Estimation of the Influence of Natural Forest Protection Project on Wood Forest Products Industry in Heilongjiang Province

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Abstract
This paper makes a lot of investigation on the influence of natural forest protection project on the forest industry in Heilongjiang province, comprehensively analyzes the present situation of wood forest products industry, puts forward the existing problems, and makes a positive prospect for the future. The forest products industry in Heilongjiang Province plays an important role in the forest industry, is the key and center of Forestry Development, and is a relatively more embodiment of human capabilities, more with the characteristics of technology and capital-intensive industries. Forestry without wood forest products industry does not have a future, and wood forest products industry cannot be developed greatly lack the power. This determines that Heilongjiang province wood forest products industry must develop rapidly, only in this way, can drive the revitalization of the whole forest industry.

Key words: Natural Forest Protection, Wood Forest Products, Heilongjiang Province

1. Introduction
In this paper, it first describes the present situation of wood forest products industry in Heilongjiang province after combing the relevant literature and collating a large number of statistical data and survey data. Secondly, it qualitatively analyzes the influence of natural forest protection project on wood forest products industry in Heilongjiang province. Using quantitative Analysis method, the influence of natural forest protection project on wood forest products industry in Heilongjiang province can be studied. Finally, according to the research results, the countermeasures and safeguard measures of wood forest products industry in Heilongjiang province under the background of natural forest protection project are put forward.

2. Background Description
As the main body of terrestrial ecological environment and the cradle of human existence, forest, especially its rise and fall, is closely related to the development of human society. However, in order to meet the needs of life, the unlimited harvesting by human beings has caused the depletion of recoverable resources, and endangered the survival of mankind; further, the gradual deterioration of the Earth’s environment has endangered people’s survival [1]. In Heilongjiang Province, at the same time of the long-term overload production and contribution of the wood forest products industry, the forest industry forest resources on the survival of forests have been seriously damaged, and the total amount has reduced, as well as the quality has declined. The total accumulation of resources was 37.4% lower than in the early days of the founding of the nation, and the accumulation of recoverable 81.8% was reduced. And furthermore, it has led to the deterioration of the ecological environment, which has seriously threatened the ecological security of the land [2]. Therefore, for the survival and development of people, the protection of the ecological environment and the realization of the sustainable development of forest resources, the third generation of the party’s leading collective has made the decision to implement natural forest protection project from a strategic point of view and the Chinese nation’s survival and the height of human civilization progress as well as China’s ecological environment. The sustainable development of national economy and society is related to the survival and development of state-owned forest areas [3]. The implementation of natural forest protection project in Heilongjiang Province has brought new opportunities and challenges to the development of wood forest products industry, and the forest industry should give full play to the leading role in the construction of forestry industry system and the leading role in the cultivation and development of forest resources, so as to meet the increasing requirements of national economic construction and people’s life for forest products.
Figure 1. Trend of Heilongjiang total exports of major forest products and gross output value of forest products industry

From the figure, it can be seen that Heilongjiang forest products export promotes the development of forestry industry, which is in line with the classical theory of international trade on the contribution of exports to economic development. Developing foreign trade in forest products stimulates the development of related industries, improves the level of industrial productivity and promotes industrial technological progress under the role of the market. Developing foreign trade needs to continuously enhance the competitiveness of forest products as a support, which requires enterprises and industries to invest more human and financial resources in the technological progress of forestry industry, the development of series of forest products and the development of logistics, brand marketing and other industries in the process of developing foreign trade. Therefore, the development of foreign trade of forest products in Heilongjiang not only brings about the growth of output value of forestry industry, but also stimulates the development of the upstream and downstream industries of forestry industry, such as raw material procurement, product and technology research and development, logistics, brand marketing and so on, and brings about the improvement of the overall quality of forestry industry.

As a large forestry province in China, Heilongjiang Province has long assumed the national wood production task. At the same time, the wood processing industry plays an important role in the economic construction of Heilongjiang Province. However, overloaded wood production has had an impact on the balance of the entire forest ecosystem and has also raised a number of environmental problems. In April 2014, the State Forestry Administration issued a comprehensive cessation of natural forest commercial logging policy, which marks China’s forest resources protection and forestry ecological benefits to a new height, but also marks the development of the wood processing industry, will enter a new transition period. Therefore, it is necessary to study and analyze the impact of natural forest protection project on the wood forest products industry in Heilongjiang Province, and to provide a theoretical basis for government and enterprises to make decisions.

3. Literature Review

From the analysis of the present situation, as a new problem of ecological environment construction, natural forest protection has aroused the concern of many scholars. The research covers a wide range, and the content is rich, mainly around five aspects, namely, the background, the goal and the content of the natural forest protection, the theoretical basis, the operation mechanism, the evaluation as well as the countermeasure measures, etc. However, most of these studies focus on the natural forest protection itself, and often involve one aspect of them and have little comprehensive research [5-7]. At the same time, from the coordinated development research field, around the coordinated development of regional economy, economic and environmental coordinated development of two levels of research, focusing on four aspects, that is, the characteristics, the mechanism, the model of the coordinated development as well as policy support and countermeasures for it, etc. [8-10]. The research on the coordinated development of regional economy in China focuses on the east and west, while the research on the coordinated development of economy and environment pays more attention to the environmental problems caused by industrial pollution [11]. There are relatively few research topics around the coordinated development of
natural forest resources protection and social economy.

Ning et al. (2018) studied and realized that the ecological efficiency of its production is conducive to the development of sustainable forestry and the realization of the United Nations sustainable development goals (SDGs): decent labor and economic growth [12-15]. The overall ecological efficiency of SOFE is assessed by analyzing the bad outputs from the SBM-DEA model based on the data package of Slacks. Using the basic data of 87 SOFEs in Northeast China from 2003 to 2016, the development level and spatial pattern of ecological benefits in the region are evaluated. The results show that the low ecological efficiency of SOFEs is caused by the low pure technical efficiency. Regional differences in ecological efficiency are very significant, and the differences become larger, but market-oriented reforms may help to improve this efficiency. Due to the implementation of Natural Forest Protection Project (NFPP), the ecological efficiency of SOFE decreased from 2003 to 2016. However, due to the relative lack of input of factors of production, most SOFE’s scale returns are increasing. In the future, efforts should be made to promote market-oriented reform and take the road of large-scale development. Han et al. (2018) pointed out that the state-owned forestry enterprises in Northeast China experienced economic losses and environmental deterioration, which led the government to seek reform [16]. Measuring technological efficiency enables people to assess overall trends and how reforms affect the production of social and environmental products. Previous assessments use small samples, short periods of time, and regard SOFE as the profit maximizer. The traditional profit maximization framework is compared with SOFE’s alternative “social company” framework to classify input and output, and the data package is used to analyze and measure the efficiency of 86 SOFEs from 2003 to 2009 [17]. In view of its established objectives, the social company framework is more suitable for SOFE. It is found that there is no general trend in pure technical efficiency of social enterprise framework. However, consistent with the previous literature, the pure technical efficiency of the profit maximization framework has improved. At the same time, the main reason for the decline of scale efficiency is the high level of government investment. Wang et al. (2018) found that accurately estimating and mapping large-scale forest biomass is very important for better understanding the terrestrial carbon cycle and improving the effectiveness of forest management. In this study, the total forest biomass and the spatial distribution of forest biomass in Northeast China (resolution 1 km) are estimated using forest plot sample data, forest resource inventory (FRI) data and SPOT-VGT normalized difference vegetation index (NDVI) data. Using FRI data of 11 different forest types, forest biomass at county and provincial levels is estimated by sampling 1156 forest samples and the newly created biomass conversion model. Spatial distribution of forest biomass is estimated using SPOT-VGT NDVI data and county-level biomass density (average 77.2 Mg hectare-1). During the study period, forests with high biomass density are located in the middle mountains of the study area. Human activities affect forest biomass at different altitudes, slopes and aspects. The results show that more sample plots and more detailed forest types can be used. The volume-biomass conversion model developed by classification will be more suitable for the study area and will provide more accurate biomass estimation. By using FRI and remote sensing data, the regional forest biomass statistics can be reduced to forest cover pixels, thus generating biomass maps with relatively fine resolution [18]. It can be seen that it is a new problem to explore the coordination of natural forest protection and social and economic development from the angle of theory and practice, and it is still lacking in comprehensive research. Therefore, based on the goal of the coordinated development of natural forest resources protection and social economy, as well as typical investigation and analysis of forest resources and environment and social economy in the protected areas of natural forest, this study takes the protected areas of natural forest as the research object, and explores the influence of natural forest protection on the local area, especially the damage to the benefit of the main stakeholders, interest orientation and so on to carry on the thorough analysis, and explores in the protected areas of natural forest in this particular region the forest resource protection and the social economy coordinated development possibility, and further draws on the domestic and foreign resources environment and the coordinated development successful experience and the practice, proposes the protected areas of natural forest resources protection and the social economy coordinated development pattern, and the mechanisms and measures to implement the safeguard model in order to promote the development of the long-term cause of natural forest protection in China and the sustainable development of social economy in the protected areas of natural forest are of great significance.

4. Research Methods

In recent years, under the background of forestry economic transformation and structural adjustment, woody forest products industry in Heilongjiang state-owned forest areas has made certain progress. From the point of view of the total output value of woody forest products industry, the curve of the total output value of woody forest products industry showed a significant growth trend in fluctuation from 2006 to 2018, as shown in figure 2.
Figure 2. Industrial output value of woody forest products in Heilongjiang state-owned forest areas from 2006 to 2018

From the macro point of view, the scale of woody forest products industry in Heilongjiang state-owned forest areas shows a trend of overall expansion, which is consistent with the development of forestry economy and policy requirements. In order to understand the development of woody forest products industry in Heilongjiang state-owned forest area more carefully, it is necessary to further analyze the development and composition of each secondary industry within the three industries of non-woody forest products in Heilongjiang state-owned forest area from the micro-perspective.

Figure 3. Composition of secondary industry in secondary industry of woody forest products in state-owned forest areas of Heilongjiang Province

The structural crisis of forest resources has intensified and the exploitable resources have decreased, which is mainly manifested in the unreasonable structure of forest age. After decades of development and cultivation, the total amount of forest resources in state-owned forest areas has not changed greatly, but the structure and function of forest resources have changed greatly. The structure of forest age is unreasonable, and the area and stock of
natural over matured forest decrease sharply. Young and middle-aged forests account for a considerable proportion, and the area and volume of over-mature forests are not high.

![Graph showing composition of secondary industry after reclassification of tertiary industry of woody forest products]

**Figure 4.** Composition of secondary industry after reclassification of tertiary industry of woody forest products

Natural Forest Protection Project is an important ecological construction project. Through reducing and stopping natural forest harvesting, vigorously building plantations, the recovery and development of natural forest resources are promoted. Through the establishment of conversion projects, economic structure is adjusted and optimized, so as to restore and develop the economy to distribute and resettle surplus workers in forest areas, to solve the problems of recuperation and rehabilitation of major natural forest areas in China, to protect biodiversity, to fundamentally curb the deteriorating trend of ecological environment, and to promote the sustainable development of social economy [19].

The implementation scope of natural forest protection projects in China mainly includes key state-owned forestry enterprises in the upper and middle reaches of the Yangtze River, the upper and middle reaches of the Yellow River, northeast and Inner Mongolia, local forestry enterprises with important ecological status, quarries, state-owned forestry farms and collective forestry farms, involving 17 provinces (autonomous regions, municipalities directly under the Central Government), 734 counties and 163 forestry bureaus. The natural forest area covered by the project is 0.74 billion hm2, accounting for 69% of the National Natural Forest of 1.07 million hm2.

Natural Forest Protection Project is a complex and systematic project. In order to achieve the above objectives, the state should adjust forest classification management and regionalization, strengthen the construction of ecological public welfare forests, implement the conversion of farmland to forests, increase the construction of commercial forests, implement the construction of conversion projects, divert personnel, and promote the construction of basic engineering security system, so as to ensure the smooth implementation of the project.

Guided by modern forestry theory, forestry division of labor theory and sustainable development theory, combined with the different needs of society for forest ecology and economy, as well as the different functions and utilization directions of forests, according to natural and socio-economic conditions, forestry land is divided into ecological public welfare forest and commercial forest. Among them, the ecological public welfare forest is divided into the key protected ecological public welfare forest (referred to as the key public welfare forest) and the general protected ecological public welfare forest (the general public welfare forest) according to the different degree of protection, and its management system and development mode are determined according to their respective characteristics and rules, so as to give full play to the various functions of the forest.

The construction of ecological public welfare forest is to conserve water resources, and reduce soil erosion in the upper reaches of the Yangtze River by building water conservation forest and soil conservation forest, increasing forest and grass vegetation. Conversion of farmland to forestry means the conversion of sloping farmland, decertified farmland, saline-alkali farmland above 25 degrees, and cultivated land in scenic tourist areas to forestry. Through returning farmland to forestry, forest ecosystem can be restored and rebuilt, and water conservation function and soil and water conservation function can be enhanced [20]. To strengthen the construction of commercial forests is to solve the contradiction between supply and demand of timber and the
outstanding supply and demand of timber after the implementation of Natural Forest Protection Project. Transfer project construction is to fundamentally reverse and solve the “two dangers” situation and “wood finance” by adjusting the economic structure of forest areas and cultivating alternative industries. After the implementation of the Natural Forest Protection Project, timber production has decreased, and a large number of surplus workers need to be diverted and resettled. To do a good job of personnel diversion is the key to maintain social stability and smooth implementation of Natural Forest Protection Project.

(1) Literature analysis method. Collect the natural forest protection project policy and the related literature of the impact on the wood forest products industry of domestic and foreign scholars, and sum up the collection of relevant literature, so as to obtain the purpose of this study and research significance.

(2) Descriptive analysis method. By finding and obtaining the relevant data of statistical yearbook, this paper makes a descriptive analysis on the present situation of wood forest products industry in Heilongjiang Province as well as the influence of natural forest protection project on wood forest products industry in Heilongjiang province under the condition of investigation.

(3) Empirical analysis method. According to the statistical data of wood forest products industry in Heilongjiang Province, the influence of natural forest protection project on the wood forest products industry in Heilongjiang Province was tested by the least squares method, and the influence of the wood forest products industry in Heilongjiang Province was estimated by co-integration analysis and error correction model.

5. Result Analysis

The selection of evaluation indicators for Natural Forest Protection Project in Heilongjiang should take full account of the background and phased objectives of the implementation of Natural Forest Protection Project, and consider the following principles of evaluation indicators in light of local actual conditions.

Comprehensive and scientific: The index system of the Natural Forest Protection Project is based on science, which not only fully reflects the inherent mechanism of sustainable forest development and sustainable forest management, but also reflects the overall characteristics of the forest ecological system and the economic and social situation of the region. In content, it reflects not only ecological, economic and social indicators, but also dynamic and static indicators of forest resources development.

Targeting and Feasibility: When the index system is established, it must have clear objectives, be effective and feasible in practice. The difficulty, reliability and representativeness of basic data acquisition should also be taken into account.

Consistency and comparability: Because of the excessive moisture of statistical indicators in different regions in the collection indicators, the differences of indicators in the index system are also large. Therefore, in the collection and processing of indicators, people should not only ensure the comparability of indicators at different times, regions, industries, but also ensure the consistency of indicators in time and space.

Practicality and systematism: The index system should have clear meaning, be easily accessible in statistical data, investigation and experimental data, and be easy to calculate. It also requires that the index system should have integrity and structural hierarchy. It is not only required that the index system established can systematically reflect the ecological, economic and social benefits of the project, but also that the index system established is an organic whole with clear objectives, distinct levels and interlinkages.

According to statistics, after the implementation of natural forest protection project in Heilongjiang Province, in 2014, the forest production industry processing per cubic meter of wood to create an output value of 4080 yuan, 167 yuan higher than 2013 with a year-on-year increase of 4.09; each million cubic meters of wood to accommodate 440 people, 45 persons higher than 2013 with a year-on-year increase of 45; the consumption of wood per million yuan of output was reduced to 2.45 cubic meters. It can be seen that after the implementation of the natural forest protection project, although the production capacity of wood processing enterprises is decreasing, the processing utilization rate of wood has been further improved. Therefore, for the problems of the reduced supply of wood raw materials, price rise as well as the uncertainty of wood import trade, enterprises need to adjust their own product structure, and eliminate low value-added products, and gradually change from simple processing mode to refined deep processing mode, in order to improve the processing utilization rate of wood and to create higher value for enterprises.

The implementation of natural forest protection project directly affects the supply of wood, so this paper tests the long-term and short-term effects of wood production on wood forest products industry by using the data of wood production in Heilongjiang Province in the 2000-2015 China Forestry Statistics Yearbook. Thus, accurate details can be reflected. Through empirical research, this paper mainly draws the following conclusions:

In the long run, there is a long-term stable equilibrium relationship between wood yield and wood forest products industry. From the empirical analysis results, the impact of wood production on the wood forest products industry is negative. In other words, the implementation of natural forest conservation projects has further reduced wood production, which is detrimental to the production and operation of the wood forest products industry in the
long term, and it is expected that this adverse effect will be the most significant in 2020, after which the impact will gradually become smaller. As in the long term, the impact of wood imports on the wood forest products industry is positive, so companies may be importing wood to make up for the raw material gap. In the short term, the reduction of wood production has not had a negative impact on the wood forest products industry, but on the wood forest products industry has a positive effect. In other words, wood production decline, wood forest products industry enterprises will be in a short period of time to make corresponding strategic adjustments, so although the production of wood is reduced, but also still promote the improvement of the output value of the industry. After the implementation of the natural forest protection project, wood forest products enterprises may have a certain amount of wood reserves, which still can deal with the impact of natural forest protection projects in the short term.

6. Conclusions

The influence of natural forest protection project on wood forest products industry in Heilongjiang Province was analyzed quantitatively. First, the influence of natural forest protection project on wood forest products industry is preliminarily tested by the least squares method, and the results show that natural forest protection project has a negative influence on wood forest products industry, but it is not very significant, it may be due to the limitation of data. Secondly, using co-integration analysis method and error correction model, the long-term and short-term effects of natural forest protection project on wood forest products industry are analyzed and the results show that the long-term natural forest protection project has a negative impact on wood forest products industry, but the impact of natural forest protection project on wood forest products industry is not prominent in the short term. The possible reason is that in the short term wood forest products enterprises have a certain amount of wood reserve resources.

At present, China’s economy will, with the trend of economic globalization, be integrated to a large extent into the trend of economic development, which will also make China’s forestry into a historic stage of transformation, and place the future forestry development and forestry policies under the framework of globalization. Therefore, we must take seriously the possible positive and negative impact on China’s forestry so that the favorable conditions and opportunities offered by globalization to further promote the development of forestry undertakings.

(1) To accelerate the industrial restructuring

China and the world are closely linked. Due to domestic and foreign shocks and being forced to carry out large-scale industrial adjustment and industrial restructuring, the forest industry in order to enhance strength in the market competition environment. The integration and collectivization of the forest industry will become a development trend, so that our province forest industry enterprises in the reorganization to seek a combination of advantages, so as to overcome the shortcomings.

(2) To promote the adjustment of the forestry industrial industry structures

In recent years, although the state and various departments have repeatedly stressed the need to adjust the industrial structure, expand the scale, the equipment backward, low efficiency, serious pollution of small enterprises to implement, stop, and turn, but it is difficult to work, economic efficiency as the principle of market competition, will inevitably lead to the survival of the fittest, so that the enterprises cannot adapt In order to achieve the adjustment of industrial structure.

(3) To promote the scientific and technological progress of the forest industry and the economic development of enterprises

China’s forest industry and all enterprises will face fierce market competition, forest industry to occupy a place in the fierce international market competition, in addition to their own good reputation, the most important thing is that the enterprise’s products to have the advantages of low cost, high quality, can be compared with similar products abroad, but to achieve this advantage, It is necessary to adopt advanced science and technology, only by absorbing scientific and technological achievements, and constantly strengthen science, the use of advanced production technology and equipment, improve the production efficiency of enterprises, so that enterprises in an invincible position.

(4) To promote the development of the export-oriented economy of forest industry enterprises towards market

For the long-term service of domestic market mainly in China’s forest industry, at present, in addition to the implementation of all-round opening to the outside world, China’s enterprises were real access to the international economy, technology, trade on the big stage, its environment will be greatly improved, thus contributing to the development of China’s forest products foreign trade.

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