Formation of the timber industry competitiveness

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Abstract. The article is devoted to the methodological and instrumental study of the process of forming the competitiveness of the timber industry. The authors substantiated the structural and logical scheme of the competitive development of the logging industry, which includes the directions for generating competitive advantages in the process of industry development. Within the framework of the program-targeted approach, the main directions of the system of measures for the formation of the competitive development of the logging industry were formulated in the form of a draft Program for the Development of the Competitiveness of the Timber Industry, considering the time periods of the Strategy for the Development of the Forestry Complex of the Russian Federation until 2030. The authors have proposed the Passport of the Program for the Development of the Competitiveness of the Timber Industry, which includes a set of Subprograms within the framework of the legal and regulatory framework that regulates the use and reproduction of forests. The tactical goals are clarified, tasks are solved within each subprogram; target objectively controlled indicators of the Program are proposed.

1. Introduction

Due to the fact that ensuring the competitiveness of the timber industry is directly determined by the prerequisites and factor dependences of the competitive development of the logging industry, it is of particular relevance to study the specifics of the competitive development of the logging industry from the point of view of the most varied substantiation and implementation of all diversification directions for realizing the total potential of the industry. The subject of the research are socio-economic and managerial relations that determine the laws of the process of forming the competitiveness of the timber industry.

The aim of the study is to substantiate the instrumental and applied program components of the formation of the competitiveness of the timber industry on the basis of rapid reforestation, optimization of the regulatory and technical and technological bases that regulate the use and reproduction of forests in the Russian Federation.

Within the framework of the purpose, the following research objectives have been formulated:

- to determine the structural and logical scheme of the competitive development of the logging industry;
- to develop an algorithm for the implementation of the Program for the Development of the Competitiveness of the timber industry;
• to substantiate a set of subprograms for the development of the competitiveness of the timber industry within the framework of the legal and regulatory framework governing the use and reproduction of forests;
• to propose a system of objectively controlled indicators of target indicators of the Program for the Development of the Competitiveness of the timber industry;
• to develop the main system elements for assessing the level of formation of the competitiveness of the timber industry.

The competitiveness of the timber industry is a difficult task and many authors are developing this problem. Along with this, according to Proskurina S, Junginger M, Heinimö J, Vakkilainen E [1,2] export of biomass seems to be beneficial. Many countries are trying to export this product to European countries that are interested in using biomass as energy. Others authors analyze about benefits and implications of practices of forest exploitation in priority investment projects [3]. The countries such as Turkey are actively engaged in promoting its products in the markets for wood-based panels. They increase the competitiveness of woodworking machinery [4] and try to strengthen its positions in this market.

Biondić D [5] consider the author examines the assessment of business performance. Integral performance assessment is a function of achieving business excellence. Bahur O [6] improving the competitiveness of Russian-made wood boards is not only an important task for the Russian economy, but it can also make a significant contribution to the energy-efficient developing economy of the whole world.

Dzhukha V [7] consider the purpose of the study is to assess the potential for structural transformation of the emerging timber industry in the Rostov region and identify mechanisms to enhance its growth.

Tian G [8] pay attention that China should increase investment in scientific research, as well as establish policies to restrict and treat pollution in the industry of wooden forest products, while increasing the export volumes of products with high added value. China should attach importance to the pollution resulting from the manufacture of wooden forest products. The state should support policies for these producers reducing production emissions.

Lundmark R [9] pay attention improving the efficiency of the forestry sector will have an important impact on our possibility to attain long-term sustainability and mitigate climate change. The results indicate that the harvested volumes of forest products, both for the industry and energy sectors, can be significantly increased if a more efficient forest management is adopted.

Thus, the issues of wood processing product competitiveness arise in different countries. The tendencies of time related to the development of a green economy, the tightening of environmental standards of production, the development of more environmentally friendly energy sources contribute to the relevance of the consideration of this research topic.

2. Methodology

The study of the instrumental and applied components of the formation of the competitiveness of the timber industry based on the classic scientific papers of foreign and domestic scientists, who form the scientific field of studying the forest economy; retrieving prospective research within the stated problem. As a methodological basis, research approaches of modern theories of the economic systems development, state program and project documents for territorial and sectoral development, legal and regulatory acts of the Russian Federation on problems related to the development of the timber industry were used. The methodological basis is the systematic approach and the method of dialectical cognition, which made it possible to systematize and substantiate the approaches that determine the specifics of the formation of instrumental and applied components of the competitive development of the timber industry.

For a comprehensive substantiation of promising planning directions for the formation of competitive advantages of the timber industry, it is necessary to use a structural and logical scheme for ensuring the competitive development of the forest sector in the Russian Federation (figure 1).
Figure 1. Structural and logical diagram of the competitive development of the logging industry.

In modern conditions of geopolitical turbulence in the development of the world economic space, the competitive development of the logging industry in Russia is possible only through the toolkit of medium-term state and sectoral projects and programs [10,11]. In the context of the existing problem areas for the development of the industry, focusing on the program-target approach, the main directions of the system of measures for the formation of the competitive development of the logging industry have been formulated in the form of a draft Program for the Development of Competitiveness of the timber industry (hereinafter the Program).

3. Results and discussion
Consider the proposed program. A systematic approach to substantiating the Program (figure 2), the implementation deadlines are determined considering the time periods of the Strategy for the Development of the Forestry Complex of the Russian Federation until 2030: Stage I (2021-2025) – elimination of barriers and restrictions existing in the sectoral economic space; Stage II (2025-
2028) – offensive extrapolative generation of systemic measures to form competitive advantages; Stage III (2028-2030) – a planned and controlled increase in the globally competitive advantages of the industry system.

The constituent elements of the proposed Program are the implementation of a set of Subprograms within the framework of the legal and regulatory framework that regulates the use and reproduction of forests, and that regulate the use of the resource potential of the forestry complex (table 1) [11].

1. The subprogram “Science-intensive development of the timber industry” includes activities aimed at:
   - the use of protocols for the application of innovative technical and technological solutions that provide an industry-specific increase in labor productivity;
   - development of cooperation, integration ties in the timber industry through a well-grounded organization of sub-sectors and territorial clusters, as a unified system for the development of the economy forest sector;
   - environmental safety of the development of the economy forest sector.

2. The subprogram “Development of competitive advantages of the timber industry” includes activities aimed at:
   - maximum diffusion of innovative technologies in the process of integrated use, production and processing of forest raw materials, which guaranteed the growth of the production index of the forestry sector of the economy in all business entities, regardless of the organizational and legal form and size;
   - development of the production of alternative product elements for the processing of forest raw materials, based on the most complete and waste-free use of the branch resource potential and to a greater extent export-oriented;
   - expansion of sales markets for products of the forestry sector of the economy, induced by trends in demand and consumption of global world market systems.

3. The subprogram “Development of technical, technological and transport and logistics infrastructure” includes activities aimed at:
   - providing a systemic integration link between all industries involved in the use, production and processing of forest raw materials;
   - the formation of closed production systems aimed at the maximum machine and technological support for industry development;
   - creation of multi-level transport corridors providing an infrastructure basis for expanding sales markets for timber products;
   - increasing the level of network transport mobility of the community of economic entities within the framework of the formation of competitive relations in the timber industry;
   - controlled provision of aviation, road and rail communications (depending on regional conditions for the development of the timber industry complex) for the expansion of all types of cooperation within the framework of integration processes with other economic systems.

4. The subprogram “Formation of image status in the timber industry” includes activities aimed at:
   - active development of branding of all participants in the processes of use, production and processing of forest raw materials;
   - the widest possible use of image strategies in organizing complex interaction within the framework of export-import operations;
   - formation of an objective base of investment lending directions in industry systems;
   - reasonable compensatory structuring of direct costs incurred for the construction and modernization of technical, technological and transport and logistics infrastructure facilities.

5. The subprogram “Development of the forestry cluster sector” includes activities aimed at:
   - the most variable systemic diversification of the economy of the enterprises of the processing of mined wood on the basis of science-intensive technological development;
Figure 2. Algorithm for the implementation of the Program for the Development of the Competitiveness of the Timber Industry.
creation of a highly competitive institutional environment that forms commercial interests for
the development of entrepreneurial activity in the timber industry.

Table 1. Passport of the Program for the Development of Competitiveness of the Timber Industry.

| Program Coordinator | Ministry of Natural Resources and Environmental Protection |
|---------------------|-----------------------------------------------------------|
| Subprogram Coordinators | Russian Federal Forestry Agency (Rosleshoz) |
| Program participants | Federal State Institution “Roslesresurs”, Federal State-funded Institution “Russian Center for Forest Protection”, FSBI “Roslesinforg”, public organizations, etc. |
| Sub-programs | 1. Subprogram “Science-intensive development of the timber industry complex”
2. Subprogram “Development of competitive advantages of the timber industry”
3. Subprogram “Development of technical, technological and transport and logistics infrastructure”
4. Subprogram “Formation of image status in the timber industry”
5. Subprogram “Development of the sector of forestry clusters” |
| Program purpose | Ensuring sustainable dynamic development of the timber industry complex through the formation of competitive advantages based on innovative technical and technological use, protection and forest regeneration. |
| Objectives of the program | 1. stimulating the growth of diversification activity in all enterprises of the timber industry;
2. ensuring a dynamic rate of production growth in all system elements of the timber industry;
3. formation of the image portfolio of the timber industry;
4. support for the development of technical, technological, transport and logistics infrastructure;
5. creation of conditions for the preservation and restoration of natural biogeocenoses;
6. stimulation of the use of science-intensive resource-saving technologies that ensure an increase in labor productivity in all enterprises of the timber industry;
7. formation of timber industry cluster sector;
8. ensuring environmental well-being in forest areas and in regions with forest resources;
9. stimulation of a sustainable growth rate of the production index of timber products;
10. development of the production of alternative energy sources associated with the processes of production and processing in the timber industry and the variability of the use of the sectoral resource potential;
11. creation of conditions for sustainable expansion of sales markets for timber products;
12. creation of multilevel transport systems to expand the sales
markets for timber products;
13. increasing the level of transport mobility of the entrepreneurial community of the forest industry;
14. maintaining the stable development of all types of transport communication with all economic agents in the framework of the development of the forest industry;
15. stimulation and support of investment lending in industry subsystems and clusters;
16. variable systemic diversification of the economy of mined timber processing enterprises based on science-intensive technological development;
17. creation of a highly competitive institutional environment that forms commercial interests for the development of entrepreneurial activities in the timber industry;
18. improvement of the information support system in the timber industry complex;
19. research work and professional development of personnel in the timber industry complex;
20. creation of the most comfortable living conditions and improvement of the social and infrastructural arrangement of forest areas.

List of program targets

- the level and dynamics of reforestation, protection and protection of forests;
- removal of wood from a unit area of commercial forests;
- the level of use of forest raw materials;
- the volume of the domestic market for forest products;
- the volume of investments in forestry enterprises;
- the index of production in the enterprises of the timber industry;
- the index of the volume of investments in fixed assets per unit of production capacity at the enterprises of the timber industry;
- index of labor productivity at enterprises of the timber industry;
- average monthly nominal wages at the enterprises of the timber industry;
- the level of conservation and restoration of the ecological potential of forests;
- the number of projects for the development of processing industries;
- the level of employment of the population in forest areas;
- the density of paved roads;
- the degree of wear and tear of fixed assets at the enterprises of the timber industry;
- the share of internal costs for research and development at the enterprises of the timber industry;
- the level of innovative activity at the enterprises of the timber industry;
- the specific weight of unprofitable organizations of the timber industry;
- volumes of pollutant emissions.
Experiences have made it clear that in most enterprises of the timber industry complex there is a problem of technical and technological development, which does not allow the formation of competitive advantages, making the most of all system conditions and factors, which leads to an extensive path of development.

In order to solve this problem, the starting points for the development of a scientific and methodological approach to assessing the level of formation of competitive advantages are substantiated, both internal and external factors are subject to research using the developed system of indicators that correlate at different levels (macro-, meso-, micro-), as well as factors affecting the competitiveness of the timber industry complex [10,11]. Such an assessment system allows to determine the compliance of the result with the principles of forming the competitiveness of the timber industry, to determine the degree of development (extensive or intensive). Based on the initial provisions, a scheme for assessing the level of formation of the competitive advantages of the timber industry was developed, in which the subject of assessment correlates with certain blocks (A “Assessment of diversification activity at enterprises of the timber industry”, B “Assessment of innovative development at enterprises of the timber industry”, C “Assessment of technical – technological and transport and logistics infrastructure”) and with priority management methods aimed at creating conditions for a dynamic increase in the contribution of the forestry complex to the country’s economy (figure 3).

**Figure 3.** Scheme for assessing the formation of the competitiveness of the timber industry.
When using this scientific and methodological approach, it is possible to identify the dependence of the differentiation of the indicators of blocks B and C on the modification of the dynamics of the indicators of block A (directly characterizing the diversification activity of the competitiveness of the timber industry and factor conditions for the formation of competitive advantages) [10,11].

A system of indicators for assessing the formation of the competitiveness of the timber industry has been developed, which formed the basis of the target indicators of the Program (table 2).

| Table 2. Target indicators of the Program for the Development of Competitiveness of the Timber Industry. |
|---------------------------------------------------------------|
| **Indicator name** | **Unit** | **Target development trend** | **Indicator threshold** |
| The level of diversification activity at the enterprises of the timber industry (the ratio of the number of innovative enterprises using science-intensive technological tools to the total number of organizations in the timber industry) – Sdf. | % | increase | ≥45 |
| The level of innovative development at the enterprises of the timber industry (the ratio of the number of organizations innovatively organizing the production of products to the total number of organizations in the region) – Syn. | % | increase | ≤65 |
| The level of technical, technological, transport and logistics infrastructure (the size of the infrastructure system per the number of enterprises in the complex, rubles) – Synf. | % | increase | ≤60 |
| The rate of change in labor productivity (the ratio of labor productivity before the implementation of the program to labor productivity after the implementation of the program) – ∆PTR (k) | % | increase | ≥45 |
| Coefficient of efficiency of expenditures on the development of timber industry competitiveness (the ratio of the rate of change in labor productivity to the cost of developing the competitiveness of the timber industry complex) (Kynf) | % | increase | ≥50 |

4. Conclusion

Implementation of the Program with the fullest possible involvement of sectoral resource institutes in the regulatory and regulatory aspect will provide an optimal regulatory framework that allows the unification of the application of innovative tools for the long-term formation of the competitiveness of the forestry complex and the creation of conditions for the preservation and restoration of natural biogeocenoses, as well as for rational forest management and intensive use and forest reproduction. In terms of organizational and managerial directions, the Program for the Development of Competitiveness of the Timber Industry will form a system of basic conditions for the structural diversification of the economic space of all enterprises of the timber industry, the formation of a cluster system within the complex, which in the economic context will ensure the growth of production in the timber industry, the maximum use of innovative technological tools, providing an increase in labor productivity; in the social aspect – an increase in the average monthly nominal wages at the enterprises of the timber industry, the level of conservation and restoration of the ecological potential of forests, etc.
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