

Interaction model of forestry enterprises with society and environment

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Abstract. The article presents the results of a study on the interaction between timber enterprises, society, and the environment. Currently, a business's effectiveness is determined by its ability to resolve conflicts between social, environmental, and economic spheres. The purpose of this work was to obtain and substantiate an adequate model of enterprise interaction with society and the environment. The main method used was analysis. Several models were developed to describe the interaction of the studied objects. The text provides a justification for existing conflicts in the work of timber enterprises. The development of technological aspects is proposed as a direction to transition the forest industry to a qualitatively new level of functioning. Several proposed key transformations can contribute to the transition to a balanced interaction model between the enterprise and the environment. The model of interaction between timber enterprises, society, and the environment is developed, highlighting areas for both increase and decrease. The study concludes that a balanced policy, oriented towards achieving sustainable results over time, is necessary for timber enterprises to achieve long-term success. It is important to consider the interests of future generations and the surrounding society, as this approach will only become more important in the future.

1 Introduction

The development of enterprises is associated with the consideration of many different factors. They can be generalized into external and internal environment factors [1]. It is considered that the internal environment is significantly influenced by the organization, while the external environment is extremely difficult to adjust to the desires of the enterprise. External factors practically do not depend on individual business elements. The market, the government, suppliers, customers, the environment, etc., they all act in their own interests. That is why every enterprise has to adjust to them.

In modern conditions the most important role for the success of business is given to the ability to adapt to the current requirements of society (buyers). In this case, in addition to the previously standard requirements to products (quality, price, delivery time), obligations to organizations to conduct responsible business are added. At the same time, responsibility means not only observance of personnel rights, trade union requirements, etc., but also

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responsible attitude to the natural environment. In scientific literature and practice, this approach is called "sustainable development".

It means such a business development that would take into account the interests of future generations. Generalized and very roughly we can characterize this policy of enterprises as follows: achieving high economic performance with simultaneous attention to the natural environment (minimum possible damage) and society as a whole. It should be noted that organizations (to the greatest extent in highly developed countries) that have adopted the principles of sustainable development do receive significant preferences from customers. This is expressed either in a greater number of consumers of products, or in the possibility to increase prices for goods, arguing that increased costs for the introduction and implementation of sustainable development principles.

To a large extent, the peculiarities of interaction of enterprises with the environment and counterparties are determined by the specifics of business. Industry specifics impose both unique constraints and provide special opportunities in different areas of activity.

One of the industries with unique features of interaction with the external environment is the timber industry. This industry is characterized by the use of natural raw materials of plant origin - wood. This determines the possibility of restoration of used resources (reforestation). Also, the uniqueness of the industry is due to the direct impact on the carbon balance due to the cutting of forests - the main natural carbon sinks. Thus, timber enterprises are unique from the position of interaction with the environment.

The aspect of interaction between enterprises of the timber industry and society deserves special attention. In Russia there are conditions different from developed countries in terms of interaction with the population, staff, customers. This aspect was studied by the author's team in the context of sustainable business development.

This work is devoted to the development of the model of interaction of Russian timber enterprises with the environment in modern conditions.

2 Materials and Methods

The purpose of this paper is to investigate the existing features of interaction of timber enterprises with society and the environment, as well as to develop an optimal model of this interaction.

The study is based on the works of well-known authors in the field of development and functioning of timber enterprises, as well as interaction within complex systems. The main research method is analytical.

3 Results and Discussion

The modern timber industry complex consists of many specialized enterprises that carry out a variety of activities to transform wood raw materials into final products. At the same time, the structure of the industry has an established form, and new types of production appear quite rarely. The main innovation processes take place at the already established enterprises, improving the existing areas of activity and introducing new technological solutions. In Russia, the main areas of modernization for a long period of time for the most part were associated with the use of Western machinery and equipment. At the same time, there was often a need to customize such equipment for domestic realities and conditions. To a certain extent, this led to losses, downtime and risk situations of various kinds.

The activity of timber enterprises is associated with the resolution of a number of conflicts between the interests of business owners, society, the state and the natural environment. The general model of such conflict of interests is presented in Fig. 1.

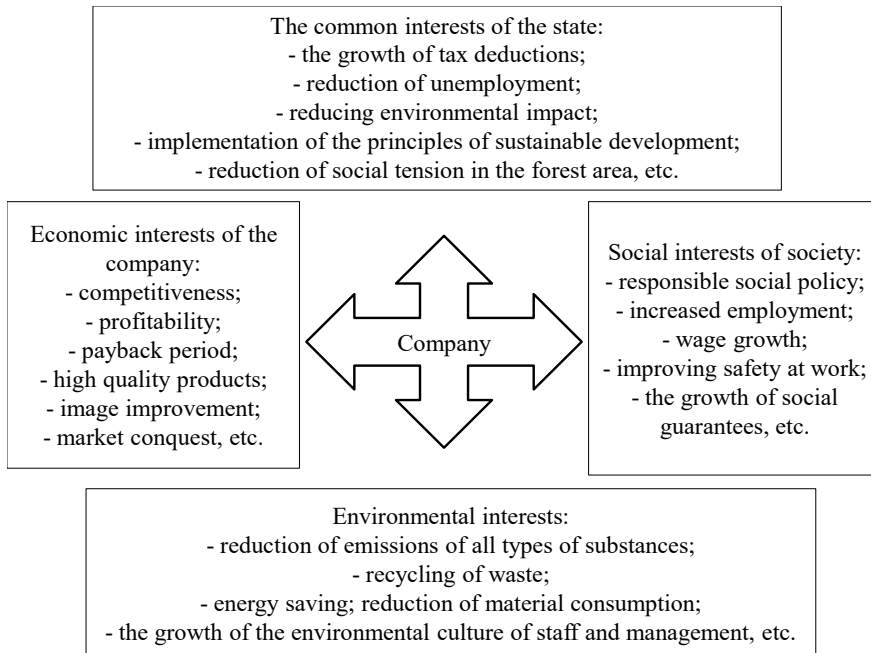


Fig. 1. Conflict model related to the activities of a forestry enterprise.

In the author's opinion, generalized interests of all parties noted in Fig. 1 can be defined as follows:

1. The state wants an increase in taxes from business, employment of all the unemployed and reduction of the impact of enterprises on nature. This should contribute to the reduction of various tensions and conflict situations in society.

2. The enterprise is primarily interested in achieving high economic performance. This is achieved by conquering markets, high margins, reducing personnel costs and participation in various social programs, sales volumes and product quality.

3. The society mainly needs protection from the harmful effects of enterprises and high wages for all its members. At the same time, maximum openness of business and its participation in various social programs will also be desirable.

4 The natural environment, as suggested by the researchers, should be protected from the harmful effects of forestry enterprises. This is achieved by reducing the volume of activities, maximizing the conservation of all natural resources used, developing environmental culture and commitment to environmental principles of all people without exception - both employees of enterprises and ordinary members of society.

Thus, each of the parties to this situation is interested in quite explainable and justified phenomena. However, they are often mutually exclusive. The most important of these conflicts are as follows:

1. Increase/decrease in production.
2. Decrease/increase in personnel costs.
3. Increase/decrease in consumption of all types of natural resources.
4. Increase/decrease in profits of enterprises.

Obviously, the main conflicts are associated with the economic, environmental and social aspects of forestry enterprises. Analyzing the practical experience of these structures, as well as the results of individual studies, the author's team came to the conclusion that the resolution of this conflict should be associated with another important aspect of the

enterprises' activities - technological. This approach will allow to take into account most of the possible aspects of the enterprise functioning.

The organization of implementation of appropriate technological solutions should adhere to a clear algorithm. Technological solutions should take into account all the key goals and objectives set by the management of the enterprise. Feedback should also be organized, allowing to assess the implementation of targets. In general, the model of the enterprise policy for achieving sustainable development (in all four spheres described above) is presented in Fig. 2.

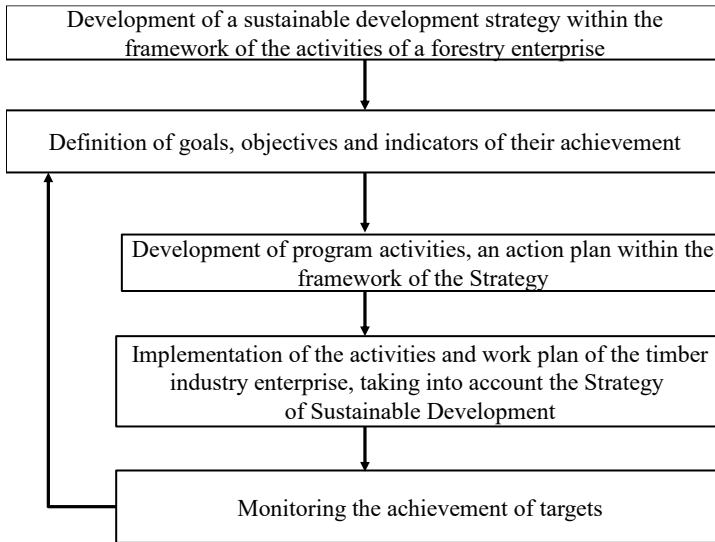


Fig. 2. A model of forestry enterprise actions to achieve sustainable development.

The final result of the enterprise's work in the direction of sustainability development should be the resolution of conflicts between environmental, economic, social and technological spheres of its functioning. At the same time, as already mentioned, it is technological transformations that should be the basis for this direction of work.

Technological transformations mentioned above require a detailed description. In the author's opinion, as well as taking into account the studies of a number of other authors, the introduced innovations should meet a number of requirements:

1. To have the minimum possible impact on the natural environment.
2. To be automated as much as possible.
3. To use closed-cycle technology or to be a part of such technology.
4. To be oriented at obtaining products of deep wood processing or to be one of the elements of obtaining raw materials used for production of deep wood processing products.
5. To use energy efficient technological solutions.
6. To provide the maximum possible (optimal) useful yield of products.
7. To rely on scientific research and development.

Naturally, some requirements may be partially fulfilled or unattainable. However, in most cases forestry enterprises should focus on them.

Regarding the immediate solutions, we can give an example of a number of transformations that can contribute to the transition to the model of balanced interaction between the enterprise and the environment:

1. Expanding the list of industries that use secondary wood resources left after sawmilling. Until recently, a significant part of large timber enterprises actively developed the production of fuel pellets and briquettes. Due to export restrictions, the production of these products is decreasing. Alternatives are required. Obvious solutions may be various pressed materials for construction purposes.

2. Active utilization of various forest residues. Currently, the problem of utilization of needles, branches, twigs and other resources left after logging has not been solved. The main obstacle is the considerable distance of transportation of raw materials (from the forest) for the production of low-margin products. One of the solutions is the primary preparation of raw materials in the forest area and transportation of semi-finished products to industrial sites. For even greater efficiency, such semi-finished products can be pressed and sealed to preserve properties and reduce volumes.

3. Use of closed-loop technologies. Established and modernized industrial plants should ensure minimal impact on nature. This applies not only to waste, but also to emissions and discharges. At the moment there are technological solutions that allow to practically completely eliminate the impact on nature from forestry enterprises. These are the directions of the future. In addition to maintaining the image of an environmentally responsible business, the enterprises will receive significant benefits from their implementation in the form of the absence of payments for water resources and fines for impact on nature.

There are other directions of modernization of timber enterprises in the studied section. However, it is the ones presented above that are presented by the author's team as the key ones. It should also be noted that to a large extent the direction of modernization depends on the specifics of a particular enterprise's activity - the type and volume of production, the quality of products received, etc.

Summarizing the results of the study, the authors obtained a model of interaction of timber enterprises with society and the environment (Fig. 3)

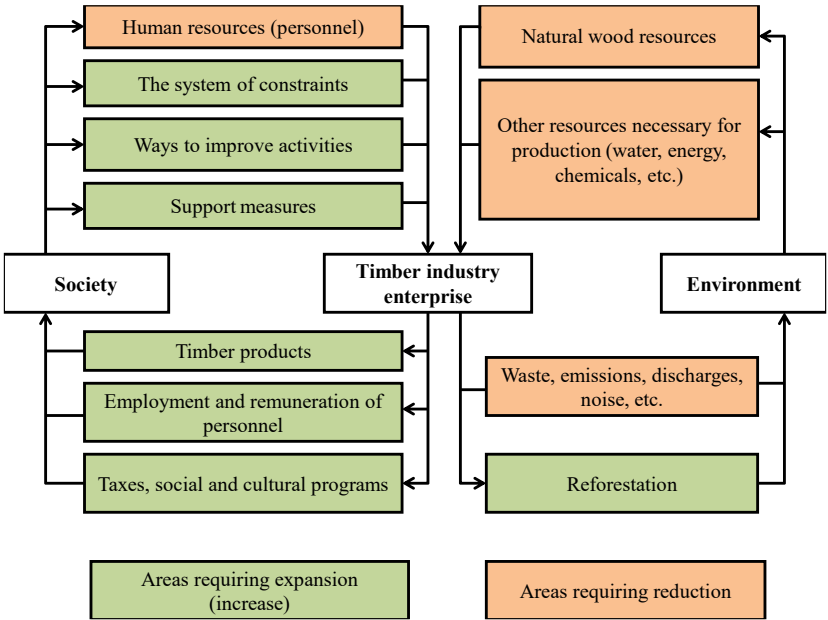


Fig. 3. Interaction model of forestry enterprises with society and environment.

The presented model demonstrates the ways/directions of interaction of three elements: society, forest enterprise and environment. At the same time, these structures should be considered broader than is generally accepted. For example, society is understood broader than just the population. It includes scientific results achieved by members of society (researchers) and legislative norms formed taking into account the opinion of citizens and many other things. Ultimately, society consists of a huge number of people with their unique achievements, capabilities and actions that influence all processes in the country.

It is important to note that within the key elements - society, timber enterprise, environment there are many processes that affect the objects studied in the paper. For example, the enterprise produces products using certain equipment with a number of characteristics, which determine the number of required personnel, the amount of impact on nature, and the final production efficiency (including economic).

All areas of interaction are divided into two groups - those that require increasing and those that require decreasing. In the author's opinion, this approach allows forestry enterprises to strive for sustainable development. The key prerequisites for explaining the categorization into one of these two groups are described in the paper above. Nevertheless, a number of clarifications regarding the individual areas of interaction are required.

The system of constraints is the restrictions that society, the market and the state impose on the activities of a forestry enterprise. Restrictions concern production, environmental, social and other aspects. Support measures are both state support in the form of subsidies, benefits, and support from the society that purchases products of timber enterprises. The support is conditioned by the efficiency and necessity for the society of the activity of specific timber enterprises. Taxes, social and cultural programs are those projects in which the enterprise participates on its own initiative, as well as compulsory payments and taxes transferred to society through deductions to budgets of various levels and further redistribution by the state.

Ultimately, the presented model is designed to provide all stakeholders in a balanced achievement of results. In other words, the work of a forestry enterprise should take into account the interests of all stakeholders and contribute to the resolution of existing conflicts.

4 Conclusion

As a result of the research conducted, conflicts between different parties regarding various aspects of the functioning of timber enterprises have been identified. There are different approaches to resolving these conflicts and some researchers sometimes propose radical ways of solving them. In some cases it may be a question of complete cessation of industrial production. However, in the author's opinion, a more constructive approach should be followed. The development of domestic enterprises should follow the path chosen by most developed countries - finding a balance between the economy, ecology and social sphere. As a result of the study it is shown that the most correct answer to the way out of the current situation can be technological transformation. The paper shows the main requirements for such transformations.

Given the complexity and scope of the task, it cannot be solved in a short time. However, the work in this direction is already being actively carried out both by the enterprises themselves and by the state. Sustainable development is one of the priorities designated at the federal level. Enterprises, on their part, are adjusting their activities to the changing requirements of society and markets. In the end, a reasonable, balanced policy, oriented not to achieve high results in a short time, but taking into account the interests of future generations and the surrounding society, is what will allow forest enterprises to achieve high results.

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