Economic and legal challenges in the development of forestry in Russia and ways to address them

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Abstract: Market relations in Russian forestry started in 1993. That year, new forest law was adopted. This law enshrined the right of the state government to forests. Later on, the forest laws were adopted in 1997 and 2006 and left forests in state ownership. Despite the frequent change of forest laws, forestry faces many challenges: economic, social and environmental. Ways to address these challenges could be found on the basis of analysis and evaluation of the forestry development.

1. Introduction
Despite the transition from planned to market economy going on since 1993, state ownership on forests in Russia remains, producing a number of problems.

From an economic point of view, the main problem lies in the discrepancy between the forest potential of the vast areas of 795 million hectares of forest-covered lands with a timber stock of more than 83 billion m³ (24% of the world’s stock) and the low level of its use and low profitability of the forest sector.

From the legal point of view, the main problem is existence of a solitary federal forest law, which does not take into account regional differences and regulates forest relations according to one common pattern.

The trend towards a steady increase in the consumption of wood and paper products in the world gives hope for a positive solution to this problem. However, the solution does not seem feasible within the framework of existing economic system and forest legislation.

2. Methods
The study used methods of sectoral analysis, routine and time-line analysis, and trend planning. It refers to official statistical sources and earlier results of scientific research in this area.

3. Experimental part
Any scientific research on economic topics is fraught with difficulties in setting up experiments. For this reason, in our work we have restricted ourselves to the use of an economic and mathematical method of extrapolation. The factual data of the Federal Forestry Agency for a number of years were taken as the basis. The amount of data was necessary and representative.

The logic of the study is structured as follows: first, the macroeconomic indicators of the forest sector are considered; then an analysis is made and a forecast regarding the development of the main types of forestry activities is carried out. In particular, revenues from and expenditures on forest
management, rental relations, volumes of forest restoration, data on forest fires, foci of pests and diseases, and illegal logging (timber harvesting, wood cutting) were analyzed.

Analysis of the economic condition of the forest sector shows that its share in the volume of GDP approximately amounts to 1.0%.

By the structure, volume and efficiency of timber exports, Russia is significantly inferior to developed countries. Earnings from the export of wood and paper products exceed 9 billion US dollars, which amounts to 3.4% of the total exports.

The main disadvantage of Russian forest exports is the low level of deep wood processing. The main reason is the presence of various risks hindering the development of private entrepreneurship. Exports of roundwood and sawn timber account for about 50% of the total exports of the forest sector. This trend is popular because it has the least number of risks and is developed in the country [1].

The criterion of the effectiveness of the state management of state forests from the economic point of view is the profitability of forests, while from a legal point of view it is ensuring with legal measures the balance of economic, environmental and social interests of various parties. Russia's forestry is going through a developmental stage when forest policy and forest legislation cause a major impact on forestry. Many state decisions are made without taking into account their economic consequences. Such decisions include the binding pricing of forest resources. The desire of the state to remain the major player in forestry restrains the development of entrepreneurship. For example, the procedure for setting prices for forest resources remains unchanged since the 1950s. The Russian government prescriptively sets the value of standing timber for all tree species throughout the country.

Thus, this stage of the development of forestry could be characterized as a transfer from a planned economy to a market one.

For a number of decades, the forest income in Russia did not cover the costs of forest management. Let’s consider years 2010-2016 as an example (Figure 1). Insufficient amounts of budget financing ($1.2/ha) of forest-covered lands stepped over the critical line, beyond which we can claim the beginning of negative qualitative changes.

Figure 1. Forest sector income and costs of forest management in Russia, billion rubles. Source: open-access data of the Federal Forestry Agency of the Russian Federation.
The trend of forest sector income and forestry expenditures can be described by a linear equation:

\[ y = ax + b, \]

where, \( y \) - is the forest sector income / amount of forest management expenditures, billion rubles, \( x \) - is the number of the period (sequential number of the year), \( b \) - is the initial level of values, \( a \) - is the growth of the index by years.

Comparability of indexes is ensured by uniform economic parameters, both for the revenue and for the expenditure parts (inflationary expectations, the volume of financing, management structure, forest legislation, etc.).

In our case of the forest sector income, the equation looks as follows: \( y = 1.760x - 3519 \); the value of the determination ratio is \( R^2 = 0.935 \), which is quite a high value for the index of correlation reliability of the variables. The equation for the forest management expenditures is \( y = -3.648x + 7299 \), and the value of approximation reliability amounts to \( R^2 = 0.850 \), which is quite an acceptable outcome, characterizing the smoothing as consistent.

Extrapolation of the forest section income and forest management expenditures shows that the situation is getting worse. The growth rate of expenditures will exceed the growth rate of income from forests. By 2030, expenses will exceed revenues by more than 90%, while in 2017, the excess amounted to 72%, and in 2010, to 30%.

Let's consider the development of forest lease. The main types of forest use are timber harvesting, recreation, geological exploration of the subsoil, construction of linear structures (oil pipelines, power transmission lines, etc.).

Forest plots are provided only for use. The term of use varies from 10 to 49 years. The forecast for the development of forest lease is shown in figure 2. Comparability of indicators is insured by the following factors: equal economically accessible forest resources, composition of plantations and their age, equipment and technologies for logging and reforestation, etc. [2, 3].

The equation for the area of all leased forest plots looks like following: \( y = 6.214x - 38.9 \); the value of the determination ratio amounts to \( R^2 = 0.96 \), which is a high index of the availability of strong correlation of the variables.

The equation for the area of forest plots leased only for the procurement of timber looks as the following: \( y = 7.314x - 14498 \); the value of approximation reliability amounts to \( R^2 = 0.835 \), which is quite an acceptable outcome, characterizing the smoothing as consistent.

The linear trend equation for the number of forest lease contracts is: \( y = 1.114x - 2073 \); at that, the determination ratio \( R^2 = 0.106 \), which is a consequence of the lack of connection between the number of the period and the indicator in question.
Figure 2. Progress in forest lease in 2010–2016.

The data in Figure 2 show doubling of the amount of signed lease contracts by all types of forest utilization in 2010-2016. In 2016, nearly 80 thousand leased contracts were signed for all types of forest use. The total area of leased plots amounted to 167 mln ha or 69% of all leased forest area.

The volume of logging in recent years does not reach the level of logging of the Second World War period. In 1940, this indicator amounted to 246 mln m$^3$; after the war, in 1945, the volume of logging amounted to 168 mln m$^3$ of timber. Starting with 2014, the volume of logging exceeded 200 mln m$^3$ and amounted in 2014 to 202.8 mln m$^3$, and in 2017, to 212.4 mln m$^3$. At the same time, the volume of the logging does not exceed 30% of the allowable volume of withdrawal [4].

The lack of stability in forestry and the low level of social protection of the population of forest villages are the cause of illegal logging. Over the past few years, official statistical indicators on illegal logging have been growing in Russia [5].

Official statistical indicators differ from the non-governmental organizations’ data. The official data show relatively insignificant amounts of illegal logging, i.e., less than 1% of the total amount of legal logging; however, in the opinion of some forestry experts, the real figures are several times higher.

According to public non-governmental organizations’ data, the volume of illegal logging amounts to about 20% of the official felling volumes. One of the main reasons for the lack of reliable information on illegal logging is the low quality, and in some cases, total lack of information about forests. As of 2016, forest management materials for more than 85% of forest land are older than 10 years, while for 67% those materials are older than 15 years.

The scope of forestry activities, including reforestation, thinning, forest management (transfer of forest areas to lease, other types of activities), forest protection against fires and forest violations, protection from pests and diseases, control functions, forest accounting, etc., under the influence of many factors (economic, legal and social) have a steady downward trend, while the quality of these activities leaves much to be desired.

The main reason for this situation is the incompatibility of the economic organization of national forestry with the requirements of a market economy.

The economic mechanism of forestry, the foundations of which were laid in 1924, has been in function without fundamental changes up to the present time. The main disadvantage of this mechanism is the absence of a comparison of costs and the results obtained. To this day, the state
finances works in forestry, not the results of these works. You can do a lot of work and still get a negative result.

The lack of the necessary budget financing does not allow the state to effect the main forestry works in the required amounts.

The volume of work in forestry in recent years is low. In 2018, restoration of forests after felling was carried out on an area 1.55 times smaller than in 1993. Figure 3 shows the area of forest restoration for the period from 2000 to 2018 and its trend until 2030.

The equation for the area under the clear-felling system (thousand ha) looks as follows: \( y = 11.97x - 23201 \); at that, the value of the determination ratio \( R^2=0.402 \), which shows low correlation between the variables studied. The equation for the trend for reforestation area (thousand ha) is: \( y = -16.06x + 33202 \), the value of approximation reliability amounts to \( R^2 = 0.548 \), which also shows a low correlation level. The equation of the linear trend for the area of afforestation (thousand ha) looks like \( y = -7.497x + 15276 \), while the value of the determination ratio is \( R^2 = 0.732 \), which indicates the low level of interconnection network the number of the period and the index under examination.

![Figure 3. Reforestation areas in Russia, thousand ha [6].](image)

The amount and areas of forest fires remain at a relatively high level (see Table 1).

For the period from 2014 to 2016, budget spending on preventive measures for protecting the forest reserves from fires was effected in the amount of 3.4 billion rubles annually, i.e. 5 rubles/ha. The outcome of the low funding level for this type of work was the increase in the total area of forest fires [7].

| Table 1 Information about forest fires, foci of pests and diseases, and illegal logging. |
|-----------------------------------------------|--------|--------|--------|--------|--------|--------|
| Indicator                                      | 2010   | 2013   | 2014   | 2015   | 2016   | 2017   |
| The area of forest land covered by fires, thousand ha | 1962.3 | 1158.0 | 3190.7 | 2748.9 | 2508.3 | 3282.1 |
| Average area of one forest fire, ha            | 58.75  | 66.78  | 104.01 | 115.80 | 188.80 | 223.49 |
4. Results and discussion

Over the past seven years, expenditures on forest management have exceeded, in the average, revenues from forest use by 21.75 billion rubles/year (or 94%). In the period under review, the growth rate of forest income amounted to 168%, while of expenses to 222%. This speaks about the negative economic trend in forestry development.

The growth trend in the number of signed lease contracts for forest plots continues: for the period from 2010 to 2016, their number more than doubled. The average rental area of one plot went down from 4.7 thousand ha to 3.0 thousand ha. In the past years, due to the risks (unstable forest legislation, frequent changes in the economy enacted by the state, etc.), a downward tendency was registered for the share of forest plots leased for harvesting timber.

The volume of artificial forest regeneration at felling sites (creation of forest crops) remains at a low level. It amounts to no more than 22% of the reforestation area.

This way, investments are required for the further development of the forest industry. According to the innovative forecast for the development of the forestry sector, the investments volume should amount to 160 billion rubles, which is about 12 times more than actual investments in forestry in 2017 (13.7 billion rubles). The issue of attracting investment is one of the key economic challenges of forestry development. The lack of state guarantees of the rights to private capital is one of the main factors hindering the investment process in the forest sector. To attract investors, we need a favorable investment climate. Lately, certain attempts have been made to improve the investment climate and attract investment in the timber industry. A public-private partnership is increasing through the form of priority investment projects in the field of forest development. The implementation of priority investment projects makes it possible for potential investors to obtain a forest plot without an auction, reduce the rent for the use of forest resources by 50%, and get tax privileges.

A number of economic indicators, such as a decline in production, bank interest increase, a decrease in profits, the level of prices, and bankruptcy of enterprises in the forest sector, are clear signs of crisis manifestations in the forest sector of the economy.

It should be noted that during economic transformations, the actual recurring economic and social relations come about much earlier than the norms to serve these relations appear. A similar situation has now developed in the forest sector, where the objectively existing sphere of market relations has no adequate system of legal regulations to support it.

The present-day domestic institute of forest leasing that has been in existence since 1993, is a partial solution, which by its administrative-market economic nature and legal imperative does not meet the public interest (expenditures on forestry exceed revenues), nor the interests of private business (the burden of costs on forestry management, social load, low profitability, etc.).

Here comes the question: in the long run, is it economically profitable for the state to lease forest land for 49 years or more, while remaining owner of the forests? Wouldn't it be easier to start developing qualitatively new forest relations based on a variety of forest ownership forms, or maybe give preference to the development of new rights for the use of forest?

These are two strategic dimensions of the forest relations development: a revolutionary and an evolutionary one within the framework of state forest ownership.

The second dimension is at the early phase of its development. Today, we confined only to the right of rent, sale agreements, etc., undeservingly discarding the concession of forest plots.

| Protecting forests from pests by biological methods, thousand ha | 226.6 | 245.4 | 208.8 | 196.1 | 379.9 | - |
| Protecting forests from pests by chemical methods, thousand ha | 49.0 | 97.2 | 84.4 | 36.6 | 20.6 | - |
| Illegal logging, mln m³ | 0.70 | 1.45 | 1.10 | 1.21 | 1.69 | 1.61 |
At present, the most sought-after right of use is rent, and its economic content is payments for the right to use forest plots.

The unified economic and legal framework for the use of forest resources is extremely convenient for state forest management bodies, but is unacceptable for the entire territory of the forest resource: it hinders the development of forest relations in the field of the use of natural resources [1].

The introduction of the institute of priority investment projects was an addition to the existing rights of use: an example of private-state partnership in the forest sector and the diversity of the content of rental relations.

With all the shortcomings and imperfection of rental relations for our national conditions, this is a prototype of the future private ownership of forests.

Already now, we can assume with a certain degree of probability that the first private forest owners will be tenants who have been engaged in this type of business for a long time.

However, the diversity of forms of ownership is not a guarantee for solving problems, i.e., economic, environmental and social, in the timber industry complex. This is merely a hypothesis based on assumptions, on the managerial experience of other countries and the national history of forestry.

The existence of forest rent institutions, which could be regarded as the first step to privatization of forest plots, does not, nevertheless, give grounds to speak about the positive development of tenant consciousness, the main elements of which in the economic sphere are timely and full payment of taxes and fees and the rent; in the environmental sphere it is production of logging with regard to environmental requirements; and in the legal sphere it means no violations of forest law and order.

There will not appear any economic benefits in society from one or another form of ownership of forests until the form of ownership is not agreed with public institutions functioning in it.

For a fundamental change in forest relations, ideological support for the process of reforming forest property is needed. An important role is played by higher and secondary field-specific educational institutions in forestry, the media, and non-governmental organizations.

Private forest ownership will, undoubtedly, have positive and negative aspects.

The negative aspects of the forest privatization for the state are: difficulties in the alienation of forest areas for state needs and additional costs of compensation; for private business those include: the unpredictability of state forest policy and taxation; for general public this might mean possible restriction of freedom of access to forest areas.

The positive aspects of forest privatization for the state include budgetary recharge and reduction of costs on forest management; for private business this means the increase in business capitalization, growth of motivation, potential forest transferability; and there is almost none for the general public.

Another redistribution of forest property should not lead to fatal mistakes in the development of national forestry.

This is why the adoption of such important decisions as changing the form of ownership, the introduction of turnover of forest areas, etc., requires compulsory consideration of public opinion.

Social issues of society should not be subordinated in favor of private capital or populist political decisions.

Since 1997 to the present, Professor V. Petrov [8] has annually surveyed students of the St. Petersburg State Forest Technical University in the form of questionnaires regarding the introduction of private ownership of forests in Russia.

Each year, 300 senior students were surveyed; the average age of those was 21 years. This is a new generation of young people who have not personally experienced either the positive or negative effects of a centrally planned economy, but who are well aware of the consequences of privatization in other sectors of the economy.

The principal question was what condition the forests will be in, if only state ownership of the forests remains and rental relations continue to develop, or private ownership emerges.

Privatization issues should be postponed until certain stability in the country's economy is achieved and the formation of relevant public institutions and the development of a unified, unambiguous state forest policy are shaped.
The unity in this case does not mean any strict centralization, but implies the existence of a unified organizing principle with the obligatory consideration of regional conditions for forest management and industrial use of forests.

Prior to privatization, it is necessary to formalize in legislation other rights on the use of forest resources and to improve the economic content of existing rights to use, e.g., by introducing differentiated forest payment rates with consideration of road construction by the tenants.

5. Conclusion

The results of the study bring us to the conclusion that there are two stages of the forestry development in Russia since 1993.

At the first stage of forestry development (1993-2019), law serves as the determining factor in formation of economic relations. The majority of forestry challenges are caused by the imperfection of forest legislation. Forest economy at this stage depends mostly not on the market laws, but primarily on the impact of legislative norms.

The second stage (as forecasted) should develop such economic conditions, when the economics would primarily influence legislature.

The second stage is acceptable in case of creation of qualitatively new economic relations, which would become predominant in the forest sector.

However, the study has shown that no drastic changes in the forest economy will take place in the near future due to the low workforce productivity in forestry, insufficient investments in forest road construction, and the common country-wide forest law, which cannot take into account vegetative, economic and social features of so diverse forest regions in Russia.

References

[1] Petrov V, Bespal'ko A, Bogatova E, Filinova I, Katkova T 2014 Analysis of the system of payments for the use of forests in the Russian Federation. Scientific Report. (Saint-Petersburg SPbSFTU)

[2] Bemm ann A and Petrov V Wald und aktuelle Waldnutzung in Russland. In: Holz-Zentralblatt 139 (2013) 36 p 866

[3] Bemm ann A, Gasisullin A H, Wagner S, Puryaev A Wald und Forstwirtschaft in der Republik Tatarstan. In: Holz-Zentralblatt 141 (2015), 41 p 1022-23

[4] The Russian Federation Forest Sector Outlook Study to 2030. Food And Agriculture Organization Of The United Nations. Rome, 2012. http://www.fao.org/3/i3020e/i3020e00.pdf

[5] APEC's Illegal Logging Best Practices Resource Guide. APEC EGI LAT And SCCP Workshop On Customs Best Practices To Identify Illegal Timber And Wood Products Ho Chi Minh City, Viet Nam August 18-19, 2017 https://www.illegal-logging.info/content/apecs-illegal-logging-best-practices-resource-guide

[6] Russia in Figures. 2018. Short stat. digest/Rosstat-Moscow p 522

[7] Shvidenko, A Z, Schepaschenko, D G, Vaganov E I, Suhinina, A I, Maksyutov Sh, McCallum I. & Lakida I P 2011 Vliyanie prirodnih pozharov v Rossiiyskom Federatsii v 1998–2010 gg. na ekosystemy 1 globalnyj uglordnyj bjuhdzhet [Impact of natural fires in the Russian Federation in 1998-2010 on ecosystems and global carbon budget]. Reports of the Russian Academy of Sciences 44(4) 544–548

[8] Petrov V N 2015 Forest Policies and Forest Law: (Saint-Petersburg SPbSFTU) p 216