




# An Exploratory Study of U.S. Home Builder and Architect Use of Tropical Hardwoods

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**Working Paper #79**

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November 15, 2006

**Abstract**

Tropical hardwood products originate from developing countries. Southeast Asia, Latin America, and Central Western Africa are the three main regions from which tropical hardwood products are exported. The trend in past years has been to reduce the export of tropical hardwood logs with a commensurate increase in semi-finished and finished goods. Exporting countries are making this shift in an attempt to increase value-added to their forest resources. The United Nations Economic Commission for Europe/ Food Agricultural Organization/ Food Agricultural Organization (UNECE/FAO) reports that the three primary regions that import tropical hardwood products are the U.S., European Union (EU), and Japan. Concurrent with exporter shifts to finished products exports, importing countries are changing the trend of importing primary products to importing secondary products from tropical countries. In 2004, a mail survey was conducted to identify U.S. home builder and architect use of tropical hardwoods. Forty-six percent of respondents buy or specify tropical wood products although these products represent a small percent of respondent sales. The primary tropical hardwood products that these companies purchase or specify are flooring, millwork/molding and doors. South America was the most cited source of these products and a majority of respondents purchased/specified tropical hardwoods from U.S. brokers or wholesalers.

**Overview**

The objective of this study was to determine U.S. home builder and architect use of tropical hardwood products. Why did we choose to research these two sectors? Lefaix-Durand et al. (2005) summarize the importance of residential construction. They report the following National Association of Home Builders (2004) information: in the average single-family home (2,272 sq. ft.) or multifamily home (1,268 sq. ft.), 90 percent of the beams used are wood-based (lumber, L VL, glulam, I-Joist, etc.), 80 percent of the materials used for exterior wall framing is wood, 75 percent of decking materials are wooden, and 80 percent of floor, wall and room sheathing are wood-based (plywood, oriented strand board, etc.) In terms of end-use consumption, almost 60 percent of all lumber purchased in 2003 was directed towards residential construction (31 percent in new housing and 27 percent in residential upkeep and improvements) (US Census Bureau 2005).

In 2005, privately-owned, single-family housing units completed totaled nearly 85 percent of all privately-owned housing completions. Most of the remaining 15 percent was comprised of multi-unit structures containing five or more units (Poole 2006). Historically, housing has been critical to the health of the forest products industry since two-thirds or more of our structural lumber and panel products are consumed in new housing and remodeling (Schuler and Adair 2003).

Although architects do not purchase wood products directly, they strongly influence the planning, designing, and oversight of building construction and building materials that are ultimately used. They design and provide advice about the functional, aesthetic, and technical requirements of construction. “In the broadest sense, an architect is a person who interfaces between the end user of a planned structure and the builder. The architect translates the user's needs into the builder's requirements” (Wikipedia 2006). In general architects buy or specify the required materials from providers in the country. Commonly, if a project is large, architects specify materials from wholesalers, while for smaller projects, they rely on retailers (Eid 2006).

Clearly, these two sectors significantly influence the demand for wood products in the U.S. In this paper, we examine the characteristics of builders and architects related to tropical hardwood product purchasing/specifying.

**U.S demand for tropical hardwoods**

In 1980, the U.S. was the second largest consumer of tropical hardwood after Japan. At that time, demand for tropical hardwoods was increasing caused by the rising prices of high quality domestic hardwoods followed by general interest in preservation of U.S. hardwoods for recreational and aesthetic values. Another important reason was that tropical hardwoods, particularly plywood paneling could be obtained at low prices from Southeast and East Asia (Myers 1980).

In 1978, U.S. demand for tropical sawnwood was US$ 537 million and was predicted to increase 75 percent by the year 2000 (U.S. and International Institutions 1983). In 2000, total U.S. imports of tropical sawnwood were valued at US$ 493 million, eight percent less than in 1978 (IWPA 2004). During this period there was a notable reduction of imports of primary tropical products and an increase in imports of secondary tropical products (ITTO 2004).

In 1990, 40 percent of all U.S. hardwood lumber imports came from tropical countries with Brazil being the largest supplier (The World Forestry Center 2003). The U.S. is currently the largest importer of secondary value-added tropical hardwood products in the world. U.S. imports of tropical hardwood products in 2003 were US$ 16.5 billion accounting for 34 percent of global imports. Twenty-three percent of U.S. imports came from International Tropical Timber Organization (ITTO) producer countries which represent 90 percent of all value-added tropical wood product producing countries. U.S. imports of these products have multiplied four fold in the last ten years. The increase in single housing starts has been the primary driver of demand (ITTO 2004). In 1992, Latin America supplied 70 percent of U.S. tropical hardwood lumber imports while Brazil and Bolivia supplied 91 million $m^3$ and 21 million $m^3$ of hardwood lumber, respectively. Mahogany lumber represented 53 percent of lumber consumption volume and 57 percent of value. Latin America was the second largest supplier of tropical hardwood veneer, contributing 6.1 million $m^2$ and 31 percent of the volume of tropical hardwood veneer exported to the United States with Brazil being the number one exporter at 5.8 million $m^2$ (ITTO 2004).

In a study conducted by Metafore (2003a) it was found that imported tropical hardwood products are mainly used for decorative purposes, and that they represent only 4 percent of the total wood market in the U.S. Metafore (2003b) also found that tropical and temperate hardwood products often compete for the same markets such as flooring, doors, millwork and molding. Strong U.S. housing starts in the past decade have sustained demand for these products, whether originating from temperate or tropical sources.

The U.S. currently imports approximately 1.7 million $m^3$ of tropical hardwoods annually. Eighty percent are veneer (1.36 million $m^3$) and sawnwood (0.34 million $m^3$) (Metafore 2003c). The U.S. imports over 160 different species of tropical hardwoods with 20 percent originating from Africa, 43 percent from Asia, and 37 percent from Latin America (IWPA 2003).

Tropical hardwoods compete with U.S. hardwoods for the similar niche markets; i.e. furniture parts and flooring (Metafore 2003d). Some disadvantages of tropical hardwoods are the transportation time, higher costs, and variable quality, an inconsistent frequency of supply. Advantages include unique species not available domestically and durability. One of the most important tropical species used in the furniture sector is mahogany. However, in the past few

years mahogany has become endangered, leading to a reduction in its use. In 1997, 8 percent of all the bedrooms and dining rooms in the U.S. were made of mahogany. In 2005 this declined to 5 percent. Another major wood species used in the furniture sector is rubberwood. In 1997 rubberwood held less than 1 percent of raw materials used in the U.S. furniture sector but had increased to 6 percent by 2005 (ITTO 2005a). In many cases, importers are often resistant to market new tropical wood species as it is difficult to introduce new species that compete with species currently accepted in the market.

Tropical hardwoods are mainly used in the furniture industry, and despite the apparent reduction in U.S. furniture manufacturing, there is an increasing trend in the use of tropical species. This trend is driven by changes in consumer preferences (ITTO 2005b). Examples of other important secondary tropical hardwood products are furniture parts, cabinets, flooring, decking, molding, and musical instruments.

## The Study

Primary data collection was conducted using mail surveys. The samples of the largest 500 U.S. home builders and 500 largest architectural firms were purchased from Best Lists, Inc. a survey list company. Companies were surveyed at the headquarters level. The survey process followed the Tailored Design Method proposed by Dillman (2000). Accordingly, a letter was sent prior to the survey informing companies that a survey would be arriving a week later. The survey included a hand-signed explanatory cover letter. A reminder letter was sent a week after the survey mailing and a second mailing was conducted to initial non-respondents. Before the survey was sent out it was pre-tested with 10 companies randomly selected from each group. After accounting for undeliverable surveys and surveys that were inadvertently sent to companies that were neither builders nor architects, we received 119 useable responses for an adjusted response rate of 12 percent.

Non-response bias was measured by using a two-tailed t-test conducted by comparing frequencies of respondents by state. No difference in state distribution was detected at $\alpha$=.05. In addition, research has shown that late respondents typically respond similarly to non-respondents (Donald 1960). Accordingly, second mailing respondents, as a proxy for non-respondents, were compared to first mailing respondents by state of origin. In this case as well, no difference in state distribution was detected at $\alpha$=.05. Because a priori information on number of company employees or sales was not available, non-response bias tests were not conducted on these factors.

Respondent companies are generally small to mid-size firms. Twenty-one percent of respondents had annual gross sales in 2003 of $5 million or less. An additional 24 percent had sales of $6-10 million, and 23 percent had sales of $11-25 million. Thirty-seven percent of respondents had 1-25 employees and 42 percent had 26-100 employees. Twenty-two percent were large companies with 101-500 employees. A majority of the respondents (35 percent) are headquartered in the North Central region of the country although the balance is fairly well distributed among the other three regions (**Figure 1)**.

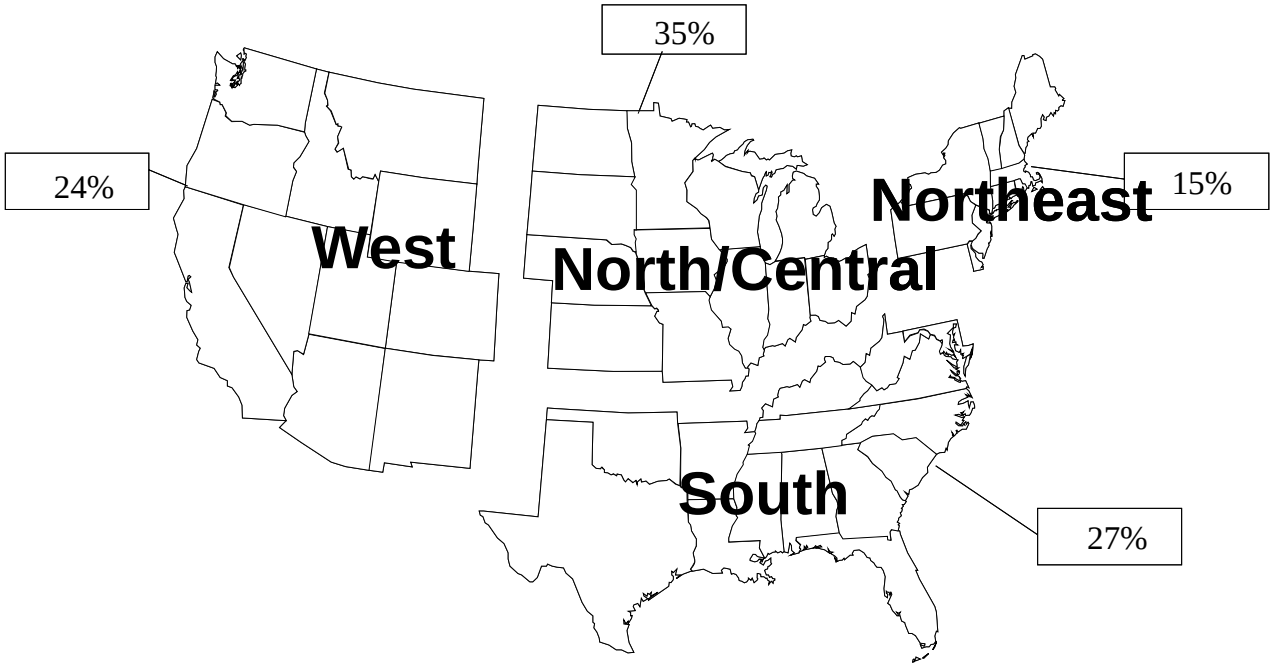


**Figure 1. Respondent corporate locations (n=119)**

**Tropical hardwood products sales and purchases**

Forty-six percent of respondents (n=55) stated that they buy/specify tropical wood products (TWP). The balance of this paper refers only to these respondents. Of the 54 percent that did not buy TWP at the time the study was conducted, 21 percent were planning to buy TWP in the future.

Of the respondents that did buy/specify TWP, 83 percent said that between one and nine percent of their company's annual gross sales in 2003 were attributed to TWP. For 15 percent of respondents, TWP represented 10-19 percent of sales and two percent of respondents said TWP represented 20-29 percent of gross sales. The primary tropical hardwood products that these 52 companies purchase or specify are flooring, millwork/molding, doors, decking and furniture (**Figure 2**).

Sixty-five percent of respondents state that they purchased TWP from U.S. broker/wholesalers, 6 percent buy directly from international producers, 4 percent from international brokers, and 25 percent from other channels such as company agents, local retailers and sub-contractors.

Allowing for multiple responses, sixty-five percent of respondents purchase TWP from South America, 38 percent from Central America, 25 percent from Africa and 25 percent of respondents purchase TWP from Southeast Asia. Twenty-seven percent of respondents did not know where their company's TWP originated. The countries where most respondent TWP purchases originate are Brazil (41 percent of respondents) and Honduras (22 percent of

respondents) (**Figure 3**). This finding is supported by World Forestry Center (2003) figures that show that since 1990, Brazil has being the largest supplier of tropical hardwood to the U.S.

More than 50 percent of respondents said that they have been purchasing or specifying TWP for 10 or more years suggesting that they have established long-term business relationships with their suppliers or that they have established a customer base that desires these products. Forty percent of respondents have been involved with TWP for six or fewer years.

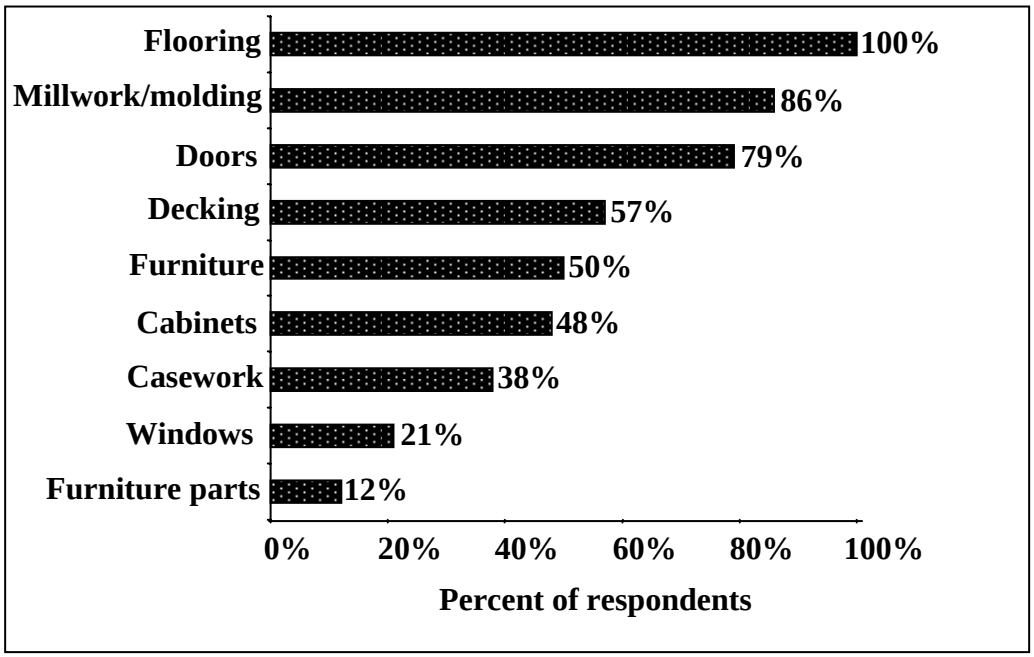


**Figure 2. Products that respondents buy or specify are manufactured with tropical hardwood species (n=42) (multiple responses possible)**

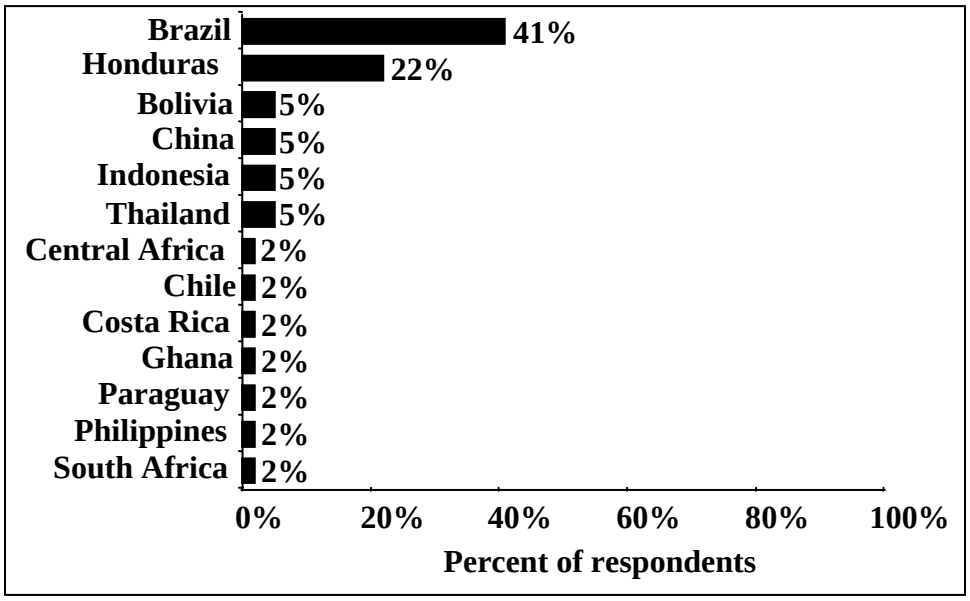


**Figure 3. Top 13 countries where respondent tropical hardwood products originate (n=52) (multiple responses possible)**

**The tropical hardwood buying/specifying process**

The three most cited sources of information that respondents rely on to locate TWP suppliers are distributors (53 percent of respondents) and company sales representatives (52 percent) (**Figure 4**). Websites and email are very important sources of information for 31 percent and 11 percent of respondents, respectively.

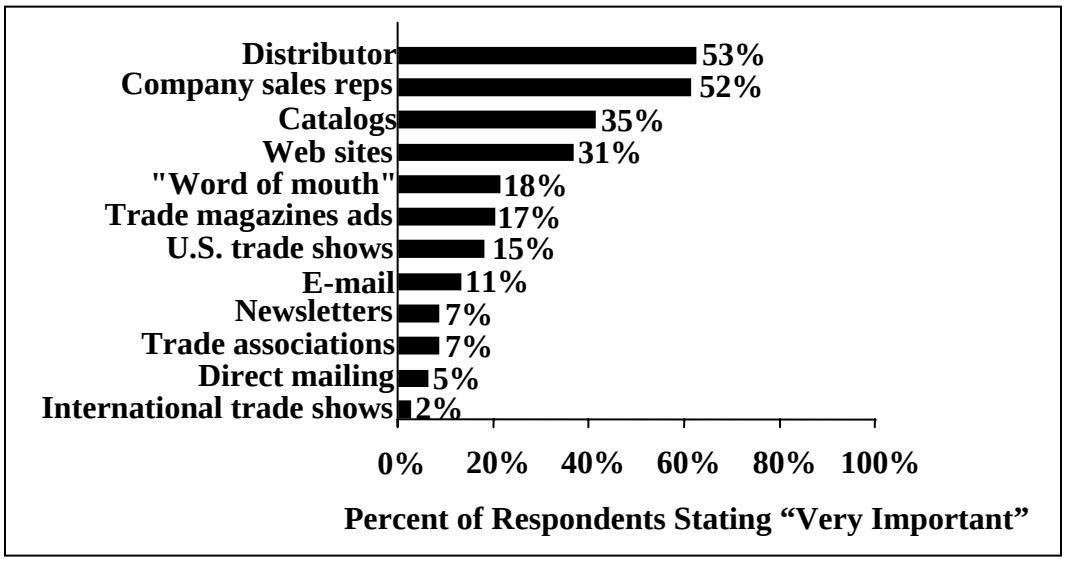


**Figure 4. Important of sources of information to locate tropical hardwood product suppliers (multiple responses possible) (n=43)**

Respondents also identified barriers they face in purchasing or specifying TWP (**Figure 5**). Forty percent of respondents stated that overpriced products were a significant barrier followed by, lack of consistent supply (33 percent of respondents), punctual delivery (31 percent), and product quality (25 percent). The three most important criteria for selecting suppliers are product quality (90 percent of respondents), product availability (80 percent), and product performance (74 percent) (**Figure 6**).

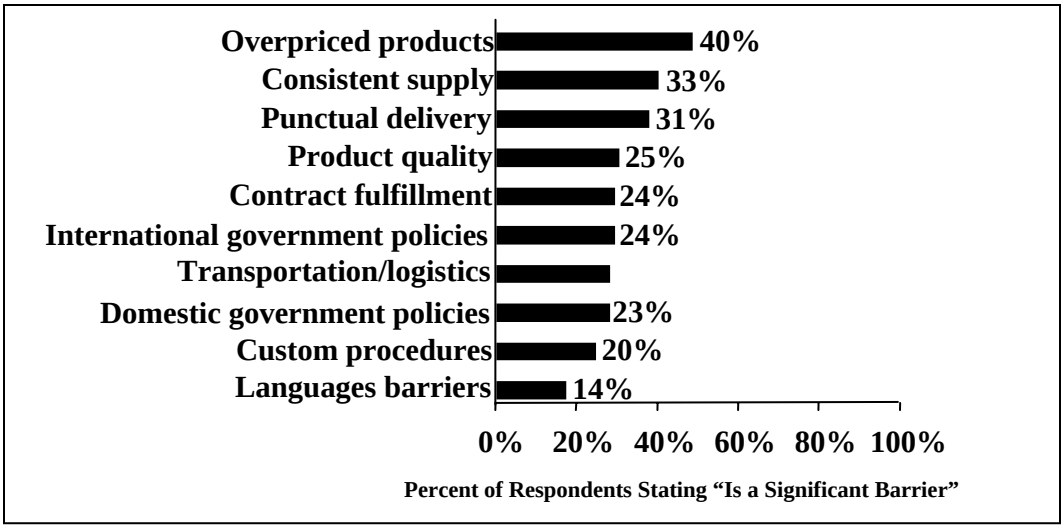


**Figure 5. Barriers to purchasing/specifying tropical hardwood products (n=42)**

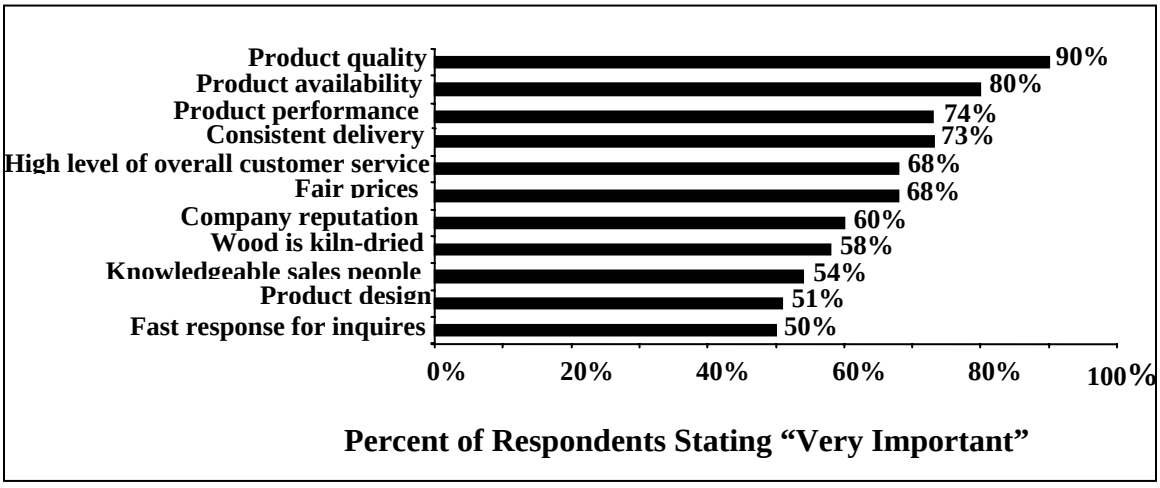


**Figure 6. Importance of criteria used in selecting tropical hardwood product suppliers (n=45)**

There are a number of actions that builders and architects can take to strengthen exchange relationships with suppliers. Ninety-four percent of respondents do not work directly with producers in tropical countries to procure TWP but rather work through supply chain intermediaries. Of the 55 respondents that buy/specify TWP, 35 percent (n=19) said they would be interested in developing stronger direct linkages with producers (**Figure 7**). Twenty-five percent of these 19 respondents said they were willing to explore using products made of lesser known species and 18 percent would explore joint product development research.

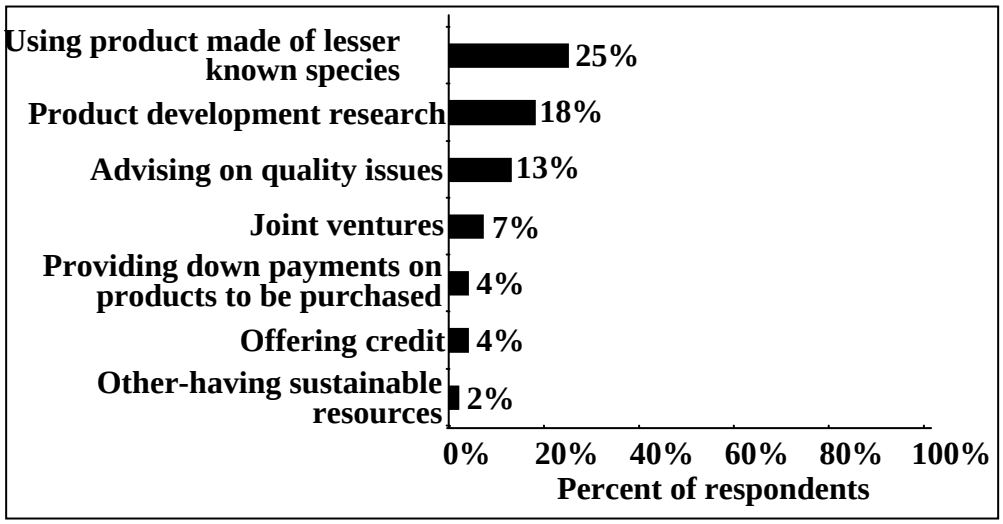


**Figure 7. Ways that Builders and Architects respondents would be willing to work with tropical hardwood producers in the future (n=19) (multiple responses possible)**

**Summary**

Results indicate that just under half of respondents are engaged in purchasing or specifying tropical hardwood products and that, for the most part, tropical hardwoods account for a small percentage of wood product purchases.

The sources of information that are most important to respondents in seeking tropical hardwoods suppliers tropical hardwoods are distributors and company sales representatives, both of which require personal communication and contact. Dealing tropical producing countries can be daunting as a whole layer of complexity comes into play such as cultural difference, language barriers, differences in grading rules and different levels of quality. Although relation-based channels are most prevalent for respondents, nearly a third of respondents use websites to identify potential tropical hardwoods suppliers suggesting an increasing comfort level with using the Internet to conduct business.

The criteria that are most important in selecting tropical hardwoods are no different in making purchasing decisions for temperate wood products, quality, availability, and performance. Similarly, the most significant barriers that respondents have in purchasing tropical hardwoods are overpricing, lack of availability, and problems with punctuality of delivery.

For current and potential suppliers of tropical hardwoods to the home building and architectural market segments, it is important that they address these issues in order to maximize success. Home builders and architects, in turn, can work more closely with suppliers to communicate their product and service requirements resulting in a more profitable exchange relationship.

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