



Development of the Recycling Sector and Its Marketing Support as a Factor in the Sustainable Development of the Forestry Sector of the Economy

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Abstract

Nowadays, the direction associated with the development of the forest sector of the economy of the Russian Federation is relevant. Using wood processing, it is possible to manufacture various products and materials that can be used in industry and everyday life. The order and rationalization of the use of natural resources are ensured through the processing of wood waste. The facts presented in this research testify to the availability of business development opportunities in the recycling industry. There is a need to create a system related to the use of recycled raw wood materials. This system is a direction that ensures the rational use and development of the forest sector of the economy. The problems of collecting and processing recycled wood affect the furniture and woodworking industries and harm the environment. In this regard, it is necessary to give particular attention to the issues considered in the research. Russian and foreign enterprises manufacture equipment, develop and introduce advanced technologies related to the utilization and processing of wood waste, the production and use of biological fuel, and the production of fuel pellets, granules, and other products. By implementing waste-free production, enterprises increase profitability and environmental friendliness. Despite the development and widespread use of technologies for re-involving waste back into the production process, for the most part, there are no legal acts that regulate these issues. In this regard, state marketing is necessary to implement the considered direction at this stage. In this type of activity, state authorities and management structures at all levels are represented as subjects; citizens, public and private enterprises, and social groups are represented as objects. The authors also formulate measures that will help implement effective interaction

between state authorities, various departments, and public organizations in the area of wood recycling.

Keywords

Forest sector · Timber · Recycling · Waste · Disposal · Circular economy · Public marketing · Technology

JEL Codes

H8 · I0

1 Introduction

Nowadays, the topic related to the development of the Russian forest complex is very relevant. Issues of development of this economy sector are under special control in the Federation Council. Thus, in November 2020, the Decree “On measures to improve the state policy in the area of forestry” was adopted, which affected many areas of the country’s forestry sector (Council of Federation of the Federal Assembly of the Russian Federation, 2020).

The Russian Federation has the most significant forest reserves, almost a quarter of the world’s reserves. In Russia, forests are a colossal resource base. However, only half of all wood waste, and in Siberia, which is the most “forest” region of Russia, about 35% of wood raw materials, are used. The rest of the production waste is thrown away without any attempt to recycle it. Practically, wood greens, shavings, sawdust, and bark are not used in processing. Thus, the data indicate great opportunities for the development of entrepreneurial structures in the recycling sector.

Trees are renewable natural resources. However, it takes decades to restore forest plantations fully. This affects the climate and reduces the total amount of available resources. Wood processing includes manufacturing basic products and

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processing waste generated during production (Muravieva, 2019). For the rational use of the wood resources of the planet, it is necessary to use most of the remnants of production, which make up about half of all incoming raw materials.

Waste wood is a valuable resource generated in large volumes (depending on the degree of quality); it can be used as a secondary raw material or energy source. Rising disposal costs and growing environmental awareness mean that the recycling of old wood is becoming increasingly important.

One of the promising directions in developing the forestry sector of the economy is the reuse of wood. The current realities speak of the need to develop recycling, a circular economy, and maximize waste recycling to ensure efficient operation. This has to do not only with the lack of wood resources but also with drawing attention to the environment.

The problems of forming a system associated with the use of secondary raw wood materials, which is one of the directions for the rational use and development of the forest sector of the Russian economy, are very relevant. This is due to the fact that the issues of collecting and processing recycled wood relate to the woodworking, furniture industry, and ecology (Muravieva et al., 2016). Therefore, more attention should be paid to addressing these issues. This topic needs to be considered systemically, in complex.

Statistics for 2019 show that more than 5924 thousand tons of waste were generated in Russia during wood processing, and about 70% was disposed of. Different types of disposals were included here, including the production of wood pellets. However, most of the waste was simply incinerated. Simultaneously, nothing is noted about the recycling of wood and its subsequent launch into the processes of the circular economy, recycling and the manufacture of high-tech goods from recycled materials, and the production of furniture.

In 2019, waste from the furniture industry amounted to approximately 185.5 thousand tons, of which only 21% was recycled (the percentage is lower because scraps of tiles and furniture waste are not burned).

Data from European countries indicate that the main supplier of recycled wood is not the timber industry at all. For example, in Germany, the main source is the road construction complex (27%). Shopping malls and wooden packaging are in second place (22%). Municipal waste ranks third (20%). Woodworking production is in fourth place (14%). Import of wood is about 10%. Small-scale supplies of secondary wood resources provide the remaining 7%. The bulk of this waste is recycled.

There are also no data on the percentage and volume of waste in Russia that occur in various industries. However, even without this data, it is apparent that significant volumes of dilapidated furniture, building fixtures, wooden frames,

and doors appear only when the renovation program is carried out.

A particular issue is the number of forest resources that can be saved by using recycled wood as a raw material. Calculations on the possibility of processing by only two Kronospan enterprises in Elektrogorsk and Yegorievsk demonstrated that approximately 500 thousand cubic meters of wood could be saved. It should also be considered that many enterprises regularly face problems with the supply of raw materials, which means that recycling could well help to solve this problem.

2 Materials and Methods

Speaking about the formation of the recycling system and the development of a circular economy in the forest sector, we should consider the experience of single but already functioning enterprises.

European business entities were the first ones to talk about the possibility of using secondary raw materials. This idea was developed from a purely economic point of view. The search for cheaper raw materials came to the fore. This direction has been successfully implemented in the enterprises of France, Luxembourg, and Belgium. In Russia, there are all prerequisites for introducing such a practice. Thus, in the Moscow Region, the average cost of raw materials in terms of wood per cubic meter of chipboard is about 22 euros, in Bashkiria—about 28 euros. The cost of 1 m³ chipboard in European countries is less than 12 euros. Therefore, it will be very relevant for Russia to resolve the issue of reducing the cost of wood-based panels.

The main suppliers of secondary wood resources for processing enterprises are recycling companies (operators for handling municipal solid waste), construction organizations, woodworking plants, and municipal landfills. Thus, the LLC “Kronospan” received a license for the collection, transportation, further processing, and subsequent disposal of waste, representing the fourth hazard class. Waste in the form of metal, glass, and film is often found in recycled wood materials; it is transferred to enterprises that recycle these materials.

When launching a program for the collection and processing of recycled wood in the Moscow Region, the enterprises of LLC “Kronospan” tried to assess the prospects of the project without resorting to government support. Approximately 300 tons of waste are collected at the Yegorievsk site per day. To achieve this goal, the organization lacks 1700 tons. According to estimates, two enterprises of LLC “Kronospan” near Moscow are quite possible to process more than 1 million tons of recycled wood. Thus, it becomes possible to make a complete transition to its use as a raw material resource in chipboard production.

The authors think that the idea of using resources for reuse in the production process is beginning to be implemented in Russia. Thus, in 2019, in addition to LLC “Kronospan,” IKEA also started to accept old furniture for recycling, planning to organize a cyclical service, thereby increasing customer loyalty to its product line, optimizing furniture production, and finding wider use of biofuels. Other companies are ready to support this initiative, including large plate manufacturers like Kastamonu, Egger, and UPG.

The Egger group in Germany, the UK, and Romania has its Timberpak enterprises engaged in procuring secondary raw materials. The used wood is prepared for the production of chipboard. Also, the company’s plants generate large volumes of their waste and by-products that can be used to produce wood-based panels and generate thermal and environmentally friendly electricity.

The first experience of Kronospan and IKEA shows positive results, which indicates the relevance of the development of the recycling of wood resources and the formation of a waste collection system. However, in collecting and processing recycled wood, these enterprises face factors that hinder the development of recycling. To change the situation, practicing organizations have ideas about taking the necessary measures.

Proposals related to changing individual items and the existing sanitary rules and norms, supplementing the Federal law “On production and consumption wastes” (Russian Federation, 1998) in terms of listing those wood products that can be processed and should not end up in landfills, they should be returned as a new product to end-users. Also, as part of the development of the considered direction, it is possible to include the recycling fee in the duty on imported products.

Implementing a pilot project to collect used furniture from the population of St. Petersburg, IKEA analyzed the current legislation governing waste management. The authors also analyzed all risks and the existing infrastructure in Russia, specifically in large metropolitan areas. As a result, it was noted that many issues are devoted to the processing of technical wood by legal entities. However, problems related to the collection of recycled wood and old furniture by the population are poorly reflected and are practically not regulated.

In turn, Russian and foreign enterprises produce equipment and develop and introduce advanced technologies related to the utilization and processing of wood waste, the production and use of biological fuel, and the production of fuel pellets, granules, and other products. By implementing waste-free production, enterprises increase profitability and environmental friendliness (Goncharenko et al., 2018).

Manufacturers and suppliers demonstrate the following categories of equipment:

- Installations and lines for the production of wood fuel in granules, pellets, and briquettes; screw, mechanical, electrical, and hydraulic devices for chopping firewood, briquette molds, granulators for the production of pellets, and lines for the production of fuel briquettes;
- Machines that utilize wood waste generated during the production process; wood chipping equipment, rotary and drum crushers, woodchip production plants, shredders, and wood waste shredders;
- A technique that converts wood fuel into energy; technologies and lines for the production of biofuels from wood; automatic and semi-automatic pellet boilers; mobile, stationary, and modular pellet boilers.

Additionally, for example, in Siberia, a unique technology for processing wood waste is being introduced. The development was based on the ability of some types of fungi to destruct wood (Dementieva, 2021). This requires fresh or stale sawdust, water, and a few additives of mineral origin to help develop the mycelium at the initial stage. Mushroom growth is very fast. Penetrating into all holes, they eventually cover the entire substrate. Biohumus (compost) is formed a few months later. This technology was developed by scientists over 20 years ago. However, it is currently in demand. This is due to the fact that from 2022 it is planned to introduce a ban on the open burning of waste generated during sawmilling in Russia. It will also be forbidden to throw them out. Simultaneously, the embargo on the export of round wood will come into force, which should be processed in the country, and, consequently, the volume of waste will also increase. Enterprises solve this problem in different ways. Some convert their boilers to biofuels; others produce briquettes and pellets or use wood chips to produce cellulose or turpentine spirits.

In the light of the decarbonization of the economy, the considered technology has a very attractive prospect, which consists of the following:

- Treeless spaces are decreasing because the landfill for storing sawdust is huge areas on which nothing can grow; with the formation of humus, even without organizing its export, the territory quickly overgrows with forest;
- Sawdust, during normal decay for many years, emits carbon dioxide into the atmosphere and often smolders, emitting a huge amount of carcinogenic organic compounds and carbon monoxide; when processing these wastes with mushrooms, such options are excluded;
- The final product received can be used in reforestation.

Processing of wood waste based on the use of innovative technologies in woodworking and the use of sawdust is a

profitable and promising area for business. This industry can ensure close interaction between large industrial forest complexes with medium and small representatives of business structures, making recycling one of the most effective and promising areas of activity.

However, business entities that belong to small and medium-sized businesses have no opportunity to use most waste processing technologies due to their high cost or legislative procedures that are associated with certain difficulties.

Thus, according to the calculations of LLC “Kronospan,” to install a recycling production line with a capacity of 100–200 t/h, it is required to invest approximately 26.160 thousand euros, including the cost of vehicles, the purchase of containers for the collection and transportation of waste, mobile crushing machines, equipment for cleaning secondary wood, and the processing plant. Thus, 1 million tons of waste per year can be processed by four installations, which means that the total cost of investments can be more than 1 million euros.

In this regard, a significant increase in demand for wood waste processing from business structures can be provided by state support. Currently, most enterprises in Russia often have neither economic incentive to use the practice of recycling nor infrastructural opportunities for the collection and processing of waste. The lack of legal acts regulating the considered issues also hinders the development and widespread use of wood recycling technologies.

Three years ago, it was already proposed to draw up a roadmap that would help increase the level of wood waste collection, thereby providing recycled pulp and paper enterprises and organizations engaged in deep wood processing.

The following suggestions were made:

- Mandatory separating collection of wood materials and wood waste by state, municipal organizations, and institutions with state participation;
- Development of incentive and incentive measures for representatives of small and medium-sized businesses that collect, sort, and transport wood waste;
- Drawing up criteria and establishing a procedure for introducing temporary restrictions on the export of unprocessed wood based on the use of quotas or the application of export duties;
- Increasing the share of wood raw materials collected by various organizations and households that collect and carry out primary processing of secondary wood resources;
- Organization of centers for collecting wood waste in places of large garbage dumps and in the areas where waste processing plants operate, with the further direction

of this waste to the relevant enterprises involved in the processing of wood material.

Except for actions to create a system of legal acts that regulate this issue, a separate section must be included in the Strategy for the Development of the Forest Complex until 2030, which will deal with the processing of secondary raw wood materials and reflect specific actions to address current problems (Government of the Russian Federation, 2021). Local government authorities, organizations implementing the “garbage program,” and enterprises for the production of boards and shopping centers must be actively involved in drafting regulatory documents related to the formation of a system for the collection and supply of recycled wood for processing.

State marketing is necessary to implement the considered direction at this stage.

Acting as a marketing subject, state structures, along with the seller and consumer, play a special role in the market. They do not provide direct satisfaction of consumer needs but regulate these processes and help achieve a compromise of interests with minimal social costs. This is because economic and social processes are considered in a single vein and in close interaction with each other. Unlike a single company, the state is also interested in the efficient functioning of the economy (Kamalova, 2015).

Marketing research determines future guidelines that allow determining the goals and objectives of economic and social public policy. This information will help to develop effective management decisions, which, in turn, will consider the nature of the development of processes and help to prevent or reduce the negative consequences of crises in the economic and social sectors. Particular attention should be paid to the importance of the media, which act as an active participant, influencing the consciousness of the population and the economic situation in the market. Stories and materials that they present can, in a short time, lead to a certain stir or provoke social tension. However, journalists admit that information is often biased and preconceived. Considering these points, the information activity of public authorities must be aimed at providing truthful and timely data.

In state marketing, state authorities and management structures at all levels are represented as subjects; citizens, state and private enterprises, and social groups are represented as objects. Goods are public services and social development programs. The purpose of marketing is to implement and distribute them. A high degree of monopolization of all economic processes, and the dominant influence of legal norms, which are established by the state itself, determine the characteristics of the market.

3 Results

State policy that reflects issues related to waste management must focus on reducing their generation and increasing the share of return to the production process. To maintain this policy, the following actions should be performed:

- To focus on the prohibition of wood waste disposal, including waste of fourth and fifth classes, which include waste from furniture production and the manufacture of fiberboard, chipboard, and wooden packaging;
- To introduce them into the composition of industrial waste, which contains useful components, and to prohibit their disposal (Government of the Russian Federation, 2017);
- To clarify the requirements for groups of the same type of waste;
- To establish that such waste should be treated and disposed of, including through the production of fuel chips.

Given the proposals presented, incentives will be created for the separate collection of wood waste and the development of infrastructure necessary for its future recycling from business entities.

The existing legislation does not define a general approach regarding the following point: further processing based on the grinding of wood waste is the utilization or neutralization of this waste. This circumstance leads to the formation of an additional administrative barrier in the development of technologies and the work of the processing companies.

Nowadays, only representatives of large businesses have access to the development of this area. The forestry sector must involve other partners involved in the recycling process. This, it is necessary to perform the following next steps:

- To eliminate technologies associated with the disposal of wood waste, which does not have a significant impact on the environment;
- To adjust the list of objects of the Federal State Environmental Expertise in the area of technical documentation schemes for new equipment and technology in paragraph 5, article 11, Federal law “On ecological expertise” (No. 174-FZ) (Russian Federation, 1995).

The use of state marketing will help remove the existing excessive administrative barriers that hinder the development of the wood waste processing industry; this will also attract many interested economic entities who want to develop a recycling business.

It is also necessary to pay attention to issues related to the regulation of licensing activities in the area of wood waste

management because financial costs represent a significant barrier today:

- At this stage, to promote the development of wood waste processing, it is necessary to turn to the practice of 2012–2016, when waste management activities were carried out without obtaining a license for all wood waste;
- Elimination of additional financial costs associated with licensing issues for waste accumulator enterprises and organizations engaged in transportation, processing, and disposal.

Nowadays, for the development of the considered industry, one of the timeliest decisions is the formation of a common information system that allows providing potential consumers, who are waste producers, with reliable and up-to-date information about companies that specialize in the area of recycling or rather in their locations, requirements to accepted waste, their minimum processing volumes, and price. Waste aggregation centers could help solve issues related to the accumulation and transportation of waste from enterprises that produce a small amount of waste daily, i.e., up to 500 kg.

The development of interdepartmental and government-supported projects related to introducing a circular economy into production will be a timely event. This will help implement effective interaction between government authorities, various departments, and public organizations in the area of wood recycling.

In addition to the above, it is necessary to create mechanisms to stimulate investment in the area of technological modernization and development of waste processing infrastructure, the implementation of information work by government agencies regarding reasonable production, and reasonable consumption.

4 Conclusion

The system of using secondary raw wood materials is a promising direction for developing the forestry sector of the economy and for humanity as a whole. It solves economic issues and simultaneously removes several important issues associated with the provision of enterprises with raw materials and waste disposal. Most importantly, it also solves many environmental problems.

Nowadays, only representatives of large businesses have access to the development of this area, and it is important for the forestry sector to involve other partners involved in the recycling process. The use of state marketing will help in removing the existing excessive administrative barriers that

hinder the development of the wood waste processing industry, as well as in attracting a large number of interested economic entities who want to develop a recycling business.

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