

FOREST INDUSTRY'S INCREASINGLY PROBLEMATIC  
JOURNEY INTO THE FUTURE

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**Abstract.** --\_The southern wood products industry has been committed to establishment of the southern pines in plantations for over 70 years. Likewise, the industry has been applying genetic principles to improving the growth of the trees in these plantations for over 40 years. The goal, of course, was to produce fiber to be consumed in company mills. An investment in plantations lasting about a quarter of a century is justifiable if sustainability of supply is assured as well as the maintenance of a competitive advantage. Until recently, growing highly productive forests for harvest was looked upon favorably by the public. Now, the industry is increasingly berated for its cutting and intensive management practices. This includes the use of genetically improved planting stock.

The ever lengthening list of business and environmental issues facing executives in segments of the forest products industry make it increasingly difficult to choose a profitable path to the future with a reasonable level of risk and a competitive rate of return. This paper reviews a number of these interacting issues. **The** research community can buffer the risks by assuring that the genetic integrity of the industrial high yielding plantations is beyond question.

INTRODUCTION

The southern wood products industry has been committed to forest renewal for over 70 years. U.S. Forest Service records indicate a modest beginning as only 15 thousand acres were planted on industry land in 1925(U.S.F.S. 1988). Interestingly, this was 48 percent of the acreage planted that year. Plantation establishment on industry land in the South has now grown to over a million acres per year in the 1990's. The forest industry is now responsible for over 60 percent of the tree planting in the South. Industry plantations currently occupy over 16 million acres. The 55 percent of the land area of the 12 southern states that is forested totals 182 million acres. Thus, one acre of every eleven forested acres is an industry pine plantation. If Forest Service projections to 2030 come true, then one acre of every seven forested would be an industry pine

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plantation.

The industry has been committed for over 40 years to applying genetic principles to improving the trees used in establishing these plantations. These extremely successful programs are producing improved seed in record amounts. In excess of 60 tons of improved seed is being harvested in good years. Soon, 25 percent of the seed for plantation establishment will be from advanced generation orchards.

Until recently, growing highly productive forests for harvest and conversion to useful products was looked upon favorably by the public, who incidently are the very customers that buy the products produced from the forest. Now the industry is increasingly berated for the practices of clear cutting and the intensively managed pine plantations. Our increasingly urban and affluent public wants much more than wood from forests. This applies to public as well as privately owned timberlands. There is an increasing concern about the quality of life now and in the future as the U.S. and other developed countries move into what some term the "post-industrial society." Issues like biodiversity, forest sustainability, wetlands, air and water quality, endangered species, ancient and tropical forests, and ecosystem management swarm around practicing industrial foresters like a hive of killer bees. It was probably inevitable that these concerns be extended to the tree genetic program (Hoekstra 1992). The warning signs have been present for some time. Concerns have been frequently raised about the wisdom and safety of the genetic manipulation of agricultural plants and the medicines used to cure our ills. All these environmental issues are more likely to intensify before they diminish.

These environmental issues are an over burdening addition to the other current challenges facing the industry. Choosing a profitable path to the future with a reasonable level of risk and a competitive rate of return is the goal. The following section will review these interacting issues.

#### OVERVIEW

##### Wood, The Essential Raw Material

The growing of trees as crops to be harvested is big business in the South. Timber is the most important agricultural crop in the South. Wood ranks ahead of such other crops as soybeans, cotton, tobacco, wheat or corn (U.S.F.S. 1988). The portion of the industry most familiar to me, the integrated producers of solid wood products, pulp, paper and paperboard, maintain a competitive advantage because of the currently abundant and competitively priced wood supply in the South. Jaakko Poyry (1989) stated "that this preeminent position was in danger because of the diminishing supply of softwood pulp and neglected silviculture, particularly in the "U.S. woodbasket" of the Southern U.S." Recently, Colberg (1992) reported that softwood inventories were declining in many areas of the South.

Wood is the single most expensive item used in the manufacturing process by the forest products industries. The industry must cost effectively produce wood while concurrently meeting the other expectations that the public wants from the forest.

## The Industry

Any discussion of the forest products industry must address diversity. Diversity exists in location, size, capital structure, land ownership, product lines, manufacturing processes and marketing strategies et al. This diversity means it is extremely difficult to put forth one industry position. There are similarities among the largest companies. The largest wood consuming industries are frequently integrated producers of pulp, a wide variety of paper products and several solid wood products. Increasingly, these businesses have a global focus. In fact, their long term profitability depends on selling to foreign markets. Also, many are divisions of larger companies that sell a wide variety of consumer products. The majority of the company revenue comes from selling the consumer products. The pulp and paper operations supply the other businesses but are not the reason the companies exist as a commercial entity. These consumer products are sold in very competitive markets that bring the customer and the company selling them into very close contact from a marketing and sales standpoint. The end result is that customer expectations can greatly influence not only what is produced, but how it is produced. This means customer expectations in Europe or the Far East as well as the United States can ultimately influence how we produce and manufacture wood products in the South. An example is Germany's "Green Dot" legislation. No longer are purchase specifications (for pulp) in Germany limited to those pulp properties required to satisfy its intended use. Now the pulp must meet strict environmental performance standards at the mill producing it, and sustainable management practices in the forests from which the fiber comes (Wrist 1992). Another section of the law deals with recycling which is the next topic.

## Recycled Fiber

As a result of governmental and public expectations, the consumption of recycled fiber is growing more than twice as fast as overall fiber consumption. This trend is projected to continue to 1995 and beyond. Recovery rates were 24 percent in 1985, 29 percent in 1991 and are expected to rise to at least 40 percent in 1995. As a benchmark note, the Japanese are working hard to push an already high rate of 55 percent recycled fiber to 60 percent. The basic technology to do this already exists for some grades of paper. The challenge is to improve on the existing technology. These recent and essentially mandated rapid increases in recycle use have a negative impact on company profits. Recycled products require additional capital and manufacturing expertise but bring no more in the marketplace at this time. Use of recycled fiber does however keep the producer in the market. Capital spent on recycle capabilities is not available to be spent elsewhere such as in the forest. Also, high usage rates of recycled fiber can tend to weaken the corporate focus on the primary fiber source which is of course the forest.

## A Capital Intensive Industry

These capital expenditures for recycle capacity come close to being the proverbial straw that broke the camel's back. These expenditures are an additional unwelcome burden added to the balance sheet of the paper industry which is already the most capital intensive industry in the United States and probably the world. During the last ten years, the paper industry has been twice as capital intensive as the average of all manufacturing (Storat 1993).

Environmental protection is a big part of this. Expenditures for water and air quality protection and solid waste disposal are consuming billions of dollars of industry capital. The National Council of the Paper Industry for Air and Stream Improvement reported spending estimated at 1.343 billion dollars in 1991. These investments in environmental protection represented about 19 percent of all industry capital spending in 1991. These expenditures of over a billion dollars a year for environmental protection have been occurring since 1989 and are expected to recur in 1992. Spending for environmental protection could claim about 20 percent of industry capital during the 1990's (Storat 1993). Capital properly invested allows the industry to remain globally competitive. However, the capital invested must generate sufficient revenue to cover the costs of obtaining the capital plus provide returns to investors. Also, as mentioned previously, capital spent for environmental protection is not currently available to invest in the forest. However, this huge manufacturing base must be supplied longterm with an abundant supply of fiber that allows the U.S. industry to remain cost competitive.

### wetlands

The debate over wetland classification, protection and management is another environmental issue which clouds the business picture for the Southern industry. The most contentious issues regarding silvicultural operations in wetlands are harvesting, intensive site preparation, and planting. Other points of hot debate are minor or major drainage during harvesting and regeneration (Cubbage and Flather 1993). Although there are 26 million acres of southern forested wetlands, only 6.5 million of the pine or pine-hardwood type are involved in the latest debates over intensive management. Cubbage and Flather (1993) point out that the 6.5 million acres is a modest 3.6 percent of the total forested area in the South, but they are a crucial part of the most productive lands in some regions. A million here, a million there and pretty soon you are talking real acreage. The forester trying to manage timberland for a reasonable profit continually asks - where will it all end?

### Ecosystem Management

Ecosystem management is the proposed solution for maintaining all the forest values. Logan Norris (1993) is the principal author of a SAF task force report entitled "Sustaining Long-Term Forest Health and Productivity." The summary of the report contains 11 key findings. Two are particularly troubling to anyone managing timberlands for a profit. Item three states "Traditional sustained yield management, focusing primarily on the production of commodities, is proving insufficient to meet the long-term needs of our society for the broad mix of forest resources. Increased awareness of this shortcoming, coupled with new knowledge, is causing society to change the fundamental policies under which forests are managed." Item nine further states "Today's economic theories and market forces present a barrier to sustaining long-term forest productivity. The key difficulty is assigning values to items or conditions which are not in the market place." Under ecosystem management, logging plans and forest practices would be based on ecosystems rather than on individual tracts of land. A landowner wishing to cut a particular tract or carry out a particular silvicultural activity would be required to show that his plans were compatible with the

entire ecosystem. This implies the imposition of government regulation upon the entire forested landbase. Industrial plantations are established to provide cost competitive fiber to company mills on an as needed basis. Regulation of cutting and management practices weaken the incentive for intensively managing land by decreasing the potential for a profitable return.

The southern wood industry is heavily dependent on the NIPF owners. Ecosystem management will probably weaken their incentive for intensive management much more than the industry.

### Wood Fiber as a Raw Material

Foresters tend to equate paper making with wood. This has been true only in recent times. The first paper was made by the Chinese in 105 A.D. Cai Lun, the inventor, used hemp rope, rags and fishing nets. Chinese have made paper from bamboo, rice and wheat straw, hibiscus, silk, rattan, jute and flax. These papers are very strong but very coarse.

Papermaking began in this country in Germantown, Pennsylvania in 1690. Rags were the principal furnish. A recent newspaper article spoke of using residue cloth from making bluejeans in paper making. Recent articles in the TAPPI magazine presented research on wheat straw, bagasse, kudzu, sunflower stalks, vine shoots, cotton stalks and kenaf. Horn, Wegner et.al. (1992) found that kenaf CTMP fiber could be used as a reinforcement pulp instead of expensive semi-bleached softwood kraft fiber. Kaldor (1992) predicts an inevitable shortage of wood fiber. He proposes the use of fast growing annual fibers such as kenaf as an environmentally acceptable alternative which would help save the world's forest resources. Currently, in the United States, non-wood fibers such as cotton, bagasse, hemp, abaca, and kenaf provide just .3 percent of the paper industry's fiber needs. (Slinn 1992)

Hardwood species have increasingly been utilized by the papermakers in the South. Hardwoods were initially used by some mills because they were cheaper than pine and readily available. In many parts of the South this is no longer true. Also, procuring hardwoods during wet conditions poses significant environmental problems. Other mills use hardwoods because of the properties they impart to the paper. Recycled pine can replace some portion of the hardwood fiber.

As wood prices rise, even the home builders consider alternatives. Wood's traditional competitors, such as steel and aluminum, are hoping to gain market share. Other less traditional building materials are also testing the market place. According to the National Association of Home Builders, a builder in Northern California is promoting the "rammed earth" technique. This system compacts moist soil, sand and cement, then reinforces it with steel to make walls. An Arizona couple is using "green" marketing to sell its houses which are made from straw bales that are stuccoed or plastered over and then reinforced with steel.

**One can conclude that any fiber source, such as wood, is potentially replaceable if a economical supply is no longer available.**

### The West Coast Impact

Half of the standing softwood timber in the United States is owned and managed by government agencies. This timber is mainly in the western United States. The controversy over old-growth and endangered species has drastically reduced the annual cut. Federal timber volume under contract has dropped from 41.2 BBF in 1983 to 10.8 BBF in 1992. This significant and ongoing curtailment of supply continues to decrease western lumber production. The 1992-1995 production is expected to drop another 10 percent beyond the 1991 levels.

Projections through 1997 by Clear Vision Associates indicate 40 percent of the North American softwood lumber production will be Canadian as it was in 1981. However, there is a significant shift from the west to the South. In 1981 the South produced one-third of the nation's softwood lumber. The 1997 projection has the South producing 47 percent of the softwood lumber, an increase of 14 percent. This increased demand on a diminishing supply pushes prices up dramatically. Southern pine stumpage prices rise by 1997 to 133 percent over 1992. Southern pine chip prices increase by 17 percent from 1992 through 1997.

These high prices and increased demand put a tremendous pressure on the timber resources of the South. The resultant increased cutting will intensify the concern over environmental protection and hasten development of restrictive practices. More restrictions on harvesting and forest management are inevitable as the environmental standards are tightened. California is the model we can ill afford to emulate. At present, California has the most stringent and comprehensive forestry regulations in the United States (Porter 1993). These regulations cover both timber management and harvesting. Porter (1993) quotes Bob Shaffer, Associate Professor of Industrial Forestry at Virginia Tech, as reporting that timber owners in California net 30 to 50 percent less for their timber than owners in non-regulated states.

### TVA Decision on Chip Mills and Chip Transportation

The recent TVA decision to deny barge terminal building permits for transporting chips on the Tennessee River to Boise Cascade, Donghae Pulp and Parker Towing is self-declared regulation of forestry practices. The major reason cited for denying the permits was the lack of environmental protection. The TVA said that the voluntary nature of the harvesting guidelines and the inability of landowners and forest interests to accept more extensive, special harvesting procedures was the reason for denial of the permits. The TVA was no doubt influenced by the U.S. Fish and Wildlife Service claim that 16-17 species would be jeopardized without extreme environmental regulation of land management practices and harvesting practices beyond those expected to be voluntarily practiced. The timberland owners in the 42 county area impacted by this decision clearly have seen the value of their timber resource decrease. The wood using industries can and will seek their fiber supply elsewhere. The APA reports that Stone Container Corporation is growing hardwood in Costa Rica because its assessment of the preservationist impact in the United States makes long-term domestic fiber supplies uncertain at best. Stone also is entering into contracts for cutting Caribbean pine in Venezuela.

Growth rates are several times greater and rotation lengths much shorter in Brazil and other South American countries. Our market is so attractive to them that they will comply with the "green dot" laws simply to sell their products.

### Endangered Species, The Everglades and Other Ecosystems

The South has had its share of problems with the Endangered Species Act (ESA) and will see more. The controversy over the Red-Cockaded woodpecker is southwide and ongoing. Recently, U.S. District Court Judge Robert Parker issued a preliminary injunction barring even-aged logging on the national forests in Texas. The charges against three civilian foresters at Ft. Benning, Georgia who had been charged with violating the ESA were finally dropped. This action began with a letter from the Sierra Club Legal Defense Fund threatening to sue the U.S. Army and the U.S. Fish and wildlife Service. Several pages could be written about the times ESA issues have impacted the southern wood using industries.

However, forests are by far not the only area where there is public concern about environmental quality. Water quality and ecosystem degradation are big issues in the Florida Everglades. Farming, housing and man-made disruptions in freshwater flow are said to be causing significant modifications in the Everglades ecosystem. These changes in turn are threatening the commercial fishing industries in southern Florida for lobster, stone crab and shrimp. There is also concern about damage to the coral reefs. There is no cheap easy solution. Correction of the problems could boost the price of sugar and vegetables grown near the Everglades. Southern Florida's 5 million residents could be facing tough water-use restrictions and higher taxes to pay for water purifying efforts. Resolution of the problems will require ecosystem management on a broad scale. A similar scenerio exists for the Chesapeake Bay. The bay is impacted by a watershed 25 times as large as the bay itself.

Salmon in the Columbia basin of the states of Washington and Oregon is another example. The interacting forces of dams, irrigation canals, flood control projects, mines, crop lands, communities that have replaced wetlands, industrial parks and forest practices have all modified the environment so that salmon are negatively affected. The summation of all the changes in the Pacific Northwest are just now beginning to be understood according to Dr. Victor Kaczynski, a leading limnologist. Dr. Kaczynski states "Every industry, including the timber industry, is going to have to give up something for salmon. There are also government policies that must be changed, because these, too, are hurting salmon."

The message I get loud and clear from this type of information is that sooner or later forest practices in the South will be subject to more and more restrictions. The costs of environmental protection will move from the mills to the woods.

### Forest Stewardship Council

An international body called the "Forest Stewardship Council" was formed in 1992 (Hill, 1993). The stated goal is to "set a worldwide standard for good forest management by promoting widely recognized and respected principles of good forest management." Organizations that become certified by the FSC have to

demonstrate accurate, verifiable procedures for tracing products from their source to the marketplace. The FSC has set forth 10 principles. Portions of these 10 that are particularly relevant here are as follows: "Forest management must minimize adverse environmental impact in terms of wildlife, biodiversity, water resources, soils and non-timber and timber resources." "Forest plantations should not replace natural forests; they should augment, complement, and reduce pressures on existing natural forests." This council was formed in response to the "green" movement. The points made are another version of the German "green dot law." This is a direct approach for environmental protection through the consumer. The premise being that more and more consumers are "demanding that forest management be environmentally appropriate, socially beneficial, and economically viable" (Hill, 1993).

#### SUMMARY AND CONCLUSIONS

What vision of the future can be drawn from all these interacting issues? What will happen in a general sense appears clear to me. The why is also clear. When and to what degree are partially up to all of us.

The world is a finite resource. However, our demands upon the world resource base continually increase. The general expectation is that "we" can and must do a more environmentally friendly job of satisfying these demands in the future than we have in the past. Unquestionably, the growing, harvesting, and processing of wood into products useful to society can be done in an environmentally acceptable manner. The southern forest products industry will continue to be a big player in this effort. The industry has already shown a willingness to spend capital dollars to make the manufacturing processes environmentally acceptable. A similar willingness will continue at the forest level. The industry will do whatever is necessary as long as these efforts allow the industry to remain globally competitive. However, no matter what we do, the criticisms will continue and the environmental wish lists will continue to grow. Public opinion, local, national and international will encourage increased government regulation of the management and harvesting of forests.

The integrated global forest product companies will find solutions that are acceptable to the public in order to maintain market share. One part of the solution will be very highly intensively managed plantations on selected sites. This intensive management will have a minimal environmental impact on the functioning of the ecosystem as a unit. Genetic improvement will be an essential contributor to the outstanding growth in these plantations. The genetic pedigree of these forests, just as much as their management, will be under scrutiny from the critics. The wise thing would be to expect this intensive scrutiny and make plans to exploit it to an advantage.

My intent here has not been to imply that we are faced with imminent change more drastic than we have been contending with on a steady basis. However, planning to meet future expectations in tree improvement requires a longer time span than in most other disciplines. Now is the time to prepare for the future.



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