

# Forms of Interaction of Participants of Timber Industry Clusters in North-West Russia

Plastinin A

Northern (Arctic) Federal University  
Arkhangelsk, Russia

Sushko O.

Northern (Arctic) Federal University  
Arkhangelsk, Russia  
o.sushko@narfu.ru

**Abstract** – The field study was conducted in order to identify the forms of interaction of cluster participants and the scale of the clustering process of the Russian timber industry complex. The timber industry complex of Russia is characterized by weak cooperation of timber industry enterprises using a common forest resource base, transport and energy infrastructure, services of scientific and educational organizations. Disunity hinders the development of the Russian timber industry complex. An effective approach to the development of the timber industry complex in the regions is associated with the formation and functioning of clusters. The advantages of cluster integration are manifested in effective current, investment, and innovation activities. The cooperation of cluster members provides a common synergistic effect, minimizes costs, and ensures higher profitability of business processes. Another important direction in the functioning of timber industry clusters in Russia is integration into global transnational processes. Clustering will result in the breakthrough level of the technological base of domestic timber industry enterprises, access to modern technologies, financial and investment resources, competitive international markets. The information was collected using questioning at specialized industry events of international significance and interviewing experts participating in clusters in two regions. As a result of the field study, a slowdown in the formation of timber industry clusters in the North-West region was revealed. Created timber industry clusters experience problems with achieving the set tasks, implementing joint projects. The clustering recession is associated with the imperfection of the regulatory framework and difficulties of its application. Among the reasons for the clustering decline is the lack of theoretical studies on cluster processes and clear understanding among business entities and representatives of state bodies of the essence of the cluster. There is a problem of business and science disunity. The field study of regional clusters in the North-West Russia allowed us to identify the forms of interaction with the selection of the main tasks, as well as to define the common expert assessment.

**Key words** – woodworks, timber industry, Russian North, industry clusters, business interactions

## I. INTRODUCTION

The main content of cluster activities is usually aimed at modernizing and diversifying the industrial sector of various industries, forming new scientific and technological competencies, developing innovative products and technologies, promoting to domestic and foreign markets. The process of cluster formation in Russia is focused on foreign experience of clustering the economies of a number of

developed countries of the world, which have proved, not only in theory, but also in practice, the efficiency of using network structures in enhancing competitiveness of the economy, both in individual regions and countries as a whole. In this regard, innovative territorial clusters are considered as points of growth, poles of competitiveness of national economies, factors of development of territories [1, 2]. In the conditions of digitalization of modern Russia, in the period of institutional transformations of the entire economic mechanism, special attention should be paid to the processes of economic diversification of economic activities of regional timber processing complexes, which is an important condition for the formation and development of a balanced forestry system as a whole. An important driver of institutional transformations can be the process of clustering in different spheres of life, industries, and regions [3, 4]. Cluster development of different sectors of the economy is associated with benefits that the interaction of participants and the integration of different types of activity give: they are current, investment, and innovation benefits. The organization of regional clusters is a global trend. The cluster development of the timber industry complex in Russia allows maintaining production stability by increasing export supplies of high value-added timber. Regional timber industry clusters mainly consist of spatially focused associations, which include partners in science, business, the sector of public institutions and organizations [5, 6]. Clusters integrate all types of value chain activities. They are distinguished by intense interaction between stakeholders. Due to close cooperation between research institutions and enterprises, clusters have a favorable innovation climate. A distinctive feature of clusters is the relationship of participants over a certain period of time and on the basis of motivated mutual trust. Mere existence of regional clusters is not sufficient for joint activities, as this requires intensive integration and feedback. This feature requires the continuous development of clusters and improved performance. If this does not happen, cluster members lose interest in joint activities.

## II. PROBLEM, METHODS AND TASKS OF RESEARCH

### A. Problem Statement

Since 2000 and for a decade and a half, cluster processes have been initiated and actively conducted in the timber industry complex of Russia and have now entered a recession stage, which causes concern among cluster members themselves and stakeholders interested in the development of the timber industry complex. Slowdown of clustering is due to

the fact that planned results are not achieved or the effectiveness is low, and the implementation periods of structural, technological and other measures are very long, which does not suit cluster members [7, 8].

The main goal of clustering of the timber industry complex was innovative development with accelerated production growth rates, introduction of new technologies for complex raw materials harvesting and processing into final types of high-value-added paper products. The transition period to the formation of clusters in the Russian timber industry complex was the formation of vertically and horizontally integrated timber industry companies in Russia, which exhausted the possibilities for further structural transformation of the complex. Today, the search for new drivers of cluster development is due to the fact that formation of associated regional complexes in the Russian timber industry complex will allow competing with major global associations and will increase the share in the highly competitive international timber products market. An important advantage of the development of timber industry clusters in Russia could be their integration into the global transnational processes of creating timber industry products. Clustering of the timber industry complex will result in an innovative level of the domestic technological base of enterprises, access to new technologies, world raw materials bases, and modern management methods. This process is relevant in the conditions of uncertainty in the development of commodity markets of wood and paper products due to the instability of the economic state of world consumers and, accordingly, fluctuations in demand [9, 10]. Despite its importance, the clustering process in the timber industry complex is currently suspended, which causes concern of many industry experts and representatives of governmental bodies. According to experts, this is due to the imperfection of the regulatory and legal framework, difficulties of its application to create clusters in industries based on harvesting, extraction and further processing of natural resources.

#### *B. Research Questions*

The purpose of the field study is to identify the level of the clustering process of the Russian timber industry complex, to determine the prerequisites for further development of regional clusters in the timber industry complex. This field study was conducted in the framework of project No. 18-010-00147\18 "Theoretical and methodological approaches to the functioning of the territorial production timber industry cluster as a tool for the spatial development of the Russian Federation". The following main tasks were solved:

- clarification of the hypothesis, collection of information;
- analysis of the awareness level and opinions on the issue of uniting the subjects of the timber industry complex into clusters;
- identifying the main interests of cluster members, forms of interaction with a generalized expert assessment.

#### *C. Purpose of the study*

Among the new scientific results of the field study are the identification of the scale of the clustering process in the Russian timber industry complex, prerequisites and factors for further development of regional clusters in the timber industry complex. An important result of this study is the substantiation of the need for clustering as a factor in the interaction of the state and business entities in a modern market economy. Practical significance of the research consists in determining the forms of interaction of cluster participants

#### *D. Research methods*

The study objects were timber industry clusters of Russian regions. Tools such as questioning, and interviewing were used for the research. Questioning was conducted at PAP-FOR exhibition and business forum (St. Petersburg), "Russian Forest" exhibition and forum (Vologda) [11–13]. Information was collected through the dissemination of standardized questionnaires with open and closed questions. At the first stage of the study, when developing the questionnaires, the method of factor analysis was used. This allowed identifying aggregate variables that affect respondents' answers. Particular attention was paid to quality control in determining the methodology, quoting, assessing the optimal study volume. The sample scope of the questioning covered at least 25 % of the participants of the exhibition. Given that the exhibition participants are leading participants in the timber industry, the sample is considered to be representative. At the second stage of the study of clustering processes in the timber industry complex, surveys were conducted using electronic and paper questionnaires. At the third stage, the following types of work were carried out: adjusting filters, counting quantitative data, compiling analytical tables and the data set as a whole. Data entry and statistical processing was performed in SPSS program. The results of the study can be extended to the general population, since exhibition and forum participants represent major stakeholders in the timber industry business.

Expert focusing, and interviewing were conducted in two regions, in which timber industry plays an important role in the economy and has sufficient contribution to the regional gross turnover. The choice of regions is also connected with the fact that timber industry clusters are created and function there. The first region for interviewing was the Arkhangelsk region, where PomorInnovaLes cluster was created, which included more than 30 participants of the regional timber industry complex. Interviewing in the form of business discussions with official representatives was conducted in the Komi Republic, where *Forest Education Cluster* was created, which in 2015 was transformed into the timber industry cluster [7, 12].

### III. FINDINGS

As a result of the survey, a brief description of the activities of the participants of the timber industry complex was compiled, which is very important for determining the representativeness of the sample and the possibility of distributing the results to the general population of the study. In the course of the survey, it turned out that more than half of

the respondents were Russian and foreign commercial enterprises. Almost 88% of survey participants are representatives with a long period of activity in the timber industry complex. Therefore, they have a real understanding of the problems of functioning, development dynamics and trends. In terms of the number of employees, the respondents refer to medium and large businesses (69 % of the total number of respondents), which is also confirmed by the answers to the question of the company's annual turnover. Among the participants, in terms of the volume of the annual turnover of the company, those that belong to large and medium-sized businesses with an aggregate share of 64 % prevailed. 28 % of the respondents found it difficult to answer due to the observance of trade secrets for this information. One third of the respondents participates in the world market and has long-term relations with foreign partners. 47 % of the respondents are involved in the domestic market, but note that they plan to promote their products and / or services to the CIS or foreign markets. Almost 62 % of the survey participants rate the forestry products market as highly competitive. A small number of respondents rate competition in their segment as low, which is remarkable for foreign equipment suppliers. The main block of questions was aimed at asking for opinions about the clustering process. Almost 80 % of survey participants know about the integration of enterprises into a cluster in one way or another, and almost 31% (Fig. 1) consider the activities of clusters to be positive. Some of these respondents are members or partners of clusters. 10 % of the respondents do not have experience of interaction with such an association of enterprises; so, they could not provide a definite answer.

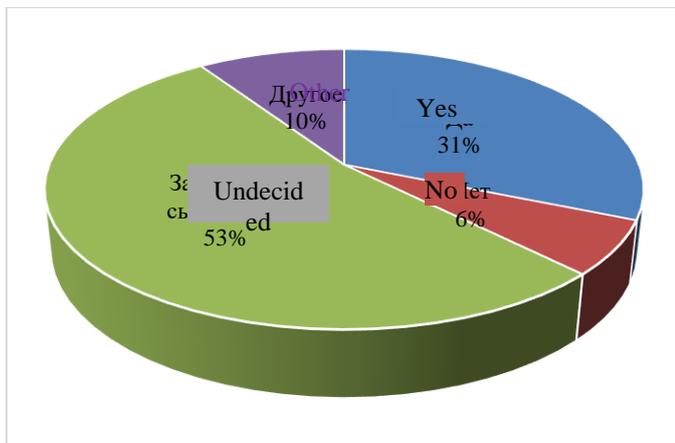


Fig. 1. Results of the opinion survey on the effective form of clusters

The concretization of the questions about the activities of clusters, the forms of relations between the participants showed that 67 % of respondents would like to receive financial, material and technical resources from the association of enterprises, that is, specific assistance for the development of their activities, expansion of production capacity and implementation of investment projects (Fig. 2). Detailed answers of the survey participants showed that some enterprises have difficulties with highly qualified personnel and narrowly focused specialists. Therefore, they would like to receive assistance in provision of labor resources and

conducting training, retraining and further training of specialists. This opinion gained 17 % of positive responses from the respondents. The respondents are least interested in “personal connections” – 8 %.

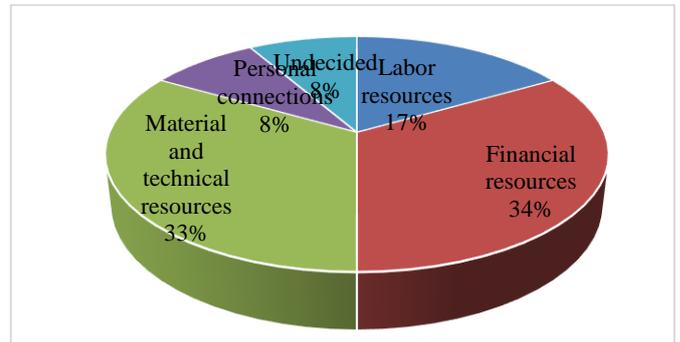


Fig. 2. The results of the opinion survey on the specific forms of interaction of cluster members

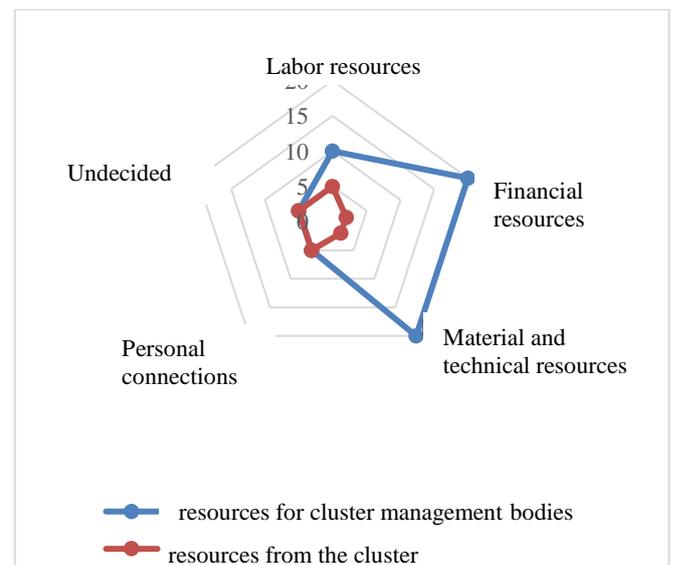


Fig. 3. Forms of interaction of cluster members

The willingness of the enterprises to provide financial, material and technical resources is not high enough, as evidenced by 22 % of the respondents who answered “yes” to this question. Positions “labor resources” and “personal connections” had equal number of answers. The same number of respondents found it difficult to answer the question.

Thus, the analysis of the respondents' answers shows that the absolute majority of survey participants believe that the cluster should provide practical assistance in the form of material and financial resources, but at the same time they are not ready to provide such assistance themselves.

When asking about the expectations of joining the cluster and what main tasks the cluster should perform, most of the respondents could not give a concrete answer (65 %). The rest of the respondents gave brief answers, which reduced to the opinion that effective measures are needed to develop the timber industry complex and other industries with which the development of the regional economy is connected.

The majority of the respondents expressed their opinion on improving professionalism, enhancing experience exchange activities among the existing clusters and other forms of associations of timber industry enterprises. This is undoubtedly an important and not quite expected conclusion. It also shows that many market participants are ready for action and the introduction of changes. Perhaps, market participants believe, it is after such changes that the change of the framework conditions will become just a necessary and independent action from the state (that is, it will be prompted by the need and the new reality of the education market). The cluster as the most influential organization on the market has the opportunity with the help of its products and services to become the unifying driver that will be the source and provider of all these changes in the timber industry complex. The interaction of business, science and government in clusters receives a structured organizational design. The task

of the cluster is to assist in the preparation and initiation of new projects, start-ups using the results of intellectual activity, in creating a communication platform and conditions for the development of the enterprises. Promising technological innovations of startups are difficult to integrate into business plans of large companies. Clusters should help create innovative structures with a maximum set of various services, equipment and links with scientific and educational organizations.

Consequently, the respondents' answers show that there is no a clearly established opinion and proposals on the work of clusters.

The field study of regional clusters of North-West Russia showed that there are several forms of cluster interaction (Table 1).

TABLE I. FORMS OF INTERACTION OF CLUSTER MEMBERS.

№	Form of interaction	Content of the form of interaction
1	Organizational interaction	Organizational interaction is aimed at the management of the cluster by the state through the provision of state preferences, services, competitions, etc. However, state support schemes should be developed and codified for the effectiveness of this form of interaction. Organizational interaction in the current period requires regulation at the federal and regional legislative levels.
2	Informational interaction	Support of cluster members consists in the methodological support and coordination of transactions and projects in order to accelerate their approval and implementation. Another important point in this form of interaction is the integration of information projects to create a system solution that, in aggregate, contributes to the digitization of cluster members' activities.
3	Interaction in innovation and science	Spread of the results of new technologies and exchange of innovative experience, which will allow avoiding some mistakes, activating practice, and standardizing processes, which is especially important for small businesses in the timber industry complex. Cluster research and innovation activity will allow solving an important national task of import substitution and production of innovative products.
4	Investment interaction	Investment interaction is associated with the creation of favorable conditions for investment in technical and technological renovation of the basic activities of the timber industry complex: forestry, wood processing, production of wood products, pulp and paper. An important task of investment interaction is consolidating private investment and state support, which will ultimately expand the investment attractiveness of the timber industry and ensure the inflow of foreign investment. Joint investment activities of cluster participants will help to increase the efficiency (payback period, implementation time) of many projects, expand existing capacities, and build new enterprises. To improve forest infrastructure, it is necessary to provide for the additional construction of automated warehouses for year-round storage of petroleum products at the logging bases of large enterprises, building forest infrastructure, and creating timber processing infrastructure.
5	Marketing and sales interaction	Marketing and sales interaction is implemented in joint marketing research, studying market requirements, organizing promotional events, searching for new partners, concluding commercial agreements that will expand the sales markets. This commercial cooperation is also more in demand by medium and small businesses. On the sales market, medium and small enterprises also do not withstand competition from large enterprises. In the conditions of seasonality of incoming orders, well-established monopoly in pricing and procurement of raw materials by large consumers, small enterprises are forced out of the industry. The segment of small and medium timber industry enterprises in a cluster association can expand and establish new types of products: forest chemistry, forest nurseries, round timber, antiseptics, etc.
6	Ecological interaction	Joint actions of cluster participants will make it possible to increase the scale of preservation and restoration of forest resources of the regions. Along with forest restoration, the priorities of the regional timber industry complex include great attention to monitoring and protecting forests from fires, rational use of natural resources, including through the development of advanced wood processing industries in the region, as well as creating new modern jobs in the industry. Other serious environmental problems are storage, recycling, utilization and disposal of solid industrial waste.
7	Social interaction	The level of social welfare in the timber industry complex of the region varies considerably depending on the employment in logging, woodworking, or pulp and paper industry. This difference is due to the location of production facilities. Logging enterprises are usually located in rural areas. Woodworking and pulp and paper industries are mainly situated near developed urban centers. The level of social security is also determined by the availability and condition of the housing stock, characteristics of education and healthcare objects and their personnel qualifications.
8	International interaction	External relations and integration with transnational companies will allow access to raw materials, financial resources, and new technologies. Another promising task is the growth of domestic exchange trading and its consolidation with world exchanges. In Russia, domestic exchange trading was opened just a few years ago. Exchange trading provides the following benefits: <ul style="list-style-type: none"> <li>• the principle of equal accessibility is implemented, which contributes to the development of competition;</li> <li>• formation of fair prices, reduction of chains of intermediaries, speed of transactions, removal of commercial and tax risks of the counterparty;</li> <li>• the region receives full transparency of the pricing process and the formation of the tax base.</li> </ul>

To quantify the forms of interaction, the method of analyzing hierarchies was applied. As a result, weighting coefficients were determined, the sum of which equaled to one (or 100 %) [10]. As a result of the analysis, the parity of two forms of interaction was obtained, which is explained by their high importance for the participants' activities: investment, marketing and sales (Fig. 3). At the same time, these forms have high financial risks due to the weak regulatory and legislative framework, which does not allow them to be introduced and developed [10, 14].

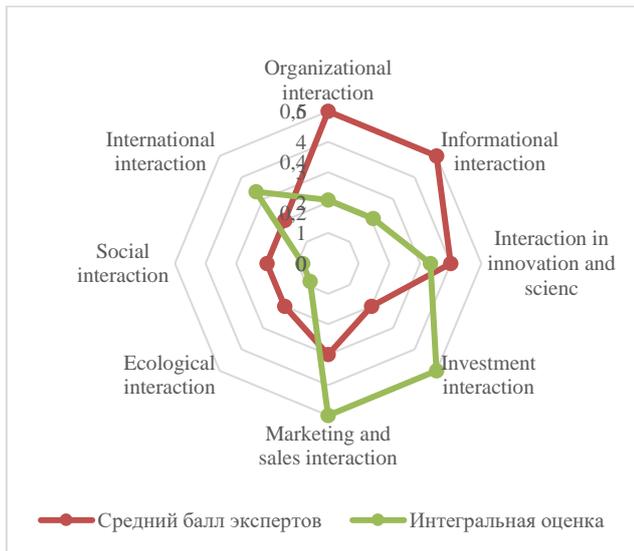


Fig. 4. Average expert assessment of the development of cluster members' forms of interaction

Thus, the opinions of experts, specialists and managers of enterprises of the timber industry complex of the regions, state bodies, and researchers of scientific institutions show that the clustering process of the complex can provide significant benefits and allow for the transition to an innovative type of development. However, today clustering processes are suspended, which requires new scientific and practical approaches to regulating the activities of clusters.

#### IV. CONCLUSION

Summarizing the results of the field study in the framework of the project, the following conclusions should be made:

1. The processes of cluster formation in the timber industry complex have slowed down, and the created clusters in the regions will experience problems with solving the main tasks of unification and implementation of joint projects.
2. The slowdown of clustering is due to the imperfection of the regulatory and legal framework, difficulties of its application for creating clusters in industries based on harvesting, extraction and further processing of natural resources.

3. Among the reasons for clustering decline is the lack of theoretical studies on cluster processes and a clear understanding among business entities and representatives of state bodies of the essence of the cluster. There is a problem of business and science disunity.
4. There is the lack of readiness of the majority of the subjects of the state, commercial and non-profit sectors to partnership and cooperation in the association.
5. There is no practical information about the processes of creation and functioning of associations of forest industry entities.

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