shade trees and in the back yards of homes, displaying their wares in the open and on congested streets, at the mercy of the weather. The Ghanaian government and these small-scale operators have discussed and agreed upon the establishment of a "wood village" in the Kumasi area. Operators will be encouraged to move their businesses or shops to the wood village where they will have the opportunity to build sheltered units from which they can operate. Construction had not yet begun at the time of this study as there was disagreement over leasing costs, which some operators considered prohibitive.

Proposed interventions for infrastructural constraints

1. The private sector should explore the possibilities of generating backup facilities to handle disruptions in power and water supplies through individual and/or collective ventures.
2. Small-scale operators should discuss with local authorities (city/town councils) the creation of industrial parks or zones for housing the micro- and small-scale wood product entrepreneurs.

Investment or Credit Constraints

During the field visit, several manufacturers stated their desire to acquire the equipment that would enable them to add value to their products. Wood manufacturing equipment is often very expensive, not only to purchase but to train personnel to operate. Many manufacturers, especially small-scale ones, would have to borrow funds to do this; unfortunately, the cost of borrowing money, along with collateral requirements, usually makes this impossible. At the time of this study, interest rates were around 40 percent, which was almost always prohibitive.

Proposed interventions for investment or credit constraints

1. The government, along with large-scale manufacturers, should invest in efficient credit/or investment equipment in the primary sector.
2. The government and large-scale manufacturers should also expand the capability of the secondary and tertiary sectors by investing in furniture and other high-value product machinery.
3. The government should provide alternative financing arrangements that would induce or encourage investments in the industry.

Access to Information

Countries like Brazil, Canada, China, Indonesia, Malaysia and Taiwan already hold significant shares of the U.S. import market for furniture products. Lessons learned from these countries on how they gained access to information on high-value secondary and tertiary products in the United States would be valuable to Ghana's private sector. A critical factor for Ghanaian success in the U.S. market is access to current market information. By all indications, the larger-scale

Ghanaian manufacturers have a measure of access to U.S. market information. However, smaller-scale manufacturers lack that kind of access. As a result, many of them limit themselves to the domestic markets and markets in neighboring countries. If these smaller-scale operators are to become involved in exporting to the United States, their access to current U.S. market information must be enhanced.

Proposed interventions for access to information

1. Current U.S. wood products market information must be made more accessible to all interested parties in Ghana. Organizations such as the Ghana Timber Millers Organization and the Small Scale Carpenters Association could play a major role in this effort. TEDB trade missions to other parts of the world should include the United States.
2. Ghanaian manufacturers should form partnerships with wood products manufacturers in the United States to ensure that new wood and/or secondary wood products introduced into the U.S. market are competitive.
3. Strong marketing intelligence units should be established within the associations to keep companies up to date on the state of markets. A thorough review of the lists of buyers registered by TEDB should be undertaken in order to eliminate those buyers whose continued participation in the trade is detrimental to the good of the exporters and Ghana. A study of marketing strategies adopted by various successful companies—in Ghana and other developing countries—would be useful in designing marketing strategies for less competitive small firms.
4. Because Ghanaian producers need access to market information worldwide, stock levels, buyer's annual procurement plans, price trends and other market indicators should be monitored when targeting points of distribution for major products in the United States.
5. While companies continue to maintain their individuality, the size of most companies and their production levels are insignificant in the international arena. For most products (i.e., machine lumber items, decorative sliced veneers, plywood, veneer particleboard and other value-added products) each group of producers of a specific product should work together in order to gain the benefits of economy of scale in marketing. The logo of GTMO and other product groups should be displayed on their products. Establishing export sheds at Tema or Takoradi (either owned by exporters or rented by the GTMO/SSCA/FAWAS) where export goods can be kept efficiently and economically is also a good idea.

Moisture Content Compliance Constraints

The moisture content requirements (specific dryness level of wood/wood products) of the U.S. market could hinder some Ghanaian manufacturers from entering the U.S. market or expanding their share of the U.S. market. To meet such requirements, mills must have drying kilns and trained personnel to operate them. While some larger mills do have kilns, many others must rely on air-drying techniques. This is a problem because air-dried lumber and wood products do not attract the higher prices that kiln-dried wood products do. However, kilning capacity has been expanding tremendously, and 25 percent of the lumber exports to United States are now kiln-dried. According to FPIB, approximately 55 companies worldwide export kiln-dried lumber. The export markets for Ghana's kiln-dried lumber by volume are as follows: Taiwan, 20 percent; the United Kingdom, 18 percent; France, 16 percent; Germany, 11 percent; Hong Kong, 9 percent;

and others, 26 percent. While the United States imports mainly mahogany, asanfona and teak, the bulk of kiln capacity is utilized by industry as follows: wawa, 80 percent; koto, 9 percent; odum, 5 percent; and others, 6 percent.

Wawa constitutes about 60 percent of round log production. Until recently, the largest market for this wood was the United States, but exporters have been drawn towards Taiwan, Hong Kong and Japan through concerted efforts on the part of Asian buyers. As far as kiln capacity is concerned, a number of companies are installing an additional capacity for 3,000 m^3 in Ghana.

Proposed intervention for moisture content compliance constraints

1. Since kiln-dried wood/wood products attract higher prices than do air-dried wood/wood products, Ghanaian manufacturers should focus on buying or sharing kilns or expanding their kiln capacity.

Trading Constraints

Wood products trade in Ghana is characterized by the presence of a few large-scale producers and many small-scale producers; thus, the advantages that accrue from large shipment sizes cannot be enjoyed by the industry since small-scale producers lack both the economy of scale in operations and the critical mass required to realize lower shipping costs.

Proposed interventions for trade constraints

1. The viability and competitiveness of manufacturing value-added wood products, such as high-value furniture, in Ghana needs additional study.
2. Producers and exporters should be encouraged to form associations that could export on behalf of small companies. Trading companies should also act as separate entities from production mills, so that the Ghanaian timber industry can become more efficient in terms of delivery, quality and quantity.

Recommendations

To assist the Ghanaian wood/wood products industry to become more competitive in the U.S. market, the following recommendations are proposed for USAID, the Ghanaian government, and the public and private sectors.

1. USAID/Ghana and its partners could help improve and expand the capacity of the wood manufacturing sector by supporting skills development or training, particularly for small-scale manufacturers and carpenters.

2. USAID/Ghana, its partners, other donors, the Ghanaian government and the private sector should collaborate to identify and establish alternative sources of affordable financing for forestry-related projects.

3. The public and private sectors should collaborate with NGOs to devise strategies to strengthen outreach activities in agroforestry.

4. The Ghanaian government and the public sector should develop strategies for effective involvement of district assemblies, as well as local community involvement in sustainable forestry management.

5. The Ghanaian government should undertake a careful review of the current draft land policy and implementation plan, both to clarify ownership rights to land and forests and to ensure that, in the long run, there will be equitable access to these resources.

6. To facilitate private-sector development and effective participation in broader economic development activities, the donor community should encourage partnership in initiatives among government, private sectors and NGOs through donor-supported projects or activities.

6. ORGANIZATIONS AND FIRMS WITH POTENTIAL INTEREST IN TRADE AND INVESTMENT IN TROPICAL HARDWOOD: AN INITIAL STEP TO NETWORKING

Assessments of current wood/wood products, market conditions and promotion of trade of rare and exotic wood between the United States and Ghana require full access to relevant information, databases and census statistics. Likewise, determining niches for Ghana's wood/wood products in U.S. markets, promoting mutually beneficiary exchanges and assessing business potential are areas that depend heavily on the availability of information, statistics and analysis of both the U.S. and Ghanaian markets.

In order to identify and match trading partners between the two countries, Ghanaian firms need to be fully knowledgeable with U.S. wood/wood products markets, businesses and companies that import such commodities, national and international wood and wood products organizations, standards of specifications for finished and/or processed products, and the names and addresses of useful contacts in the industry. Likewise, U.S. firms need to be fully knowledgeable with Ghanaian companies and businesses, import and export agents, processing and manufacturing facilities, Ghana's business infrastructure and Ghanaian policies for wood/wood products exchange.

To facilitate collection of such data and to establish an ongoing process for continuous flow of information, networking efforts were initiated. Expected outcomes of the networking activities include the following items:

1. A list of all organizations, national and international associations, and federal and state agencies with interest in wood/wood products in international trade.
2. A list of all technical contact persons and resources for future communications and inquiries concerning wood/wood products.
3. A profile of U.S. companies with potential interest in trading in Ghanaian wood/wood products.
4. A list of all Ghanaian businesses that export or are interested in exporting wood/wood products to the United States.

Data were collected using a number of mechanisms which included: 1) accessing scientific databases; 2) surfing the Internet; 3) reviewing published reports; 4) solicitation of information through a questionnaire; 5) visiting sites in Ghana and selected manufacturers in the United States; and 6) interviewing individuals who can serve as resources. Most of the data collection and information gathering occurred through a series of interviews with individuals whose expertise and background were relevant to the study. Governmental officials, field officers, contact persons, forest scientists, marketing professionals, and import and export promoters were consulted. Information on organizations and firms with potential interest in trade and investment in tropical hardwoods is presented in Appendices 2–9.

7. IMPLICATIONS AND OPPORTUNITIES FOR ECONOMIC GROWTH

The Government of the Republic of Ghana (GOG) has developed a plan for Ghana, known as Vision 2020, which states: "The long-term vision for Ghana is that by the year 2020, Ghana will have achieved a balanced economy and middle-income country status and standard of living. This will be realized by creating an open and liberal market economy, founded on competition, initiative and creativity, that employs science and technology in deriving maximum productivity from the use of all our human and natural resources and in optimizing the rate of economic and social development, with due regard for the protection of the environment and equity in the distribution of benefits to development."

To achieve this vision, and the middle-income status it includes, Ghana must increase her economic growth at a rate of above 7 percent per year. Such a level of growth requires programs to develop critical sectors that can serve as engines of economic growth.

The agricultural sector is the major source of Ghana's employment, income and foreign exchange; it therefore holds great potential to increase economic growth. Agriculture, as defined here, includes inputs and outputs of crops, livestock, forestry and fisheries; agribusiness (agro-processing); marketing; trade; investment; rural financing; microenterprise; and agricultural support services. In order to facilitate economic growth in this sector, access to and use of improved technology and information sources must become more widespread. However, this can only occur in an environment in which the policy, legal and regulatory frameworks, as well as human capacity in terms of technical, managerial, and business skills, are showing strong improvement. The primary task is to increase productivity and efficiency in the agricultural and food systems, defined as systems that integrate the input, production and post-harvest/marketing components. Improvement here depends on advances in technology transfer and commercialization, which in turn depend on the ability of the enabling environment to provide incentives for the private sector to operate efficiently and effectively.

The private sector has always played and should continue to play a dominant role in developing the forestry subsector. Consequently, activities that can enhance the productivity of private enterprises in the wood/wood products subsector will be very helpful in accelerating the growth of Ghana's economy.

Mineral resources are another sector of Ghana's economy that shows promise. The nation's gold and other mineral deposits are well known. Where deposits have attracted investors and IDA and IFC finances, heavy earth-moving equipment has been brought in, gold was mined and export earnings were increased. The loans were repaid from the export earnings; once a mine was depleted or became economically unprofitable, it was decommissioned, leaving a ghost town.

When harvesting timber, local processing of the extracted wood creates linkages with villages so that local carpenters, builders and consumers can obtain materials to meet their needs for housing, schools, clinics, etc. Unfortunately, every stage of this process, from logging to the consumer, depends heavily on external technological sources, such as motor and chain saws, road construction equipment, log extraction skidders, tractors and crawlers, haulage trucks, sawmills, plymills, veneer mills, drying kilns, fuel, oils, lubricants, phenolic and urea

formaldehyde glues for plywood and particleboard, forklifts, molders, and planers—all of which must be imported.

Equipment and spare parts that exist in Ghana did not originate in rural areas; their local availability depends on the availability of international liquidity. It is thus through external loans and retention of all or part of export earnings in convertible currencies that established industries are able to exist and maintain production. It may be necessary to explore the possibility of engaging the skills of local artisans in adapting technologies to manufacture small-scale equipment and spare parts.

Suggestions have been made regarding further processing of mill and forest residue. Logging wastes and residue from the mills are can serve as excellent material for the manufacture of particleboard and similar products. However, external financing is required for the importation of the equipment. An example is the BMK particleboard factory to be commissioned soon at a cost of $15 million, with a capacity to produce 130 m^3 of particleboard a day. BMK Particleboard, Ltd., is the second particleboard company to open a plant in Ghana (the first opened in the late 1970s). Particleboard production increases the utility of trees already harvested. This may appear satisfactory to natural resources managers, but the high cost of the factory, the need to import the equipment, human resource development, knowledge of the external markets, and domestic promotion of the product among craftsmen all require intensive capital investment. In short, the whole process of marketing the product, in an atmosphere of keen competition among several products, comes into play and must be taken into consideration when considering sustainable development.

Classical discussions on economic development and industrialization generally assume that technology is available. However, in Ghana's case, technology cannot be taken for granted. It must be imported, and Ghana must have the capacity to pay for it. Ghana has the wood, but not the sophisticated means with which to harvest it.

For sustainable resource management, the question therefore arises: Which is more important to Ghana—acquisition of equipment to harvest trees for consumption domestically as well as for exports to earn foreign exchange, or acquisition of technology for the reforestation of the land in order to increase future supplies of raw materials? Both goals are equally important, and effort should be made to ensure that both are carried out completely.

The timber industry needs access to international liquidity and the technology needed to 1) transform wood into finished products and 2) maintain a sustainable supply of timber. International financial liquidity is important because, in the medium term, Ghana needs more technology and must pay for it. The Ghanaian economy at large, including government and research institutions, cannot yet provide what the forests and forest-based industries need.

Other forestry-related activities that show potential for economic growth and should be pursued include the following, present below.

1. *Silviculture*

The idea of a silvicultural industry has been proposed by several members of GTMO. Instead of having so many government employees engaged in tree growing, these members feel that companies and cooperatives engaged in reforestation with the object of producing industrial raw materials should employ highly skilled forest workers and technical and professional personnel for this work. The output would consist of fuel wood to support rural (and urban) families, poles for rural electrification and communications and industrial timber for the major mills.

The curricula of forestry schools and colleges should place greater emphasis on practical work covering all aspects of plant breeding, nursery practices and seedling identification in the natural forests, while technical and professional foresters should regularly take refresher courses in silviculture and forest management. At present, the Forestry Department, as a government organization, is not allowed to recruit additional technical staff, and so some graduates of the forestry institutions have not secured employment. Obviously, if the private sector took over this sector, jobs would be available for technical/professional men and women as well as sub-technical staff. In fact, some GTMO members, including their president, expressed a desire to employ staff from the Forestry Department and have them undertake the rehabilitation of the forests.[6] Tree planting on a sustainable basis could be a major solution to the unemployment situation in rural Ghana, which is becoming increasingly serious and could lead to pressures on the environment and natural resources, if not resolved.

2. *Production of pulp wood/wood chips*

Not only silvicultural farms but tree farmers have the capacity to put their lands under plantations to produce pulp wood. Ghana's Vision 2020 sees the country as the gateway to the ECOWAS markets. Production of pulp wood as a source of raw material for the pulp and paper industry is an attractive area for investment. Already, the Subri Industrial Plantations, Ltd., has a large Ghanaian plantation financed by the African Development Bank and the Government of Ghana. The company is on the divestiture list.

The United States has much experience in silviculture, including biotechnological applications (i.e., tissue culture). Various private companies that produce decorative veneers are building particleboard plants to process mill and forest residue. Panels made from this particlewood can then be laminated with highly valued decorative veneers. Forming joint ventures between U.S. pulp and paper companies, U.S. panel products firms (particleboard and medium-density fiberboard) and Ghanaian private companies is one way to attract investment.

[6] Personal communication with GTMO and NUTGA members during the field study.

Cocoa has long been associated with Ghana. The backbone of the Ghanaian economy, the cocoa industry was established through the efforts of individual peasant farmers. Although cocoa is now indigenous to Ghana, the seed was originally exotic. Through their efforts, Ghanaian farmers were able to plant 180 million trees to establish the basis for a viable export corp. The spontaneity with which ordinary individuals responded to market forces through the establishment of a cash/export crop from scratch is commendable. It demonstrates that given the support, farmers can undertake tree growing to add to Ghana's forest estate. This is already taking place, and many tree growers or farmers have seeded plantations of teak, cedrela, mahogany and other species. Tree growers associations have been formed, and workshops are regularly organized.

It is clear that tree growing is a viable means of absorbing a high percentage of the unemployed in both urban and rural areas. Tree growing can also combine well with food production (agroforestry). However, serious constraints exist, such as land tenure, high cost of money, training of field labor and supervisors, provision of seed and other planting materials and inadequate financing of the Forestry Research Institute of Ghana (FORIG). These constraints will adversely affect the long-term availability of raw materials if not corrected.

Using agriculture as an engine of economic growth to achieve the balanced and sustainable economic development described in Vision 2020 implies the following interventions:

a. Sustainable forest resource management and support for private professional foresters in establishing silvicultural businesses. The objective is for businesses to undertake silvicultural treatment of forests, including application of regeneration techniques.
b. Encouragement of private individuals who are manufacturing spare parts for the timber industry.
c. Manufacture of bandsaw blades, circular saws, and cutters for molders through a joint venture between WITC and U.S. firms.
d. Establishing a joint venture between a spare parts factory in Bibiani and U.S. firms.
e. Encouraging U.S. machine manufacturing firms to open branches in Ghana to expedite supplies of equipment and spares to the industry.
f. Technical and financial support to small business holders.

The goal of USAID/Ghana's Country Strategic Plan is a broad-based, sustainable economic growth; the Plan's Strategic Objective #1 is increased private sector growth. USAID/Ghana has argued that in order for Ghana to achieve its desired level of economic growth, increased international competitiveness through more efficient generation of "value-added" activities in production and marketing and substantial increases in investment are essential. Section 2 of this report presents evidence that supports opportunities for "value-added" activities in the processing and marketing of wood/wood products, especially by the tertiary players (carpenters, carvers, etc.) in the forestry subsector. Most of these entrepreneurs operate micro and small businesses. The constraints identified in pre-production, production and post-harvest sections of the analysis reinforced the need for investment in all three areas.

The proposed activities under SO 1 of the Mission's Country Strategic Plan for 1997–2001 include assistance to: (a) improve policies; (b) improve availability of an access to finance; (c) increase access to and use of technology and information; (d) increase the management capacity of production and marketing enterprises; (e) increase the use of improved technology; and (f) increase the access to market information.

The constraints and interventions recommended in the analysis are consistent with the proposed activities under SO 1. The inclusion of forest resources management, production and marketing activities proposed here into USAID/Ghana's activities will substantially contribute to the accomplishment of the Mission's SO 1. The recommended interventions in this study are therefore consistent with and complementary to Ghana's Vision 2020 and USAID/Ghana's country Strategic Plan.

Elements of potential opportunity for Ghanaian economic growth:

1. Expanded trade and investment of non-traditional wood/wood products.
2. Opportunities for U.S. firms to increase trade with Ghanaian counterparts in forestry manufacturing technology, pulp and paper productions.
3. Creation of employment and increased income for rural families and small businesses in reforestation (tree planting), biotechnology and silviculture.
4. Expanded capacities for Ghana to increase its foreign exchange earnings.

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APPENDICES

Appendix 1: Scope of Work for the Study

USAID/PSGE Agribusiness Advisor, Charles Whyte, served as the USAID manager of this activity. The activity was managed as a PASA by USDA/FAS/ICD with Catherine Watkins as the Activity Manager. It was implemented through a Cooperative Agreement between USDA/FAS/ICD and Tuskegee University, with Eloise Carter, Deputy Director of International Programs at Tuskegee University, as the manager of the activity.

The technical team consisted of the following: Emmanuel Acquah, Team Leader (University of Maryland Eastern Shore); Stephen Kolison, Forestry Marketing Economist (Tuskegee University); and Peter Boateng, Forestry Economist (Ghanaian consultant).

A. Team Leader: This shall be an individual with a Ph.D. in Production or Resource Economics who has extensive work experience in coordinating and managing multi-disciplinary research teams.

The Team Leader shall have the following skills and experience:

a. experience in a leadership role in the technical assistance project in sub-Saharan Africa
b. a strong background in institutional development, particularly with African governments
c. ability to work closely with African government officials and policy makers
d. experience in managing multi-disciplinary teams in the field
e. experience in implementing complex development projects and programs
f. experience in working with host country technical counterparts.

The Team Leader will be responsible for the following tasks:

1. in charge of the overall technical aspects of the activity
2. responsible for recommending consultants, through the Contractor, for USAID approval
3. supervising the activities of consultants
4. responsible for the timely outputs of team members and deliverables
5. responsible for recommending local consultants for field activities and for logistics, through the Contractor, for USAID approval
6. responsible for getting work plans of action developed by each consultant before commencing any activity.

B. Wood Products Marketing Specialist: This individual will be responsible for the market analysis for actual and potential wood products from Africa in the U.S. market. The individual shall have training in forestry economics or agricultural marketing.

The Specialist will be responsible for the following specific tasks:

1. identify three to four specific African wood products in the U.S. market with medium to long-term potential
2. identify and evaluate import requirements, marketing and distribution options available to African exporters in this sector
3. identify particular market segments and/or niches towards which exports from Ghana should be targeted for greatest opportunities (i.e., furniture)
4. identify and specify unique requirements or standards for African wood products in the U.S. market
5. perform economic viability analysis for marketing of African (Ghana) wood products in America
6. analyze current competition in the U.S. market from both domestic producers and foreign suppliers, particularly from other developing countries
7. identify wood processing technology used by successful developing country exporters in the U.S. market
8. identify and analyze constraints faced by African exporters to the U.S. market
9. identify potential U.S. importers and distributors of African wood/wood products
10. collaborate with local Ghanaian consultant to:

    a. assess the medium to long-term availability of rare and exotic species of Ghanaian timber for international markets
    b. determine the current value, types and specifications of wood/wood products exported to the U.S. and other European markets
    c. determine the nature of wood processing technology used by successful developing countries that export to the U.S. market and compare it with Ghanaian technology
    d. assess the extent of accessibility of Ghanaian wood products, exporters and manufacturing to information on U.S. wood products specifications and standards
    e. determine salient constraints faced by African exporters (especially Ghana) to the U.S. market in addition to technology and lack of adequate market information and recommend solutions to these constraints
    f. assess economic viability of exporting wood products from Ghana to the U.S. market
    g. assess the options available to African (Ghanaian) exports of wood and wood products in terms of marketing and distribution strategies.

C. Forest Products Networking Consultant: The individual shall have experience and contacts with various organizations (government, NGO, private firms, etc.) that are involved in wood products development, marketing and distribution in America and overseas.

The Consultant will be responsible for the following tasks:

1. identify and develop a list of individuals and organizations interested in promoting importation of rare exotic wood products from Africa (Ghana in particular)
2. develop a profile of U.S. and Ghana businesses that are interested in forming joint ventures for importing and marketing Ghana wood products in the U.S.

The original intent of this activity was to use two African countries (Ghana and Tanzania) as case studies for sub-Saharan Africa. However, due to budgetary constraints, USAID/PSGE decided to initially limit the study to one country, and Ghana was selected.

Appendix 2: List of Organizations with Interest in Tropical Hardwood and Wood Products

1. Britain's Oversea Development Administration (ODA)
2. Ghana's Forest Department
3. International Tropical Timber Organization (ITTO)
4. Forest Research Institute of Ghana (FORIG)
5. Ghana Studies Council (GSC)
6. Ghana's Bureau of Integrated Rural Development
7. DANIDA and IDA
8. Ghana's Wood Industry Training Center (WITC)
9. Ghana's Timber Export Development Board (TEDB)
10. Ghana's Forest Products Inspection Bureau (FPIB)
11. International Institute for Environmental and Development (IIED)
12. University of Washington, Forest-Product Marketing Program
13. Center for Forest Product Marketing at VPI
14. Center for International Trade in Forest Products - University of Washington
15. Center for Global Trade Development in Ghana
16. U.S. Forest Service Agency
17. U.S. Chamber of Commerce
18. U.S. Department of Commerce
19. U.S. Department of Agriculture
20. Ghana's trade mission with the United States
21. The World Bank
22. International Monetary Fund (IMF)
23. U.S. Wood Manufacturing Association Import/Export Agents
24. Forest Inventory Project (FIP)
25. Ghana's Plant Genetic Resources Center (PGRC) at Bunso
26. Center For Scientific Research into Plant Medicine (CSRPM) at Marnpong Akwapin
27. Ghana Timber Millers Organization (GTMO)
28. American Forest & Paper Association (AF&PA)
29. American Hardboard Association
30. American Hardwood Export Council

31. American Hardware Manufacturers Association (AHMA)
32. American Association of Woodturners (AAW)
33. Engineered Wood Association (formerly the American Plywood Association) (APA)
34. American Wood Council
35. American Wood-Preservers Association (AWPA)
36. American Wood Preservers Institute
37. Appalachian Hardwood Manufacturers
38. Arizona Woodturners Association
39. Business and Institutional Furniture Manufacturers Association (BIFMA)
40. California Furniture Manufacturers Association (CFMA)
41. California Redwood Association
42. Carolinas-Tennessee Building Materials Association, Inc.
43. Cascade Woodturners Association
44. Cedar Shake and Shingle Bureau (CSSB)
45. Charlotte Woodworking Association (CWA)
46. Classic (wooden) Yacht Association (CYA)
47. Empire State Forest Products Association (ESFPA)
48. Evergreen Partnership
49. Florida Building Material Association (FBMA)
50. Florida Wood Council (FWC)
51. Forest Industry Council
52. Forest Products Society
53. Hardwood Distributors Association
54. Hardwood Manufacturers Association (HMA)
55. Hardwood Plywood and Veneer Association (HPVA)
56. International Wood Products Association (IWPA)
57. Kentucky Wood Products Competitiveness Corporation
58. Kitchen Cabinet Manufacturers Association (KCMA)
59. Laminating Materials Association (LMA)
60. Lumbermen's Credit Association (LCA)
61. Maine Wood Products Association
62. National Hardwood Lumber Association (NHLA)
63. National Lumber and Building Materials Dealers Association (NLBMDA)

64. National Oak Flooring Manufacturers Association
65. National Particleboard Association
66. National Sash & Door Jobbers Association (NSDJA)
67. National Wood Flooring Association
68. National Wood Window and Door Association (NWWDA)
69. North American Wholesale Lumber Association (NAWLA)
70. Northeastern Retail Lumber Association (NRLA)
71. Northeast Lumber Manufacturers Association
72. Northwest Independent Forest Manufacturers
73. Oregon Forest Industries Council (OFIC)
74. Pacific Lumber Inspection Bureau
75. Plywood Research Foundation
76. Secondary Wood Products Consortium (SWPC)
77. Southeastern Lumber Manufacturers Association
78. Southern Pine Inspection Bureau
79. Temperate Forest Foundation
80. Timber Products Manufacturers
81. Western Red Cedar Lumber Association
82. Western Wood Products Association (WWPA)
83. Wood Moulding and Millwork Producers Association (WMMPA)
84. Wood Products Competitiveness Council (WPCC)

Appendix 3: List of Contact Points in Federal and State Organizations and Universities

For future reference and inquiries, a list of technical points of contacts is here provided. Individuals listed are those who hold positions of responsibility in areas that range from wood/wood products processing, production and marketing to regulation, management and administration.

Program Leader
James A. Caron
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Chris Liggert
USDA Forest Service
Email: fswa/s=c.liggett/oul=
w0 1 c-mhs.attmail.com
Phone: 202-205-1576

Cliff Hickman
USDA Forest Service
P.O. Box 96090
Washington, DC 20090-6090
Phone: 202-205-1162
Email: Hickman Cliff/wogfs.fed.us

Carolyn Alkire
The Wilderness Society
900 17th Street, NW
Washington, DC 20006
Phone: 202-429-2685
Fax: 202-429-3958

Janine Bologna
USDA Forest Service
P. 0. Box 96090
Washington, DC 20090-6090
Phone: 202-205-1110

David Allen
USDA Forest Service
14th & Independence St., SW
P.O Box 96090
Washington, DC 20090-6090
Phone: 202-205-0967
Fax: 202-205-1074

Becky Batts
Office of Inspector General
14th and Independence Avenue, SW
Room 416 East
Washington, DC 20254
Phone: 202-720-6805
Fax: 202-690-4110

Doug Crandall
American Forest & Paper Association
1111 19th Street NW
Suite 800
Washington, DC 20036
Phone: 202-463-2752
Fax: 202-463-2708

Walter Dunn
USDA Forest Service Office International Programs
P.O. Box 96090 Washington, DC 20090-6090
Phone: 202-273-4733
Fax: 202-273-4749

Ross Gorte
Congressional Research Service
Environmental and Natural Resources
Section LM 423
101 Independence Ave., SE

Washington, DC 20540
Phone: 202-707-7266
Fax: 202-707-3342

Linda Harmon
U.S. General Accounting Office
441 G Street, NW
Washington, DC 20548
Phone: 202-512-8046
Fax: 202-512-8354

David L. Hessel
USDA Forest Service
Timber Management Staff
P.O. Box 96090
Washington, DC 20090-6090
Phone: 202-205-1185
Fax: 202-205-1045

James Hubbard
State Forest Service
Colorado State University
Forestry Building
Ft. Collins, CO 80523
Phone: 970-491-6303

James W. Lyons
US Department of Agriculture
Undersecretary for Natural Resources and Environment
14th & Independence Ave., SW
Washington, DC 20250
Phone: 202-720-7173
Fax: 202-720-4732

Jay McWhirter
USDA Office of General Counsel
Room 46, 19 South Building
14th and Independence, SW
Washington, DC 20250-1400
Phone: 202-690-0329
Fax: 202-690-2730

Bruce R. Lippke
David Franklin
President
CINTRAFOR
College of Forest Resources
University of Washington
P.O. Box 352100
Seattle, WA 98195-2100
Email: blippkeguwashington.edu
Phone: 206-543-8684
Fax: 206-685-0790

Donald G. Arganbright
Department Chair, Wood Technology
Northern Arizona University
Email: Donald. G.Arganbright@nau.edu

Kieran Whelan
T.R.A.D.E.,Inc.
Trade Reporting and Data Exchange, Inc.
2755 Campus Drive
San Mateo CA 94403
Phone: 650-513-0930, ext. 241
Fax: 650-513-0944

Miller Publishing Corporation
Import and Export news
P.O. Box 34908
Memphis, TN 38184-8280
Phone: 901-373-6180
Email: mktgsubsgmillerpublishing.com

AgExport Connections
Ag Box 1052, AGXIFAS/USDA
Washington, DC 20250-1052
Phone: 202-720-71031 /690-3416
Fax: 202-690-4374/690-720-6896

Wendy Baer
Executive Vice President
International Hardwood Products Association
4214 King Street West
Alexandria, VA 22302
Phone: 703-820-6696
Fax: 703-820-8550
E-mail: info@ ihpa.org

Lou Harrell
Vice President
Sigma I Corporation
Chapel Hill, NC
Phone: 919-361-9800
Fax: 919-361-5858

David Oglesby
Kenan Institute of Private Enterprise
Chapel Hill, NC
Phone: 919-962-8201
Fax: 919-962-8202

Mark P. Buccowich
Africa Bureau Chief
USDA Forest Service
International Forestry Program
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Washington, D. C. 20090-6538
Phone: 202-501-2632
Fax: 202-273-4749

Anita Katial Zemany
Program Coordinator
American Hardwood Export Council
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Washington, D. C. 20036
Phone: 202-463-2720
Fax: 202-463-2787

Appendix 4: Profile of U.S. Firms with Interest in Tropical Hardwood

A profile of major U.S. firms involved in tropical hardwood/wood products is presented here. The profile includes the following: (a) name and address of the firm, (b) telephone and fax number, (c) contact persons, (d) type of business (importer or exporter), (e) species of hardwood imported or exported, and (f) types of products imported or exported. A total of 47 firms are included in the profile.

Each firm was contacted by phone/fax to ascertain its interest in participating in a USAID-sponsored networking workshop of U.S. and African wood and wood products manufacturers to promote trade and investment between the two continents. Almost all of them responded favorably to attend such a workshop if invited. However, the majority indicated that they needed more information before committing themselves to a joint venture in trade and investment.

Some of these firms do have contacts with one or more African manufacturers. Those firms that are currently dealing with African manufacturers are: David R. Webb Company (dealing with Zaire, Ivory Coast, Ghana); Newman Lumber Company (Ghana); Terra Intertrade, Inc. (Ghana); Aleal Trading Company Ltd. (Nigeria); Mega Company (Ghana); T. Bird McIlvain International Company (Ghana, Cameroon); American Hardwood (Ghana); Public Lumber Hardwood International (Nigeria); California Pacific Trading Corporation (Gabon, Cameroon, Togo, Ivory Coast); Clarke Veneers and Plywood (Ghana); Dean Hardwoods, Inc. (Zaire); EAC Timber Americas, Inc. (Ghana); Mid-Atlantic Veneer Company (Ghana); DLH Nordisk (Ghana); Pat Brown Lumber Corporation (Cameroon, Ivory Coast, Gabon); Penrod Company THE (Ghana); Ply Gem Manufacturing (Swaziland): Weyerhauser (South Africa, Zaire); and Afri-Rural Industries (Ghana, Congo).

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
Aljoma Lumber, Inc. 10300 NW 121 Way Medley, FL 33178 (305) 556-8003 (305) 556-4991	Jose A. Lamas, Jr., CEO Romel Bezerra, Vice President, Hardwoods Peter Wolff, Vice President, Imported Panel Products	Importer, exporter	mahogany, Spanish cedar, imbuia, virola, jatoba, Brazilian lauan, elliottis pine, sande, ipe	Same as imports	Hardwood, plywood, imported, fancy plywood, pre-finished plywood, paper and /or vinyl overlay plywood, cut-to-size plywood including drawer sides, plywood products, exterior, siding, industrial, carved, unidirectional, core stock, veneers, hardwood lumber, rough and dressed, softwood lumber, rough and dressed, lumber dimension, stock lumber products, car decking, truck flooring, panel and louver doors, hardboard, hardwood flooring including strip and parquet flooring, hardwood furniture, squares, imported	Hardwood, plywood imported, hardwood plywood, domestic, fancy plywood, pre-finished plywood, paper and or vinyl overlay plywood, door skin plywood, cut to size plywood including drawer sides, plywood products, exterior, siding, industrial, carved, unidirectional, core stock, veneers, hardwood lumber, rough and dressed softwood lumber, rough and dressed lumber dimension, stock lumber, molding, jambs, dowels, hardwood flooring including strip and parquet flooring, hardwood furniture, squares, imported
Allied International 200 Baker Avenue Suite 210 Concord, MA 01742-2212 (508) 371-3399 (508) 371-2334	Bob Nassau, President Harte Whittle, Vice President	Importer, exporter	meranti, melapi, mersawa, red oak, birch, sen, rubberwood, Baltic birch, agathis, kapur, kreuing, lauan	lauan, meranti, mersawa, agathis, red oak, birch, Baltic birch	Hardwood plywood imported, fancy plywood, pre-finished plywood, printed plywood, paper and/or vinyl overlay plywood, embossed plywood, door skin plywood, cut to size plywood including drawer sides, plywood products, exterior siding, industrial, carved, unidirectional, core stock veneers, backs and crossband veneers, hard-wood lumber, rough and dressed lumber, moldings, jambs, dowels, lumber drawer sides, lumber products, car decking, truck flooring, panel and louver door, hardboard door skin, hardboard cut to size, hardboard products other, insulation board, ceiling tiles, particleboard, particleboard cut to size, hardwood flooring including strip and parquet flooring, furniture components, parts, assembled and knockdown, hardwood furniture squares imported	Hardwood plywood imported, hardwood plywood, domestic, hardboard, hardboard doorskin, hardboard, cut to size, hardboard, products other, particleboard, particleboard cut to size

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
American Hardwood Company 15411 S. Figueroa Gardena, CA 90248 (310) 527-9066 (310) 527-9074	Nathan Osborne	Importer, manufac-turer, furniture				
American Pacific Plywood 250 Industrial Way Buellton, CA 93427 P.O. Box 8 Solvang, CA 93464 (805) 688-7919 (805) 688-2956	J. Pat Bennett, President Officers: Mark O'Brien, Vice President, Sales	Importer via China	meranti, kapur, keruing seyra, white woods, Brazilian woods, pine terentang, agathis		Hardwood plywood importer, hardwood plywood, domestic, fancy plywood, paper and/or vinyl overlay plywood, doors skin, plywood, cut to size plywood including drawer sides, core stock veneers, backs and cross band veneers, hardwood, lumber, rough and dressed, softwood, lumber, rough and dressed, lumber, moldings, jambs, dowels, lumber, drawer sides, lumber products, car decking, truck flooring, panel and louver doors, furniture components, parts, assembled and knockdown	
Argo Fine Imports, Inc. 3032 Ridgelake Drive, Suite 201 Metairie, LA 70002 (504) 828-0943 (504) 828-0946	Tony Santoro, Vice President, Sales Richard Olano, Sales	Importer, sales rep., commiss-ioned agent	lauan, merantim, agathis, melapi, oak, birch, teak, virola		Hardwood, plywood, imported, fancy plywood, pre-finished plywood, paper and/or vinyl overlay plywood, door skin plywood, cut to size plywood including drawer sides, plywood products, exterior, siding, industrial, carved, unidirectional hardboard, hardboard door skin, hardboard cut to size	

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
Bayside, Ltd. 701 5`h Avenue Suite 6600 Seattle, WA 98104 (206) 386-8000 (206) 386-8014	Scott Howell, Vice President	Importer	lenga, coigne		Backs, cross bands veneers, hardwood lumber, rough and dressed lumber, dimension stock, lumber moldings, jambs, dowels, lumber drawer sides, lumber products, car decking, truck flooring, panel, louver doors, hardwood flooring including strip and parquet flooring, furniture components, parts, assembled, and knockdown, hardwood furniture squares imported	
Brookside Veneers Ltd. 215 Liberty Street P. 0. Box 4348 Metuchen, NJ 08840 (609) 409-1311 (609) 409-1322	Arne Thomsson, President, Eric Thomsson, Vice President, David Thomsson, Vice President	Importer, exporter	Brookline composite veneer, African mahogany, negre, African chestnut, sapeli, bubinga, zebrawood, birds-eye maple, paldao, satinwood, brown oak, makore, ash, pearwood, yew, burls	Brookline composite veneer	Hardwood plywood, imported, door skin plywood, plywood products, exterior, siding, industrial, carved, unidirectional, lumber moldings, jambs, dowels, furniture components, parts, assembled, and knockdown, other products handled, face veneers, spliced veneer faces	Other products handled, face veneer faces
Brookside Veneers, Ltd. 3200 Northline Av., Forum, VI Suite 524 Greensboro, NC 27408 (910) 852-7721 (910) 299-7181	Eric Thomsson, Vice President					

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
California Pacific Trading Corporation, 6520 Etiwana Av, Rancho Cucamonga, CA 91739 (909) 899-0395 (909) 899-0396	Roy Chowdhury, President	Importer	teak veneer, teak lumber, teak marine plywood, teak cabin sole panel, sapeli veneer, sapeli marine plywood, okoume veneer, okoume marine plywood, honduras mahogany, meranti up to 10 faces, afromosia, Russian birch plywood type i type 11, mreianti platform plywood, type I and li, pijian species dakua, kaudamu, damanu, 1/28",1/16", 1/10" afromosia, negre, logs or custom cut veneer, white oak, red oak, cherry, ash, walnut, maple		Hardwood plywood imported, hardwood plywood, domestic, fancy plywood, paper and or vinyl overlay plywood, door skin plywood, cut to size plywood, including drawer sides, core stock veneers, backs and cross band veneers, hardwood lumber rough and dressed, softwood lumber rough and dressed lumber moldings, jambs, dowels, lumber, drawer sides, lumber products, car decking, truck flooring, panel and louver doors, furniture components, parts, assembled and knockdown	
Chesapeake Hardwood Products, Inc. 201 Dexter St. West Chesapeake, VA 23320 (757) 543-1601 (757) 543-4335	James Hynie, President/CEO					

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
Clarke Veneers and Plywood 3000 Old Canton Rd, # 235, P. 0. Box 4876, Jackson, MS 39216-4876 (601) 366-0331 (601) 366-0334	Holden M. Clarke, President, Stuart H. Clarke, Vice President	Importer	lauan, meranti, dakua, kaudamu, kauvula, pine, eucalyptus, samba, Chilean oak, teak, okoume, cativo, angegre, sapeli, ribbon striped meranti, other tropical species	maple, oak, birch, polar, gum	Core stock veneers, backs and cross band veneers, particleboard, hardwood furniture squares imported, other products handled	Core lock veneers, hardwood lumber, rough and dressed, furniture components, parts, assembled and knockdown, other products handled, rotary and sliced face and black veneers, core stock, centers, cross banding, natural whole piece, non-spliced, spliced to size and lumber core and veneer core platforms
Commonwealth Plywood Co. Ltd, P. 0. Box 1332 Tualatin, OR 97602 (503) 684-6378 (503) 620-5864	Ronald McEvers, Sales Manager, western division					
Contact International, Inc. 1881 SW Front Avenue, Portland, OR 97201 (503) 228-7361 (503) 228-8211	Paul McKay, President	Importer	pine, agathis, meranti, lauan, keruing, jeluton, teak		Hardwood lumber, rough and dressed, softwood lumber, rough and dressed, lumber moldings, jambs, dowels, lumber drawer sides, lumber products, car decking, truck flooring, panel and louver doors, hardwood flooring including strip and parquet flooring, furniture components, parts, assembled, and knockdown, hardwood furniture squares imported	
Craig Lumber Corporation 200 South Progress Road P. O. Box 158 Collierville, TN 38027	A. Charles Craig, President	Importer, exporter	European hard-woods and ahura, aniegre, ayuodire, bubinga, black ebony, imbuia, iroko, lacewood, peru walnut, zebrawood, African	white and red oak, ash	Lumber, squares, dimension	Lumber and strips

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
(901) 853-4317 (901) 853-5028			mahogany, genuine mahogany, sapele, makore, padouk, purpleheart, shedua, Burmese teak, tigerwood wenge			
Crown Hardwood Veneer Corp. 1086 West Baltimore Pike West Grove, PA 19390 (610) 869-8771 (610) 869-4166	Stephan Schlobach, Vice President	Importer	imported architectural veneer species including world-wide exotic species, over 80 in stock, U.S. hard-wood, white oak, architectural species, red oak, maple, birdseye, walnut, cherry, curly, maple		Hardwood lumber, rough and dressed	
Crown Hardwood Veneer Corp. West Coast Office 181 South Park San Francisco, CA 94107 (415) 543-7700 (415) 543-7796	Christina Garcia, Manager	Importer	Same		Same	

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
David R. Webb Co., Inc. 206 Holland Street, P. 0. Box 8, Edinberg, IN 46124-0008 (812) 526-2601 (812) 526-5842	John A. Grunwald, President Tony Simmons, Vice President	Importer, exporter, manu-facturers, domestic hardwood plywood	Mahogany, anigre, Spanish cedar, beech, ebony, burls	Redwood burls, madroba burls, walnut burls, maple burls	Hardwood lumber, rough and dressed, other products handled, decorative face veneer	Hardwood lumber, rough and dressed
Dean Hardwoods, Inc. 1 Cowan Street P.O. Box 1595a Wilmington, NC 28402 (910) 763-5409 (910) 763-3748	Charles D. Dean, Jr., President	Importer	Teak, mahogany, Philippine mahogany, sapele, afromosia, other foreign species		Hardwood lumber, rough and dressed, lumber moldings, jambs, dowels, hardwood flooring including strip and parquet flooring, furniture components, parts, assembled and knockdown, products handled, distributor of rough lumber and manufacturer of custom moldings and flooring from foreign and domestic lumber	
EAC Timber Americas, Inc. 5509-B West Friendly Avenue Suite 201 Greensboro, NC 27410 (910) 855-9474 (910) 855-9485	Finn Grubbe, Chris Harrington, Christian Mengel, Tim McGill,	Importer	South American, Far Eastern, and African species		Hardwood lumber, rough and dressed, lumber moldings, jambs, dowels, lumber products, car decking, truck flooring, panel and louver doors, hardwood flooring, including strip and parquet flooring	

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
Frank Paxton Company 6311 St. John Avenue P.O. Box 6610 Kansas, MO 64114 (816) 483-5009 (816) 483-5111	Roger W. Davis, President	Importer	Balsa, bubinga, bloodwood, koa, cocobolo, teak, jelutong, African mahogany, lauan, moradillo, padauk, purpleheart, satin-wood, lace-wood, rosewood, wenge, zebrawood		Hardwood, plywood imported, hardwood, plywood, domestic, fancy plywood, pre-finished plywood, cut to size plywood, including drawersides, plywood products, exterior siding, industrial, carved, unidirectional, hardwood lumber, rough and dressed, softwood lumber, rough and dressed, lumber dimension, stock, lumber moldings, jambs, dowels, lumber, drawer sides, lumber, products, car decking, truck, flooring, panel and louver doors, hardboard, particle board	
Frost Hardwood Lumber Company 6565 Miramar Road, P. O. Box 15, San Diego, CA 92112-0015 (619) 455-9060 (619) 455-0450	Gordon T. Frost, Chairman of the Board, G.T. Frost, Jr., President and General Manager	Importer			Hardwood plywood importer, hardwood plywood, domestic, fancy plywood, pre-finished plywood, paper and/or vinyl overlay plywood, hardwood lumber, rough and dressed, lumber moldings, jambs, dowels, lumber products, car decking, truck flooring, panel and louver doors, hardwood flooring including strip and parquet flooring	
G. B. Associates, Inc., 813 Ridge Lake Blvd., Suite 370, Memphis TN 38120 (901) 682-2440 (901) 682-2442	George Bryn, President George H. Bryn, Vice President	Importer, exporter, sales rep.	South American and African, South American pines	All American hardwoods	Hardwood, plywood, domestic, fancy plywood, plywood products, exterior, siding, industrial, carved, core stock veneers, unidirectional, backs, and cross band veneers, lumber products, car decking, truck flooring, panel and louver doors, particleboard, cut to size, hardwood furniture, squares, imported, other products handled, MDF all thickness	Hardwood, plywood, imported, cut to size, plywood, including drawer side, core stock veneers, backs, and cross band veneers, hardwood flooring including strip and parquet flooring

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
Gross Veneer Sales, Inc. 2040 Brevard Road, P. O. Box 5212 Emerywood Station, High Point, NC 27262 (910) 883-0196 (910) 886-1366	Robert A. Gross, President Robert D. Gross, Vice President	Importer, exporter, whole-saler	mahogany, koto, primavera, fuma, sumauma, sande, anime, meranti, birch, guatmaby, coigue, copaiba, eucalyptus-muiritin ga, jacareuba	Same as import species	Hardwood, plywood imported, cut to size, plywood, including drawer side, core stock veneers, backs, and cross band veneers, other products, handled, Casco glue film, Guatamby, drawer side blanks, dieboard stock	
Afrasian/Gross Veneer Sales 39 East Jericho Turnpike Mineola, NY 11501 (516) 747-4190 (516) 747-8622	Frank Sheridan, President					
Harlan Pacific, Inc. 320 108th Avenue, NE, Suite 600, P.O. Box 1433 Bellevue, WA 98009 (425) 454-3788 (425) 454-8902	Robert Harlan, President	Importer, exporter	Shores, Western red cedar, South-east Asian, South American, and African species		Core stock veneers, backs, and crossband veneers	Other products handled, logs, Douglas fir, hemlock, white fir, western red cedar

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
Ihlo Sales and Import Co. P. 0. Box 2138 Center, TX 75935 (409) 598-8146 (409) 598-9210	Suzanna Ihlo, President Roy Blackshear, Vice President		Lauan, sen, teak, agathis, Japanese oak, ramin, kapur, meranti, merapi, mersawa, African mahogany		Imported door skin, plywood, cut to size, plywood, including drawer sides, plywood products, exterior, siding, industrial, carved, unidirectional, core stock veneers, backs, cross band veneers, lumber, moldings, jambs, dowels, lumber, drawer sides, lumber, products, car decking, truck flooring, panel and louver doors, furniture components, parts, assembled and knockdown	
Intercontinental Hardwoods, Inc. 6841 Malpass Corner Road P.O. Drawer 119, Currie, NC 28435 (910) 283-9960 (910) 283-9964	Thomas Herga, President Robert Hunink, Vice President	Importer				
International Specialties, Inc. 2009 Myrtle Bend Drive P. 0. Box 38282 Germantown, TN 38282 (901) 755-2640 (901) 755-2982	Thomas E. Wilson, President	Importer, exporter	agathis, balsa, banak, birch, coigue, meranti, eucalyptus, pine, guuatambu, ramin, jelutong, keruing, lenga, mahogany, melapi, oak, rauli, rubberwood, teak, tepa, walnut, coigne, rauli, lenga		Hardwood, plywood, imported, fancy plywood, pre-finished plywood, cut to size plywood, including drawer sides, plywood product, exterior siding, industrial, carved, unidirectional, core stock, veneer, hardwood, lumber, rough and dressed, softwood lumber, rough and dressed, lumb er dimension stock, lumber molding, jambs, dowels, lumber drawer sides, lumber products, car decking, truck flooring, panel and louver doors, hardwood cut to size, furniture, other products, handled, clued up panels, tool handles	Hardwood lumber, rough and dressed lumber, dimension

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
Kindel Furniture P.O. Box 2047 Grand Rapids, MI 49501 (616) 243-3676 (616) 243-6248	Robert S. Fogarty, Jr., President Jon Graber, Vice President	Furniture				
Lane Stanton Vance Lumber Company P.O. Box 3468 City of Industry, CA 91744 (818) 968-8331 (415) 632-9663	Jerry Lapin, Sales	Importer, exporter	keruing, meranti, mahogany, Fiji veneers, genuine mahogany, ramin, teak, rosewood, hardwood lumber, koa, purpleheart, African padauk		Hardwood, plywood imported, hardwood plywood, domestic, cut to size plywood, including drawer sides, core stock, veneers, backs, cross bands, veneers, hardwood lumber, rough and dressed, lumber molding, jambs, dowels, lumber drawer sides, lumber products, car decking, truck flooring, panel, louver doors	Hardwood lumber, rough and dressed
McCarthay Timber, Inc. 1440 N. Dayton Suite 307 Chicago, IL 60622-2604 (312) 751-1171 (312) 440-0667	Daniel Road, President Kenneth R. Roach, II, Vice President	Importer			Hardwood, plywood, imported, fancy plywood, pre-finished, plywood, printed plywood, paper and/or vinyl overlay plywood, door skin, plywood, cut to size plywood including drawer side, plywood products, exterior, siding, industrial carved, unidirectional, core stock veneers, backs, cross band veneers, hardwood lumber, rough and dressed, lumber moldings, jambs, dowels, lumber drawer sides, lumber products, car decking, truck flooring, panel and louver doors, hardwood flooring including strip and parquet flooring, furniture components, parts, assembled and knockdown, hardwood furniture squares imported	

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
MidAtlantic Veneer Co. 800 Bee Street Princeton, WV 24740 (304) 425-8701	Giancarlo Fumagalli, Chairman A.H. Herb McClaugherty, President	Importer, exporter	anigre, khoya, sapele, makore, maobi, kato, longhy, ayous, aradire mavingui, chen-chen, sound backs and faces	fig anigre, makore, moabi, longhy, koto	Core stock veneers, backs, crossband veneers, hardwood lumber, rough and dressed, other products handled, fancy face veneers	Other products handled, fancy face veneers
Mitsubishi International Corporation 520 Madison Avenue New York, NY 10022 (212) 605-2534/ 2537 (212) 605-1869	John Andl, Vice President	Importer, exporter	all	hardwoods	Hardwood, plywood, imported, fancy plywood, pre-finished plywood, printed plywood, paper and/or vinyl overlay plywood, embossed plywood, door skin plywood, cut to size plywood, incl. drawer sides, plywood products, core stock veneers, exterior, siding, backs, industrial, carved, uni-directional, crossband veneers, hardwood lumber, rough and dressed, lumber moldings, jambs, dowels, lumber drawer sides, lumber products, car decking, truck flooring, panel and louver doors, hardboard, hardboard, door skin, hard-wood flooring, including strip and parquet flooring, furniture components, parts, assembled and knockdown, hardwood furniture squares (imported)	Hardwood lumber, rough and dressed, hardwood flooring, including strip and parquet flooring, furniture components, parts assembled and knockdown
Newman Lumber Company 15393 Landon Road (zip:39503) P. O. Box 2580 Gulfport, MS 39505-2580 (228) 832-1899 (228) 831-1149	Roy Newman, President Rodney R. Newman, Executive Vice President	Importer, exporter	Genuine mahogany, Spanish cedar	Same as imports	Hardwood lumber, rough and dressed, other products handled, genuine mahogany KD and AD, Spanish cedar	Hardwood lumber, rough and dressed, other products handled, genuine mahogany KD and AD, Spanish cedar

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
DLH Nordisk, Inc. 2211 W. Meadowview Road, Suite 10 Greensboro, NC 27407 (910) 852-8341 (910) 852-1933	Ramus Fenger, President Stewart Sexton, Vice President	Importer, exporter	mahogany, jatoba, meranti, ramin, keruing, kapur, kempas, marupa, bangkarai, spruce, pine balau	white oak, red oak, poplar, ash, cherry, hard maple, syp., yellow pine, walnut	Hardwood lumber, rough and dressed, lumber dimension stock, hardwood, flooring including and strip parquet flooring	Lumber, moldings, jambs, dowels, lumber product, car decking, truck flooring panel and louver doors
North Pacific Lumber Co. P.O. Box 3915 Portland, OR 97208 (503) 231-1166 (503) 238-2651	T.J. Tomjack, President Irwin Rogers, Sr., Vice President	Importer, whole-saler	andiroba, banak, cedro, cocobolo, ipe, imbuia, mahogany, jatoba, purpleheart, tatajuba, most African South and Central American species		Hardwood plywood, imported fancy plywood, pre-finished plywood, printed plywood, door skin plywood, hardwood lumber, rough and dressed, lumber molding, jambs, dowels, lumber products, car decking, truck flooring, panel and louver doors, hardboard, hardwood flooring, including strip and parquet flooring, furniture, parts, components, assembled, knockdown, hardwood furniture squares, imported	
Pacific Lumber and Shipping Company 12 Marshall St Boston, MA 02108 (617) 723-2161 (617) 723-0624		Importer, exporter	African mahogany, wawa, chen-chen, celtis, ceiba	red oak, white oak, ash, polar, maple	Core stock veneers, backs, cross band veneers, hardwood lumber, rough and dressed, soft wood lumber, rough and dressed	Hardwood lumber, rough and dressed, soft wood lumber, rough and dressed, lumber dimension stock

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
Pat Brown Lumber Corp. 4605 Suite F Dundas Drive (zip: 27407) P.O. Box 19065 Greensboro, NC 27419 (336) 299-7755 (336) 299-4050)	Paul D. Senior, President Paul D. Gosnell, General Manager	Importer, exporter	Southeast Asian species, agathis, kapur, keruing, melapi, meranti, South American species, andiroba, banak, Spanish cedar, guatamby, ipe, jatobam, mahogany (swietenia macrophylla, marupa, virola	Same as exports	Hardwood, plywood, imported fancy plywood, cut to size plywood, including drawer sides, plywood products, exterior siding, industrial, carved, unidirectional, core stock veneers, hardwood lumber, rough and dressed, lumber, molding, jambs, dowels, lumber products, car decking, truck flooring, panel, louver doors, furniture, components, parts, assembled, knockdown, hardwood furniture squares, imported	Hardwood, plywood, imported hardwood lumber, rough and dressed
Penberthy Lumber Co. 2011 East Carson Street Carson, CA 90810 (310) 835-6222 (310) 835-6823	Farrier Penberthy, Chairman of the Board Gary Penberthy, Director of Operations	Importer, exporter	apitong, bocote, bubinga, canary-wood, cedar, ebony, macassar, goncalo alves, imbuia, jarah, jelutong, koa, lacewood, maho-gany, African mahogany, pradu, genuine maple, northern soft, meranti, padauk, African, pau ferro, pau marfim, pipcana negra, red, purpleheart, rosewood various	ash, domestic, beech, birch, domestic, cedar, cherry, cocobolo, fir, Douglas, vg, fg, hickory, maple, Eastern hard, oak, pecan, pine, poplar, spruce, walnut black	Hardwood lumber, rough and dressed, lumber moldings, jambs, dowels, lumber products, car decking, truck flooring, panel and louver doors	Hardwood lumber, rough and dressed, lumber moldings, jambs, dowels, lumber products, car decking, truck flooring, panel and louver doors

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
Penrod Co. 2809 S. Lynnhaven Road, Suite 350 P. 0. Box 2100 Zip: 23450 Virginia Beach, VA 23452 (757) 498-0186 (757) 498-1075	Edward A. Heidt, Chairman Edward A. Heidt, Jr., President	Importer, exporter	meranti, mersawa, melapi, guatamby, ceiba, swietenia, magohany, virola, agathis, sande, oak, walnut, sen., cherry, apitong, birch, sapele, khaya, koto, teak, okoume, homa, knodrotti other species	oak, ash, pine, poplar, cypress, cherry	Hardwood, plywood imported, hardwood, plywood, domestic, fancy plywood, door skin plywood, cut to size plywood, including drawer sides, plywood, products, exterior, siding, industrial, carved, unidirectional, core stock veneers, backs, cross band, veneers, hardwood lumber, rough and dressed, lumber, dimension stock, lumber molding, jambs, dowels, lumber drawer sides, hardboard, particleboard, cut to size, furniture components, parts, assembled, knockdown	Hardwood, plywood imported, hardwood plywood, domestic, fancy plywood, door skin plywood, core stock veneers, backs, cross bands veneers, hardwood lumber, rough dressed lumber dimension stock, particleboard, cut to size
Ply Gem Manufacturing 201 Black Horse Pike Haddon Heights, NJ 08035 (609) 456-9100 (609) 456-0042	Howard Steinberg, President Don McDonald, Vice President	Importer, exporter, paneling processor	meranti, lauan, melapi, mersawa, red oak, birch, agathis, walnut, cherry, rubber-wood, pine		Hardboard, ceiling tiles, furniture components, parts, assembled, knockdown	Pre-finished plywood, printed, plywood, paper and/or vinyl, overlay plywood, embossed plywood, hardboard, ceiling tiles, furniture components, parts, assembled and knockdown
T. Baird Mcilvain International Co. 601 S. Henderson Rd King of Prussia, PA 19406 (610) 265-3630 (610) 265-8545	Eugene Reitz, President	Importer	mahogany, anegre, bubinga, sapele, obeche, morado, teak, Spanish cedar, jatoba, purpleheart, lacewood, makore, yellowheart,		Products, car decking, truck flooring, panel and louver doors, hardboard, door skin, furniture, furniture components, parts, assembled, knockdown, other products handled, swietenia, mahogany, teak, ramin, meranti, kapur, keruing, agathis, mersawa, melapi, sungkai, rubber-wood, pine, Russian birch plywood	

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
T. Evju and Associates 2641 Riebli Rd Santa Rosa, CA 95404 (707) 538-8844 (707) 538-7959	Mark Evju	Importer	kani janch, tropical timbers		Hardwood, plywood, imported, door skin, plywood, cut to size, plywood, including drawer sides, plywood products, exterior, siding, industrial, carved, unidirectional, hardwood lumber rough and dressed, soft wood lumber, rough and dressed, lumber dimension stock, lumber moldings, jambs, dowels, lumber products, car decking, truck flooring, panel and louver doors, hardboard, hardwood flooring, including strip and parquet flooring, furniture components, parts, assembled	
Thompson Mahogany Co. 7400 Edmund Street Philadelphia, PA 19136 (215) 624-1866 (215) 338-1060	Donald A. Thompson, President James F. McDonald, Vice President	Importer	mahogany, teak, afromosia, sapele, angico, aniegre, avodire, blood-wood, bocote, budingo, cherry, Brazilian ebony goncalo alves. imubia, ipe, iroko, jarrah, jatoba, lacewood, padauk, macacauba, makore, mansonia, obeche, purple-heart, rosewood, sedua, sucupira, walnut tropical, wenge, zebrawood		Hard lumber, rough and dressed, hardwood flooring including strip and parquet flooring, other products handled, decking	

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
Timber Products Co. P. 0. Box 269 Springfield, OR 97477 (541) 747-4577 (541) 744-5443	Dan Diffendaffer, Vice President	Importer, exporter, manu-facturer, domestic hardwood plywood	birch, oak, sande, meranti, virola, sumauma, pine, mersawa,melapi, agathis, radiata elliotis pine	beech, birch, oak, maple, Douglas fir, white fir, hemlock, lodge-pole pine, spruce, ponderosa pine,	Hardwood plywood imported, fancy plywood, cut to size plywood, including drawer sides, plywood products, exterior, siding, industrial, carved, unidirectional, core stock veneers, backs, cross band veneer, hardwood lumber, rough and dressed, soft wood lumber, rough and dressed, lumber products, car decking, truck flooring, panel and louver doors, hardboard, particleboard, hardwood flooring including strip and parquet flooring, other products handled, MDF	Hardwood plywood domestic, cut to size, plywood, including drawer sides plywood products, exterior, siding, industrial, carved, unidirectional, hardwood lumber rough and dressed, soft wood lumber, rough and dressed, lumber dimension stock, particleboard, other products handled, MDF
Tumac Lumber Co., Inc. 529 W. Third Avenue, Suite 600, Portland, OR 97204 (503) 226-6661 (503) 273-2650	Keith Johnson, International Sales Manager	Importer			Hardwood plywood imported, fancy plywood, cut to size plywood, including drawer sides, plywood products, exterior, siding, industrial, carved, unidirectional, core stock veneers, backs, cross band veneer, hardwood lumber, rough and dressed, soft wood lumber, rough and dressed, lumber products, car decking, truck flooring, panel and louver doors, hardboard, hardboard door skin, hardboard products, other, insulation board, ceiling tiles, particleboard, particleboard cut to size, particleboard, hardwood flooring including strip and parquet flooring, furniture components, parts, assembled, knockdown, hardwood furniture squares, imported	

Name, Address, Phone, Fax	Points of Contact	Type of Business	Import Species	Export Species	Imported Products	Exported Products
Weyerhaeuser Company 33405 8th Av S Federal Way, WA 98003 P. O. Box 1645 Tacoma, WA 98401 Dept. WWC 253 (253) 924-2364 (253) 924-4819	Mark Hennings, General Manager	Importer, exporter	meranti, red oak, white oak, natural birch, sen, virola, European birch, guatamby, radiata pine, baromalli, elliotti pine	Douglas fir, southern yellow pine	Hardwood plywood imported, fancy plywood, domestic, fancy plywood, door skin, plywood, cut to size plywood, including drawer sides, plywood products, exterior, siding, industrial, carved, unidirectional, core stock veneers, backs, hardwood lumber rough and dressed, soft wood lumber, rough and dressed, lumber moldings, jambs, dowels , lumber products, car decking, truck flooring, panel and louver doors, hardboard, particleboard, particleboard cut to size, other products handled, steel products, rebar, fasteners	

Appendix 5: List of Ghanaian Firms with Interest in Wood and Wood Products Exportation to the United States

This appendix lists those Ghanaian companies and organizations with interest in trade with the United States. Eighteen businesses were contacted and interviewed onsite by the Marketing Consultant and the Ghanaian local expert. Information reported includes company's name, address, telephone and fax numbers, and name/title of company contact person. All companies listed here have expressed interest in exporting wood products to the United States or are doing so already.

Company/Organization	Address	Phone and Fax	Company Contacts
SUNSTEX Co., LTD	P. O. Box 4991 Kumasi, Ghana	Phone: 233-51-5318 Fax: 233-51-2826	Nana Dwomoh, Executive Director
SND Limited	P. O. Box 1075 Kumasi, Ghana		Sarfo Adu Amankwah
Logwood Industries	P. O. Box 567 Kumasi, Ghana	Phone: 233-51-21839 Fax: 233-51-883766	K. N. Poku, Managing Director
Ghana Veneer Processing Co., LTD	P. O. Box 492 or 1405 Kumasi, Ghana	Phone: 233-51-23892 Fax: 233-51-23892	Dominic Arhin, Production Manager
Ejisu Forest Products, LTD	P. O. Box 38 Kimasi, Ghana	Phone: 233-51-20176 Fax: 233-51-20177	Andrea Busnelli and Pierre Gillet, Managing Directors
Specialized Timber Products, LTD	P. O. Box 8631 Kumasi, Ghana	Phone: 233-51-27690 Fax: 233-51-24315	Imad C. Berbari, Managing Director

Company/Organization	Address	Phone and Fax	Company Contacts
Kumi & Company, LTD	P.O. Box 244 Sunyani, Ghana	Phone: 233-51-25773 Fax: 233-51-25858	Osei Kumi, Managing Director
Oti Yeboah Complex, LTD	P. O. Box 220 Berekum, Ghana	Phone: 233-061-7382 Fax: 233-061-7383	Maxwell Oti Yeboah, Managing Director Fayez Akill, General Manager
Asuo Bomosadu Timbers & Sawmills, LTD	P. O. Box 220 Berekum, Ghana	Phone: 233-0642-22003 Fax: 233-0642-22000	Ernest Apraku, Managing Director
Naja David Veneer & Plywood, LTD A. G. Timber, LTD	P. O Box 244 Takoradi, Ghana	Phone: 233-31-24236 Fax: 233-31-24236	Paul Payne, Shipping Officer
Ghana Primewood Products Limited	P. O. Box 370 Takoradi, Ghana	Phone: 233-31-22591 Fax: 233-31-23432	
Yenok Limited	P. O. Box 526 Takoradi, Ghana	Phone: 233-31-22791	Joe Koney, Executive Director
Pee Wood Processing Limited	P. O. Box 12585 Accra North, Ghana	Phone: 233-51-227419 Fax: 233-51-227481	E. Adu Arthur, CEO and Chairman

Company/Organization	Address	Phone and Fax	Company Contacts
Ghana Timber Millers' Organization	P. O. Box 4991 Kumasi, Ghana	Phone: 233-51-22983 Fax: 233-51-29750	F. Mensah Banahane, Executive Secretary
Forest Products Inspection Bureau	P. O. Box 8138 Kumasi, Ghana		Coffei Nyarko, Section Head
Wood Industries Training Center	P.O. Box 6424 Kumasi, Ghana	Phone: 233-51-29540	Kwaku Duah, Director
Small Scale Carpenters Association	P.O. Box 55194 Kumasi, Ghana	Phone: 233-51-28849	Maxwell A. Boadi, Secretary Reynold A. Derah, President
Timber Exchange Development Board	P.O. Box 515 Takoradi, Ghana	Phone: 233-31-23336 Fax: 233-31-23339	Samuel K. Appiah, Managing Director

Appendix 6: Ghana-Based Hardwood Product Suppliers to the United States

This appendix contains a selected list of Ghana-based hardwood product suppliers to U.S. manufacturers, as well as a corresponding list of U.S. importers/manufacturers. In 1997, a total of 1,524,848 kg. of veneer, lumber, carvings, assorted handicrafts, moldings, sows and air-dried liner mahogany were imported by 14 U.S. manufacturers from 14 different hardwood suppliers based in Ghana. The largest import was 2,399 pieces of primary aluminum sows (1,163,9033 kg) by the Aluminum Company of America supplied via Barclay's Physical Trading, Limited, of London. Value-added products included 6,000 kg of carvings, 21,757 kg of molding and 10,500 kg of assorted handicrafts. The wood species used for such products included khaya, anthotheca, sapele, makore and mahogany.

Shipper	Importer/ Manufacturer	Wt (kg)	Sample Product
MIM Co. Ltd. P.O. Box 1950 Kumasi	Harlan Pacific 9822 Lake Wash Blvd Box 1433 Bellevue, WA 98004 Phone: 206-454-3788	115,794	rotary cut veneer
Mondial Veneer GH Ltd. P.O. Box 798 Takoradi	SITCO Lumbar Co. Pleasant Run Road Vilmer, TX 75172	23,910	lumber
Wood Pillar Ltd. P.O. Box 1604 Kumasi	Gross Veneer Sales, Inc. 2040 Brevard Road Box 5212 High Point, NC 27263 Phone: 910-883-0196	13,114	rotary cut veneer
Duke Importers & Exporters P.O. Box K527 Accra	Edmond Nwokoye 5905 Lundy Drive Lanham, MD 20706 Phone: 301-306-6927	6,000	carvings, others
Getrade (GH) Ltd. P. O. Box 1260 Accra	Cost Plus, Inc. 201 Clay Street Oakland, CA 94607 Phone: 510-893-7300	5,500	assorted handicrafts

Shipper	Importer/ Manufacturer	Wt (kg)	Sample Product
AG Timber Ltd. P.O. Box 3806 Kumasi	Hardwood, Inc. 5874 Brisa Street Livermore, CA 94550	7,329	lumber (Khaya)
AE Saoud Ltd. P.O. Box 1816 Kumasi	Triumph Technologies No. 405 5850 Beltline Road Dallas, TX 75240 Phone: 972-392-0274	21,757	Molding (wawa and ofram)
Barclays Physical Trading, Limited, London	Aluminum Company of America 1200 River V Tower 900 S. Gray Street Knoxville, TN 37902-1846	1,163,933	Primary aluminum sows
John Bitart Co. P.O. Box 406 Secondi, Takoradi	P & M Toosey, Inc. 75Z Bard Avenue Staten Island, NY 10310	18,011	air-dried liner mahogany (khaya, anthotheca)
Mondeal Veneer Ltd. P.O. Box 798 Takoradi	Craig Lumber Corporation 200 S. Progress Road Box 158 Collierville, TN 38027 Phone: 901-853-4317	29,582	lumber (sapele)
Semak Ghana Ltd. P. O. Box 12316 Accra	Bamboula Ltd. 147 W. 25th Street, 3rd Floor New York, NY 10001 Phone:212-675-2714	5,000	handicrafts

Shipper	Importer/ Manufacturer	Wt (kg)	Sample Product
RAD Forest Product Co., Ltd. P.O. Box 0226 Takoradi	Craig Lumber Corporation 200 S. Progress Road Box 158 Collierville, TN 38027	24,812	lumber (makore)
K.G. Wood Processing P.O. Box 432 Akim Oda	P & M Toosey, Inc. 752 Brad Avenue Staten Island, NY 10310	18,036	lumber (mahogany)
Ghana Prime Wood Products Ltd. P. O. Box 370 Takoradi	P & M Toosey, Inc. 752 Brad Avenue Staten Island, NY 10310 (for T.T. Timber Int'1 SA)	12,040	lumber (kiln-dried)

Total = 1,524,848 kg

Source: Personal communication with Mr. Kieran Whelan, Regional Manager, Trade Reporting and Data Exchange (TRADE), January 9, 1998.

Appendix 7: European and U.K. Companies Trading in African Wood/Wood Products to the U.S. Market

Trade of wood and wood products from Africa to the U.S. market often involves one or more European agents and/or buyers. Since Europe and the United Kingdom, in particular, have developed longstanding trade relations with Africa, marketing of African wood products is usually initiated and financed through European intermediaries. Hence, as part of networking and market data collection effort, a short list of European and U.K. buyers and agents is presented.

1. Hinrich Feldmeyer Gmbh & Co., KG
   Windhukstr. 15
   Postfach 210151
   D - 2800 Bremen 21
   Germany
   Telex: 041 17421 2259
   Fax: 0421641285
   Also at: Postfach 1245
   D-27342
   Rotenburg, Germany

2. Fritz Offerman
   Holzimport
   Postfach 1209, Getmolder Str. 32
   32353 Preu Oldendorf
   Tele: 05742 - 9313 - 0
   Fax: 05742 - 5717 + 3017

3. R. Bernard & Co. Ltd.
   Bilsten House Unit B 1
   Blackbush Business Park
   Galway Road
   Yateley Camberley
   Surrey GU 17 7 GE
   England

4. Horst Godderidge Furniere
   Im Muehlengrund 6,
   56566 Neuwid, Germany
   Fax: 02631 – 47786

5. Ghana Timber Supplies Limited
   Unit 4, Granard Business Centre
   Burns Lane, Mill Hill, London
   NW72DZ

6. Ital - Legno S.P.A.
   Via M. Polo 10
   20036 Meda (MI), Italy
   Tele: 0362/75301
   Telex: 331816 ITLI
   Fax: 0362 71313

7. Plankta Trading Limited
   175 Regent Street
   London WIR 7fb
   England

8. Fritz Kohl Gmbh & Co. KG
   Furnierwerk
   D9 7747 Karlstadt/Main
   Tele: 09353 79500
   Fax: 09353 79510
   Mobile: 0171 7266102
   Contact: Peter Hollenberger

9. Dalhoff Larsen & Hornemann A/S
   (DLH Nordisk A/S)
   Skagensgade 66 - DK 2630
   Taastrup - Denmark
   Tele: + 45 42 52 56 11
   Fax: + 45 42 52 15 66

Appendix 8: List of Individuals Contacted by Consultant(s) in Ghana

A total of 46 individuals representing Ghanaian government organizations, foundations, NGOs, private firms and wood manufacturing associations, as well as USAID officials in Ghana, were contacted during the field trip to Ghana.

Person Contacted	Position	Organization
Dr. K. Abeasi	Director-General	Private Enterprise Foundation
Dr. F. Abu	Minister	Ministry of Trade and Industry
G. Adu	Technical Advisor/Wood	AMEX
S. Adu	Managing Director	SND Ltd.
C. Ahadome	Head/Monitoring	Forestry Commission
J. E. Aidoo	Former Director	Ghana Ports and Harbors Authority
F. Akill	General Manager	O. Y. Complex Ltd.
S. K. Appiah	Managing Director	Timber Export Development Board
D. Arhin	Deputy Production Manager	Ghana Veneer Processing Ltd.
M.E. Armah	Program Director	AMEX
E.A. Arthur	Chief Executive Officer	Peewood Processing Ltd.
A.A. Asibuo	Managing Director	Ras Wood Products
A.O. Asiedu	Director	Forestry Research Institute
J. Asmah	President	Institute of Professional Foresters
K. Ayensu	Manager/Takoradi	Export Promotion Council
C. Avoka	Minister	Ministry of Lands and Forestry
K. B. B-Boateng	Chief Administrator	Forestry Commission
F. M. Fanahene	Executive Secretary	GTMO
Imad Berbari	Vice President-Elect	GTMO

Person Contacted	Position	Organization
William Bitar	Managing Director	Logs & Lumber Co./Kumasi
M.A. Buadi	Regional Secretary	S.S.C.A.
A. Busnelli	Managing Director	Ejisu Forest Products Ltd.
Capt. K. Duah	Director	Wood Industry Training Center
Nana Dwomoh	Executive Director	Sunstex Ltd.
Rev. S. K. Fugah	President	Small Scale Carpenters Association
P. Gillet	Technical Advisor	Ejisu Forest Products Ltd.
D. Gyimah	Private Sector Advisor	USAID
T. D. Hobgood	Deputy Director	USAID
J. Koney	Executive Director	Ghana Primewood Products Ltd.
N. Koranteng	Development Program Officer	CIDA
B.K. Kufuor	President-Elect	GTMO
O. Kumi	Managing Director	Kumai and Co./Kumasi
L. Mensah	General Manager	Logwood Industries Ltd.
E. H. Miller	Export Development Advisor	AMEX
F. Mintah	President	Furniture & Wood Manufacturing Association, Ghana
G. Mouganie	Managing Director	Prima Woods Ltd./Kumasi
E.O. Nsenkyire	Chief Conservator of Forests	Forestry Department
Dan Obuobi	Office Manager/Accra	TEDB
K. Offei	Officer Manager/Kumasi	FPIB
M. Owusu	Director	Maxwell Owusu Ltd./Kumasi

Person Contacted	Position	Organization
P. Payne	Shipping Manager	Naja David Veneer and Plywood Ltd.
J. Peprah	Training Manager	FPIB
Lawrence Quarshie	Managing Director	L&L Processing Company
C.H. Tetteh	Executive Director	Absolute Ltd.
K. Wereko-Brobby	President (outgoing)	GTMO
O. Yeboah	Managing Director	O.Y. Complex Ltd.

Appendix 9: List of U.S. Companies Registered in Ghana with the Timber Export Development Board

Name	Address	Phone/Fax
Agri-Rural Industries Development	960 Grand Concourse, 4B Bronx, NY 10451	718-538-4133 718-538-4133
American Import Company (AIC)	508 48th Avenue Long Island City, NY 11101	718-784-3700 718-784-3709
Anfinson Lumber Sales	1341 Union Avenue Fontana, CA 92337	909-681-4707 909-681-3566
BHY Enterprises	18122 Williamsburg Oval Sronsville, OH 44136	216-238-3443 216-238-1138
Charlotte Investments, Inc. Managed Forest Resources	30 Main Street Suite 401 Burlington, VT 05401	801-863-2311 802-863-2313
Clarke Veneers & Plywood	P.O. Box 4876 Jackson, MI 39296	601-366-0331 601-366-0334
Diversified Exports	5914 Hunters View Dallas, TX 75232	214-376-3919 214-376-3919
Forest Hardwood Lumber Co.	6565 Miramar Road P.O. Box 15 San Diego, CA 92112	619-455-9060 619-455-0455
Ghanausa, Inc.	231 Brian Drive Slidell, LA 70458	504-646-6472 504-646-6472
TRADE, Inc.	2755 Campus Drive San Mateo, CA 94403	415-513-0930 415-513-0944
International Wood Products Association	4214 King Street, West Alexandria, VA 22302	703-820-6696 703-820-8550
Gross Veneer Sales, Inc.	Emerywood Station 2040 Brevard Road High Point, NC 27263	336-883-0196 336-886-1366
K.F. International Trading Group, Ltd.	206 Grand Avenue Thiensville, WI 53092	414-242-9444 414-242-5080

Name	Address	Phone/Fax
New Sensor Corporation	133 5th Avenue, 4th Floor New York, NY 10003	212-529-0466 212-529-0486
Penrod Company	2809 S. Lynhaven Road Suite 350 Virginia Beach, VA 23452	757-498-0186 757-498-1075
Stuart Company	732 S. Mansfield Avenue Suite 424 Los Angeles, CA 90036	213-954-1027 213-954-1027
Terra Intertrade, Inc.	14 Parkfield Road Scarsdale, NY 10683	914-725-7424 914-472-3049
Mega Company	2502 K Street, NW Suite 9C Washington, D.C. 20037	202-342-6585 202-337-8932
Thompson Mahogany Company	7400 Edmond Street Philadelphia, PA 19136	215-624-1866 215-338-1060

Appendix 10: Import/Export Agents for U.S. Wood/Wood Products Currently in Operation

The following companies could play a major role in acting as intermediaries between the United States and African wood products manufacturers.

Company	Telephone	Fax
A.K. Arthur International Company, Inc.	718-382-8069	718-382-3252
Amtraco, Inc.	954-341-3225	954-755-8578
A.P.S., Inc.	312-551-0207	312-551-0208
Axcess	706-321-1216	706-322-6689
Detco Enterprise	704-648-9698	704-648-8934
HL Industries, Commodity Service Group	610-294-8030	610-294-8031
Ki Technologies	801-544-3214	801-544-4030
Mann Endless Cassette Industries Group	415-221-2000	415-387-2425
Panama Trading Company	904-784-2848	904-763-0084
Reliance International	757-393-6586	757-393-6586
S.W. Trading	505-883-8909	505-883-8909
Seitec International	801-752-4142	801-752-6139
Smith & Adams	402-430-6691	402-464-2566
Speedy Order Supply	407-269-9466	407-269-9466
U.S. Trade Associates	718-854-6414	718-854-8645