

Timber industry and forest environmental resources of the North-West Federal District of Russia

Marina Perekopskaya^{1,*} and Yuri Alekseev¹

¹ National Research Moscow State University of Civil Engineering, 129337 Moscow Yaroslavl highway 26, Russia

Abstract. The territories of the timber industry complex of the constituent entities of the Russian Federation that are part of the North-West Federal District are considered. A number of regions in the North-West Federal District possess a significant forest resource base and a system of logging and woodworking centers, which is a prerequisite for the intensive development of the timber industry complex and its territories. However, at present, the wood resource potential of these constituent entities of the Russian Federation and the capabilities of the timber industry complex of the North-West Federal District are not being used rationally and are being subject to extracting the current profits by renters of forest areas, which causes stagnation of wood processing companies and places of their locations. In order to search for potential field of development of territories belonging to the timber industry complex of the North-West Federal District, urban planning aspects of the modern use of these territories have been studied, key urban-planning and resource problems requiring a scientifically based solution have been identified and structured.

1.2 Formatting the text

Rational placement of timber industry enterprises and the development of its territories depends on a large number of interrelated factors, among which the qualitative and quantitative characteristics of wood raw materials, the possibility of organizing consistent and complex processing of raw materials, infrastructure of production, transport accessibility and proximity of forest areas, the geography of consumption of products can be found.

The resource potential of the forest is a basic factor in the activity of the timber industry complex (hereinafter referred to as LPC), determining the efficiency and sustainability of the complex itself [10]. This natural resource is renewable, but the process of reforestation lasts long. In addition, forests perform invaluable functions of formation and protection of environment [12].

Therefore, the vast majority of developed countries focus on the export of deeply processed forest products and their major aim is also the cost reduction of raw materials

* Corresponding author: mappi25@yandex.ru

[14]. At the same time, the existing model of the activity of the domestic forestry complex is characterized in general by the exchange of raw materials for products of the processing industry for consumer and industrial purposes [6], which does not correspond to modern ideas about the rational use of natural resources and sustainable development.

The all-Russian trend of wasteful use of forest resources is also characteristic of forest regions of the North-West Federal District (hereinafter - the NWFD). On this basis, in the framework of this article, the main urban-planning aspects of the modern use of their territories are considered and the resource- urban-planning problems of productive forests development requiring a science-based solution, as well as their causes, are identified.

An important factor in the location of the timber industry complex is the availability of wood raw materials, the quantitative and qualitative characteristics of which meet the needs of timber processing industries.

The forests of the regions of the NWFD are mainly represented by coniferous stands. They are distinguished by low productivity and a smaller variety of tree species (pine, spruce, fir, birch, aspen, alder, willow) compared to forests in the southern and western parts of the forest zone of the European part of Russia. The structure of forests located on the lands of the forest fund, the basic data on the forest cover of the territories of the NWFD, the stock of wood are shown in Figure 1.

From the presented data [1-9], it is clear that forests occupy from 18 to 73% of the territory (NWFD regions) under consideration. The greatest forest coverage in relation to land area (72%) is characteristic of the Republic of Komi and the Arkhangelsk region. These regions also possess a significant raw material stock of wood. In general, the regions of the NWFD account for 10% of the allocated logging fund of Russia.

Despite the impressive reserves of wood resources, the average level of development of the annual allowable cutting area is 62%. This is due to the inaccessibility of large forests, the mismatch of wood raw materials of individual forest areas with the needs of wood processing industries in terms of quality characteristics.

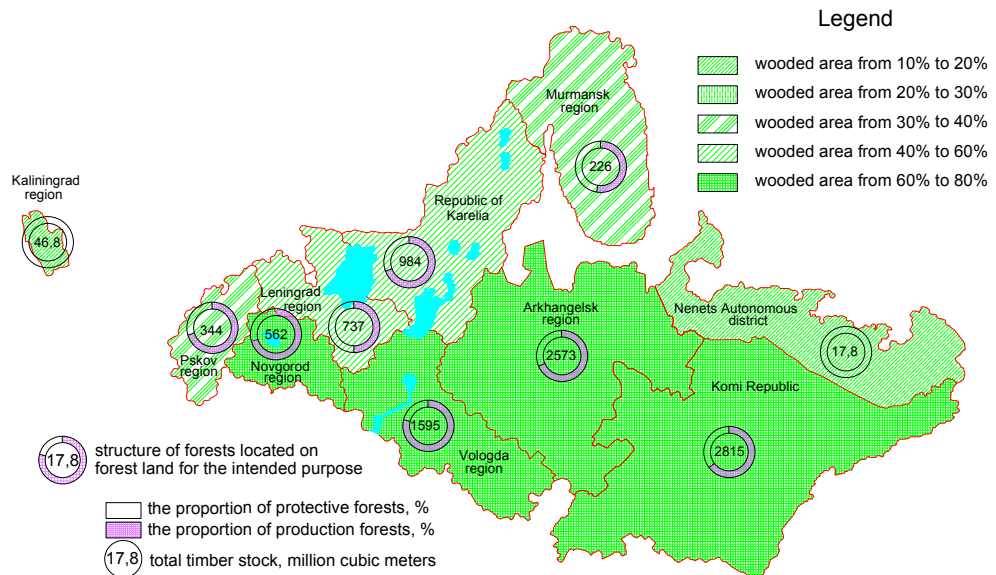


Fig. 1. Forest structure, forest cover of the territory and wood supply in the NWFD regions.

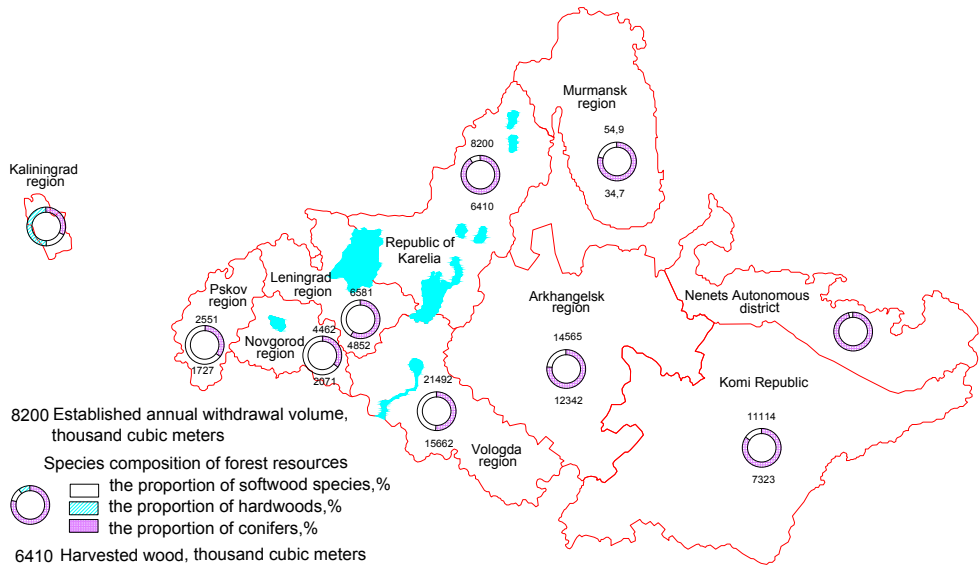


Fig. 2. Species composition of forest resources and data on harvesting volumes as of January 1, 2018.

Comparing the indicators of the NWFD regions presented in Figure 2, it should be noted that the forest fund is most intensively used in the Vologda Oblast, the Republic of Karelia and the Arkhangelsk region. Analyzing the indicators of the use of the forest fund of the NWFD regions in dynamics it is necessary to note their steady increase during the last decade.

The geographical position of the North-West Federal District relative to the internal and external markets for timber and paper products, significant forest resources, wood processing capacities being present on its territory, determined the production specialization of the Republic of Karelia, the Komi Republic, the Arkhangelsk, Vologda, Leningrad, Novgorod and Pskov Regions in logging, woodworking and wood processing activities [12]. For example, the branches of the timber industry complex in the Republic of Karelia (43.7%), the Arkhangelsk region (46%) constitute the lion share in the structure of regional industrial production.

In the territorial division of labor, most regions of the NWFD act primarily as major suppliers of forest products (Figure 3).

The data presented in Figure 3 confirm the predominance of the logging and woodworking industries (62.3%) in the structure of the timber industry complex of the NWFD regions. The share of deep chemical processing is only 18% (in Finland –72, Sweden - 75%) [18]. Despite the significant resource base, the situation in the considered regions of the NWFD is characterized by a high degree of tension and stagnation of wood processing.

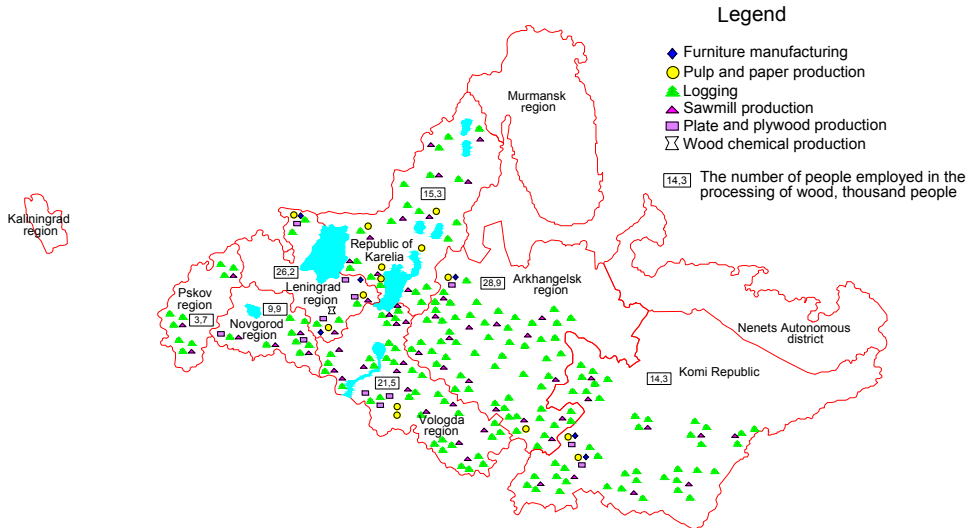


Fig. 3. Specialization in forest regions of the NWFD.

Wood processing enterprises are unevenly distributed in the NWFD; therefore, there is a tendency to supply sawn timber from adjacent constituent entities of the Russian Federation. For example, pulpwood and sawn timber of logging enterprises of the Pskov region are sent mainly to the processing enterprises of the Leningrad and Novgorod regions, as well as to the Republic of Karelia [6]. Part of the harvested pulpwood in the Republic of Karelia is supplied to the Arkhangelsk sawmill enterprises, and the balance wood harvested in the Onega district of the Arkhangelsk region is supplied to the wood processing enterprises in the Republic of Karelia of the Segezha Group (Figure 4). Small and medium enterprises of the Vologda region supply pulpwood to processing enterprises of the Arkhangelsk region.

Timber industry holding companies, the largest of which are Segezha Group (Republic of Karelia, Vologda region), GC "Titan" (Arkhangelsk region), Group "Ilim" (Leningrad and Arkhangelsk regions), JSC "Mondi Syktyvkar LPK" (Komi Republic), The ULK Group of Companies (Arkhangelsk Region) is focused both on the development of raw materials of their regions and on meeting the gradually increasing demand for wood at the expense of raw materials bases of neighboring regions. The listed structures incorporate logging enterprises that harvest up to 70% of wood in the territories of the constituent entities of the Russian Federation under consideration.

In the Komi Republic, the main volume of logging falls on a fairly limited circle of enterprises, namely, the three largest ones: Mondi Syktyvkar Timber Processing Complex JSC (about 56.2% of timber harvesting, including contractors working on its lease), Luzales LLC (14, 9%) and LokchimLesProm LLC (7.3%) [1]. At the same time, about 85% of the raw wood harvested in the region is processed by enterprises of the republic [1].

There are significant differences in the use of forest resources of individual territories of the constituent entities of the NWFD under consideration. Thus, in the Arkhangelsk region, the main logging activities are carried out in areas adjacent to transport routes and in areas close to the centers of mechanical wood working and pulp and paper industry (Figure 4).

The main center of woodworking is located in Arkhangelsk (indicated by explication number 1 in figure 4), and the center of pulp and paper industry is the town of Novodvinsk (indicated by explication number 2 in figure 4), where the largest enterprises of the region are concentrated. The share of these wood processing centers accounts for up to 60% of the total processing industry of the region. The Arkhangelsk and Novodvinsk centers are

characterized by binding to the water supply routes for wood processing, which was historically due to the presence of large reserves of forest in coastal forest districts and the low cost of transporting raw materials along large rivers. Partially, raw materials are supplied to these centers from plots located in the west of the region by rail, and by road within the effective delivery arm. The wood processing centers in Arkhangelsk and Novodvinsk were provided with labor resources, energy infrastructure and port facilities for exporting products, but due to active logging in previous periods, especially in the 1940-50s, the forest resources in the districts adjacent to these centers were depleted, especially in conifers, which creates certain restrictions for the further development of processing capacity.

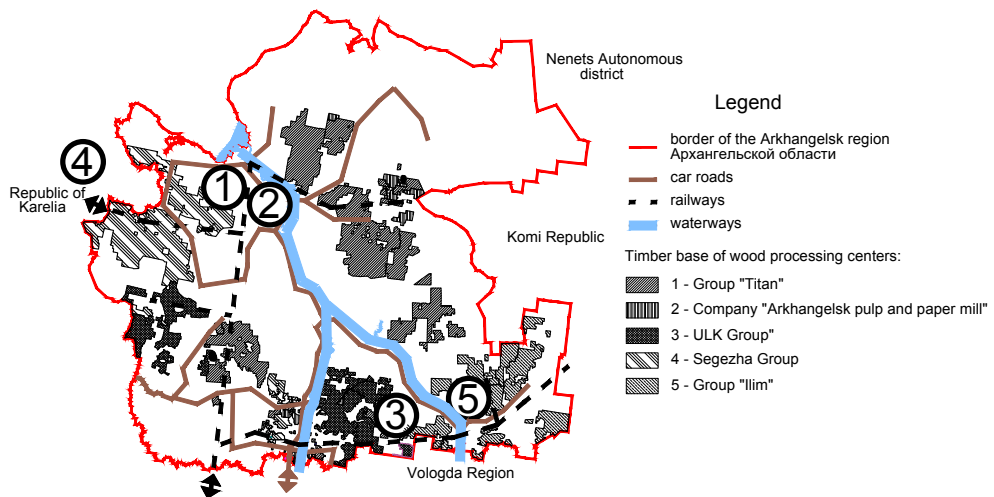


Fig. 4. Wood processing centers and forest resources of the Arkhangelsk region.

The second in importance is the center of the pulp and paper industry, indicated by explication number 5 in Figure 4, which accounts for up to 35% of the total regional processing volume. This timber processing center is close to the raw material base, is supplied with wood raw material by waterway, by rail and by road, provided with labor resources, energy infrastructure.

Its share of the third most important processing complex, designated explication number 3 in Figure 4, accounts for about 15% of the regional volume of processing. The sawmills produced by the ULK Group are close to the source of raw materials and are supplied with wood raw materials by rail and road [3].

For the established areas of logging in the NWFD, there is a high concentration of settlements, in the adjacent territory of which forest areas are located. In the most developed parts of the NWFD logging areas, the remnants of the timber base are made up of scattered forest areas and low-productive forest areas that require large expenditures for their development. At the same time, vast areas of operational forests are not involved in the regime of rational forest exploitation due to the disproportionate development of the settlement system and transport communications.

The depletion of reserves in the developed parts of operational forests is largely due to the peculiarities of the functioning of the forest complex of Russia.

In general, the development of the timber industry complex located in the North-West Federal District as well as the development of its territories should correspond to the specifics of the processes of logging, reforestation and timber processing, the functional and technological urban-planning requirements should be observed.

Consideration of the specifics of these processes should be consistent with the objectives of increasing the volume of reuse of developed forest areas, continuous forest use, the possibility of restoring the forest sector of the economy and the introduction of integrated and waste-free processing of wood.

Fulfillment of functional and technological requirements should be focused on preserving the existing system of logging and woodworking centers, settlement systems and their further development.

References

1. *Forest plan of the Komi Republic* (2018)
2. *Forest plan of the Arkhangelsk region* (2018)
3. *Forest plan of the Republic of Karelia* (2018)
4. *Forest plan of the Vologda region* (2018)
5. *Forest plan of the Novgorod region* (2018)
6. *Forest plan of the Pskov Region* (2018)
7. *Forest Plan of the Nenets autonomous district* (2018)
8. *Forest plan of the Kaliningrad region* (2018)
9. *Forest plan of the Leningrad region* (2018)
10. L. Mayorova *Rational use of wood raw materials* (2011)
11. N. Samoylova *Specificity and features of the registration of disturbed territories* (2016)
12. *Development Strategy for the Forestry Complex of the Russian Federation* (2018)
13. *Territorial planning scheme of the Arkhangelsk region* (2012).
14. M.Dennis, PCOE, **7** (1990).