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Trends in the Development of Forestry in Russia and Finland

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Abstract. The article is devoted to the forestry in Russia and Finland considered through economic relations developing under the influence of national forest legislation and state forest management systems. The purpose of the article is to assess the trends in the development of forest relations formed within the framework of national forest regulations and their respective forest management mechanisms on the example of two countries: Russia and Finland. The study is based on a system approach to forestry

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considered from an ecological and economic perspective, using subject-object, abstract and logical methods, comparative, spatial, statistical analysis, modern theories of sustainable development, as well as foreign and domestic experience of forest relations. The research novelty lies in revealing trends in the development of forest economy formed under the influence of national forest legislation systems, forest management systems taking into account population's opinion. The ratio of organizational-administrative and economic methods of forest management by public authorities of the two countries are analyzed. The economic efficiency of forest management in two countries is compared through contrasting costs and revenues of forestry. The positive and negative trends of the Russian forest economy since the beginning of the administrative reform in the country are analyzed. Trends in forest economy, environment and sociology showed are more negative rather than positive. The research results can be in demand by research institutions forecasting the development of sectoral economies, forest organizations for building economic relations between the state, forestry business and the population. The study can be continued in terms of assessing trends in the development of forestry as an eco-economic system with a long manufacturing cycle, taking into account the new paradigm of thinking about the role of renewable forest resources in human life.

Key words: forest economy, forest management, forest legislation, forest ecosystem services.

Introduction. The well-established methods for measuring the effectiveness of forest economy are generally based on the comparison of costs and results from sale of useful material products originating from forests. However, this approach does not take into account the costs of the "intangible benefits" consumed by the society or the regulatory, supporting and other forest services that extend far beyond states where the forests are located. The development of international relations with other countries – consumers or suppliers of forest resources – excludes isolated consideration of the national forest economy. In this case, contractual relations between countries are based on the laws of supply and demand. The problem of consumption of "intangible benefits" by an unlimited number of states in the absence of an act of purchase and sale remains unresolved.

The features of a forest as a complex ecosystem formation determine the features for defining the efficiency of forest management. A significant number of works of classic Russian forest researchers and forest economists are devoted to the multilateral study of forest as a biological system with all its numerous services. A.T. Bolotov [1], N.A. Moiseev [2], G.F. Morozov [3], V.V. Strakhov [4], V.N. Sukachev [5], M.E. Tkachenko [6], M.K. Turskii [7] and other researchers supplemented theoretical forestry with knowledge of a forest as a geographical and economic phenomenon. This approach to forests has become a prerequisite for the development of the ecosystem approach.

A number of domestic studies is focused on the aspects of eco-economic assessment of forests and the multiple services of forest ecosystems. The most remarkable are the works by N.P. Anuchin [8], N.A. Moiseev [2], N.I. Kozhukhov [9], P.T. Voronkov [10], K.H. Gofman [11], A.A. Gusev [11], E.P. Smolonogov [12], T.I. Yakovleva [12], etc.

The approaches to measuring the economic value of ecosystem services and biodiversity in comparison are analyzed in international studies [13; 14; 15; 16; 17; 18; 19]. However, not all ecosystem services can be accurately measured and assessed; the problems of their assessment

are currently debatable in the scientific community, which suggests the need to continue research into this area, especially taking into account regional characteristics.

The quality of forest legislation and state forest management determines the effectiveness of forest relations, regardless of ownership of forest. State forest management inherent in all countries is carried out within the framework of legal regulation of branches of law forming the national legal system.

The interaction of the society with the nature takes place in two main directions: the use of natural resources and their reproduction and conservation. National peculiarities, traditions, customs and global challenges influence the national systems of state forest management. Current challenges indicate global climate change and environmental degradation in the world. The eco-balance on the planet is largely determined by forests.

All these determine the attitude of the forest states to the problems of forest management and forest conservation, bringing to the fore the protection of forests, sustainable forest management, "greening" of the forest legislation – a unifying sign of actions of almost all forest states for the conservation of forest resources. At the same time, forest management schemes of different countries have a number of features, the main being their relative structural stability and focus on income from the use of forests. There is no consistency between the environment and the economy when implementing control actions in state forest management.

The priority goal of the forest policy in all countries is to maintain balance between the various interests of the population, the state and private business.

Despite the external stability of the management structure, its internal content determined by a set of functions and powers, the range of tasks to be solved put forward in a given period of time changes over time. The stability of forest management, which is the most important quality of the management system, is based on the standards of constitutional and forest law, as well as traditions and customs, which contributes to the continuity of forest legislation. Therefore, countries with economies in transition, including Russia, which are forced to meet both new external challenges and internal revolutionary changes in the national economy, are in a difficult situation.

Forest management in Russia has a number of disadvantages:

– lack of reliable and complete information on the quantitative and qualitative state of forests;

– non-compliance with the balance of interests of main subjects of forest relations: the state, the population and forest business structures;

– imperfect balance of powers in forestry between Russia and its entities, etc.

The negative features of the Russian forest economy are:

– discrepancy of budgetary interests of Russia and its entities in establishing and distributing payments for forest management;

– low fees for the right to use forest plots (average of 60 RUB/m^3);

– revenues from the use of forests are two times lower than the cost of public forest management over a long period of time, etc.

The above stated mainstreams the need to study foreign forest management systems to develop proposals and recommendations for possible adaptation of certain elements of foreign experience in forest management to Russian conditions taking into account the objective laws of forest relations.

The purpose of the research is to assess trends in forest relations formed within the framework of national forest regulations and their respective forest management mechanisms on the example of two countries: Russia and Finland.

The world forest economy, consisting of national forest economies of individual countries, is the cost result of the use of forest resources, their protection and management within the legal framework of the individual state. Despite the relative similarity of the forest regulatory framework of European countries and forest management systems, the forestry sector of each country is individual: there are no two countries with identical economic, social, natural conditions and forest regulations.

Finland was chosen to compare the basic economic indicators reflecting the vector of development of forest relations and their effectiveness. Finland and Russia from the beginning of the 19th to the beginning of the 20th century had a common history of forestry. After Finland's independence, the forestry sector of the two countries were developing independently. Currently, among all European countries, forestry management corresponds to the concept of sustainable forest management only in Finland. Forest management in the country is recognized as the most effective among all European forest countries [2]. Despite forest land, wood resources and forms of forest ownership different from Russia's, the comparison of specific value and natural indicators of the forest economy of the countries provides a basis for comparison and selection of factors affecting the long-term results of development of forest economies of the two countries.

The *research object* is organizational, economic and legal relations between private forest business, state forest management bodies and the population in the countries under study.

The *research subject* is trends in the economic indicators of forestry in Russia and Finland.

Research methods. The authors used subject-object, abstract-logical methods, comparative, spatial, and statistical analysis, modern theories of sustainable development, as well as foreign and domestic experience of forest relations. The data obtained from official requests to Consulate of Finland, consultations and interviews with employees of sectoral departments of the studied countries conducted by the authors of the research, materials from official websites of the state forest management bodies of the countries under review form the information and empirical framework of the research.

Research results and discussion

Forest management system and forest economy in Finland.

The system of forest law and relevant economic and administrative relations determines forest ownership. The share of private and public forest ownership varies across Europe. In Finland, private ownership prevails (*Tab. 1*). The state owns northern and eastern forest lands (a significant share is occupied by specially protected areas), private owners own more productive forest lands in the south of the state (*Tab. 1*).

The variety of forms and types of forest ownership, the unitary form of government determines a particular mechanism for national forest management.

The country has had a decentralized forest management system for many years. Forest management schemes of state bodies, municipal and commune management bodies, private owners or representatives of the owner are characterized by relative independence in decision-making and formation of management bodies.

Table 1.Forest owners in Finland

Owner	Area of forest land					
	South of Finland		North of Finland		National average	
	mln ha	%	mln ha	%	mln ha	%
Physical persons	8.766	73.3	5.131	36.1	13.897	53.1
State	1.149	9.6	7.933	55.8	9.082	34.7
Legal persons	1.330	11.1	0.546	3.8	1.876	7.2
Other (municipalities, the church and other owners)	0.720	6.0	0.617	4.3	1.337	5.1
Total	11.965	100	14.226	100	26.192	100

Source: compiled by the authors based on official statistics: *Luke's statistical services*. Available at: http://stat.luke.fi/en/uusi-etusivu [20].

Thus, the decentralized forest management scheme which has existed long time has formed its own traditions and customs, which have the power of law and do not need state regulation. The positive aspects of a decentralized management system are that economic, forestry and social characteristics are taken into account at each level of management.

At the highest level, there is no separate forest management body, state forest management is carried out by the Ministry of Agriculture and Forestry (*Maa - ja metsätalousministeriö*). The management of natural protected objects is carried out by the Ministry of Environment (*Ympäristöministeriö*) responsible for conservation and maintenance of ecosystem services of forests. The Department for Natural resources under the Ministry of Agriculture and Forestry has a division "Forests and Bioenergy", whose name indicates the importance of renewable resources at the state level, while emphasizing the importance of bioenergy as a new trend in the development of forest economy.

One of the important traditional elements characterizing the development trend of forest economy in the country is state support for private forest entrepreneurship. State forest centres (*Metsäkeskus*) provide services to private business entities for the implementation of a significant part of forestry activities and works. The funding sources of the centers are the state budget and own funds.

The functions of the state forest service "*Metsähallitus*" – a state enterprise – are: commercial activity on deriving income from forest management; providing services in tourism, recreation etc. to the population. The activity is usually costly, compensated by income from commercial activities; budget funding is provided.

Research and expert activity of Natural Resources Institute Finland (Luke) suggests the pronounced environmental and economic character of scientific research in forestry in the past decade. The Institute provides scientific substantiation for decisions in forest management aimed at the development of green economy and sustainable environmental management.

Forest management of municipalities is the sphere of local self-government. Many municipalities have their own forests, such as parks, maintenance, recreational and other forests, so the municipality administration is responsible for forest management. Municipality forests are not considered as a source of raw wood; the main purpose of their use is population's recreation and maintaining a favorable environment.

Table 2. Performance of wood resource transactions in Finland

Year	Volume of harvested wood resources			Sales volume of wood resources		
	All owners, thousand m^3	Private owners		By roadside prices, thousand m^3	By standing wood prices	
		thousand m^3	share, %		thousand m^3	share, %
1996	46915	39919	45.97	7149	25374	78.02
1997	52996	47148	47.08	6754	33042	83.03
1998	55131	48881	47.0	7175	29439	80.4
1999	55289	47757	46.35	6270	27454	81.41
2000	55903	47988	46.19	5873	31705	84.37
2001	53250	45105	45.86	6299	22919	78.44
2002	54158	46315	46.10	6876	30246	81.48
2003	55030	46715	45.91	5523	26546	82.78
2004	55051	46564	45.82	5466	28819	84.06
2005	52572	44211	45.68	5670	22741	80.04
2006	50823	39381	43.66	4797	26522	84.68
2007	57742	46359	44.53	5683	33325	85.43
2008	51686	41045	44.26	8370	20265	70.77
2009	41374	32052	43.65	3380	12448	78.65
2010	51996	40667	43.89	5322	26609	83.33
2011	52419	41023	43.90	4612	20455	81.6
2012	51502	39693	43.53	5137	22799	81.61
2013	56224	44871	44.38	5057	31297	86.09
2014	55926	44707	44.43	5934	33961	85.13
2015	58 514	48 145	45.14	5396	32850	85.89
2016	61790	51076	45.25	7190	33824	82.47

Source: compiled by the authors based on official statistics: *Luke's statistical services*. Available at: http://stat.luke.fi/en/uusi-etusivu [20].

The forest management mechanism depends on the predominant production mode, the levels and needs of the development of productive forces, the diversity of forms and types of forest ownership, creating a market environment in supply and consumption of forest resources.

Demand and supply is formed both in the national and international market in the context of particular assortments. Detailed information on the market prices of various sorts is available in the public domain, not only in Finland but also in other countries of the European community.

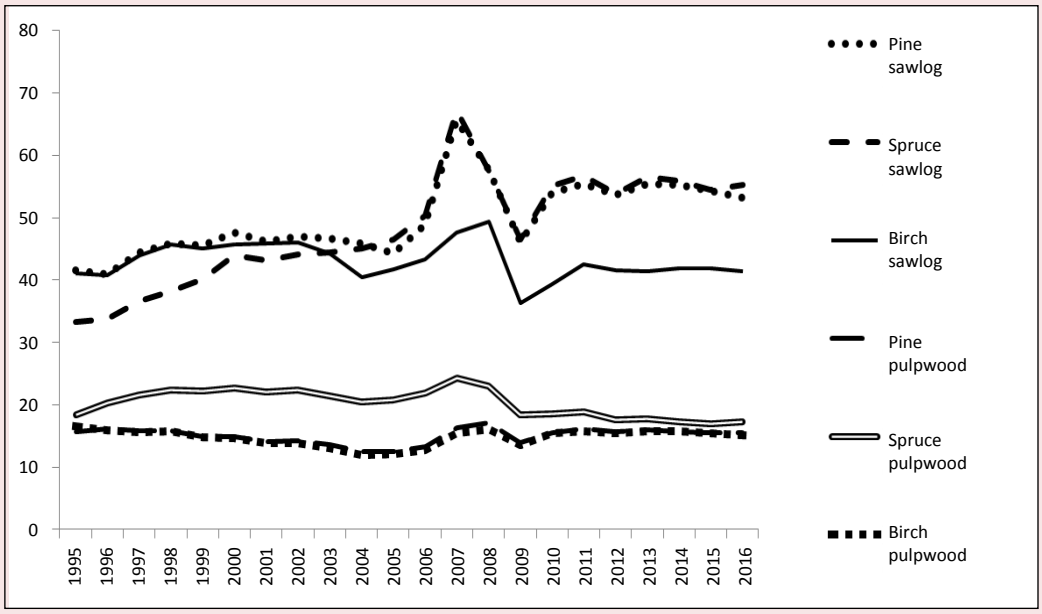
All forest owners are sellers in the sectoral market, but the bulk of wood resources is harvested by private owners (*Tab. 2*).

The market mechanism creates dynamic pricing of wood resources for key transactions: trade in growing forest plantations at "standing wood prices" (prices of growing forest); trade in harvested wood resources at "roadside prices" (*Tab. 2*) [22].

The market price of wood resources should cover the owner's costs of cultivation, preservation, management, and payment of taxes, it must contain a share of profit for the seller [22]. The price performance of standing wood depends on the market conditions of roundwood, according to the long-term performance of prices for main sorts shown in *Figure 1* and *Figure 2*. The market prices for assortment vary by type of felling, territorial factor (there is a differentiation of prices by forest center and region of the country).

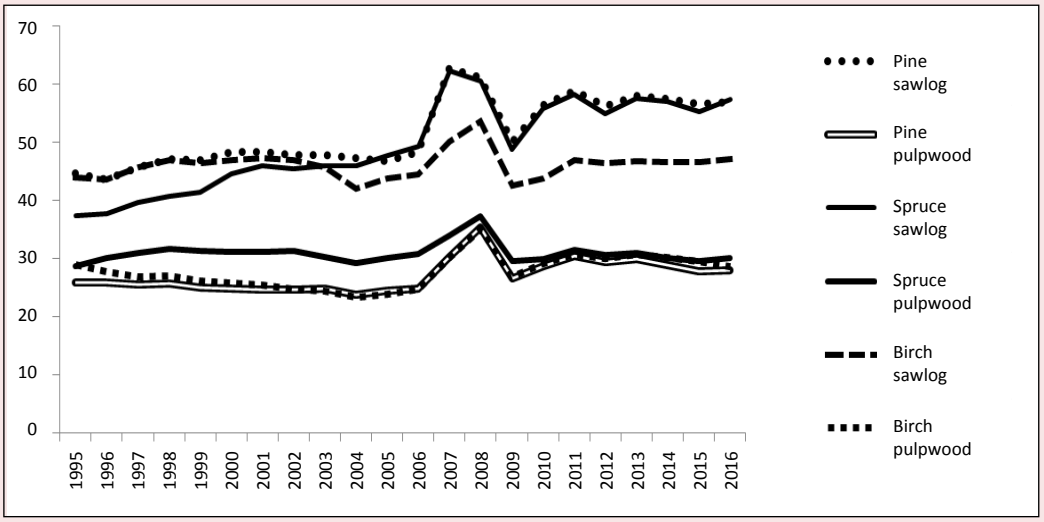
The weekly, monthly and annual statistics of price by Luke Institute shows the dynamic pricing of wood resources.

Figure 1. Performance of standing wood prices of main assortments, euro/m^3



Source: compiled by the authors based on official statistics: *Luke's statistical services*. Available at: http://stat.luke.fi/en/uusi-etusivu [20].

Figure 2. Performance of roadside prices for main assortments, euro/m^3



Source: compiled by the authors based on official statistics: *Luke's statistical services*. Available at: http://stat.luke.fi/en/uusi-etusivu [20].

More than 80% of sales are sales of standing forests (Tab. 2), therefore the buyer is usually engaged in timber harvesting. Forest enterprises mainly use the services of small contractors for harvesting wood resources. The costs of harvesting and hauling are formed according to market laws.

Pricing in the sectoral market is objective and is not determined by the form of ownership of forest resources. The state as a major owner

of forest resources (Tab. 1) in the market has an advantage over private owners. However, state forest lands are remote and less productive. Wood from state forests is sold taking into account the maintenance of stability in the domestic market.

The price policy of the state is carried out through economic and administrative levers, namely:

– participation in the preparation of various guidelines and recommendations, taking into account the conservation and maintenance of forest ecosystems at the national and European level;

– improvement of anti-monopoly legal acts;

– development of differentiated taxation of forest entrepreneurs;

– improvement of public-private partnership in forest management: the state subsidizes the implementation of measures for protection of forest ecosystems and refore-station by private owners (budget funds – an integral part of the price of standing forest) [22];

– information and consulting services, etc.

Finnish forest legislation regulating forest relations.

International agreements and treaties, the Constitution of Finland (*Suomenperustuslaki*), the "Forest Act" (*Metsälaki*), regulations of the legal systems of the country and the European Union, legal sanctioned traditions and customs are sources of forest law in Finland. Finland is an active member of:

– fundamental multilateral environmental agreements and processes on sustainable forest management;

– negotiation processes in the field of forestry at the global and regional levels (UN Forum on Forests and others);

– a number of international forest organizations;

– cooperation in the field of forestry within the Nordic Council;

– bilateral and multilateral international cooperation (cooperation with Russia is a priority in bilateral cooperation).

A comparative analysis of standards of Constitutions of Finland and Russia related to forest resources is presented in *Table 3*.

Table 3. Provisions of Constitutions of Russia and Finland related to forest resources

Provisions of Constitutions	Finland	Russia
Guarantee of the right of ownership	All are guaranteed with protection of property rights (§ 15).	In Russia, private, state, municipal and other forms of ownership are recognized and protected equally (art. 8).
The use of property	The powers and procedure for exercising state-owned rights of a participant in companies in which the state has controlling interest are established by law. The law also establishes cases in which the consent of the Parliament is required for the acquisition of controlling interest or its assignment to the state. (§ 92).	Ownership, use and distribution of land and other natural resources is carried out by their owners freely, if it does not harm the environment and does not violate the rights and legal interests of other persons (art. 36).
Alienation of property	The law defines the order of alienation with full compensation of property for general needs (§ 15). State immovable property may be alienated only with the consent of Parliament or in accordance with what is established by law (§ 92).	No one may be alienated of their property except by a court decision. Compulsory alienation of property for state needs can be carried out only on condition of preliminary and equivalent compensation (art. 35).
Source: compiled by the authors.		

Multi-purpose forest management is popular in the country. It is based on the "common right" (applies not only to the population of the country, but to all visitors to the country), which guarantees free movement in forests of all types of property. "The common right" is not specified in legal acts, but has legal force and is taken into account in judicial practice.

Adopted in 1886, the original "Forestry Act" protected forests from devastation and contributed to reforestation. Based on the principle of continuity of forest law, certain provisions of this law are still an integral part of the national forest legal acts.

The current national forest legislation system is headed by the "Forest Act" (*Mets laki*) adopted in 1997, which has a framework character. Subsequent changes and annexes to the Act show the strengthening environmental focus of sectoral legislation aimed at conservation of forest ecosystems, forest biodiversity, and sustainable forest management. In 2014, the forest legislation was updated in order to increase the profitability of forestry, expand the freedom of owners in forest management and, at the same time, strengthen their responsibility for forest lands. Legal regulation in forestry is based on the predominance of the permissive method allowing the choice of management tools over the imperative method based on power control.

There is national forest policy, a program, a strategy, a METSO forest biodiversity program for southern Finland, regional forest programs. The national forest policy is in many aspects based on the political strategies of the European Union.

Assessing the efficiency of forest management in Finland.

The efficiency of forest management is based on the comparison of costs and results of the forest owner heterogeneous in time. The criterion of efficiency is the economic, social, environmental effect measured against the costs of its realization or prevention of damage. When determining the efficiency from the forest economy perspective, in addition to economic analysis of results and costs, it is necessary to take into account the variation over time in the value of investment assets, which include a forest area with inseparable improvements (for example, forest and wood processing infrastructure). According to foreign researchers, investment in forest land give not high, but stable income, relative to income from other types of investment (for example, portfolio investment and others) [22, 23]. In market economy, the efficiency of forest management in any form of forest ownership is measured by maximum net income from forests exploitation.

Table 4 demonstrates indicators of forest management efficiency. The indicators of efficiency in the country are determined per hectare of forest land, which is the main production factor in forestry. Thus, the spatial efficiency or efficiency of one hectare of forest land is calculated. We have determined the appropriate performance indicators per cubic meter of wood (Tab. 4) as accepted in the Russian conditions per 1 hectare of forest land.

Despite different approaches to efficiency in the countries under review, the calculations can be considered comparable since the approaches are based on the comparison of costs and results obtained from the use of a unit of forest land.

The efficiency of pricing at a particular time depends on the demand and supply, the methods of state control, interest rates of credit institutions, state support for business structures etc. The period under review is characterized by positive dynamics of the total per-hectare efficiency: from 80.2 euros/ha to 114.3 euros/ha. Net profit of a forest owner identified given state support in the analyzed period ranges from 19.1 euros/m^3 to 22.1 euros/m^3.

Table 4. Average efficiency of wood harvesting in Finland

No.	Indicator	2010	2011	2012	2013	2014	2015	2016	Deviation 2016 to 2010		
									Abs (+; -)	Change rate, %	Rel, %
	Absolute indicators, thousand euros										
1.	Gross income from the sale of wood resources	1437452	1479497	1365884	1635559	1631433	1685723	1674567	237115	116.5	16.5
2.	Government subsidies	62867	63324	61201	64231	59348	57814	52746	-10121	83.9	-16.1
3.	Reforestation costs	347296	358075	345017	280539	278299	224066	218296	-129000	62.9	-37.1
3.1.	Investment in reforestation	198988	207855	204881	212085	207634	164066	156580	-42408	78.7	-21.3
3.2.	Forest management and other costs	148308	150220	140136	68454	70665	60000	61716	-86592	41.6	-58.4
4.	Operating result	1153023	1184745	1082068	1419251	1412482	1519471	1509017	355994	130.9	30.9
	Relative indicators, euro/ha of forest land										
5.	Gross income from the sale of wood resources	110.1	109.7	101.2	121.5	121.2	126.1	125.3	15.2	113.9	13.8
6.	Reforestation costs	26.6	26.5	25.6	20.8	20.7	16.8	14.9	-11.7	56.0	-43.5
7.	Government subsidies	4.8	4.7	4.5	4.8	4.4	4.3	3.9	-0.9	81.3	-18.8
8.	Operating result	88.3	87.8	80.2	105.5	105.0	113.7	114.3	26	129.4	29.4
	Relative indicators, %										
9.	Operating result/gross income from the sale of wood resources, %	80.0	80.1	79.2	86.8	86.6	90.1	90.1	10.1	112.6	12.6
	Relative indicators, euro/m^3 of harvested wood										
10.	Gross income from the sale of wood resources	35.4	36.1	34.4	36.5	36.5	35.0	33.2	-2.2	93.8	-6.2
11.	Government subsidies	1.6	1.5	1.5	1.4	1.3	1.2	1.1	-0.5	68.8	-31.3
12.	Reforestation costs	8.5	8.7	8.7	6.3	6.2	4.7	4.3	-4.2	50.6	-49.4
13.	Operating result	28.4	28.9	27.2	31.6	31.6	31.6	29.9	1.5	105.3	5.3
14.	Taxes	8.5	8.7	8.2	9.5	9.5	9.5	8.9	0.4	104.7	4.7
15.	Net profit	19.9	20.2	19.1	22.1	22.1	22.1	20.9	1	105.0	5.0
16.	Net profit excluding subsidies	18.8	19.1	18.0	21.1	21.2	21.3	20.2	1.4	107.5	7.5

Source: compiled by the authors based on official statistics: *Luke's statistical services*. Available at:http://stat.luke.fi/en/uusi-etusivu [20].

Assessing forest management efficiency in Russia.

The features of determining state forest management efficiency are determined by the predominance of state ownership of forest land and decentralized form of forest management in Russia. Decentralization in forest management is expressed in transfer of a number of powers on forest management from the owner to Russia's constituent entities which receive subventions from the federal budget to perform the transferred powers. The comparison of powers of Russia and its entities suggests that the majority of powers is concentrated at the federal level, which is why we can claim the actual preservation of the centralized system of forest management.

The most in demand among forest land rights are lease of forest plots and purchase and sale of forest land for up to one year. Forest legal acts are to a greater extent formulaic in their form; they legally bind and do not take into account the natural, economic and social characteristics of the regions.

The use of forests by legal entities and individuals, including foreign ones, is carried out with or without the provision of forest areas, with or without removal of forest resources. An auction is a common way of assignment of forest land for use. The largest number of articles of the Forest Code of the Russian Federation is devoted to forest management, which emphasizes the resource focus of the forest legislation. Fewer articles of the Forest Code are devoted to protection of forest ecosystems and forest reproduction.

Forestry in Russia has shifted towards market economy relatively recently. In 1993, the Basics of the forest legislation in Russia enshrined the right of private business to forest management. Currently, the economic relations in forestry are only being formed and can be characterized as administrative and market [24]. They provide for a centralized state determination of the minimum, initial value of the standing wood (or the value of forest right) and the establishment of the final value of standing wood after forest auctions.

Forest legislation defines the principle of payments for forest management, the payments to the budget system include: rent for long-term use of forest up to 49 years; payment under the forest land purchase and sale contract for short-term use of forest up to one year, which, along with fines and penalties, are recognized as non-tax revenues of the budget system.

A significant income from forest management comes from harvesting of wood resources. The main indicator of harvesting is allowable annual cut of harvesting of wood resources defined by the rated wood cutting with prohibited excessive cut. The allowavle cut of the past decade in Russia is about 600 million m^3, and its development is characterized by a negative downward trend. The recent actual harvesting of wood resources is no more than 25–30% of the estimated allowable cut (*Fig. 3*). Such dynamics ensures an increase in the areas of ripe and over-mature stands, reducing the demand for such them.

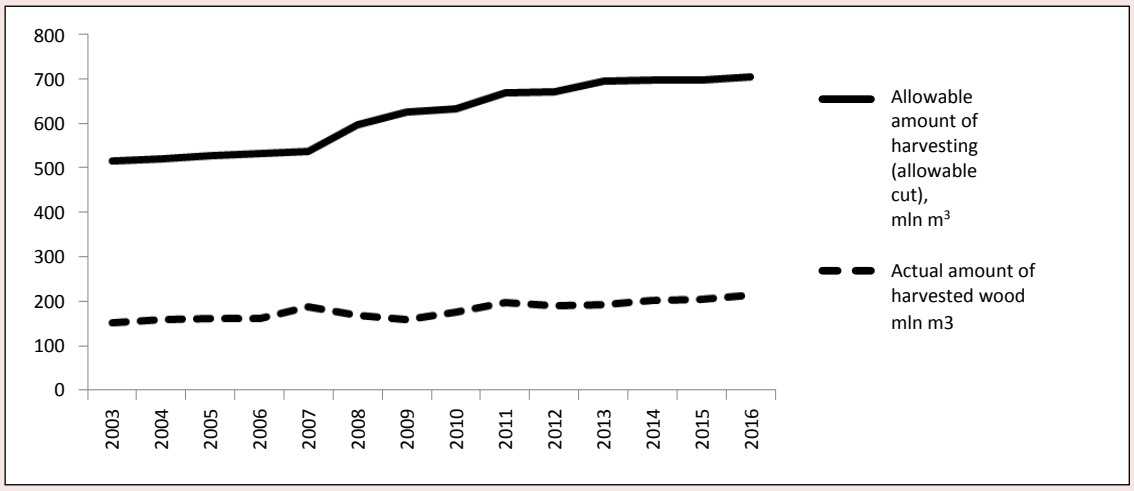
A significant risk factor is the unpredictable government decisions in forest management. Lack of negotiation process between public authorities and business increases the risk. The negotiation process between business and the state is the basis for the forest management policy in democratic states; the implementation of state power in forestry is a characteristic feature of authoritarian states.

The ratio of income and cost of forest management reflects the management efficiency (*Tab. 5*). The results in the form of state revenues from forest exploitation are less than the cost of forest management, which reflects low forest management efficiency and profitability [24].

Table 5. Forest management budget efficiency in Russia

Indicator	2010	2011	2012	2013	2014	2015	2016	Deviation 2016 to 2010		
								Abs (+; -)	**Change rate, %**	**Rel, %**
1. Cost of forest management, bln RUB	27.4	45.1	51.2	59.3	63.4	59.4	59.5	32.1	217.2	117.2
1.1. From federal budget, bln RUB	15.0	21.2	19.9	22.5	24.8	24.1	21.9	6.9	146	46
- share in total cost, %	54.7	47.0	38.9	37.9	39.1	40.6	36.8	-17.9	67.28	-32.7
1.2. From budgets of Russia's constituent entities and other sources, bln RUB	12.4	23.9	31.3	36.8	38.6	35.3	37.6	25.2	303.2	203.2
- share in total costs, %	45.3	53.0	61.1	62.1	60.9	59.4	63.2	17.9	139.5	39.51
2. Revenues from forest management, bln RUB	19.9	21.6	22.6	23.2	25.4	26.5	29.7	9.8	149.2	49.25
Including by level of the budget system: 2.1. Into federal budget, bln RUB	14.8	16.3	17.0	17.4	19.1	19.6	20.9	6.1	141.2	41.22
- share in total revenues, %	74.4	75.5	75.2	75.0	75.2	74.0	70.4	-4	94.62	-5.38
2.2. Into budgets Russia's constituent entities, bln RUB	5.1	5.3	5.6	5.8	6.3	6.9	8.8	3.7	172.5	72.55
- share in total revenues, %	25.6	24.5	24.8	25.0	24.8	26.0	29.6	4	115.6	15.63
3. Area of forest land, mln ha	1146.38	1146.38	1146.38	1146.38	1146.38	1146.38	1146.38	-	-	-
4. Forest utilization fee, RUB/ha of forest land	17.3	18.8	19.7	20.2	22.1	23.0	25.7	8.4	148.6	48.55
5. Budget expenses, RUB/ha of forest land	23.8	39.2	44.5	51.6	55.1	51.7	51.7	27.9	217.2	117.2
6. State forest management efficiency rate	0.73	0.48	0.44	0.39	0.40	0.45	0.50	-0.23	68.49	-31.5
- in relation to subventions from the federal budget	0.99	0.77	0.85	0.77	0.77	0.81	0.95	-0.04	95.96	-4.04
- in relation to budget funds of Russia's entities	0.41	0.22	0.18	0.16	0.16	0.20	0.23	-0.18	56.1	-43.9
Source: compiled and calculated by the authors based on data of the primary reporting of the Federal Forestry Agency.										

Figure 3. Forest management efficiency in the case of timber harvesting in Russia



Source: compiled by the authors based on primary reporting data of the Federal Forestry Agency.

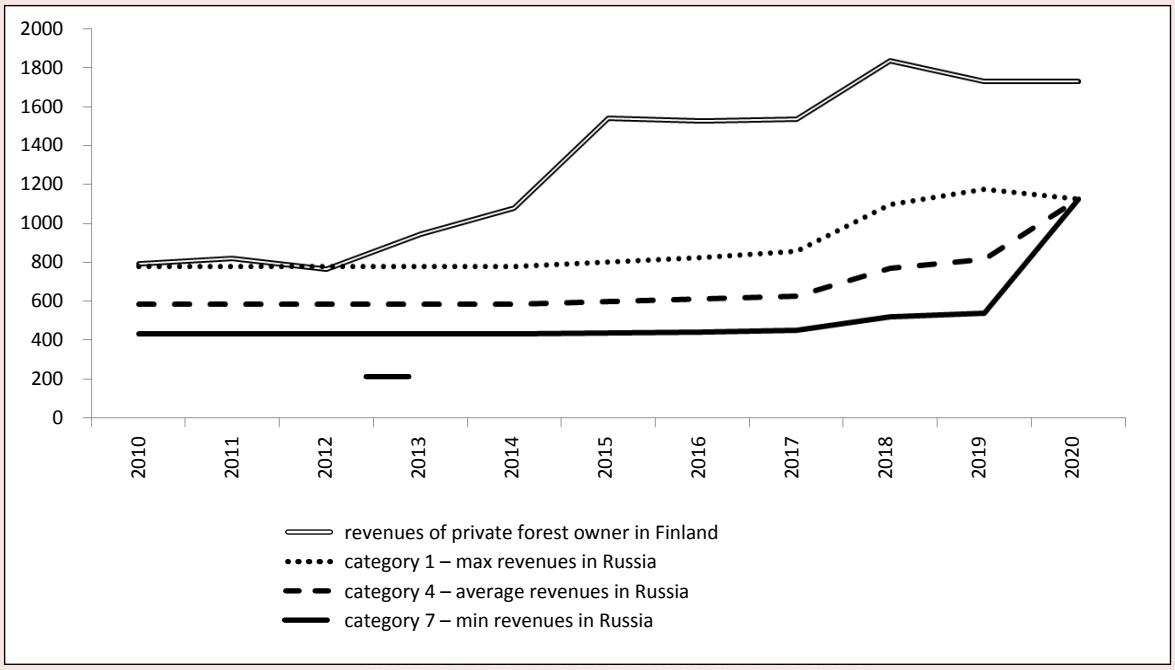
Despite the fact that forest exploitation in Russia is competitive, the rent is not always dependent on the ratio of supply and demand for primary processing products such as round timber. The inert pricing process strongly based on administrative methods makes it impossible to set the price of standing wood depending on the market price of round timber. The response of state forest management authorities to changes in forest products and services market is slow. The analysis of profitability of forestry for a number of years shows a significant lag of owner's revenues from forest exploitation, especially in recent years (*Tab. 5*).

Figure 4 graphically presents the revenues to the state budget from forest utilization by "timber harvesting" compared with the income of the forest owner in Finland.

The analyzed annual data for Russian and Finnish conditions (Fig. 4), are provided in comparable form (state financial support for private forest owners in Finland is excluded, average annual exchange rates are taken into account, all data are recalculated in RUB/m^3, specific values are calculated, the economic content of categories "net profit of private forest owner" and "revenues to the state budget of rent and net profit of a tenant" are identical in their economic content). To compare, the revenues from forest utilization in the Leningrad Oblast (the formula of species composition – 4pine3spruce2birch1asp) was calculated for three stumpage price categories (category 1 – maximum revenues, category 4 – average revenues and category 7 – minimum revenues).

The economic analysis of the resulting economic indicators for two countries (similar forest areas) leads to the following conclusion: despite the almost identical prices for round timber, the profitability of forestry in Finland is higher than in Russia. This is explained by different approaches to forestry focused on the final result of work and the formation of high-quality commercially available land, while in Russia only forestry activity is focused on. The activity and its final result is not the same. One may perform a lot of work, spend much money and not get the final result. In other words – the cost-effectiveness in forestry in

Figure 4. Net income from forest utilization in Russia and Finland, RUB/m^3



Source: calculated and compiled by the authors based on data from the Natural Resources Institute Finland (Luke) and the Ministry of Industry and Trade of Russia.

Finland is higher than in Russia. Another factor affecting the revenue difference is the exchange rate difference. In 2010, the value of euro comprised 39.87 rubles, while starting from 2015 it increased almost twice, which led to a lag in profitability of domestic forestry. The data for 2020 are forecast: for conditions in Finland they were adopted according to the forecasts of Natural Resources Institute Finland (Luke) [20], for domestic conditions – the forecast values of the Ministry of Industry and Trade of Russia, amending the Government Decree no. 310 "On rental rates per unit of forest resources and rental rates per forest area unit in federal ownership", dated 22.05.2007 [25]. The intersection of three curves in one point reflecting the maximum, minimum and average revenues is not due to market changes, but due to the wish of a forest owner – the state, to increase by administrative means the rates of lowest stumpage prices without changing the maximum.

It is noteworthy that the features of determining forest management efficiency are attributable to the fact that a forest is an ecosystem. The ranking of the degree of importance of forest ecosystem services in the countries under study at the national level is based on population's assessment and the contribution to GDP of each service: both in Russia and in Finland, the value of resource services is high; the value of cultural services is average; the value of regulatory services is low; the value of supporting services is low.

Despite similar assessments of forest ecosystem services, forestry promotion and environmental education for the population and the younger generation, is paid much more attention in Finland than in Russia.

Russian forest management tools are based mainly on the resource approach; they aim to achieve monetary objectives and do not take into account the diversity of forest ecosystem services. At the same time, there is a trend towards the greening of forestry planning. For example, the plans of Russia's constituent entities contain a section on economic assessment of "intangible benefits" in the regions. Yet in practice, the resource-based economy has become the basis not only for private forest companies; it is reflected in the modern state forest policy. Thus, the purpose of the forest policy in the economic sphere is "to increase GDP based on market demand" [26]. As a result, GDP may increase but at the expense of degradation of unique natural complexes (forests).

Conclusion. The trends in the development of forest economy of the studied countries indicate the shift transition from a resource-based to the ecosystem approach. A forest remains the object of management, but it is no longer a forest resource, but an eco-system. An example is the inclusion of ecosystem services for the population in the national project of Russia "Environment" by increasing the number of visitors to specially protected areas, increasing the reforestation area, reducing the area of forest fires, etc.

In Finland, forest management is based on measuring costs and benefits of forest utilization; the environmental functions of forests that are irrationally assessed are generally not included in the turnover. The state provides subsidies forest management activities and ecosystem services by private owners. The current state of forest relations in the country is based on the principle of continuity of forest law, with a the pronounced environmental content. The framework nature of the national forest law establishes the main areas of the increasingly eco-oriented national forest policy. The patterns of forest relations development in Finland consist in the shift from mandatory management methods towards dispositive methods, allowing the right to choose private forest business management methods.

Russia is the richest forest power in the world, but in many volume and cost indicators: from timber harvesting to products of its deep processing, it is inferior to many countries. Huge forest areas owned by the state, severe climate and underdeveloped transport infrastructure are significant reasons for the lagging forest economy. But forest management formed within the framework of forest legislation in the absence of a clear forest policy has an even more negative impact on economic indicators.

The strategic objectives include achieving sustainable forest management in Russia, innovative and effective development of utilization, protection, and reproduction of forests, ensuring advanced growth of forestry, the country's social and environmental security, and unconditionally implementing international obligations of Russia in terms of forests.

However, within the framework of the existing forest legislation, achieving the goals without a fundamental change in forest relations may result in additional costs from the state budget and an increase in the cost of forest business.

The stagnation of the national forest economy is a characteristic feature of the past ten years of the economic forestry cycle; this forces people to look for new forms of economic relations between the state and forestry business. Amid state ownership of forest lands the revival of the forest economy is unlikely without changes in forest legislation.

The rise of forest economy is possible without changing forest ownership, it is necessary to legally regulate forest relations based on the framework of the federal forest law and complete forest laws of each Russia's constituent entity taking into account the region's economic, environmental and social conditions.

According to the research results, it is inappropriate to copy the organizational and economic mechanism of forestry in Finland and apply them to domestic conditions. The analysis indicates that different groups of factors for the development of proposals for adjusting the areas of development of domestic forestry have a strong impact on effective economic indicators in forestry.

The study contributes to the theory of forest economy, which lies in identifying the patterns and trends in the development of forest relations formed by management systems and forest legislation in Russia and Finland. The significance of the research consists in the development of new approaches that provide a new assessment of the importance of domestic forest economy and forest resources in the world economy of environmental management, stabilizing climate change and improving the quality of life.

Discussion of results. The research results reveal certain trends in the development of forest economies in the two countries; however, they rose a number of questions to the economic science: what is the role of public forest management in the formation and development of forest relations economy, is the availability of forest resources the key to effective economic development of forestry, can a large amount of resources and forest services ensure effective forest economy and make a significant contribution to GDP in the country? Without turning to economic analysis of indicators reflecting the efficiency of the forest economy we can state that large forest areas have a positive impact on production and consumption of ecosystem forest services. However, the volume of production of such services almost always equals the volume of their consumption, and the production itself depends mainly on the natural production factor.

The state of forest economy depends less on the form of forest ownership, more – on the system of taxation, forest management and forest legislation of a particular country.

The issue of possibility or feasibility of including ecosystem forest services in market relations remains open. Such services do not recognize administrative and state borders, are consumed by the population of all states, but are not estimated financially, while the owner of forest resources, in our example – the Russian Federation, does not receive payments for services provided.

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