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# Study on the Structure of Forest Products Industry and Its Impact on Ecological Environment

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## To cite this article:

Xiaoyu Chen, Peihong Liu, Yifu Yuan. Study on the Structure of Forest Products Industry and Its Impact on Ecological Environment. *Journal of Energy, Environmental & Chemical Engineering*. Vol. 7, No. 3, 2022, pp. 107-110. doi: 10.11648/j.jeece.20220703.18

**Received:** September 5, 2022; **Accepted:** September 21, 2022; **Published:** September 29, 2022

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**Abstract:** The forest product industry is the main economic pillar of forestry development. However, the industrial concentration of China's forest product industry is obviously low, and there is a lack of some leading enterprises with particularly strong competitiveness. The development trend of most of the forest product industries is basically the same, the content of the industrial structure is relatively consistent, and the characteristics are few. All localities have failed to form a unique industrial layout and development direction. The low industrial concentration and the high similarity of the industrial structure bring about low-level repeated construction and excessive competition, increase the environmental pollution load and control difficulty, and lead to the aggravation of the ecological environment pressure. The resulting ecological environment problem is that the plywood production is too large, which may further worsen the severe situation of natural forest over cutting in China, and aggravate the existing water and soil loss and ecological damage. The production and development of particleboard and fiberboard with abundant raw materials are small in scale, few in variety, and lack of deep processing. The application fields are severely restricted, and the forest resources are not efficiently utilized, causing huge waste and polluting the environment. This paper analyzes the structure of China's forest products industry and its impact on the environment. According to the requirements of the current global environmental protection trend for the development of the world's forest industry technology, the direction and some ways of the structural adjustment of China's forest industry were put forward.

**Keywords:** Forest Products Industry, Industrial Structure, Ecological Environment, Influence

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## 1. Introduction

Forest products industry is the leading industry of the forestry industry and also the main economic pillar of the forestry development. It includes wood machinery processing industries such as wood-based panels, timber and furniture, forest chemical processing industries such as activated carbon, natural camphor, furfural and rosin, and wood (bamboo) pulp and paper manufacturing. China's forest industry is obviously low in industrial concentration and lacks some leading enterprises with strong competitiveness. From the perspective of the internal structure of the forest products industry in some regions, the development trend of most of the forest products industry is basically the same, the

content of the industrial structure is relatively consistent, and the characteristics are few. All localities have failed to form a unique industrial layout and development direction. This convergence phenomenon has caused a large number of wood processing, wood-based panel, pulp and paper enterprises and small production scale. The low degree of industrial concentration and the high similarity of the industrial structure bring about low-level repeated construction and excessive competition, which increase the environmental pollution load and the difficulty of governance. Structural convergence leads to excessive competition on a small scale and at a low level, resulting in low degree of industrial structure organization, short industrial chain, miniaturization and decentralization. As a result, the resource allocation is unbalanced, the loss is increased, and the

pressure on forest resources and ecological environment is increased [1-4].

In today's developed countries, the industrial structure of forest products is changing to the industry of developing fine processing and deep processing products and developing comprehensive utilization of wood, so as to replace the products of natural large-diameter wood and improve the use value and added value of forest products. At present, the structure of China's forest products industry is as follows: in the production of logs, the proportion of fuelwood is too high. In the industrial timber, the proportion of paper-making timber is low, and the proportion of sawn timber is high. At present, the production of China's timber industry enterprises is only limited to the initial processing of sawn timber, with little drying, planing and anti-corrosion treatment. There is a lack of sawn timber products with high added value such as finishing, residue processing, finger bonding and adhesive bonding. This is not only constrained by resources, but also not conducive to the sustainable development of enterprises. After drying and antiseptic, the wood can improve the use function, prolong the service life, and reduce the maintenance materials and costs. In fact, it plays the purpose of saving wood and protecting the forest, so it has attracted the attention of all countries [5, 6]. China's wood-based panel industrial products are still dominated by the old three boards, with poor quality, low grade and unreasonable proportion, and the proportion of plywood is too high. Industrial structure is also closely related to environmental problems. China's forest products are mainly processed in the primary stage, and the consumption of resources is large. The resulting structural ecological environment problems are prominent. It is obvious that the proportion structure of various industries in the forest product industry poses a great pressure on the demand for forest resources. The resulting ecological and environmental problems are as follows: first, the production of plywood is too large, which will endanger the protection of natural forests, and may further worsen the severe situation of over cutting of natural forests in China, and aggravate the existing water and soil loss and ecological damage. Second, the production and development of particleboard and fiberboard with abundant raw materials are small in scale, few in variety and lack of deep processing. The application fields are severely restricted, and the forest resources are not efficiently utilized, resulting in huge waste and environmental pollution. For example, the unreasonable raw material structure is the fundamental reason for the unreasonable scale structure, unreasonable product structure, serious pollution and weak competitiveness of China's pulp and paper enterprises [7-11].

## 2. Environmental Impact of China's Forestry Industry Structure

### 2.1. High Energy Consumption and Low Efficiency

High energy consumption and material consumption are common characteristics of industrial enterprises in China.

The energy consumption per unit output value in China is far from that in some developed countries. The forestry industry is no exception. Obviously, backward production technology and equipment are the main reasons. Energy consumption will emit CO<sub>2</sub> greenhouse gas and SO<sub>2</sub> gas causing acid rain. Therefore, high energy consumption will definitely affect the process of global warming and aggravate environmental degradation. However, high material consumption means a waste of resources, and ultimately generates a large amount of waste to pollute the environment. Obviously, it runs counter to the requirements of environmental protection. The high material consumption of forest industry enterprises is reflected in the following aspects: first, the consumption of resources is large and the utilization rate of wood is low. On the one hand, the low utilization rate of raw materials wastes a lot of resources and pollutes the environment; on the other hand, it increases the pressure of forest harvesting and poses a threat to the ecological balance. Second, the qualified rate of products is not high, especially the qualified rate of high-end products is low. Especially for the utilization of precious broad-leaved trees, many enterprises still stay in the traditional backward production mode, and use high-quality wood to produce ordinary grade products, with low economic utilization rate. This is actually a waste of resources [12, 13].

### 2.2. Serious Environmental Pollution

Like other industrial departments, the pollution of forest products industry also includes water pollution, air pollution, noise pollution and solid waste pollution. Among them, water pollution is the most serious. For example, the main pollution of wood-based panel enterprises are: sewage discharge of wet fiberboard, adhesives for wood-based panel production, volatilization of adhesives and free formaldehyde during hot pressing, which will have different impacts on water source and atmospheric environment. However, a considerable number of enterprises have not taken effective measures to deal with these pollution, for both technical and economic reasons. In recent years, with the strict environmental protection policies, many enterprises have been punished by the environmental protection departments. Except for a few large and medium-sized forest products industrial enterprises, many small and medium-sized enterprises have not installed sewage treatment systems at all, and the wastewater is directly discharged into the natural environment. A few enterprises have installed treatment facilities, but few operate normally. Results it polluted the environment and endangered the local industrial and agricultural production and the health of residents. Although the serious pollution problem of enterprises is related to external factors such as insufficient environmental protection awareness of enterprises, weak law enforcement departments, and local protection, the fundamental reason is that the overall technical level of the industry is backward, the scale efficiency is poor, and the management level is low [14].

### 3. Optimize the Industrial Structure and Protect the Environment

Optimize the structure of the forest industry, promote the upgrading of the industrial structure, and reduce the dependence of the development of the forest industry on the forest resources, which will inevitably reduce the consumption of the forest. Therefore, it is conducive to giving play to the ecological benefits of the forest in wind and sand prevention, soil erosion prevention and water conservation. Create a fresh and beautiful ecological environment for social and economic development. To optimize the industrial structure of forest products and promote the upgrading of the industrial structure, it is necessary to close, stop, merge and transfer those enterprises that consume large resources, cause serious pollution, and whose products are mainly rough processed, with small scientific and technological content and low added value, and rely on earning wood profits to survive. Instead, they should vigorously develop industrial enterprises that produce deep processed and fine processed products, with high scientific and technological content and large value-added. With the upgrading of the industrial structure of the forest products industry, the structural pollution problem of the industry and products is expected to be alleviated. The upgrading of the industrial structure of the forest industry will certainly strengthen the product competitiveness of enterprises, effectively promote the sustainable development of the forest industry economy, and thus lay a solid foundation for the realization of the dual carbon goal of forestry.

For a long time, the development of China's forest products industry has followed a path of extensive management that emphasizes economic scale and speed, while neglecting product efficiency and quality. As a result, low-level repeated construction leads to high similarity of products and lack of uniqueness. Under the cover of the high-speed growth of economic quantity, there are serious facts such as high consumption of resources, serious pollution, backward technology and poor overall efficiency. With the increasing shortage of forest resources, especially after the implementation of natural forest protection project, the share of raw material cost in the cost of forest products is increasing. According to the analysis of the scientific and technological development trend of the world's forest products industry, it is mainly to adopt the applicable technology, transform the existing process technology, and strive to reduce the consumption, product cost and harmful substances in the production process of the enterprise, so as to achieve high production efficiency, high product quality and high economic benefits. At present, the total amount and structure of forest resources have undergone fundamental changes. It is no longer sustainable to rely on large consumption of resources and low prices. It is necessary to develop new products that can improve the efficiency of resource utilization, are technology intensive, and adapt to the market demand structure [15].

### 4. Industrial Structure Adjustment Strategy

#### 4.1. Adjustment of Sawn Timber Products

The adjustment of sawn timber products must be guided by market demand, and the marketing strategy of setting production according to sales must be implemented. At present, the output of traditional drama products is declining, showing a declining trend. To survive, sawn timber enterprises must expand varieties, expand product sales, promote the utilization of wood processing residues, especially the development of sawn timber finishing and deep processing products. Developed countries have high requirements on the quality of sawn timber, and generally carry out fine processing and deep processing to produce sawn timber. Sawn wood is no longer a simple wet wood product processed in the past, but a technical product with high performance after finishing and deep processing. For example, sawn timber is supplied as semi-finished products or finished products after drying and planing. Some small timber and short timber are dried, planed, glued and spliced to produce plywood and integrated timber. Others produce special finished timber after anti-corrosion, fire prevention and surface treatment. This not only increases the service life of wood, but also improves the use value of wood.

#### 4.2. Adjustment of Plywood Products

Due to the rising price of raw materials and the gradual reduction of natural log resources, the cost rises, the product sales is difficult, and many enterprises suffer serious losses. In the face of this situation, it is not appropriate to continue to expand the output of existing varieties of plywood. The focus should be on increasing the variety of products, improving the grade and quality, such as bamboo wood-based panel products, precious tree species planed veneer and veneer products, so as to reduce or even cancel the export of precious tree species logs and sawn timber. At the same time, it is necessary to carry out industrial rectification, and resolutely clean up and rectify some enterprises with poor efficiency, serious waste of resources, and relying on the transfer of timber profits to support production.

#### 4.3. Adjustment of Fiberboard and Particleboard Products

Fiberboard and particleboard are the main products of comprehensive utilization of wood. They play an important role in improving the utilization rate of wood and alleviating the contradiction between supply and demand of forest resources, and can greatly promote their development. The fiberboard and particleboard industry should carry out product application and Development Research on the premise of continuously improving the management and improving the product quality, and expect to have a series of products. In this regard, the state and the forestry department should give key support, so that the products can be updated

and developed in the direction of deep-seated processing, so as to expand the market sales, get out of difficulties, and enhance the vitality of enterprises.

#### 4.4. Adjustment of Other Products

With the continuous progress of science and technology and the continuous diversification of human production and living needs, forests can provide more and more products for people's daily life, leisure, entertainment, food, medical treatment, health care and environmental protection. The products of the forest products industry are no longer limited to traditional products such as sawn timber, furniture, wood-based panels, paper products, forest chemical products, and some new products and new technologies emerge in an endless stream. The development of these new products only requires the use of thinning wood, and some even do not need to cut down trees. Therefore, this is an effective way to not only improve the utilization value of forest resources, but also protect the forest ecological environment. Therefore, the development must be accelerated. In particular, the development and utilization of biomass energy is promising. For example, organic waste is used as energy to partially solve the energy shortage problem. Biomass raw materials mainly refer to the photosynthetic products of plants, such as wood, wood processing residues, agricultural and forestry cutting residues, etc. According to different conversion conditions, solid, liquid or gas energy products can be obtained from biomass raw materials through pyrolysis process. These products can be directly used for power generation, extraction or synthesis of various chemicals. Compared with conventional energy, the biomass energy produced by the thermal energy conversion process has many advantages, for example, it can be produced by using wastes and residues, turning waste into treasure, and reducing the pollution of waste to the land. More importantly, the utilization of biomass energy does not increase the content of greenhouse gases CO<sub>2</sub> and SO<sub>2</sub> in the atmosphere. It is a renewable and clean energy.

## 5. Conclusion

In short, the technological progress of the enterprise is mainly reflected in the improvement of product quality, the development of new products, energy saving, consumption reduction, cost reduction and the comprehensive utilization rate of resources, so as to comprehensively improve the economic benefits of the enterprise, reduce the dependence of the enterprise development on forest resources and achieve the goal of reducing pollution. Only by continuously adopting new technologies, new processes, new equipment, new materials and new designs can it be realized. The application of modern electronic technology can speed up this process. Nowadays, countries with developed forest industry in the world have widely adopted electronic technology and various automatic monitoring systems to realize the continuous and automation of the whole process computer and television monitoring or some sections and

single machines. China's forest products industry must accelerate this process, which is the fundamental means and method for enterprises to implement environmental protection and achieve sustainable development.

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