A MARKET INTELLIGENCE BRIEF

FOR

THE WOOD PROCESSING SECTOR

USAID BUSINESS CONSULTING
SARAJEVO

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Executive Summary: conclusions and recommendations.

Bosnia has the ability to become a major wood-producing nation if managed properly. The knowledge and ability to produce high-grade products, not only lumber but also value-added products, is in place. The timber is growing, people have a sense of how to manage the forests, and the labor force is capable of producing products from this renewable source. The main problem seems to be lack of direction for the wood industry as a whole.

There are two main deterrents to this situation changing in Bosnia: misguided government policy, and lack of available financing. These two factors set the stage for growth and improvement in Bosnia's economy… or its stagnation.

What is lacking?

1. **Supportive Government Policy:** The desire of the Bosnian government should be to carefully nurture these natural resources in a way that will bring benefits to all the people of Bosnia, not just a few in power. Fair taxation laws for businesses and people in general are in the best interest of the country of Bosnia. It is common knowledge that to operate a business in Bosnia, evasion of taxes is required to survive. This is counterproductive to a healthy, growing economy. It is a proven fact that when government reduces the tax rate, eliminates corruption, creates a fair level playing field, there is less cheating and more jobs are created. Many of the business transactions being done in Bosnia today is in the form of cash. This is true for both domestic and export markets and the ensuing black market results from the present system.

Two particular misguided government policies are:

- Ban on the export of high quality or veneer logs with the intent of reducing the prices of logs domestically.
- Arbitrary government regulations, which stipulate how much high grade quality lumber a mill should be able to produce from a given grade of log. This does not take into account improved milling methods that allows for obtaining similar high quality from much lower grade material.

It would appear, by their actions, that the government of Bosnia has no long-term strategy in regards to protection and long term, sustained use of forests.

There are approximately 75,000m3 of F class (veneer) logs produced yearly in the federation alone. The capacity of the present equipment to utilize this production for this type of log is 15,000m3. Because of the ban on exports of this type of valuable log, there are 60,000 m3 being diverted as sawn logs, which produces a lower grade and yield. **This is a loss of an estimated KM 1,000,000 yearly from the economy of Bosnia. The wood sector in the RS is much larger so we could assume that the numbers would be equal or greater, making the total loss to Bosnia at over KM 2,000,000**

2. **Bank Financing:** A change in the attitude of lending institutions towards wood producing companies is required.

- Long term capital loans, where equipment is concerned, short-term loans for working capital are desperately needed.
- Providing sufficient loans for advanced technology, labor saving equipment and working capital in a responsible, timely manner.

The wood products industry in any country requires an enormous amount of cash to improve productivity, operate and be competitive with other producing countries. Bosnia is no different. Banks must be willing to become long-term partners in the sense that they must supply the capital required. Loans must be judged on merit and disbursed quickly, not in months, as is many times the present situation.

Other lesser deterrents affecting change in Bosnia are the mills themselves and the forestry personal in the way they buy /sell logs in regarding bribes and reducing the grade on the official papers. Both of these areas can not be improved without leadership from both the government and the banking sector.

3. **Strategic thinking by mill owners:** Owners have an obligation to approach business with the idea of longevity, growth and sustainability of the business that will prepare them for stiffer competition or down turns in the economy.

   - Too many companies do not have a clear picture of just what their businesses are doing in relation to costs. This is due partially because every effort is made to hide as much of the income as possible. **Improvement here can only coincide with changes in government policy and tax regulations.**

   - Companies must start immediately to understand unit cost. This is so as to determine what the profitability of the company is at any given moment**. Without this information the companies have no reason to expect loans or credits, as the lending organization will be unsure of their ability to return the credit.**

   > As Fagerlid discovered, the giant Swedish saw milling group that recently failed, increased production does not necessarily lead to increased profitability. The same is true for Bosnian mills.

   - Very few of the lumber businesses that I have visited any have cash reserves for lean times. This is caused by the "ever-expanding" mindset of the owners. **Growth for the sake of growth is poor judgment and will lead to failure of the business. Planned, calculated growth will provide for long term viability, competitiveness, and profits for the future of the company.** Without steady profitability, companies will fail and jobs will be lost.

4. **Government Employee Integrity:** Forest managers are the protectors of the natural resources of Bosnia and have sole control of what will be removed, what is not removed and how the forest shall be left for future generations. Others can set guidelines, but the actual process of honestly executing the guidelines when marking, cutting, scaling and selling of the logs starts here. If the present practice of bribery, favoritism and dishonest tallying of logs is not stopped here, then the long-term future of the wood industry in Bosnia is bound to fail.

   > State saw mills presently owe the forest companies KM 30 million. If this is never paid, or no interest is calculated, this is in effect stealing from the present and future generations of Bosnia.

Timber sales must be transparent to all. A long-term <u>Forest Resources licensing system</u> (concessions) is not the way to achieve this kind of trust. This leaves an opening for the continual practice of unsupervised cutting of the forests.

If there is a serious desire to have the forest sector shed the present image, the quickest way to accomplish this task is to become a part of either PEFC or SFI[1] and manage the forests according to international standards.

Given the present situation what can be concluded by the actions of the Bosnian government, saw mills, foresters and financial institutions:

It must be that none have looked at this problem in light of **"what is good for Bosnia".** The norm now is each organization is working toward the benefit and interests of themselves, which is to the detriment of Bosnia and the industry as a whole.
Unless this attitude is changed quickly, the Bosnian wood industry will be left way behind the rest of the world with regard to productivity, quality standards, sales, and value-added jobs. Also the present world concept that Bosnia as just a supplier of raw material or semi-finished goods will be perpetuated.

What does this mean for the BDP program in regards to the forestry sector?[2]

- **There is enormous room for expansion within the wood sector for value added products.**
- **Before loans are dispersed to potential companies, emphases should be placed on cost management, production and developing markets.**
- **Capital loans must be structured over the life of the equipment (up to 10 years in some cases) and working capital considered as short-term loans.**
- **In many cases, borrowers have wasted opportunities. New requests for equipment loans must be scrutinized carefully by industry experts.**
- **The BDP Program now needs to place a greater emphasis on MIS within the borrower companies.**
- **The efforts of the BDP could be better focus on loans towards companies that are willing to invest in technology to improve productivity and yield.**
- **The future direction of the BDP should support and contribute to the further development of the present dry kiln concentration yard concept**
- **The past policy of granting loans for small (25-50 m3) dry kilns has been counter-productive in that it has not allowed the industry to develop the "cluster concept".**

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[1] Appendix #1 describes what this is and why Bosnia forests must become part of this global initiative.
[2] See appendix #5 for detail recommendations.

Overview of Sawmilling operations

Recent History:

To understand where the forestry industry is at this time in Bosnia we must look back to 1996 and compare today with the operations at that time. Many of the present lumber companies were just starting with the production of spruce for the local reconstruction markets. These mills with very basic outdated equipment, were low producing and simple in operation for the most part. Often lumber was mis-cut and little concern was given to waste or its disposal. Using a time comparison, this would place the mills about 50 years behind the present western world in quality, technology, safety and production.

At that time, few mills were capable of producing lumber, even fewer were exporting it. Major reasons were;

- The lack of proper equipment,
- Transportation problems between the Federation and the RS,
- The inability to get outside trucking companies to come to Bosnia,
- Seaports in the region were not available for container shipping until May 1999,
- Rail transportation was not operating because of needed repairs and political problems, which still persist,
- The difficulty for directors from Bosnian companies to leave the country and meet with former customers meant that buyers had to come to a "war zone" to do business,
- Electricity, a major energy source for mills was not always reliable and might be off days at a time,
- The ability to receive funds from outside the country through normal banking channels was next to impossible.
- There were few dry kilns that were capable of drying lumber properly for exporting. Steam chambers for beech for the most part were old and in very poor condition. Productivity was very poor and many companies operated three shifts just to produce what a normal mill might do in one shift.
- The availability of logs was not reliable, as much of the heavy equipment to remove the trees from the woods and trucks to transport to the mills were destroyed in the war.

Forest Survey Jan 1997

Any country's ability to grow and create employment depends on its natural renewable resources. Bosnia is very fortunate in that it has an extensive timber base that could be prosperous for the country and its wood industry if managed properly.

There are indications of a very slight decline in the grade of hardwoods. This is a trend that is happening worldwide and is not as prevalent in Bosnia as we have seen in other countries.

No mill could give figures on the cost of labor, energy, or production rates per cubic meter sawn. Development of this would help to determine their weaknesses.

The smaller private mills are in a position to acquire and utilize newer technology such as carbide and stellite saw teeth. Whereas the larger state mills already have their older systems in place which restricts the products they can produce.

As loans from the BDP program and others started to reach the mills late in 1997 and 1998, equipment was purchased with the emphasis placed on production of beech lumber for export.

The Current Situation:

As we entered the year 2000 many of the problems like transportation, visas for Bosnian's, more buyers willing to come to Bosnia looking for material, seaports and others have slowly been dealt with. Mills have improved their operations over the past couple years to where they can start competing on the world markets with semi-quality products. There are a few companies presently exporting to the US and Asia butthe majority that are dealing with countries closer to Bosnia.

Today there are a few companies with state of the art equipment that are conscious of their responsibilities with regards to producing quality products, utilization of raw material, proper disposal of the waste produced from milling operations, the meaning of labor productivity and cost controls. For the majority of mills, however improvement to a point where they are only 5-15 years behind the times in regards to technology and production is the norm. However, a couple of the best firms have obtained the latest industry equipment and are poised to compete anywhere in the world.

The main problem that sawmills will face over the next few years will be:

1. **Reliability of the log supply**
2. **The quality of logs which will continue to decline**
3. **Competition for all markets, both domestic and export, will increase.**
4. **The prices of wood products will level off, or more likely decline, over the next few months.**
5. **Other species of woods will capture market share from beech as furniture products because of price, availability, and quality.**

Log Availability Review

The main question by donor countries, The World Bank and the mills themselves have been about the quantity / quality of logs available for processing by saw mills in Bosnia. On the surface the concern about a lack of quality logs available for cutting is warranted but this is, however, true for every other country in the world. The question should be **"How is Bosnia coping with the decline in quality logs"** and the answer to that question is "**Very poorly or not at all".**
When the sawmills purchased equipment for the manufacturing of logs into lumber, the methods of producing lumber the past 40 years were carried into the present day operations. This was a **major mistake**, as it did not allow for the improved equipment used today in the recovery of valuable wood fiber from the logs. Many improvements in equipment within the past 10 years alone have increased yield, grade and productivity in the sawmill. Computers, scanners, handling equipment have all combined to produce more valuable lumber from the same or even lower grade logs. More accurate sensors for sawing have allowed closer tolerances in sawing and planing, which will produce more lumber from each log.
For the most part, production of lumber here is still done the way it was in the past. Bosnian companies use steel rather then stellite or carbide saws, which allows for longer life between sharpening and thus more accurate cutting for a longer period of time. The band saws presently used are of the older crowned wheel types, which do not allow the faster speeds required for increased production and more accurate sawing. Related transfer equipment between machines is almost non-existent. Quality control starting from the woods right through the milling operation is spotty at best. The attitude for the most part seems to be "the customer can work with what we ship".

Comments;

Mills have used the argument about the lack of quality logs for as long as the BDP program has been operating.

The mills are also using this tactic to prevent the export of logs so they will have more raw materials for themselves, at possibly lower prices.

Preventing exports of logswill have a tendency to reward the mills for not being efficient, not finding ways to increase yield or not finding other markets from the logs they now get.

The only way this "improve or die" message is going to get across is to allow the market to inflict a little "pain". When mills can not get enough logs, smarter ones may remember what we tried to teach them over the last two years and improve.

When this happens there will be better use of the forests and logs in Bosnia.

When tax officials audit a mill, they have norms for the amount of lumber available from different grades of wood. If the norm is higher for a company because they have utilized low grade better then normal, they are considered to have stolen logs.

What has the government and lumber industry in Bosnia done to keep up with these trends and improvements? **Very little other then pass restricting laws forbidding the export of logs.** These laws do nothing to improve the situation in Bosnia and only lengthen the period of time, in which mills here will continue to be inefficient and wasteful.

These and other problems lead to a waste of natural resources, which in turn generates more demand for logs/wood fiber, thus the feeling that there is a lack of logs.

As an illustration, management of a large state sawmill made the following comments the week of April 14, 2000. BC consultants had a meeting with the director and managers of a large state owned mill; the following are the director's remarks:

We had a lengthy discussion regarding what they expect will happen to the price of logs after privatization of the logging industry. Interestingly, as with the Director of Janj Pilana, they were of the strong opinion that in the

Comment: Where much of the lumber is exported, this statement will not prove to be correct. The world demand will set prices, not local mills.

near term (1-2 years) the price of logs will decline. They supported their position with the following points:

- *The recently passed law requires that logs can only be sold domestically, a limited market.*
- *Privatized state sawmills will be forced to rationalize their production by optimizing employee headcount and increasing production efficiency with better equipment; this will lead to serious excess capacity in the industry and thus decreased demand and prices for raw materials.*
- *70% of logs are now processed by state-owned sawmills.*

Comment: The general feeling from the large state mills is that they will continue to be the major user of logs and will control the demand. This may not end up being the case, as many private mills increase capacity, efficiency of size and utilization. If this happens the demand

- *State-owned mills, currently enjoying extremely favorable payment terms, will be forced to pay cash for raw materials once they are privatized.*

Comment: This fact alone will cause major financial constraint with the newly privatized state companies. This is not the case with the present private companies. They have already learned how to manage with advance payments of logs.

Further, they expect a serious shake-out to occur in the sawmill industry, as small, inefficient operators will be unable to compete with the newly efficient large, privatized mills and will go out of business. Likewise they expect several newly privatized mills to fail. In short, they anticipate up to two years of turmoil in the industry with falling prices followed by stability and rising prices after the industry is rationalized.

Comment: In this I generally agree. Both the present private and the state, soon to be private mills, will all suffer the pains of inefficacy. Only the ones that recognize this now and are presently preparing for these changes stand a chance to survive. I do not agree that log prices will fall. Competition for logs will increase as the present mills improve productivity, cost controls and develop new and better markets. The newly privatized state mills will be short of working capital and funds to improvement equipment. This will curtail advancements for years unless there are investors willing to supply large amounts of cash. Major investors are unlikely to enter Bosnia unless they control 51% of the companies, which seems unlikely under the present privatization process.

Moreover the lack of understanding on the part of the mills on how to produce quality products from lower grades of wood and a tax system that punishes innovation in utilizing high quality fire wood to produce valuable elements also helps to lead to the perceived shortage of quality logs. Over the past few years the **available log quality** in Bosnia has diminished for a number of reasons;

- The lack of new areas being opened for logging,
- Lack of new, reliable equipment to remove the logs from the woods,
- The inability of the forest companies to maintain and improve the present woods road system.

Add this to a logging work force that has not been trained to cut logs for the highest quality possible and the quality of logs being delivered to the mills will continue to decline.

In 1998 the US in cooperation with the University of Alaska Anchorage did satellite imagery of Bosnia. The results seem to suggest that the forests in Bosnia were not being overcut.
The forest report done by Lane Krahl, in 1998 for BF, indicated similar results.

Political officials, who have connections with the state milling operations, often appoint forest directors. Many times there is a tendency to instruct the forest directors to supply logs, with very favorable terms to the state companies and unfavorable terms to the private companies. This creates an unbalance on the free log market. One way timber sales can be handled in a transparent manner is if the forest company marks trees to be cut, tally them using a fair and honest method and then putting the designated tract up to the public and excepting sealed bids, to be opened in public.

There seems to be a concern by many of the larger saw mill managers about **"illegal"**[3] mills still operating and how to close them down. The perception is that if these mills are stopped there will be more logs available to those remaining, thus the price will decline because of over supply. This is a misconception, as no mill in Bosnia will have the power to dictate log prices the way it was done in the past. The small "illegal" mills do very little to consume large amounts of logs. In fact these mills may be doing more good for the economy. By processing logs into lumber, however inefficient, they are creating jobs, supplying a need for the local markets and many times selling the production to the larger mills, which in turn export. Many times these are the same larger mills that are complaining about "illegal" operations. As the economy improves and jobs become more plentiful, many of these will cease to exist.

It seems that even today, with the perceived shortage and lower quality of logs, the owners of mills want to increase production rather than look for ways to improve productivity, yield and value added products-- in other words "squeezing" more value from each log that enters their yard.

Worldwide timber supplies are forecast to remain adequate for the next 10 years and possible for as long as 20 years.[4]

Forest Survey Jan 1997
By CDC

The SFE's contempt for the private mills comes from the former system of management that this country was under.

There is an "old-boy network" with the large state mills and they are accustomed to dealing with only one or two large enterprises.

This was evident when one of the SFE's stated that they would reduce the quantity of logs going to the private mills, if the state mills could handle the volume and pay quicker.

Some of this resentment could also be seen in the fact that private mills are required, for the most part, to pay up front for their logs. Ironically this provides the cash flow that enables the SFE to survive.

Market Opportunities Domestic and Foreign

The following is an illustration of what the present ideas and trends influenced by the development of the industry. Some of these are presently not within the reach of companies here in Bosnia but ideas such as these should be included in the future goals of all company plans.

These Trends are:

- Thin kerf sawing technologies reduce the amount of sawdust, increasing yield.
- Curve sawing allows for crooked logs to be sawed along the lines of the grain into straight boards that resist twisting and warping when dried.
- Internet advertising, product searches, and market information is a must for all progressive companies. E-business for the wood industry will grow at an explosive rate over the next few years. Thus the Internet will have a major impact on the supply chain worldwide. Transportation, ordering, tracking and even the location of substitute species will be done in minutes rather then days. Inefficient companies will struggle to survive in a world of low transaction costs, value pricing and customized services. Companies here must be connected to the Internet, and have a presence in some form even if it is in the free classified sections that are available.
- The use of bar-codes for inventory control, billing, and shipping instructions helps to manage sales, deliveries and cash flow.
- Production of thin veneer products that will simulate parquet flooring will continue to replace the thicker flooring now produced.

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[3] Illegal mills. These may be any small private sawmills not wanted by larger industry members.

[4] R.E. Taylor & Associates Vancouver BC

- Scanning devices and linear positioners will improve both grade and yield.

- The use of lasers to monitor defects of tolerances in manufacturing as soon as the lumber is cut is a reality in many operations.

- The use of ultrasound to determine the potential defects in logs and how to process them to maximize the grade has become a reality with the installation of a working model at East Alabama Lumber.

- Cryogenics (the process of deep chilling tool steel) is a process that adds life and improves wear characteristics of cutting tools.

Market Subsectors

Present Markets:[5]

- **Beech**

Although there are local furniture manufacturers, they are not well developed at this time. The majority of beech lumber is exported to Italy, Germany, Austria, France, Egypt, with a small amount going to Asia. This is basically in the form of lumber, flooring and elements for furniture,

- **Spruce**

For the past three years the majority of spruce was used domestically with some exports going to Germany, Austria, Serbia, Slovenia and other countries within the region. In 1999 the conflict in Kosovo has opened that market with the humanitarian aid that is being sent to that region. This has given the Bosnian softwood mills a quick, high use market, which in turn has improved cash flow for many companies. This market should subside almost as quickly as it materialized, quite possibly by the end of this year.

- **Oak**

Oak has been a product used throughout Europe in high-end furniture, flooring and stair treads. Because this wood is used in more expensive products, the demand has been steady for many years and should continue to be for the foreseeable future. This specie is less plentiful than others but is generally available in areas near the Sava River.

Potential Markets:

The two major species available for both domestic use and export in both the Federation and RS are beech and spruce. White oak will remain a minor specie.

Beech

- Markets for furniture will depend on the world economy and all forecasts indicate that the present level of demand will continue. As prices of beech escalate other woods such as Guatambu from South America and rubber wood from Indonesia will continue to make inroads into the markets for beech products. Rubber wood logs delivered to the mills are presently in the range of 80dm per cubic meter, compared to130dm for beech in Bosnia. This is a 61% reduction of raw material costs.

[5] Appendix #4 describes specific characteristics and uses of all species

- Many furniture manufactures are working towards cutting their labor costs by having more of the initial work done by the supplier. Milling to finish sizes, sanding and even applying the lacquer finish is now being required by manufacturing customers, mainly found in the US where labor costs are highest. The time is **now** for reliable companies in Bosnia to capture this business. **For the company that is able to capitalize on this, the opportunities are endless.**

- The loss of 160 million cubic meters of wood due to winter storms in Europe during 1999-2000 will present an opportunity for increased exports to these regions. Starting in 2-3 years after the supply of damaged timber is consumed, it is quite possible that the local lumber manufacturers in the hardest hit regions of Europe will not have sufficient logs to supply demand. This will cause them to expand their area of purchasing. For the companies that take advantage of this and prove to be reliable suppliers' long-term relationships will be forged.

Spruce

- The largest consumer markets are in the United States, Europe, and Great Britain.
- The use of spruce for furniture, finger-joint lumber, doors & windows will increase. Finger-joint, solid tops, "Glulam", engineered structural & laminated beams are growing in use each year.
- Post & beam and high end log homes are products that are becoming more in demand in both the US and Japan. These types of sales create a higher value product in a market that is somewhat recession proof.
- Small wooden consumer products are always in demand. Many of these products are now being supplied by off shore firms because of lower labor costs. These types of products utilize short, narrow pieces of lumber that normally are considered waste. There are many small wooden items such as knife holders, toys, house ornaments, shutters for window decoration that can be made by Bosnian companies and shipped to distributors.

Oak

- Solid tops for furniture and counters.
- Ornate rails and turnings.
- Veneers and solid wood for boxed items such as jewelry or other specially items

Firewood

- With the rapid increase in the cost and the continued short supply of oil, for the next few years, the demand for firewood will increase. This is the type of market that is easily serviced with a low investment. Markets are not only in Bosnia but also Austria, Italy and Germany. With the large supply of firewood available this could be a profitable business for those that can operate efficiently.

Other regional opportunities

This is an illustration of the opportunities available to companies here in Bosnia. It would be wise to take advantage of the expertise of these outside companies.

MEETING OF BUSINESSPEOPLE OF B-H AND SLOVENIA

Sarajevo, April 6 (BHP) – Business people from wood-processing industries of BiH and Slovenia met here Thursday to discuss improvement of their co-operation.

Slovenian ambassador to BiH Drago Mirosic pointed out that BiH is becoming more and more important for Slovenian economy and its long-term businesses and investments. He added that privatization in BiH opens new possibilities for reaching of joint standards.

Structure of goods exchange between the two states in this part of industry is not good for BiH, because BiH mainly exports incomplete processed goods and imports HQ final products.

The following European companies are expanding because of increased sales and will need lumber from somewhere. There should be no reason why Bosnian companies should not be considered as suppliers.

The German furniture manufacturer Schieder is to start independent production in Bulgaria and Romania. The company is also expanding four existing production plants in Eastern Europe and building a new one in Poland, near Bydgoszcz
The expansion in Eastern Europe concentrates on upholstered furniture. In the fiscal year ending 31 March 2000 Schieder group expects a 1-2% increase in turnover from about DM 2 billion in 1998-99. In the current fiscal year sales are expected to grow by about DM 100 million.

Snaidero, Italian kitchen furniture producer which is also active in Germany with the Rational brand, might enter the French market thanks to an acquisition. The Italian company should be the buyer of a 65% stake in Valois Habitat, currently owned by Mr. Michel Coencas.
The operation should be completed in March 2000.Valois Habitat has subsidiaries in the kitchen furniture manufacturing and marketing sector under the Comera, Cuisine Plus, Artur Bonnet and other brands.

According to Anieme, the Spanish association of furniture manufacturers and exporters, in October 1999 Spanish exports of furniture increased by 8.56% compared to the same month of 1998. In the months January-October 1999 Spanish furniture exporters reported sales worth Pta 183.290 million. The main exporting companies were those from the Valencia region (accounting for Pta 57.953 million sales), followed by those from Catalonia (Pta 39.203 million sales) and those from the Basque Country (Pta 13.915 million sales).

It is important that wood producer in Bosnia take advantage of the present demand for their products. This is a clear message to Bosnian producers of a market opportunity, which will be filled by others unless they react.

Potential Markets Lost to Alternative Products:

- Plastics are now being mixed with 90% recycled wood fiber to produce planking, railings and supports for deck components. Such materials are also being used for dimensional lumber, railroad ties and outdoor furniture are also growing and taking market share from lumber manufacturers.

- Steel studs are becoming much more accepted in home and office construction.

- Plastic pallets have made inroads to what has been traditionally a wood product.

- Home Depot, the world's largest home-improvement retailer, plans to sell strawboard as an alternative to chipboard and plywood.

- The introduction of Thick Walled Bamboo for products such as solid tops for counter tops, furniture, high-grade tongue & grooved flooring and fencing is receiving favorable results. The flooring cost is comparable to other hardwoods. Tests show that resistance to denting is better than Oak in addition the shrinking and swelling is 50% less. These are a couple of examples of up-coming world competition. Bosnian companies need to employ similar creativity.

These and other products will replace approximately 500 million-bd. ft of lumber each year for the foreseeable future.

These and other substitutes will tend to limit major increases of the demand for lumber products.

Common Problems Experienced by Customers of Bosnian companies

- 75% of wood manufacturing problems are related to moisture.
  Improper moisture levels in wood can affect the quality and durability of a product as much as, if not more, than product design or actual production process itself. With rising costs of raw material and the decline in lumber quality, it is important that the wood being produced is controlled for proper moisture content levels and reduction of twist and warp, which is common in beech. The company's reputation, not to mention the bottom line, depends on it.[6]

- Changing cutting standards and mis-manufactured lumber is one of the main causes for customer discontent and claims. The mills in Bosnia, because of inaccurate equipment must cut oversize to allow for deviations in the milling process. This is a waste of profits and natural resources.

- Bosnian companies must learn to listen and react to their customers for directions in the markets, trends and styles.

- They must learn to use other measurements such as inches, feet, and board feet that are common in other countries. If the companies' plan on selling worldwide, it is necessary to have the ability to produce products in the way it is bought and sold in the target markets.

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[6] Delmhorst Instrument CO. Modern Woodworking Feb. 2000

- The lack of trained graders using grading standards accepted world wide creates a situation where companies exporting are at the mercy of the buyer's determination of what is acceptable when the goods arrive. This leaves the supplier no choice but to accept the results of the buyer and generally a reduction in price.

- Most buyers from other countries will only pay for goods when the material in on a truck they control, at the border, or delivered to their place of business. **This method of doing business generally means that the buyer does not trust either the Bosnian companies to fulfill the contracts correctly, or the Bosnian legal system to protect outsiders in the event of problems.**

Distribution Channels

Exporting Transportation methods

- **Truck**
  Much of the lumber for use within Europe leaves Bosnia by truck. This is an acceptable method of transportation for the green, air dried, and kiln dried material for delivery within eastern Europe, shipments for destinations further away must be handled by ocean transportation to be economical. At the present time there are many trucking firms both within and from Europe delivering goods to Bosnia. These companies are always looking for loads to return to their home base. This allows companies within Bosnia the ability to negotiate favorable terms if they are willing to work with a number of companies.

- **Rail**
  At this time this is not a very viable method of shipping material from Bosnia because of the unreliability of the system. This could be one of the cheapest methods for transport not only to Europe, but also the ports, if it was operational.

- **Container/ Ocean**
  This method is the preferred method of transportation by most buyers. It allows for a safe, tamperproof system, which allows for shipments worldwide.
  - Packaging and loading
    Packaging for container shipping requires more care in building the lumber packages to allow for the maximum amount of lumber to be placed into the container.
    It is important to load the container in such a way that the bundles do not move from side to side.
    Generally 48,000 lb. is the maximum allowed weight in either a 20' or 40' container. In beech this is generally 27-30 cubic meters of lumber. When spruce is being shipped it is much more difficult to hit the maximum weight limit as the container size limits the volume of material that can be placed into the container.
    Elements should be palletized in such a way as to allow two down and two on top all the way back in the container. Beech elements, flooring and furniture parts can generally reach maximum weight in a 20' container, thus reducing the cost of ocean shipping slightly.
    Pallets of finished (surfaced or planed) lumber, elements or flooring should be shrink-wrapped to prevent moisture from the lumber also to protect the goods from shifting in transit.[7]

[7] Appendix #3 has a list of individual transportation along with company information

Impediments Currently Restricting Bosnian companies to enter world markets and some Solutions.

> The demand for quality wood products in Europe is growing. Only 5% of hardwoods and 1% of the softwoods utilized by Europe come from Bosnia. This is because manufacturing here is not up to the standards required by consumers in Europe.

- The future viability of the furniture industry in Bosnia will depend on the ability to obtain high quality dried lumber (6%-8% moisture content). This is something that is not available on a scale large enough to foster growth in the expansion of furniture manufacturing. The quickest way to develop local companies in the manufacturing of furniture is to eliminate the need for the capital expense of dry kilns and large boilers. If there was a reliable source of dry lumber the cost of entering the manufacturing of furniture is much less. Thus more jobs would be created quicker.

- Many times companies fail to remember that an unhappy buyer/customer will look for the needed products elsewhere. This translates into lost sales and profits. Thus developing a customer-orientated philosophy is a must.

- Laws and regulation presently used by the financial police, restrict the use of low-grade logs that is presently being used for firewood from being utilized into higher value products. This needs to be changed to allow for advancements in utilization.

- **Dry Kilns /Concentration yard concept:**

  Even though there has been a number of dry kilns installed in Bosnia over the past couple years they are generally small in capacity and inefficient for custom drying or a large scale operation. Over the next few years, the requirement for new dry kiln capacity will increase dramatically. This does not mean financing the small 25m3 size kilns scattered among many producers, but somewhere in the range of 400-1000m3 under one company. This will allow many small producers to have a local / export market for their product, customers can come to one or two locations to purchase material. The economy of scale affect will take place with higher value and utilization of lumber. With increased capacity and value-added sorting and grading, finished products will have the ability to be transported profitable worldwide. The development of the concentration yard concept to pool wood from many small producers at a central **"cluster"** location, with the ability to steam and dry for export is a must. At this time there are start-ups, Vitez and Gornji Vakuf. Agroimpex in Laktasi has taken this concept to a very successful level.

- **Public opinion not only from within Bosnia, but more importantly from consumers outside Bosnia, will dictate the availability and use of raw material. <u>Sustainable Forest Initiative</u> and <u>Pan European Forest Certification</u>[8] are two methods of informing the public that the wood products they are purchasing comes from a properly managed forest, which will produce trees for generations to come. This will be a major selling tool in the near future as more consumers are electing to pay more for products that have this seal of approval attached to the end produce. The Bosnian government must immediate take steps in this direction and follow the trend in Europe or Bosnian wood companies risk being left out of the better markets**

[8] Appendix #1 describes what this is and why Bosnia forests must become part of this global initiative.

- Europe's winter storms of 1999/2000 will depress wood prices. European sawmillers worried in January 2000 that December's severe windstorms might lead to a collapse of wood prices. Storms blew down 160 million cubic meters of timber (35.3 billion board feet), according to the European Organization of the Sawmill Industry (EOS).
  The EOS is proposing some wood be exported as humanitarian aid to Turkey and Bosnia to help reconstruct these countries following earthquakes and the war.

These types of storms generally destroy the largest and best trees. After this volume of wood is utilized there may be a shortage of local high-grade logs in the regions hardest hit for a number of years to come. This will create an external demand by end users within the devastated regions.

- It is important to note that although the hourly wages in the US, Canada, Germany and Austria are higher compared to Bosnia, companies. Companies in these countries compete in the world markets daily. The reason is because of constant productivity improvements that companies are willing to implement. This allows for a much lower unit cost and an increase in yield. Labor, energy and raw material are the major areas for constant improvement. The cost of labor in Bosnia is high in relation to the value of the finished product. **Low productivity** and **poor yield** of lumber from the logs cause much of this. **Until these are corrected, profits, the ability to compete on the world markets, and the infusion of investor funds to improve equipment will not be available**.

During a discussion with the very knowledgeable commercial director of a furniture company, he mentioned that it was his opinion that productivity per hour per person has remained stagnant for the past four years. He felt that until privatization was completed and investment from outside the country took place the situation would not improve.

- The unwillingness for wood production companies to work together marketing their products prevents them from attracting a wider more stable customer base. Working as a cooperative could also help to influence laws favorable to the lumber industry.

- The lack of technologically advanced equipment is another major drawback to improvements in Bosnia. Much of the equipment purchased over the past few years by lumber companies in Bosnia has either been used is unproductive or is very labor intensive. Emphasis now must be directed towards accurate sawing, increased yield and labor reduction equipment. Many companies have lost the opportunity to continue the rapid advancements made over the past few years because of their choice of equipment purchased. Much of it was based on older technology that did not conform to present day needs of closer manufacturing tolerances. The new improved methods of manufacturing would have allowed for better grades of lumber and a higher lumber yield from the same high quality logs.

- The desire of company owners to direct funds towards **expansion of production** rather than **improving value added** products is **counterproductive** in a region experiencing an ever growing shortage of high quality logs.

- Training programs for the workers in Bosnia seem to be nonexistent. It is assumed that the workers know and understand the given jobs. This is not true here or in any other part of the world. For the owner to get the desired results from the workers, constant training for both new and long term employees is a must. Continual changes in the markets require new production techniques, which will require new methods of operating along with, higher levels of worker skills.

BC Forestry Report. March 99

Bosnia forest industry is unique. In many ways it is better off than other countries in the region in its potential to produce for world markets.

The supply of logs here, if properly managed, will afford this country a plentiful renewable natural resource for many years to come. Neither Croatia, Slovenia, nor the FYR (Serbia) has the quantity or quality that Bosnia has.

Mills must learn how to improve the yield of lumber from the log either with updated machinery, changing the way the log is processed, or to utilize lumber in a more efficient way.

Much of the equipment purchased during the last two years will not always allow companies to target world markets.

No other country in Eastern Europe has the support and money for business development on the scale that Bosnia now has.

Productivity based on per cubic meters per man-hour has not increased over the last two years

In each of these cases the main stumbling block to becoming a truly international

- Prompt responses to requests for information and quotes are the exception rather then the rule for most companies. To establish good customer relationships all replies need to be prompt. When a sale is committed, the terms of the agreement must be followed to ensure that the customer gets what was requested.

- Not knowing the company's unit cost of production prevents Bosnian sawmills from pricing the products properly. There are computer programs available at BC, at no cost, which will give this information monthly.

- There seems to be an unwillingness by owners, sales directors and managers to search out or develop new products. It is imperative that companies constantly search out new products that will improve their production mix.

- The improper handling of lumber by Bosnian companies after it is cut is a major cause of degrading. Stickers should be closely spaced with each one placed over the other on every bundle produced. The storage area should be free from weeds, trash, mud and blowing sand. Weather covers should be used on all lumber stored outside more than 5 days. Prevention of degrading is one of the easiest way to increase value and thus increasing profits.

Company Improvement Measures:

- Automation of handling equipment should be high on the list of places to improve the throughput of logs and lumber.

- Creating a "team" mentality among workers and management and work as a unit. Management should let the employees take part improving working conditions and production. The employees are usually some of the best sources for labor saving improvements.

- Quality control is a never-ending process, which must always be improved on.

- Waste reduction can be improved by converting slabs & sawdust into marketable boards. This may be accomplished in many ways. The easiest and cheapest may be as simple as changing the way a log is processed. It is important to remember that the highest value lumber in beech is located at the outside of the log. This valuable product should not be put it into firewood, where it currently often the situation. **Better utilization and grade recovery will improve the profit immediately.**

- Machines should be adjusted to cut to exact required sizes, not over or under, this is a waste of natural resources and shipping costs. It also creates problems at the buyer's end with processing thick & thin lumber.

- Travel distances between log yard, the mill, outside storage and a dry kiln are very important. The closer each is the less handling will be required. Concentration, as the "industry cluster", discussed previously, will reduce both handling and transportation costs.

- The most important thing for a wood manufacturer to remember is that the company is a **Material Handling** operation, The fewer times a piece of lumber is handled the higher the profit for the company will be.

- The yard and work area should be cleaned constantly. Not only will it make working conditions easier, but also the image that influences buyers visiting the manufacturing facilities.

- Control of inventory is mandatory. Logs are the #1 cost, and this is a good area for cost reduction.

- Adequate lighting in the work area is important to the manufacturing of a quality product. If the workers are unable to see clearly the product they are processing expensive mistakes will be made.

- Value added products are the best way to gain profit out of the log. Often the value added might be something as simple as plaining the material for the customer. Other times it may mean further manufacturing to meet customer requirements.[9]

[9] Appendix #2 describes web sites of equipment manufacturers, dry kiln information sites, potential market sites, competitors, publications and magazines

Appendix #1

What is PEFC? (Pan European Forest Certification)
The aim of the Pan-European Forest Certification (PEFC) scheme is to establish an internationally credible forest certification framework for forest certification schemes and initiatives in European countries, which will facilitate mutual recognition of schemes. PEFC will define the basic requirements of forest certification and set up the institutional arrangements at Pan-European and national and sub-national levels. Timber from certified forests, which meet the PEFC criteria, will have access to a PEFC logo.

PEFC was initiated by Finnish, German, French, Norwegian, Austrian and Swedish forest owners in early August 1998. Since then participants from the following countries have become involved in PEFC' development: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Ireland, Latvia, Luxembourg, Norway, Portugal, Slovenia, Spain, Sweden and Switzerland. In these countries the forest area under non-industrial private ownership covers more than 100 million hectares and the total annual cutting is approx. 280 million cubic meters.

To date 14 have created national PEFC Governing Bodies and further countries namely the United Kingdom, Belarus, Hungary, Lithuania Slovenia, Poland, Romania, Greece and Luxembourg have indicated that they intend to do so in the very near future.

The objectives of PEFC are:

- PEFC is voluntary private sector initiative based on a consensus view among relevant interested parties on sustainable forest management at the national or regional level.
- PEFC offers a Pan European framework for the establishment of mutually compatible national certification systems and their mutual recognition.
- PEFC aims at strengthening and improving the positive image of forestry and wood as a renewable raw material.
- PEFC contributes to the promotion of economically viable, environmentally appropriate and socially beneficial management of forests as defined by the Helsinki-criteria.
- PEFC gives assurance to customers and the general public that forests certified under the program are managed as defined by the Helsinki-criteria.
- PEFC is based on independent third party auditing.

PEFC is based on regional certification levels and is open for other options if appropriate.

SFI (Sustainable Forest Initiative) is a similar type of verification system.
Founded in 1994, the Forest Stewardship Council (FSC) is by far the most significant non-governmental process to establish elements of an international framework to support sustainable forest management. This council responds partly to pressure by voters in Europe and North America to prohibit imports of timber produced unsustainably. Importers and some producer countries have been interested in certification systems that would guarantee that wood coming from certain sources is being produced in ways that meet ecological and social criteria.

FSC-related sites:

http://www.fscoax.org/index.html
http://www.fscus.org/
http://www.fsc-uk.demon.co.uk/
http://www.fscoax.org/html/5-3-3.html
http://www.fsc.org.br/
http://www.fscoax.org/not/noteng/not8.htm
http://www.wri.org/wri/ffi/business/ffi-fsc.htm
http://www.wcmc.org.uk/forest/ffl/fsc_maps/world.htm
http://www.wcmc.org.uk/forest/ffl/fis/fsc_large.htm

Certifying Bodies (mostly for FSC)

http://www.certifiedwood.org/membernews/mn0300.htm
http://www.web.net/goodwood/goodwood_list/cert_agencies/soil.html

http://www.scs1.com/
http://www.smartwood.org/
http://www.sgs.co.uk/
http://www.wwf.org.br/fsc/certifica.htm
http://www.scs1.com/forestcert.html
http://www.IMO.CH/

Products, Retailers, Buyers Groups

http://www.certifiedproducts.org/
http://www.smartwood.org/product-finder/index.html
http://www.smartwood.org/product-finder/product-finder.html
http://www.certifiedwood.org/Database/DatabaseContent.html
http://www.panda.org/tradefair2000/tradefr2000.htm
http://www.lyonsfalls.com/
http://www.diy.co.uk/

Buyers Groups and Certified Wood Suppliers

http://www.certifiedwood.org/Database/DatabaseContent.html
http://www.panda.org/forests4life/network.htm
http://www.fsc-uk.demon.co.uk/95PlusGroup.html

Research, Online papers, etc.

http://www.forestsforever.org.uk/forestcertification.html
http://www.forestry.ubc.ca/concert/evans.html
http://www.smartwood.org/reports/flor-y-fauna.html
http://www.forestsforever.org.uk/timbcert2.html
http://www.sustain.org/Bulletins/GetCurrentBulletin.cfm?Bulletin_ID=32&SID=
http://www.efi.fi/cis/english/whatsnews/updates.html
http://www.menominee.com/mte/forehome.html
http://www.oneworld.org/odi/fpeg/networkpapers23english.html
http://www.smartwood.org/new/russian.html
http://www.forestworld.com/newscenter/features/feature_archive/yba/yba2/yba2p4.htm
http://www.efi.fi/cis/
http://id.mind.net/~roguinst/
http://id.mind.net/~roguinst/riee5.html
http://www.efi.fi/cis/articlnf.html
http://www.greendesign.net/understory/
http://eetd.lbl.gov/ea/ccm/ccPubs.html
http://www.smy.fi/certification/reports/
http://www.safnet.org/policy/fmcpch1.htm

Appendix #2

Equipment producer sites:

http://woodworking.miningco.com/msub12.htm?rf=dp&COB=home
http://controlparts.com/siemens.htm
http://www.baker-online.com/
http://www.sawmill-exchange.com/for_sale.htm
http://www.tmsco.com/
http://members.xoom.com/lbrexchange/
http://www.tigerstop.com/
http://www.conwaycleveland.com/index.html
http://www.portablesawmill.com/
http://www.mebor.si/mebor/izdelki_slo.htm
http://www.silvatech.com/
http://www.timberharvester.com/
http://www.brewerinc.com

Up coming Equipment Events:

June 7,8,9, 2000 http://forexpo.mediaforest.net/
June 6-9 2001 http://www.wood.elmia.se/
May 5-6, 2000 http://www.nefpexpo.com/HOMEAT.htm

MAY

Tuesday 9, 2000 Poland
DREMA 2000
+48 (0) 22 635 7098

Sunday 21-25, 2000 Birmingham
Interbuild
+44 (0)207 886 3053

Wednesday 24-28, 2000 Milan
Xylexpo and Sasmil Exhibitions
+39 (0) 02 575 11051

Wednesday 24-26, 2000 Nantes
Carrefour
+33 (0) 240 73 60 64

JUNE

Tuesday 6, 2000 London
Global Trade Fair and Millennium Forest for Life Conference
+44 (0)1483 419178

Wednesday 14-16, 2000 Portland
Northwest Manufacturing Automation Expo
+1 415 905 4940

Dry Kiln information sites:

http://www.baldor.com/
http://excitesearch.netscape.
http://www.wooddesign.bc.ca/6ckiln.htmcom/search.gw?lk=excite_netcenter_us&search=drykilns
http://www.forestry.uga.edu/abstracts/for97-005.html

http://www.informs.org/Conf/NO95/TALKS/SE03.1.html
http://infoseek.go.com/Titles?qt=niel+dry+kiln&col=WW&sv=N7&svx=nssbR1&submit=++Go++&st=30

Potential market sites:

http://e-Wood.com/ http://www.tritrade-ro.com/ http://www.timber.co.uk/
http://www.schwarzwald-baar-heuberg.ihk.de/ids/abt3a.HTM
http://www.exportdrvo.hr/ http://www.iwpawood.org/
http://www.lumber-source.com/ http://www.itto.or.jp/Index.html
http://www.woodweb.com/woodweb.html http://www.ctba.fr/Default.htm
http://bpgto.netvigator.com/eng/gto.asp http://www.hengmei.com.tw/
http://www2.hardwood.net/hardwood.net/ http://world-trade-search.com/
http://www.schwarzwald-baar-heuberg.ihk.de/
http://www.forestdirectory.com/

Competitors:

http://www.euroasia-alliance.bigstep.com http://www.actufax.com/Alexbois.html
http://www.alpeng.com/ http://www.harbornet.com/atforest/
http://www.babb.com/Lumber/ http://www.bennett-lumber.com/
http://www.reelpeople.com/ http://www.fitzweller.com/
http://www.cooperage.com/ http://www.qbc.clic.net/~blanchet/
http://www.businessfs.com/mulberry/ http://www.norskeskog.no/
http://www.overlack.com/ http://www.acces-cible.qc.ca:80/prokit/
http://www.robinsonsawmill.com/ http://www.rctc.com/sirianni/
http://www.asiainfo.com.sg/uniseraya/

Major competitor in Austria. http://www.holznet.at/english/Default.htm

Up coming Conferences:

June 6-7, 2000 http://www.panda.org/tradefair2000/tradefr2000.htm
July 31 - August 3, 2000 http://www.wood.ubc.ca/news/events.html
May 5-6, 2000 http://www.efi.fi/events/

Publications:

Magazines

http://www.austforest.com.au/ http://www.west-coast.com/log_hom.html
http://www.cabi.org/ http://www.cabinetmag.com/
http://www.csilmilano.com/ http://www.crows.com/
http://www.rctc.com/irland/ http://randomlengths.com/nlexport.html
http://www.metsalehti.fi/t/english/ http://www.forestnet.com/index.htm
http://www.forestshop.com/ http://forestry.miningco.com/education/forestry/
http://courses.ncsu.edu/classes/wps202001/IAWA/iawaj.htm
http://www.uidaho.edu/e-journal/ecoforestry/
http://www.sciage-lumber.qc.ca/english/publi/index.html#asso
http://randomlengths.com/nllocator.html
http://www.millerpublishing.com/ http://www.tfguild.org/scantao.html
http://www.edge.net/magazine/ http://www.tms-sales.com/
http://www.wood.ca/ http://www.woodwideweb.com/

Appendix #3

Truck transportation companies in Bosnia:

Address:	Telephone:	Fax
1. AIS – SPEDITRANS Izeta Comore 92 Sarajevo – Ilidza	+387 71 622 820	+387 71 622 820
2. AUTOPREVOZ TERETNI SAOBRACAJ Bisce polje bb Mostar	+387 88 551 039	+387 88 551 046
3. AUTOPREVOZ, Dragojevic Vidosav Dragojevic Rudarska 168 Banjaluka	+38 178 48400	None
4. AUTOPREVOZ, Savic Momcilo Savic Branka Popovica 46 Banjaluka	0038 178 31104	None
5. AUTOPREVOZNIK Bosko Vukomanovic Poljskog p. bataljon Banjaluka	None	None
6. AUTOTRANS Alija Mulalic Djure Djakovica 26 Vares	+387 71 845 238	+387 71 845 355
7. AUTOTRANSPORT Nisvet Mrkonja Aleja Konzula 1 Travnik	+387 72 811 804	+387 72 811 804
8. BOSANSKI TRANSPORTNI SERVIS Midhat Limo Branilaca bb Visoko	+387 71 732 725	+387 71 732 884
9. CENTROTRANS - ZBIRNI TRANSPOR Mustafa Ruvic Safeta Zajke 15 Sarajevo	+387 71 542 131	+387 71 543 838
10. EUROTRANS Hasan Nezic Sehitluci 80 Gradacac	+387 76 816 996	+387 76 816 996
11. Interdean Petrakijina 18 Sarajevo	+387 71 208 837	+387 71 208 837
12. KRUPATRANS Emir Halitovic Proleterskih brigada 33 Bosanska Krupa	+387 77 477 040	+387 77 47721
13. LASER Mensur Kamenjasevic Gornji Rahic bb Brcko	+387 76 372 049	+387 76 372 049
14. LUBOKOMERC Vlado Tegeltija Slepe Stepanovica bb Sipovo	+387 70 71 256	+387 70 71 256
15. SANATRANS Meho Bilajbegovic Zeljeznicka bb Sanski Most	+387 79 811 540	+387 79 811 540
16. TRANSPED Mirsada Ahmedic Zmaja od Bosne 32 Sarajevo	+387 71 470 927	+387 71 650 925
17. ZAHA – TRANS Zahir Murtic	+387 71 644 399	+387 71 644 399

Avde Jabucice 8 Sarajevo		
18. ZENICATRANS PREVOZ ROBE I SPEDICIJA Senad Sestic Zeljezarska 7 Zenica	+387 72 418 633	+387 72 418 633

Truck transportation companies in Croatia:

Address:	Telephone:	Fax:
1. Toth d.o.o. Nikola Toth I.G.Kovacica 92 Vukovar 32000	+385 98 313704	+385 31 273859

Truck transportation companies in Romania:

Address:	Telephone:	Fax:
1. ACSA SA Nicolae Alexe 2 Nicolae Titulescu nr. 2 3351 Cimpia Turzii	+40 64 433140	+40 64 433141
2. ATCOM METALO-CHIMICA Dorin Chirita 5, Drumul Campului 1000- Rm.Valcea	+40 50 744520	+40 50 744520

International truck transportation companies in Austria:

Address:	Telephone:	Fax:
1. LKW Walter International Transportorganisation AG (Hauptsitz) Industriezentrum NÖ, Süd Strasse 14 2355 Wiener Neudorf	+ 43 2236 606-0	+ 43 2236 6092501
2. Spedition Schachinger GmbH & Co.KG Fischerweg 10 4063 Hörsching	+ 43 7221 707	+ 43 7221 70716
3. Frikus Friedrich Kraftwagentransport & Speditions GmbH Industriestr.30 8141 Zettling	+ 43 3135 500	+ 43 3135 50024
4. Gartner KG Linzer Str.20 4650 Lambach	+ 43 7245 234-0	+ 43 7245 234266
5. Birkart Austria Internationale Spedition GmbH Karl Sarggasse 3-5 1230 Wien	+ 43 1 866 36-0	+ 43 1 86636290
6. Schenker & Co.AG Hoher Markt 12 1010 Wien	+ 43 1 760 86	+ 43 1 5339111
7. Quehenberger Spedition GmbH,R. Handelszentrum 3 5101 Bergheim bei Salzburg	+ 43 662 46 80-0	+ 43 662 4680101
8. Augustin Transport GmbH,Karl Steindorf 190 5204 Strasswalchen	+ 43 6215 87 77	+ 43 6215 87778
9. Stadler Speditions GmbH Bruck 49 4722 Peuerbach	+ 43 7276 21 61-0	+ 43 7276 2161160
10. Braun Internatationale Spedition GmbH, Schützenstr.12 6923 Lauterach	+ 43 5574 67 17-0	+ 43 5574 67176,67177
11. Angermayr GmbH & Co. (Kommanditgesellschaft) Auleiten 2	+ 43 7752 835 21-0	+ 43 7752 87858

4910 Ried im Innkreis		
12. Hasenleithner,Karl Sternberg 1 4812 Pinsdorf	+ 43 7612 638 98-0	+ 43 7612 63693
13. Neudorfer KG,Fritz Atterseestr.37 4860 Lenzing, OÖ	+ 43 7672 929 06-0	+ 43 7672 9290679
14. Hamacher GmbH & Co.KG Metzgerstr. 54 5101 Bergheim bei Salzburg	+ 43 662 45 36 45	+ 43 662 45364532
15. Leitner GmbH Exerzier Platzstr.24 8141 Unterpremstätten	+ 43 3136 501	+ 43 3136 501100
16. Scheffknecht Transporte GmbH Bahnhofstr.14 6890 Lustenau	+ 43 5577 81 01	+ 43 5577 810133
17. Nothegger Transport Logistik GmbH Strass 82 6393 St.Ulrich am Pillersee	+ 43 5353 57 07	+ 43 5353 570711
18. Englmayer Spedition GmbH & Co.KG,G. Wiesenstr.51 4600 Wels	+ 43 7242 487-0	+ 43 7242 487251
19. Burtscher KG,Franz Thüringerberg 116 6721 Thüringerberg	+ 43 5550 24 15	+ 43 5550 241575
20. Heppner & Oberndorfer GmbH & Co. (Kommanditgesellschaft) Lastenstr.11 4623 Gunskirchen	+ 43 7246 84 84-0	+ 43 7246 848638

Ocean Transportation from Bosnia

Jadroagent Marsala Tita 18/II 71001Sarajevo BIH	+387-71-668-125	

Railway transportation

Zeljeznice Bosne I Hercegovine Musala 2 71000 Sarajevo	+387 71 655436	+387 71 650 075

Appendix #4

European Beech

Common Names

European beech, English beech, Carpathian beech, Danish beech
French beech, Romanian beech, Japanese beech

Common Uses

Bobbins, Piling, Chairs, Core Stock
Decorative veneer, Desks, Flooring, Furniture
Heavy construction, Joinery, Plywood, Marine construction
Musical instruments, Turnery Toys Cabinet making,
Sporting Goods, Veneer. Tool handles, Workbenches
Dowels,

Species Distribution

Regions:

Eastern Europe, Oceania and S.E. Asia, Western Europe

COUNTRIES:
Denmark, France, Germany, Japan, Romania
United Kingdom, Yugoslavia, Bosnia, Georgia

Physical and Environmental Profile

Environmental Profile

European beech is secure within its natural growth range. It is also reported to be widely planted throughout the British Isles.

Distribution

A native of Western Europe, this species is reported to grow throughout Europe, approximately between latitudes 40 degrees N and 60 degrees N, and western Asia. European beech is reported to thrive exceptionally well on chalky limestone hills, but will also do very well on any reasonably fertile light soil, with good drainage.

Product Sources

It is currently unknown whether material from the species is available from sustainable managed sources, but the timber is reported to be consumed more than any other hardwood in the United Kingdom. It is considered to be among the best known and most useful commercial timbers in the world, and is always in demand. European beech is reported to be available in long lengths, wide boards, and in the form of veneers, and is in the same price class as the lower cost hardwoods.

Strength properties of the following species in the database are reported to be similar to those of European beech:

European birch (Betula spp.) African mahogany (Khaya anthotheca)

Description;

Beech trees are sometimes called "Queen of the Woods" because of their large size and stately appearance. On deep lime soils, the trees are reported to commonly reach 100 feet (30 m), sometimes reaching 150 feet (45 m). Trunk diameters are often 4 feet (1.2 m), but may be greater. Depending upon growth conditions, boles are clear to 30 to 50 feet (9 to 15 m).

Ease of Drying

The timber is reported to dry fairly well when care is given to the predrying handling and that drying is done at a moderate rate. Proper care in air-seasoning and kiln-drying to prevent excessive shrinkage and twisting is a must and requires knowledgeable people to handle it properly.

Drying Defects

The wood is reported to have moderate refractory properties and has a tendency to check, split, and distort during drying. Shrinkage can also be very substantial.

Movement in Service

The timber is reported to have very poor dimensional stability. It tends to exhibit rather large movement in use, and requires careful and proper seasoning before application. Humidity control environment is a must to insure a stable product until a high quality finish is applied.

Natural Durability

European beech is reported to have very little or no natural resistance to attack by decay fungi and other wood destroying insects such as the common furniture beetle. Timbers in old structures are reported to be readily attacked by deathwatch beetle. The sapwood is reported to be vulnerable to attack by the longhorn beetle.

Resistance to Impregnation

The timber is reported to absorb preservatives better than many hardwoods.

Veneering Qualities

The timber is sliced into decorative veneers, which usually exhibit an attractive flecked figure on quartered surfaces, and broad rays on longitudinal surfaces.

Steam Bending

European beech is reported to have exceptional steam bending properties, even when knots and irregular grain are present. It can be bent to very small radii, which makes it particularly useful in the furniture industry.

References

Numerical Data Source

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Descriptive Data Source

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Spruce;

Picea Abies (Ant. et Klotsch.) Carr.

Common Names

White woods White spruce. Norway Spruce

Common Uses

Spruce wood is soft and without odor, easily worked and takes a good finish, making it a good wood for carpentry uses.

Crating & pallets Stringed instruments, Construction dimension stock
Furniture, Finger-joint boards. Widely used for paper pulp
Norway Spruce is a Christmas tree favorite.

Range; Some 40 to 60 species of this evergreen tree comprises the genus Picea. They are widely distributed over the cooler area of the Northern Hemisphere of both the Old and New Worlds, from the high mountains of the warm temperate latitudes of the Tropic of Cancer to the Arctic Circle.

Description; A narrowly pyramidal tree 25-35 m tall, to 210 cm in girth, with ascending branches. Most species of Picea can live in wet and cold soils, but in shallow soils they may not withstand much wind; otherwise they tolerate alot of exposure and when firmly rooted can serve as a windbreak.

Ease of Drying

This wood will dry fairly easily with little checking and twisting. Stain in the warm months can be a problem unless the fresh lumber is stuck up to allow air-drying.

(1) Silba 1986.
(2) Vidakovic 1991.

Oak

Quercus spp.
Fagaceae

Distribution:

Worldwide, the oaks (Quercus spp.) consist of 275 to 500 species that can be separated into three groups based on their microanatomy: the live or evergreen oak group, the red oak group (Erythrobalanus), and the white oak group (Leucobalanus). Species within each group look alike microscopically. The word quercus is the classical Latin name of oaks, said to be derived from Celtic fine and tree.

Description;
The Tree: Oaks can reach a height of 125 ft (38 m), with large diameters.

General Wood Characteristics: The sapwood of oak is white to very light brown, while the heartwood is light to dark brown in the white oak group and reddish brown in the red oak group. Oak wood has a course texture; it is heavy, straight-grained, hard, tough, very stiff, and strong.
Fast-grown oak, with wide rings, is stronger and heavier than slow-grown oak.

Appendix #5

What does this mean for the BDP program in regards to the forestry sector?

During 1990 $205 million of wood products were exported. In 1997 only $20 million was exported. This leaves a lot of room for expansion in this industry

- **There is enormous room for expansion within the wood sector for value added products. Administrators of the program should focus more attention on value-added products such as furniture components, parts and finished goods. Primarily, effort should be focused on small to medium value added manufacturers who will have the ability to quickly start production. They must also have the ability to adapt to ever changing markets. There are many ways for companies to approach this opportunity ranging from owning a mill and producing the rough lumber, to purchasing precut blanks for processing. Currently in Bosnia, the best way for these fledging companies to maximize production, yield, control and profitability is for them to purchase dried lumber. At this time this can only be accomplished from the very few private mills that have dry kilns. This supply is inadequate for the needs of a domestic value-added of wood industry companies. Growth over the next few years in this area could have the potential of creating numerous jobs and an improved economy within all levels of the wood manufacturing process.**

- **Before loans are dispersed to potential companies, emphases should be placed on cost management, production and developing markets. It should not be assumed that management understands these processes. Technical advisors that understand the industry should be involved at the onset of the loan application rather then after it is well underway. Many times this is too late to help correct former mistakes.**

- **Capital loans must be structured over the life of the equipment (up to 10 years in some cases) and working capital considered as short-term loans. Equipment purchases, factory layout, products produced must be approved in conjunction with the company and technical advisor. Although new equipment is important, BDP should also consider if the borrower company is operating in an efficient manner, not encouraging over employment to the detriment of a world class competitive company. These new loans, if structured properly, could have positive, far reaching effects for the economy of Bosnia.**

- **The program should ignore the requests for funds to be used on small inefficient dry kilns and boilers. Loan applicants who request such loans would be better off to enter into long-term contracts with companies that already have these facilities. Price of the equipment should be the last consideration. Only this approach will insure the best chance for a company's survival.**

Since the inception of the program, the emphasis was on creating jobs for the people of Bosnia. This has been accomplished. However, in many cases, businesses have wasted opportunities to make the leap from the older way of processing logs into lumber to the newer more efficient ways of today.

- **The BDP Program now needs to place a greater emphasis on MIS within the borrower companies. Cost controls, inventory management system, computer training and labor saving methods were not given the importance that could have been required in conjunction with all loans.**

- **The efforts of the BDP could be better focus on loans towards companies that are willing to invest in technology to improve productivity and yield. Also it is important for the BDP to recognize the new value added type of companies that have the ability to compete on the world markets.**

- **The future direction of the BDP should support and contribute to the further development of the present dry kiln concentration yard concept that will be the hub of the value added** wood industry clusters **in selected areas. This type of yard will be the center for vertical integration between small mills and the value-added companies, neither of which can afford the large investment of dry kilns, boilers and steam chambers. This is will be the catalyst for the development of many new companies in the future.**

- **In some ways, the past policy of granting loans for small (25-50 m3) dry kilns has been counter-productive in that it has not allowed the industry to develop the** "cluster concept". **The cluster concept is a very important next step in the further development of further value-added producers. Without a supply of raw material (kiln dried wood) that can be obtained from concentration yards / wholesalers, these potential companies will never start. Because these new furniture companies will be viewed as competitors, it is unlikely that any of the present state companies will sell to new furniture companies, even after they are privatized.**