

A Research Agenda for Forest Products Marketing and Business Development in Louisiana: 2009-2013

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OBJECTIVES

- 1) Examine market structures and issues facing the forest products industry in Louisiana from the perspective of the supply chain from the forest to consumers.
- 2) Identify factors and processes which promote or deter sustainable growth and market development of the forest products industry in Louisiana.
- 3) Identify Louisiana forest products sector employee training and skills development needs.

BACKGROUND AND JUSTIFICATION

Louisiana's forests represent an important resource for the state, both in terms of income to landowners and as inputs to the forest products industry. The harvest of timber, which is Louisiana's number one agricultural crop both in terms of gross income and value-added processing (LSU AgCenter, 2008), supports a solid wood forest products industry that consists of about 930 primary and secondary manufacturing establishments (Aguilar and Vlosky, 2006). The forest sector, including forestry and forest products, represents Louisiana's second largest employer with approximately 17,000 manufacturing jobs and 8,000 jobs in the harvesting/transportation of timber (LFA 2008).

The value added is a measure of net output (i.e. of gross output less those purchased inputs - such as cost of materials and supplies and of energy, water and vehicle fuel) which has been embodied in the value of the product. In contrast to the measure of manufacturing revenues, value added provides some insight into the degree of transformation which occurs within industries (Canadian Industry Statistics 2008). In the context of the wood products industry, value-added are the steps associated with turning raw timber or unfinished lumber into finished products that increases the value of the wood used to produce them. Value-added wood products typically require more wood products workers to produce them and usually require more than one mill to complete the process. This translates into more employees and more companies

contributing to an economy (Oregon Forest Resources Institute 2005). Kingslien and Greber (1993) suggest that regions need to grow industries with characteristics that fit regional goals and resources.

Although Louisiana has a wood products industry, when compared to neighboring southern states, since 1987, the state has consistently ranked at or near the bottom in adding value to its wood product resources relative to southern states with similar forest resources (Vlosky and LeJeune, 1997; Chang, Carpenter and Lu, 1992). A report on adding value to Louisiana's forest sector commissioned by Governor Mike Foster in 1997 indicated that Louisiana had potential to add more value given its resource base and employee productivity (Vlosky and LeJeune, 1997). More recently, in 2007, Louisiana added \$0.33 of value for each dollar of raw materials (logs) going into sawmills, ranking last among nine southern states (US Census Bureau 2008). This can be due to a number of factors such as a possible overall decline in timber quality, lower price-point furniture production or the use in recent years of post-Hurricanes Katrina and Rita which struck Louisiana in August 2005 damaging over 4.4 billion board feet of standing timber. Katrina and Rita wiped out the equivalent of more than two years' worth of pine sawtimber harvest and more than 11 years' worth of hardwood sawtimber harvest for the entire state (Chang 2006).

Adding value to forest resources is an issue in other U.S. states as well. For example, Oregon is the only state in the nation to ship over half of its production as unseasoned products (Oregon Forest Resources Institute 2005). In a study of the value-added wood sector in Maine from 1982-1987, Irland and Maxcy (1991) found that value-added intensity was higher in industry sectors furthest along the production chain although these sectors were characterized by

low wage rates. Their conclusion was that the Maine value-added sectors were competing on low wages at the time the study was conducted.

Cohen (1992) suggests that there are two different means of increasing the value of solid wood products; secondary manufacturing and incrementally adding value during the primary process. He states that secondary manufacturing is the focus of the majority of research and government-sponsored promotional efforts but suggests that when attempting to increase the value of exports to offshore markets whose cultures are different from the producing region (such as Japan), incrementally adding value at the primary processing stage is a more viable long-term strategy. His work showed that continuous technological innovation and increasing market knowledge are key elements to successfully expand value added wood product exports to Japan. Maness (1993) concurred that, in addition to secondary manufacturing, that value can be added in other ways. Examining advanced sawmilling through real-time value optimization in British Columbia sawmills, he found that the key to success is to maintain the correct set of product values in process control tables to maximize profit. Specific market opportunities and profits improve by frequent maintenance of process control value tables related to market price shifts.

Although the primary forest products sector is currently in distress due to the U.S. economic recession and the associated rapid decline in housing starts, the long-term potential for job creation and resource utilization is positive. For example, in 1993, value-added in the household furniture industry (SIC 2511 wood household furniture, except upholstered) was examined in terms of value-added per employee. Using 1992 Department of Commerce statistics, if this one sector in Louisiana could increase value to the level of the average of the next four lowest states analyzed (Florida, Alabama, Texas, Arkansas), or \$235.2 million, the

state could support an industry of an additional 5,735 new jobs (Vlosky and LeJeune, 1997). More recently, using 2006 Department of Commerce statistics, if this sector (now under NAICS 337 Furniture and related product manufacturing code) in Louisiana could increase total value added to the level of the average of the next four lowest states analyzed (Arkansas, South Carolina, Tennessee, Florida), or \$833.4 million, the state could support an industry of an additional 7,178 new jobs (US Census Directory of Manufacturers, 2006). The focus of the research will be on Louisiana. However, it is important to examine successes and failures that states (and even foreign countries) outside of Louisiana have faced in forest sector development.

Forest Sector Development, Markets and Competitiveness

Marketing and business development research in the forest sector involves a wide variety of components. Examples include research on existing and future consumer market trends, location decision criteria for existing Louisiana companies that might expand or companies that could be recruited from outside the state, raw materials availability and competition for raw materials, labor force skills and training requirements, the competitive environment for finished products from a global perspective, and potential for new products to be developed and how they might compete with existing traditional products (Vlosky et al. 1998).

In order to examine the attractiveness of participating in forest products markets and industries, the overall drivers of product supply and demand will be researched. These include macro-demand drivers for wood products demand and the outlook for major raw material markets (lumber and panels) for the secondary wood products industry. The product sectors that will be researched fall into the North American Industry Classification System (NAICS) Subsector 321: Wood Product Manufacturing and NAICS Subsector 337: Furniture and Related Product Manufacturing. The North American Industry Classification System (NAICS) is the

standard used by Federal statistical agencies in classifying business establishments to collect, analyze, and publish statistical data related to the U.S. business economy (US Bureau of Census-NAICS 2008). NAICS was developed under the auspices of the Office of Management and Budget (OMB), and adopted in 1997 to replace the Standard Industrial Classification (SIC) system. It was developed jointly by the U.S. Economic Classification Policy Committee (ECPC), Statistics Canada, and Mexico's Instituto Nacional de Estadística, Geografía e Informática, to allow for a high level of comparability in business statistics among the North American countries.

By using the NAICS classifications, economic censuses, known as the Census of Manufactures, which are conducted once every five years by the U.S. Department of Commerce, Bureau of the Census, will be used in the research. The Census is the major source of facts about the structure and functioning of the U.S. economy. It provides valuable data on measures of the well being of the economy, to aid government in formulating policies and for studying trends in industries and markets.

Economic development approaches are often championed by non-export based sectors hoping to bring outside dollars into a region so that they can be “re-circulated” among the employees and ownership of non-export sectors thereby increasing jobs and incomes to all economic sectors of the community. This approach has led to the often described “smokestack” chasing phenomenon by communities that try to recruit large export-base industries such as forest product manufacturers. This approach usually focuses on providing a supporting tax environment (business tax reduction or elimination) in exchange for the location of the industry in the community. The strategy has the unintended consequence of focusing too much on the

short-run recruitment effort of the industry instead of the longer-term retention issues of the industry (Smith, Fannin and Vlosky, In Press).

A strategy that takes a more balanced approach to the needs of the community and the needs of industry are described in a collection of models focused on cluster theory originally discussed by Marshall (1920) and popularized in recent times by Porter (1998). The diamond theory first described by Porter (1990) discusses supply, technical, and market environments of industry development and clustering. The supply environment consists of upstream business partners and raw material suppliers. The technical environment consists of labor with industry-specific skills, local research institutions, and related industries using similar technologies, thereby providing synergies and technology spillovers. The market environment consists of demanding customers and competitive rivalry, providing market inputs to the firm and pressuring it to position its product offering.

Another theoretical framework often used in market and industry structural research is the Resource Based View (RBV) theory. RBV explains business performance in terms of firm-specific skills and resources that are valuable, unique, rare, and non-substitutable (Barney 1991). The RBV posits that distinctiveness in a company's offering or operations are directly tied to the distinctiveness in the inputs, resources and skills employed (Conner 1991). Beyond the traditional tangible resources of labor, capital, and land, the RBV literature recognizes and emphasizes the importance of intangible resources and capabilities (Conner 1991). Intangible resources are harder to measure and duplicate than the tangible resources due to their non-physical and often ambiguous nature. Intangible resources include organizational routines, organizational processes, management skills, knowledge, information (Conner 1991), customer orientation, organizational know-how (Bharadwaj 2000), intellectual property, quality, brand

image, reputation, company networks and databases (Grant 1991; Fahy and Smithee 1999). Firms create competitive advantage by combining resources that work together to create organizational capabilities (Bharadwaj 2000). Additional theories used in market research and their applications include *Value Innovation and The Value Curve*-Identify what customers value most and innovate change to provide this value; *Porter's Five Forces of Competition Framework*-Understand industry competitiveness and market entry strategy; *Market-Oriented Ethnography*-Understand consumers by observing their behavior not by researching their attitudes; *Brand Personality Dimensions Framework*-Measuring and comparing brand personality; *Hierarchy of Effects Models*-Understand the various effect of advertising on consumers; *Service Mapping*-How to improve customer service; *Brand Relationship Spectrum*-How to manage different branding strategies; *Change Equation*-Changing the internal culture to match the brand promise; *Balanced Scorecard*-Understand performances of a business by measurements; *Doyle's Five Criteria for Segmentation*-Criteria for effective market segmentation; *Dirichlet-Marketing Benchmarks* and; *Bass Model: Diffusion of Innovations*-Forecasting and using it for word of mouth marketing.

Research to be conducted in this area will incorporate established theories such as these to take holistic approach to stimulating economic development through sustainable wood product industry expansion. The methodology, which is premised on matching production capabilities to market demand, goes beyond simply examining forest resources, current industry capabilities and market forces. In addition to these important components, the methodology includes analyses of regional economic effects of industry growth, environmental implications, socio-economic and demographic factors. The approach is flexible and can be adapted for different objectives (Vlosky, 2008a). The nature of the methodology is such that during

implementation, continued analysis and systematic follow-up can accommodate changes in demand, supply, market conditions, economic conditions, etc. Driven by markets and demand and not production, any new jobs created are likely to be maintained. This approach can assist local policy makers in formulating strategies for implementation of economic development efforts designed to capitalize on defensible market driven opportunities in forest products industry sectors (Vlosky 2008a).

Regardless of the underlying motivation (rural development, adding value, employment enhancement, etc.), this research component can be the platform for a planning tool that can help develop sustainable strategies for forest products industry development. Such development can add value to existing resources and create employment opportunities with transferable skills. For success to be achieved, the authors suggest that many stakeholders, including local development organizations, industry members, academic institutions and state and local economic development agencies must be involved to move from baseline analysis to program implementation.

Supply chain issues that connect forest products from forest to consumer are an integral part of this research agenda. La Londe and Masters proposed that a supply chain is a set of firms that pass materials forward. Normally, several independent firms are involved in manufacturing a product and placing it in the hands of the end user in a supply chain—raw material and component producers, product assemblers, wholesalers, retailer merchants and transportation companies are all members of a supply chain (La Londe and Masters 1994 in Mentzer et al. 2001). The forest industry faces pressure from increased transportation costs of its raw and primary products, a declining population and labor force in many of the rural areas where its historical firms are located, and liquidity and solvency issues made more increasingly difficult

by tightening credit markets. However, improved methods of measuring existing factor and product markets in the forest products sector will assist future spatial structuring, typically clusters, of the industry (Smith, Fannin and Vlosky, In Press).

Training and Workforce Development

Forestry and forest products manufacturing contribute significantly to Louisiana's economy. However, there are opportunities to realize additional unfulfilled potential to further develop the industry. Wood products industry development in most states in the South are outpacing Louisiana in productivity and training for their employees. This is particularly the case in the secondary component of the industry where Louisiana has been lagging in terms of productivity and adding value for at least the past 20 years. Londhe and Vlosky (2003) developed a baseline understanding of the secondary wood products industry in South Carolina. Respondents were predominantly small and well-established furniture manufacturers. Although no issues were identified as seriously hampering respondents from achieving further business success, lack of a skilled workforce training was identified as the most serious impediment for competitiveness.

Traditional educational systems often do not provide work force training and development specific to value-added forest products industries. In fact, given increasing global competitiveness, the need to plan and execute a defensible growth strategy for the industry is more important now than in the past.

As was found by Vlosky and Chance (2001) and Vlosky (2007), Louisiana has not and does not provide workforce training for the state's primary or secondary value-added wood products industries. The gaps in the skills needed and the ability to transfer skill-specific knowledge to the industry have been well documented in these studies and largely ignored by policy makers in positions to use this information.

Where industry development is to occur, there is a need to focus a sustainable educational effort on upgrading skills for existing employees, developing management programs for owner/managers and develop entry-level training for new industry employees. The main point is that such a program would be comprehensive and would draw upon the expertise and support that currently exists (Vlosky 2008a).

A training opportunities methodology should systematically examine educational and training services utilizing varied media including formal classroom instruction, certificate courses, seminars and workshops, computer aided long distance learning and technical videos. In addition, outside expertise may provide specialized machine and process training. Training must be continuously evaluated at all enterprise levels and include skilled, semi-skilled, business and production management, as well as basic skills and remedial support.

Emerging Research Issues

In addition to market research to be conducted in the areas previously mentioned, examples of emerging issues that are relevant today are “green” certification, woody biomass for fuel energy, competition for wood inputs between biofuels and traditional wood products such as particleboard, paper and oriented strandboard (IUFRO 2008, Vlosky 2008b). These issues are discussed in the following sections.

“Green” Certification

The certification of wood products had its origin in the tropical timber wars of the late 1980s. When a suggested boycott of tropical timber led to the realization that success in such an effort would likely only devalue tropical forests, the concept of identifying and rewarding responsible forest management was born (Bowyer 2008). By the mid-1990s forest certification

and chain of custody certification had become reality, first with the introduction of FSC forest certification, and then the development of a host of reactionary programs (Bowyer 2008).

Since its inception, certification has become an important issue in the wood products industry. Consumers, corporate shareholders, local communities, and other stakeholders increasingly demand assurances that the production of goods conforms to minimum standards of social and environmental responsibility (Fischer et al. 2005). Consumers express their concerns about the ethical behavior of companies by means of ethical buying and consumer behavior (De Pelsmacker et al. 2005). In response to environmental concerns, some environmental organizations, retailers and wood products companies are developing standards to encourage consumers to purchase wood originating from certified sustainable forests. These efforts are intended to counter the common perception by the general public that most forest practices involving the harvesting of wood do irreversible damage to the environment (Petersen 1996). The basis for this action is a perceived need for consumers to be assured by neutral third-party organizations that forest products companies are employing sound practices that will ensure a sustainable forest. In addition to countering negative perceptions by consumers and the general public, it is believed that companies that prove to be environmentally responsible will benefit from certification by differentiating their products in the marketplace and thus acquiring a larger share of the market. “The assumption behind these initiatives is that consumer interest in the forest dilemma is strong” and this interest may cause discrimination in favor of timber from sustainably managed forests and a willingness to pay any associated extra cost (Upton and Bass 1996).

Many studies have been conducted that examine willingness to pay for certified wood products from the customer self-reported point of view. These studies generally suggest a

willingness to pay and many forest certification proponents claim that ecolabels are associated with increased sales, price premiums, or both (Anderson et al. 2005). However, in a study by Anderson et al. (2005) using an experimental design, consumers shopping at the Oregon State University (OSU) and Auburn University (AU) bookstores were offered a choice between ecolabeled and non-ecolabeled wood pencils. Aside from the presence or absence of an ecolabel, the pencils were identical in all other respects. Sales of each pencil type were tracked during a number of pricing conditions: prices equal for each pencil type, a 20 percent premium on ecolabeled pencils, and a 100 percent ecolabeled premium (at OSU only). Comparisons were made between the quantities sold of each pencil type under each pricing condition. Results show that OSU and AU pencil consumers were largely indifferent to the presence of an ecolabel. However, as the price premium increased more and more consumers abandoned their indifference and purchased the cheaper non-ecolabeled pencils. Bowyer (2008) states that in most cases, little or no premium has been obtained on certified wood in the market to cover the added costs incurred to participate in certification.

However, participation in certification may potentially improve a firm's environmental image. Grillok, Tokarczyk and Hansen (2008) suggest that in the forest products industry, environmental image is an increasingly important consideration and varied approaches are employed to communicate environmental stewardship. Toward this end, green advertising can be used to promote an image of environmental responsibility.

Environmental certification of forest management and harvesting is a complicated issue that affects many participants in the wood products supply chain and other stakeholders. By better understanding the position of many groups, informed decisions and policies about

environmental certification can be made by Louisiana forest industry participants. In addition, alternatives to certification might be explored.

Wood-based Fuels and Energy

Society's increasing demand for transportation fuels has increased research into developing of renewable fuels. Although first-generation biofuels are dependent on starches, sugars and vegetable oils, the need to generate higher volumes of biofuels at lower cost has shifted the research focus to cellulosic ethanol. The utilization of lignocellulosics for the sustainable manufacturing of biofuels is critically dependent on the chemical constituents of the starting biomass and the desired fuel properties (Pu et al. 2007).

The forest products industry is one of a few nationally based industries that have the necessary skill set and infrastructure available to process sufficient biomass for the rapid short-term development and commercialization of biofuel, bioenergy and biochemical technologies (Ragauskas et al. 2006). Winandy et al. (2008) state that conversion of wood to biofuels is technically feasible, but with current technology and the pricing of crude petroleum, the conversion process is marginally economical.

According to Healthy Forests and Rangelands (2009), woody biomass is defined as the by-product of management, restoration and hazardous fuel reduction treatments, including trees and woody plants (i.e., limbs, tops, needles, leaves, and other woody parts, grown in a forest, woodland, or rangeland environment). Woody biomass utilization (WBU) is defined as the harvest, sale, offer, trade, and/or use of woody biomass. This utilization results in the production of a full range of wood products, including timber, engineered lumber, paper and pulp, furniture and value-added commodities, as well as bio-energy and/or bio-based products such as plastics, ethanol and diesel. Healthy Forests and Rangelands is a portal to information about the *National*

Fire Plan (NFP), Healthy Forests Initiative (HFI), and related initiatives. Healthy Forests and Rangelands, a cooperative effort between the United States Department of the Interior (DOI), the United States Department of Agriculture (USDA), and their land management agencies, provides fire, fuels, and land management information to government officials, land and fire management professionals, businesses, communities, and other interested organizations and individuals. The National Renewable Energy Laboratory (2009) defines three types of woody biomass: 1) Forest residues are logging residues and other removable material left after carrying out silviculture operations and site conversions. Logging residue comprises unused portions of trees, cut or killed by logging and left in the woods. Other removable materials are the unutilized volume of trees cut or killed during logging operations; 2) Primary mill residues-include wood materials (coarse and fine) and bark generated at manufacturing plants (primary wood-using mills) when round wood products are processed into primary wood products, like slabs, edgings, trimmings, sawdust, veneer clippings and cores, and pulp screenings and; 3) Secondary mill residues-include wood scraps and sawdust from woodworking shops, furniture factories, wood container and pallet mills, and wholesale lumberyards and; 4) Urban wood waste which includes wood residues from wood chips and pallets, utility tree trimming and/or private tree companies, and construction and demolition sites.

The forest products industry in the United States uses almost 100 million dry tons of wood waste annually for energy. A number of companies have begun, or are contemplating, installation of wood waste or hog fuel gasifiers. The producer gas resulting from this thermal decomposition can replace natural gas or be further processed to produce syngas (synthesis gas), used to manufacture other chemicals such as methanol, higher alcohols, or hydrocarbons. On an annual basis, the US pulp and paper industry already collects and processes approximately

108 million tons of wood for the production of pulp and paper in a sustainable manner (Ragauskas et al. 2006). Specific to the southeastern United States, including Louisiana, there are vast amount of woody biomass. Woody biomass is a great potential for the South as a fuel source. Between 30 and 60 tons per acre of biomass are left on the ground following a typical timber harvest. This could be a valuable feedstock for a plant that produces energy. In addition, marginal agricultural land that won't produce row crops profitably can grow a variety of grasses and woody plants for conversion into energy (Bogren 2008).

This research program will continue and expand work done in the previous three five-year McIntire-Stennis projects. The proposed research will be flexible in that it will focus on evolving trends and activities in the forest sector as they unfold.

ACTIVITIES AND OUTPUTS

Objective 1) Examine market structures and issues facing the forest products industry in Louisiana from the perspective of the supply chain from the forest to consumers.

Activities and Outputs

1. Track changes in markets and products in the Louisiana wood products industry.
2. Identify supply chain participants and target information appropriate to each segment.
3. Identify information and outreach needs of the industry as conditions change.
4. Keep abreast of certification activities globally, in the United States, in the US South and in Louisiana.
5. Identify opportunities for and possible alternatives to certification for the Louisiana forest products industry.

Objective 2) Identify factors and processes that promote or deter sustainable growth and market development of the forest products industry in Louisiana.

Activities and Outputs

1. Create sustainable employment opportunities with transferable skills while maintaining stewardship of renewable forest resources.
2. Apply market strategy and statistical tools to evaluate market attractiveness and industry expansion potential for existing and/or new Louisiana forest products.
3. Identify information and outreach needs of the industry as conditions change.

Objective 3) Identify Louisiana forest products sector employee training and skills development needs.

Activities and Outputs

1. Monitor employment structures by activity and skill level in Louisiana's primary and secondary wood products sectors.
2. Identify unfulfilled training requirements.
3. Identify impediments to increasing employment in the wood products industry.
4. Generate information that can be used by policymakers in Louisiana to develop wood processing training initiatives.
5. Develop recommendations that can lead to increased employment in the wood products sector in both rural and urban areas of Louisiana.

RESEARCH PROCEDURES

Research in marketing and business development is social science research. I study people's perceptions, awareness, motivations, actions and future perspectives. All of the research I do is conducted using mail, web-based, and telephone surveys or in-person interviews or focus groups. In general, sampling, survey procedures, follow-up efforts and data analysis will be conducted in accordance with well-documented and verified techniques (Malhotra 1993; Dillman 2000; Fowler 1984; Hair et al. 1992). The following sections describe these procedures.

Sampling

Sample frames for this research will vary depending on the area of emphasis. Generally, for market structure and competitive analysis, the wood products sample frames will be manufacturing firms the North American Industry Classification System (NAICS) Subsector 321: Wood Product Manufacturing and NAICS Subsector 337: Furniture and Related Product Manufacturing. There is a myriad of industry segments within these subsectors including hardwood and softwood lumber, plywood, particleboard, medium density fiberboard, oriented strandboard, laminated veneer lumber, hardwood dimension and flooring, wood kitchen cabinets, wood household furniture, wood office furniture, store fixtures, partitions, millwork,

and doors. For the research studies encompassed in the study objectives, many populations could be sampled including government policymakers, non-governmental organizations (NGOs), manufacturers, forestland owners, consumers, distribution intermediaries, exporters, etc.

As far as research design, once again, it depends on the size of the industry sub-sector, funding availability, and ease of access to respondents. For example, for sectors with few members such as North American medium density fiberboard producers, a census of companies would be conducted. For larger forest-sector populations such as U.S. softwood lumber sawmills either the top “X” number of companies or a random sample would be surveyed.

Sources of sample frame information are primarily purchased mailing lists by NAICS sector. In addition, industry directories, trade associations and academic institutions will be consulted in developing respondent mailing lists. These sources will be cross referenced to develop reliable lists. Examples of the many available trade associations and secondary sources include: the Random Lengths Big Book, the Wood Products Red Book, Dun and Bradstreet industry listings, the American Hardwood Export Council (AHEC) membership list, the Hardwood Manufacturers Association (HMA), the Southeastern Lumber Manufacturers Association (SLMA) the Southern Forest Products Association (SFPA), and the American Furniture Manufacturers Association (AFMA). All mail surveys are sent first-class postage mail to ensure that undeliverable surveys are sent back to me and reflected in the adjusted responses rate. Whether the survey method is survey, personal interviews, focus groups or other means of data collection, depending on the research objective and area, the appropriate key respondent will be identified and contacted.

Mail Questionnaires

The primary means of data collection in the work I do is mail survey questionnaires. Mail questionnaires are the most cost effective method of data collection. The method affords a high degree of anonymity and is less limited by rigid time constraints that can impede the effectiveness of other survey methods. Questionnaires will consist of fixed response questions, including fixed alternative and multichotomous questions for responding firm demographic profiles as well as open-ended questions which will allow respondents to express thoughts and ideas not covered in the fixed format questions. Questionnaires also incorporate Likert-type scales. The scales of measurement may be nominal, ordinal, and interval. In addition, 5-point scaling questions, typically anchored by 1 = strongly agree to 5 = strongly disagree and by 1 = very important to 5 = very unimportant, will be employed to measure the respondent's level of agreement.

Questions will be formulated to reflect the unique research topic; however, continuity in the theoretical applications will permit the generation and application of this research method to other industry sectors and in the context of other regional comparative analyses.

Following procedures recommended by Dillman (2000), mail survey procedures will include a pre-notification letter, a cover letter accompanying the initial questionnaire, a follow-up postcard, a second follow-up letter with a second copy of the questionnaire and, if deemed necessary, follow-up phone calls to key non-respondents. These procedures are conducted to maximize response rates.

Interviews and Focus Groups

The second method of the primary data collection process will be personal interviews (either face-to-face or telephone) conducted for a representative samples of companies and individuals as required. Following extensive pretest procedures, a series of semi-structured,

undisguised personal interviews will be conducted. The interviews will consist of both fixed response and open-ended questions. The interviews format will allow the researcher to explain and clarify questions and expand on issues of relatively greater importance.

Data Analysis

Interview and questionnaire quantitative data will be coded and input into the Statistical Package for the Social Sciences (SPSS) or other similar software, for data analysis and interpretation. Both univariate and multivariate statistical analysis techniques will be employed to analyze the quantitative data. Univariate inferential summary statistics will characterize the populations and examine the differences and similarities of ordinal and interval measured constructs such as distribution channels, domestic and export markets served, products produced and raw materials supplies and sources.

Multivariate statistical techniques will analyze the rating scale data addressing the factors affecting location selection criteria and business strategies. Initially Factor Analysis and/or Cluster analysis will be performed for data reduction and the development of meaningful subgroups of individuals or objects respectively (Hair et al. 1992). Multiple discriminant analysis, an appropriate technique when the dependent variable is categorical and the independent variables are metric will be used subsequent to the Factor/Cluster analysis and/or independently to examine the differences in relational factors between various respondent categories. In addition, logistic regression will be used to examine relationships between out-of-state sourcing relative to location decision criteria. Results will be reported with conclusions and recommendations.

BENEFITS TO LOUISIANA

As has been the case with research I have conducted over the past 15 years spanning three LAES projects, this research will further the understanding of the factors that influence growth and development in the forest products industry in Louisiana. Development of wood-based industry sectors, particularly those that add value through downstream manufacturing or by including value-added services are particularly important to attracting new industry and stimulating growth of current industries that retain value in Louisiana. The alternative is exporting raw material or semi-finished products to other states or countries to be remanufactured into value-added products.

INFORMATION DISSEMINATION

The overarching goal of this research is to disseminate information that will help in the development and growth of the Louisiana wood products industry. Following are venues that have significant reach to touch the varied client/stakeholder base in Louisiana.

- 1) The LSU AgCenter Content Management System (CMS).
- 2) Trade journal articles.
- 3) Reporting of findings in Louisiana Forest Products Development Center publications and newsletters.
- 4) Presentation of study results will be made at Louisiana professional meetings and conferences.
- 5) Presentations to state legislators and public policy makers as requested.
- 6) All results will be disseminated to Louisiana forest products companies either directly through the mail or be posted on the Louisiana Forest Products Development Center website.
- 7) Louisiana Forest Products Community (www.laforestproducts.org) and Louisiana Forest Industries (www.lsuagcenter.com/forestindustries) websites.
- 8) Peer-reviewed journal articles

PROJECT DURATION

This research project will span five-years.

PERSONNEL

Project leader will be Dr. Richard P. Vlosky, Professor and Director of the Louisiana Forest Products Development Center (LFPDC). He will continue work in close cooperation with other scientists at the LFPDC as well as scientists in other LSU AgCenter units, LSU A&M campus departments, regional academic institutions, and international researchers. Research associate and graduate research assistant support personnel will also be involved in this project as funding permits.

FINANCIAL SUPPORT

All research studies conducted under this umbrella project will be funded with outside grants and contracts.

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