

## LEGAL AND POLITICAL BASICS OF EFFICIENT FOREST USE

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It was found that an important condition for the implementation of forest policy and forest regulations is the establishment of an efficient mechanism in the forest sector to ensure maximizing the forest income of the state and to guarantee full compensation of the forest management costs incurred by an economic entity. The basis of the economic mechanism should be the market price for forest resources including standing timber.

This research has found that the forest policy, regulations and institutions should become a core mechanism to implement forest policy and to shift from inertial to moderate and then innovative way of development of the Russian forest sector. Meantime, the forest regulations comprise primary legislation (federal acts) and secondary legislation (instructions, orders, etc.), while the regulations incompliant with the forest policy of the Russian Federation should be cancelled or reviewed.

It was found that the exercising of owner's function by the state suggests disposal of forests and related incomes; as the forest owner, the state has to guarantee financing costs for sustainable development of forests and execution of international liabilities on protection of biodiversity, prevention of global climatic and environmental changes.

It was found that the length of forest resources reproduction cycle causes the priority of long-term strategic forest planning and forecast. The integration into forest planning of internationally accepted criteria and indicators of sustainable forest management should ensure assessment of forestry accounting for the best international quality standards in forestry. Forest regulations should find a compromise between the ecology of forests and the economy of the forest sector.

It was found that all the interested groups should be involved in the development of forest policy and forest regulations: the government, non-governmental organizations, federal and local institutions, business community and forest-related persons; such an approach will ensure the adoption of real-working laws to be abided.

**Keywords:** biodiversity, ecosystem, forest policy, forest services, green economy, habitat, monitoring, payment for ecosystems services, protective functions of forest, recreation.

### INTRODUCTION

Forest ownership determines the important political and economic significance of title to forest fund lands in the course of the formulation of a long-term strategy of the forest sector development; via ownership rights, state, public and private interests are implemented, while the federal state monopoly to own forest fund lands, occupying about 97% of the total area of forest-covered lands, is provided for in all the forestry-related federal acts.

Article 9 of the Constitution of the Russian Federation created the legal field to restructure the ownership rights: "*Land and other natural resources may be*

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*inprivate, state, municipal and other forms of ownership*". The federalism of the state makes restructuring of ownership rights to forest fund lands somewhat complicated. Article 72 of the Constitution of the Russian Federation puts the political basis for federative relations in the management of natural resources: "The joint jurisdiction of the Russian Federation and the subjects of the Russian Federation includes issues of possession, use and disposal of land, subsoil, water and other natural resources". The said joint jurisdiction principle in connection with land and natural resources is not widespread in the global land and nature management practices where each natural object (land plot) is owned by a single owner.

*Jointjurisdiction* as a political tool to form forest relations rules the system of forest management by the state via distribution of power between the federal, regional and municipal authorities; in the course of administrative restructuring of forest relations, three systems of forest management by state have been tried. Under the monopoly of federal ownership of forests, those systems differ in the level of decentralization in making managerial decisions.

The basics of forest regulations assigned forests into disposal of municipalities, administrations of regions, while forest enterprises under the status of federal state institutions were engaged in forestry; that political decision has created a great decentralization in forest management system.

The Forest Code of the Russian Federation kept the liability of the Russian Federation for forest management and assigned the basic functions in connection with disposal of forests to the constituent entities of the Russian Federation; that decision did not provide the expected results in enhancement of forest incomes and investment attractiveness of the forest sector, as the *jointjurisdiction* mechanism via directive separation of powers between the Russian Federation and its regions did not create a due balance of interests. It caused conflict situations, growth of shadow economy, and high corruption risks, kept the state monopoly for forests, and continued the decentralization in forest management system. The code assigned the basic powers in forest relations to the authorities of the Russian Federation's regions and imposed the liabilities for forestry in leased forest fund lands on lessees – private businesses; meantime, it was unable to ensure innovative development of the forest industry and forestry under public-private partnership.

## **METHODOLOGY**

The need for further institutional changes in forest management with elements of the restructuring of ownership rights to the lands of forest fund is evident, and the following scenarios of such changes are probable:

The first scenario of joint ownership is the implementation of a constitutional principle of *joint jurisdiction* via assignment of part of forest fund lands into ownership of the Russian Federation's regions, meaning division of responsibilities

of the Russian Federation and its regions for forest management but not via distribution of powers as currently occurs, but via distribution of forest fund lands between the two owners similarly to the model used in other federative countries (the USA, Germany, etc.)[1].

For the implementation of this scenario, the state should provide at the legislative level:

- creating conditions on which assignment of forest lands into ownership of regions of the Russian Federation will ensure their more efficient use and reproduction as compared to the existing forms of forest ownership; for unbiased assessment of such conditions, a great period of time is required, and within that period, the state authorities of regions of the Russian Federation should demonstrate efficient execution of their powers, imposed by the Forest Code;
- approving the criteria to differentiate forest fund lands by two kinds of state ownership – federal and regional.

Based on the present state of forests and their economic and transport accessibility, federal ownership on forest fundlands will dominate in the near future. Federal forests should include reserve forests, forest fund lands, where aboriginal nations of the European North, Siberia and Far East live, nature reserves of special national significance, subject to keeping the existing forms of public-private partnership based on forest lease [2,14].

The second possible scenario to develop the system of forest relations is privatization in compliance with the provisions of Article 9 of the Constitution of the Russian Federation providing for privatization of forest fund lands and establishment of private forests. The current Forest Code has set forth the following preparatory steps:

- forest areas are declared land parcels which, actually, means the integration of forest relations into the system of land relations where private ownership of land has been recognized for recent 15 years;
- leased forest areas undergo state cadastral registration with boundary surveying;
- leased forest areas are subject to state registration of rights and transactions.

Political decisions are pending in connection with forests privatization, to be carefully prepared accounting for the following:

- risks capable to cause economic, ecological and social losses;
- benefits for the state and private business from using private forests;
- legal, organizational and economic conditions for adopting respective regulations on forests privatization.

For privatization of forests, the following conditions should be created:

- public opinion should be formed accounting for private experience of forest owning in Western countries ensuring open and free public access for rest, picking and procurement of wild crops, berries, mushrooms, nuts and other edible forest resources; it may be a hard issue in Russia due to historically negative public perception of private property over natural goods used by population free of charge – land, forests, water;
- availability of state institutions of power able to operate private forests and ensure incomes to the budget system, to protect rights and interests of owners;
- individuals and businessmen seeking to be the class of private forest owners and manage forests on the principles of sustainable forest management.

Accounting for the specifics of forest fund lands, private forests may be established in two forms:

- *Individuals are becoming forest owners* – citizens of the Russian Federation or other countries according to legislative restrictions; meantime, agricultural businessmen and farmers should have preferential rights to buying forests into private ownership; the first objects for private ownership may be lands, withdrawn from agriculture and suitable for growing forests.

## RESULTS

The growth of forest to be further assigned to forest fund should become one of the conditions for privatization of forest land by individuals (citizens); the development of agroforestry farms will enhance employment, rise incomes and improve working and living rural conditions.

Private forest ownership creates the opportunities to commercially use territorially dispersed forest vegetation intensively cut earlier, but due to the limited scales of private forest ownership no negative results in connection with forest ecology, sale and purchase of forest lands and making forest lands a kind of speculative capital may be expected.

- *Entities are becoming forest owners* – first, lessees of forest areas. Transition to private forest ownership to replace the lease of forest areas should be prepared very carefully, as 15 years' experience of lease relations did not demonstrate private business progress in sustainable forest management and efficient use of forest resources [3, 11].

Privatization of forests via buying from current lessees relates to a great number of the following risks:

- monopolization of raw wood markets;
- making forest lands speculative capital;
- difficulties of establishment of forest administration to manage private forests;

- conflicts between state authorities and private forest owners;
- corruption.

For the transition to private forest ownership, a transition period is required. Within that period, lease relations should be replaced with concessions under which the object of public private partnership becomes forest land but not forest resources as currently occurs; as distinct from lease relations, a concession is capable to establish responsible private business in the forest sector to become efficient owner of forest lands.

Forests privatization scale should not be an object of any directive planning as occurring in development of forest lands lease; forests must be privatized for public benefit solely, accounting for interests of state, public and business. Private ownership of forests must prove its advantages in economic, social and ecological competition with other forms of natural resources ownership provided for by the Constitution of the Russian Federation [4, 12].

Within the forest policy of the Russian Federation, the development of the national forest policy guideline was much delayed as compared to many other countries having similar documents. The project is developed by the Federal Forestry Agency with active public and business community participation in the form of the document called “Russia’s Forest Policy”; it is expected to be adopted upon completion of overall discussion subject to broad national consent. Upon approval, the forest policy should be the basis to improve the national forest regulations and ensure sustainable forest management with public and business attendance.

The core targets of the forest policy are the following:

- ensuring sustainable forest management, keeping and improving forest resource and ecological potential;
- improvement of forest sector’s contribution in socioeconomic development of regions;
- ecological safety and stable meeting of public needs for forest resources and services.

## **DISCUSSION**

The forest policy goals for the next 15 years till 2030 seek to support the most favorable alternatives of the Russian forest sector, meaning in practice that within the first five years’ period (till 2020) the forest policy should ensure the transition from inertial to moderate variant of the development of the forest sector. Within the second decade (till 2030), the transition from moderate to innovative stage of development should be completed [5,13].

Among the basic ideas of the forest policy till 2020, the following political steps to support the transition from inertial to moderate development need to be made:

- By 2020, it is required to complete the transition to sustainable forest management, maintaining resource and ecological potential of forests, ensuring ecological safety and stable meeting the public needs for forest resources and services;
- Regarding property relations, the forest policy should seek to keep dominating federal ownership of forests and forest lands;
- Diversity of ownership forms may be ensured only subject to the availability of strict criteria to divide forest lands into federal, regional (of constituent entities of the Russian Federation) and municipal;

In the development and improvement of management system:

- establishment of local forest management bodies and vesting them with all required powers and resources;
- restoration of state forest protection service;
- development of forest planning system at federal, regional (of constituent entities of the Russian Federation) and local (forest districts, woodland parks) levels;
- creation of mechanisms for public engagement in forest management;
- ensuring protection, safety and use and reproduction of forests;
- development of information system including forest database;
- development of forest surveying, state system for forest inventorying and monitoring.

In the use of forests:

- ensuring intensification and efficient use of forests;
- improvement of the level of deep chemical, mechanical and energy processing of wood resources;
- improvement of structure and growth of timber industry output;
- getting available forest resources of the European and Ural parts of the country;
- development of the multipurpose use of forests;
- wide use of scattered (selective) logging and ecological technologies to make and process wood;
- simplifying public access to forest resources and creating conditions to develop small and medium businesses.

In forest security and protection:

- reducing scale of damage and loss of forest resources;
- sharing responsibility for security and protection of forests between state, business and public;

- dividing into districts and zoning of forests by kinds/levels of protection and security;
- improvement of cooperation of state authorities and forestry business in fire prevention and forest protection.

In forest restoration and reproduction:

- ensuring timely growth of young stock of commercial wood species at openings, burned areas and other empty forest land categories;
- balance between forest restoration and disposal of forests after logging, fires, pests, etc.;
- enhancement of active restoration of forests in the European part of the Russian Federation and the Urals;
- re-construction of low-value vegetation in the European part of the Russian Federation and the Urals;
- planting protective forests vegetation in the south-eastern part of the European part of the Russian Federation, North Caucasus, Southern Urals, Volga region and Western Siberia.

In the economic organization of forestry:

- development of market tools to use, protect, secure and reproduce forests;
- improvement of payment system for forest use;
- establishment of efficient tool(s) to form forest income and distribution of payments to various levels budgets;
- guaranteed allocation of funds for protection and reproduction of forest resources.

In investments stimulation:

- reducing the tax burden on investments prior to commissioning the infrastructure for deep processing of timber;
- loans to forest users in the form of deferred payment of forest use charges.

In international cooperation:

- creating conditions to attract foreign investments;
- admission of international processes in connection with forests as significant for national economy and ecology;
- cooperation in inventorying, security and protection of forests;
- study and analysis of advanced foreign experience to implement updated technologies and methods for sustainable forest management;
- implementation of recommendations of international treaties, conventions and protocols ratified by Russia;

- implementation and development of two-party and multi-party contracts/ programs for cooperation in the forest sector;
- rising national timber export potential.

In forest science and education:

- ensuring technological unity of scientific and technological developments and manufacturing processes;
- development of the sector's science;
- organization of fundamental studies on urgent issues of the contemporary science.

In science:

- scientific support of Russia's forest policy;
- working out strategic steps to ensure rational, multi-purpose and sustainable forestry;
- improvement of methods to take stock of and monitor forest ecosystems;
- working out methods for long-term forecast of forest dynamics and reasoning of allowable volume of sustainable forest use.

The forest policy, while shifting from the moderate to the innovative development scenario at the second stage, should put the following political support steps as the goals for 2020-2030.

In general:

- ensuring sustainable forest management and enhancement of forest resource and ecological potential;
- achievement by the Russian Federation of top positions in the global markets of wood and paper based products;
- transformation of forestry from a subsidized to a high-revenue sector.

In property relations:

- enhancement of legal status of forests;
- enhancement of legal protection of forests as a renewable natural resource and an important component of the biosphere;
- ensuring the diversity of ownership of forests and forest lands keeping the dominating state ownership – federal and regional.

In forest management:

- establishment of system for strategic planning and adaptive management of forests of any ownership;
- decentralizing state forest management and growing public role in managerial decision-making;
- enhancement of state regulation of the timber industry;

- restoration of vertically integrated entities from timber harvesting and timber processing enterprises at the federal and regional levels.

In the use of forest resources:

- intensification of soft-wooded broadleaved species, low-grade wood and cuttings;
- integration of forestry management, forest inventorying and monitoring into a uniform system of forest management.

In forest protection and security:

- ensuring the due level of forest protection and security, fire control;
- establishment of a centralized system for air and land security of forests, a network of fire-fighting centers to assist regions under the conditions of high and extreme fire danger;
- establishment of a system for integrated protection of forests based on dividing into districts, forecast and assessment of efficiency of works;
- working out methods to assess and decrease the risks of catastrophic forest fires, pest epidemics and forest diseases.

In forest restoration and forest resources reproduction:

- development of continuous forest-seed establishment on genetic and selection basis;
- development of a network of forest nurseries to manufacture breeding planting materials;
- enhancement of artificial re-forestation and increasing the share of forest crops with improved hereditary features;
- creating the conditions for natural regeneration of commercial wood species;
- decrease in the share of commercial young growth and forest crops loss as a result of unsatisfactory agricultural engineering, covering by low-grade species and other destructive factors.

The Forest Code of the Russian Federation should include the tools to implement the liabilities arising out of international treaties, conventions and protocols; it should create the conditions to bring foreign investments in the forest sector of the Russian Federation and develop international cooperation [6].

Education, staff, science and technology as of 1990 in the forest sector of the former USSR employed about 2.1 million people, including in the RSFSR (in 1991, the Russian Soviet Federative Socialist Republic was renamed the Russian Federation) – about 1.7 million people.

During the twenty years' term, the number of staff fell down to 1 million people due to the following reasons:

- falling timber harvesting and re-forestation;
- rise of labor productivity in timber harvesting and mechanical processing of timber;
- administrative staff reduction upon informatization and computerization of management and manufacturing;
- institutional reforms in state forest management and liquidation of forest security/protection.

Out of the total number of staff occupied in the forest sector, 40% are engaged in forestry, timber harvesting and related services; 45% – in timber and timber products processing; 15% – in cellulose and paper manufacturing.

The recent years saw some negative changes in scientific support of the forest sector; a number of scientific institutions were liquidated, the total staff was reduced, primarily, researchers. The number of researchers in federal forestry institutions had a 5 times' decrease amounting some 600 researchers now, including 132 PhDs, 37 Doctors of Science, the latter being 65 years old in the average.

The institutions providing scientific support for the forestry employ just 300 researchers, including 10 Doctors of Science and 70 PhDs. Fundamental research of the forest sector is done by 10 organizations and institutions of the Russian Academy of Sciences employing about 1,000 researchers including 600 PhDs and Doctors of Science. Expert assessment of the growth of the number of researchers to ensure development of the forest sector was made. The information covers only state scientific and educational institutions. The assessment of private business's participation in development of scientific research looks uncertain. Currently, this participation is actually missing; meantime, the needs for funding the forest science in the state sector under various scenarios of development is growing [7].

The potential of the university science in the studies of the forest sector is not fully used. Ten top forest profile universities, over 2,000 researchers, including 600 PhDs and Doctors of Science, participate in the forest sector's studies. The total number of researchers engaged in fundamental and applied research for the forest sector is about 3,500, including about 1,400 with post-graduate degrees[8].

According to the results of the expert assessment of the needs for staff with elementary, high and higher professional education for three scenarios of development of the forest sector, federal budget's costs for training staff for the forest sector at all educational levels are about 5 billion rubles. Financing was distributed as follows:

- higher professional education – 3 billion rubles,
- high professional education – 1.5 billion rubles, and
- elementary professional education – 0.5 billion rubles.

For the innovative scenario, the share of costs for forestry education in GDP in the forest sector will grow in 2010-2030 from 0.86 to 0.99%; the needs for funding

the forest science and forestry education for the innovative development scenario of the forest sector will ensure its stable development under the conditions of growing economic competition in the forest markets and growing ecological requirements to forest use and reproduction.

For the Russian forest sector, breakthrough innovations are the only way to the innovative development. European forecast of development of the forest sector notes that innovations may improve any scenario's parameters [6]. Twenty years' delay in development of the forest sector of the Russian Federation opens unique challenges to implement the innovative scenario by comprehensive re-construction of existing enterprises based on scientific achievements of the preceding two decades, up-to-date equipment and technologies of the new generations. The most feasible way to restructure existing enterprises will be the transition to manufacturing science-intensive products. For many domestic production works, such a way is the only way to survive under global competition and free trade.

The forest sector enterprises designed and built in the middle of the last century now should be fully reconstructed. The re-construction will enable to build brand new enterprises of the 21st century, bypassing the stages which the global forest sector leaders went through within the recent decades. In other words, the Russian forest sector should step over the stages completed in the recent decades by the forest sector of top forest industrial countries. The implementation of that model of technological and intellectual breakthrough requires serious scientific and manpower support, market forecast and development trends for a few decades to come [9,20].

Breakthrough technologies of the forest sector are information, nano- and biotechnologies.

*Information and computer technologies* are used in the creation of geoinformation systems (GIS). They are required to identify and specify actual timber reserves and to work out an optimal strategy for harvesting. GIS ensure operational records of timber harvesting and transportation, fire-fighting control, supply chains control, control of water storage ponds while building new hydropower stations. The development of those technologies caused structural changes in the range and volume of paper products. In particular, a new class of paper (office paper) was introduced. The share in the total global output of paper and cardboard is growing greatly. Simultaneously, the share of newsprint paper is falling. The development of computer technologies in construction caused smart house concept to emerge.

The joint use of computer technologies and the second generation biofuel (pellets) in individual automated heating systems allowed shifting to green construction of houses. Heating in such houses is programmed by days and day parts and has a high efficiency factor of timber combustion. Combination of wooden house building, computer technologies and wooden pellets will ensure superadditive effect and improve the ecology and economy of the forest sector.

*Nanotechnologies* are used to get new kinds of composite materials based on wood and its components. The principle of *biotechnologies* is implemented in the creation of new industrial technologies to process timber. Large diversified biotechnological manufacturers use renewable resources and make various kinds of materials and biofuel, organic solvents, chemical compounds, feeds and power. Such enterprises are typically called bioprocessing plants or biorefinings. Biorefining of timber is considered a main way to develop cellulose and paper industry of North America and Western Europe. In those countries, biorefining development is related to the change of business model and transition from stem business to a diversified business model. Currently, the first generation biorefinings are widespread worldwide running on food raw materials and oriented at biofuel production [10,15].

In the coming 10 years, the second generation of biorefinings is expected, capable to utilize nonfood biomass in an economically feasible way – timber and its wastes, lignocellulose, microalgae, urban and rural wastes. At present times already, so-called dietary fibers and microcrystalline cellulose (MCC) made of raw wood are widely used worldwide. Russia almost fully imports these products. So-called feed fibers made of raw wood are being rather widely spread.

The way to the green economy or bioeconomy is a main evolutionary way to develop the up-to-date technologies of the forest sector as a whole. The green economy is based on the use of renewable resources and energy sources for the purposes of sustainable material production. The analysis of prospective range of innovations to develop the Russian forest sector is feasible to begin with the analysis of the global forest sector within the two recent decades. That analysis will make it possible to choose the directions of urgency for the Russian forest sector till 2030 and later to come.

A comprehensive program on the development of biotechnologies in the Russian Federation till 2020 was approved by the Chairman of the Government of the Russian Federation. It is based on the best global practices and national developments in connection with hi-tech production.

The development of sustainable forestry is based on a number of breakthrough innovations, including scientific basics and technologies to combine the use of natural forests and plantations. That combination had principal effect to ensure sustainable procurement for the cellulose and paper sector, especially under the re-construction conditions in operating enterprises. The enterprises reconstructed have been using the existing raw materials basis for 40-50 years of operation. Further efficient operation of those enterprises is connected to growing timber shipping distance and price rise. The Bio-2020 program provides for fast-growing forest plantations by 2015 up to 20 thousand hectares and by 2020 up to 100 thousand hectares.

The development of principles and approaches to rationalize forms, kinds and felling ages of forest vegetation subject to assessment of their effect on keeping useful functions of forests provides for the following:

- scientific rationalization of felling ages of forest vegetation in forestries;
- development of progressive technologies for timber harvesting;
- development of scientific basics and forest management principles in energy forests;
- development of multipurpose use and reproduction of forests, growing forest vegetation to meet numerous needs of the Russian forest sector, improvement of forest security/protection.

Especially efficient is the use of breakthrough innovations in intersectoral developments inside the forest sector and in cooperation with economic sectors. The Bio-2020 program provides for the fivefold increase of biopharmaceuticals in the oil and gas sector by 2020 as compared to 2010. The share of biomass in the total volume of raw stock for the chemical and oil chemical sectors should grow up to 15% [1].

An example of efficient use of breakthrough innovations in intersectoral developments inside the forest sector is biotechnological processing of excess secondary sludge and other muds using vermitechnologies. The resulting vermicompost can be used for the cultivation of seedlings with closed root system and their subsequent use for the plantation cultivation of forest species needed. This technology can be recommended for the processing of sludge from sludge tanks and remediation of man-made landscapes. Bio-2020 program envisages an increase in the share of raw material processing using biotechnology from 5% in 2015 to 10% in 2020. In "Special chemicals" section, the program offers the following joint priorities of scientific research: the development of competitive organic products on the basis of wood and other plant biomass; preparation of conditioned alternative raw materials for making chemical products by comprehensive chemical and biological processing of wood, preparation of special chemicals and new generations of composites based on wood components[12].

A special place in the Bio-2020 program occupies the creation of biodegradable tare and packing. The program provides for bringing the share of biodegradable material in the total polymer products consumed up to 10% in 2020, including up to 30% in the packaging industry.

The Bio-2020 program provides for an increase in solid biofuel production from 3 million tons in 2010 to 18 million tons by 2020. "Bioenergy" section offers the following priority areas of research and development: production of solid and other biofuels; technologies for combined generation of heat and electricity and methods to increase the electric power output; biorefining of wood with co-

production of cellulose, new range of chemical products, in particular biodegradable polymers, energy and biofuel.

Technological platforms are the most efficient means to adopt breakthrough technologies and innovation scenarios based on public-private partnership. Currently, the European Union (FTP, 2012) and North America (Agenda 2020, 2012) are going that way.

Russian forestry technology platform is an integral part of Russia's technological platform "Bioindustry and Bioresources" ("BioTech2030"). The platform comprises 19 areas, of which eight are directly related to cellulose and paper industry (CPI). The national research program of the Russian platform was developed in cooperation with the European forestry technology platform. It considers a number of "breakthrough innovations", covering both technology and materials, as well as the principles of shared use. Meantime, the program focuses much on the transition to the "best available technology", the concept of which was introduced in the environmental legislation of the USA, the European Union and the Russian Federation.

The issues of global climate change prevention, evaluation and minimization of "carbon" and "water footprint", energy conservation and energy efficiency enhancement are essential at all stages of the life cycle of products, materials and technologies. All these issues should be considered as transition stages to the ecological "green economy".

The purpose of "Cellulose and paper products" section of Russian forestry technological platform is the creation and implementation of an innovative model of CPI development of the Russian Federation, primarily on the basis of a phased eco-technological reconstruction of existing enterprises. The implementation of such a way leads, however, to the emergence of a number of new questions and problems. They are associated with sustainable wood supply, energy performance, and the need to solve a number of environmental problems.

In the Russian Federation, which is home to oxygen bleaching, the transition to chlorine-free bleaching is unduly delayed. Currently, the Russian Federation remains virtually the only country that continues to use molecular chlorine for bleaching. The transition to chlorine-free bleaching in the reconstruction of existing enterprises solves the question only partially, as the problem of waste accumulated over several decades and reconstruction of sludge tailings ponds containing millions of tons of hazardous sludge, including organochlorine compounds, is still relevant. The application of biotechnologies in this case is the main way of solution [3].

In parallel with the growth of paper and paperboard consumption, innovative changes will occur in the structure of fibrous semi-finished products used for their production. For that, scientific basics for optimizing the structure of fibrous semi-finished CPI products will be developed; the use of recycled fibers (waste paper)

and mineral fillers will be expanded. The innovative development of cellulose and paper industry is ensured by the following key areas:

- development of resource and energy saving technological processes of cellulose, chemical-thermomechanical pulp, paper, cardboard production and waste paper recycling;
- creation of a new range of competitive types of paper, cardboard and composite materials in accordance with the best existing technologies to solve the problems of import substitution and to ensure integration of the Russian Federation into the global market of cellulose and paper industry, including:
  - developing technologies for making printing paper, including coated, for digital printing, coated for various purposes, based on chemical and thermomechanical mass and cellulose, chlorine-free;
  - creation of new biodegradable packaging materials for general technical and special purposes;
  - new types of paper and board products with environmentally safe barrier coatings;
  - development of advanced technologies for production of technical, sanitary papers and composite materials;
  - introduction of new types of paper and cardboard using nanotechnology and innovative chemicals.

Meantime, it is necessary to develop the scientific basics to reduce the environmental load of cellulose and paper enterprises on the environment:

- transition to chlorine-free bleaching;
- optimization of water systems in cellulose and paper plants;
- transition to energy-saving technologies and the increased use of wood waste to produce and use biofuels;
- reducing the quantity and toxicity of liquid and gaseous emissions and solid wastes by switching to the best available technologies;
- introduction of advanced technological processes, new equipment and materials;
- development of criteria to assess the damage caused by chemical pollution;
- bringing the Russian regulations and safety standards in compliance with the international standards,
- using wood waste for reclaiming man-made landscapes, etc.

In general, the following parameters may be reached by 2030 in CPI:

- degree of utilization of recycled fibers – 52%;
- percentage of cellulose bleached by chlorine-free technology – 100%;

- reduction of specific water consumption – 55%;
- powersaving – 30%;
- use of biofuels – 70% of energy consumed.

The implementation of priority investment projects with elements of innovation allows purposefully moving to the implementation of the innovative development scenario.

For successful implementation of the investment programs of CPI, of particular importance is recruiting and staff training to work with innovative technologies. Staffing of hi-tech products manufacturing is primarily associated with the most important aspect of this problem – the engineering staff, including the creation of an innovative network to train and retrain engineers and scientists.

In connection with the transition to new technologies, professionals with extensive knowledge of innovation technologies of science-intensive types of cellulose, paper and board, tare and packing, resources-saving, optimization of water use system in CPI enterprises, creation of new materials and technologies are in demand [4,14].

Innovative methods of organization of research and development (R&D) include the use of the mechanism of public-private partnership, combining in time fundamental, applied and technological works, purposeful development of the experimental base, scaling in the course of transition from research in the laboratory to test output, systematic analysis of the situation and trends in the global markets of forest products.

The innovative approach involves integrating scientific potential of universities and academic institutions in Russia, systematic involvement of leading foreign scientists and experts, using up-to-date research equipment of domestic and international research centers, wide attraction of students, graduate students and young scientists to participate in projects. The mechanism of Russian and foreign technology platforms includes cooperation with international UN agencies and non-governmental organizations.

One of the key elements of building a bioeconomy in the Russian Federation is international collaboration, while research, engineering, organization of new manufacturing facilities, development of markets – all these tasks require active participation of international companies and professionals, integrating the efforts of Russian scientists and entrepreneurs in the global system for production of knowledge, technology and products, and cooperation with United Nations (FAO, UNECE), European and international organizations.

The problem of illegal logging and trafficking of illegal or doubtful origin timber is one of the most pressing social, environmental and economic problems in the world. Russia is no exception. Currently, in the Russian Federation there is no methodology or system to assess illegal logging ensuring reliable record. There

is no consensus in the scale of assessments of illegal timber trafficking. According to the official data of Federal Forestry Agency, more than 21 thousand forest-related violations were detected in 2011. Illegal logging was in 2011, according to various estimates, 1.2-1.8 million m<sup>3</sup>; in 2010 – about 1.3 million m<sup>3</sup>; in 2009 – about 1.5 million m<sup>3</sup>. That is about 1% of the total harvest and corresponds to the best performance of countries with powerful law enforcement in the forest sector.

Official data diverge from independent evaluations. According to WWF Russia and World Bank estimates, up to 20% of the wood harvested in the Russian Federation (or about 35 million m<sup>3</sup>), is of illegal origin. In total, the Russian Federation in 2010 harvested over 173 million m<sup>3</sup> of timber. The estimates of WWF Russia are based on the “balance” method – comparing the official harvest volume with the volume of consumption, including processing, construction and exports. World Bank estimates are based on the poll of forestry experts. The total amount of economic loss of the budget of the Russian Federation caused by illicit trafficking of timber is estimated from 13 to 30 billion rubles annually.

A significant difference in estimates relates to the lack of official definition of illegal logging and imperfect methods to assess the volumes. Official estimates use satellite data for clear-cutting outside the designated cutting areas and clear-cutting of large volume without permits. Meantime, a great danger to biodiversity and forest ecology are illegal selective or mining principle cuttings, when “black loggers” cut individual trees, groups of trees and trunks of the most expensive and rare breeds. These cuttings cannot be identified in satellite images and are almost never taken into account. Meanwhile, this method of illegal logging is dominating. The absence of reliable official information on illegal logging volumes makes it difficult to efficiently fight them. Public recognition of the problem would have prompted the regional authorities to collect reliable information and facilitate efficient control over illicit timber trafficking [11,16].

The main factors contributing to widespread illegal logging and illegal timber trade in the Russian Federation, are:

- general crisis in the country’s forest management system, nontransparent relations in the forest sector;
- high levels of corruption and low level of inter-agency cooperation;
- absence of legislatively fixed definition of *illegal logging* and *illegal timber trafficking* and the associated complexity of identifying illegal logging, violators, penalties and damage to bring violators to justice;
- nontransparent timber supply chain, especially from the Russian Federation to China;
- low standard of living in rural areas, pushing people into illegal logging in the absence of state forest protection;

- demand in domestic and foreign markets (primarily, in the Chinese market) for timber, regardless of its origin.

Within the liabilities assumed, Russia is implementing a set of measures to ensure legality of timber harvesting. They in particular include:

- adoption of the Plan to prevent illegal cuts and turnover of timber in the Russian Federation for 2009-2011;
- establishment of the Commission and the workgroup to prevent illegal cuts and turnover of timber;
- activation of the Federal Forestry Agency's work in connection with remote monitoring of forests using aerospace methods;
- inspections of forest fundlands and use of forests in regions of the Russian Federation;
- development of regulations to fight illegal cuts and shadow trade of timber.

Considering the practice results, that activity has not been of significant effect so far and cannot break the situation with illegal cuts in the country and shadow timber trade. At the level of regional authorities/bodies in some regions of the Russian Federation (for instance, Arkhangelsk Oblast, Zabaikalsky Krai), attempts are made to fight illegal cuts within the governmental forest supervision. In 2009, the Act "On governing some relations in timber turnover" was adopted in Arkhangelsk Oblast. This act provides for particular documents to be held by seller and buyer for shipping and transportation of timber. An important factor to fight illegal cuts is the initiatives of forestry business related to voluntary certification and systems to trace the origin of timber. First, international brands and holdings with dominating foreign capital are concerned in it.

It has to be admitted that the issue of illegal cuts in the Russian Federation became systematic and continuous, being caused by numerous socioeconomic, regulations-related and political factors; under any scenario, the volume of illegal forest use will be falling down. Probable dynamics of real illegal logging by 2030 are seen as follows.

*Inertial scenario.* In the mid-term, the situation may change greatly. The following factors will play the greatest part in fighting illegal cuts and shadow timber trade:

- ecologization of domestic and foreign markets;
- legislative steps to ensure timber legality in the global markets;
- further rise of the middle class of forest users in the Russian Federation;
- development of voluntary timber certification.

In the Russian Federation, new legislative initiatives to ensure the legality of timber are being developed. In late 2011, draft Federal Act "On state regulation of round timber turnover" was brought for public discussion, seeking to ensure

transparency and legality of timber. The Act provides that all organizations and sole traders engaged in round timber trading in the domestic and global markets must apply respective declarations and register transactions in Unified State Automated Information System via the Internet [6].

The domestic Russian market is far behind the markets of post-industrial countries by the level of ecologization. The recent research by WWF showed a rather low level of importance for end-users whether timber was legal. About 50% respondents stated their indifference to the legal origin of timber. Meantime, the growth of ecological consciousness of the rising middle class is being observed. Growing responsible consumption in the domestic market will cause illegal use of forests to fall by 2030 by extra 5%.

Thus, the inertial scenario suggests that no significant growth of certified forests areas will occur. National initiatives to fight illegal cuts will not cause the enhancement of the state control efficiency in connection with forest use. Foreign initiatives will not create sufficient economic stimuli to support legality. Real illegal use of forests will see a slow fall. By 2030, illegal timber harvesting in the Russian Federation will fall by 5-10% due to gradual ecologization of the domestic market, development of the voluntary timber certification while keeping the existing efficiency of state control over forest use legality.

*Moderate scenario.* If the steps declared are applied in practice in an efficient way by the EU and the USA, Russian manufacturers will have to prove the legal origin of at least 1/3 of the export. In the Russian Federation there are a number of tools to ensure the legality of origin of timber: corporate tracing systems, voluntary timber certification, and legislative initiatives of federal and regional authorities. About 15% of the market is held by certified products and products traced by corporate systems. It is probable that a great share of large manufacturers will have to eliminate illegally cut timber from their supplies. In the mid-term, it may give a 20-30% fall of national illegal forest use [16].

The moderate scenario with efficient international regulations suggests making impossible selling timber and wood products of illegal and doubtful origin in the USA and European markets, including delivery via third countries. It is suggested that the law on round timber and other Russian initiatives to legalize timber will be of maximal efficiency by 2030. All those conditions will cause illegal forest logging to fall by 30-40%.

*Innovative scenario.* The most optimistic scenario provides for the restoration of efficient forest protection in Russia and successful international initiatives to fight illegal logging. In that case, by 2030 real illegal logging may be expected to sharply fall by 70-80%. Under no scenario it is not realistic to expect illegal forest use by 2030 exceeding 80%.

To ensure efficient fighting illegal logging, the following steps should be made:

- creating an efficient system to control forests use based on efficient forest protection ensuring control of documents and practice of forest use;
- defining the *illegal logging* notion;
- ensuring the efficiency of law-enforcement;
- making punishments for illegal logging more severe, especially by forestry companies and by gang in collusion;
- developing a policy of state and municipal procurements, voluntary mechanisms and voluntary forest certification;
- developing targeted informing public and business;
- creating a negative image of neglectful making and buying wood and timber products. Those steps will be efficient only in case of the solution of comprehensive problems beyond the forest sector, in particular, low living conditions in the countryside, unemployment and corruption.

## CONCLUSION

In forest legislature, public participation in preparing regulations and forest management should be focused. Public participation opportunities vary from simple notification to approval prior to decision-making. The most standard form of public participation is consulting councils of various levels. Membership and powers may greatly vary.

Management centralization is a crucial trend of forest regulations in many countries including the Russian Federation. Decentralization should bring decision-making closer to people, assisting in the satisfaction of public needs for decision-making.

Regulations should contain strict distribution of powers in connection with governing forest relations at federal, regional and local levels. The balance of interests in forest management should be based on the division of forests by ownership forms. Powers in governing forest relations should be assigned to the executive level (federal, regional, local) where they can be exercised best.

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### *References*

- Apsalyamova, S.O., Khashir, B.O., Khuazhev, O.Z., Khut, R.A., & Khachemizov, A.R. (2015). Organizational and Economic Mechanisms for Monitoring of Processes Ensuring Sustainable Development of the Forest Sector. *Biosciences, Biotechnology Research Asia*, 12(2), 1345-1349.

- Apsalyamova, S.O., Khashir, B.O., Khuazhev, O.Z., & Khachemizov, A.R. (2015). Economic Mechanisms of Competitiveness in Nature Management, Environment Protection and Ensuring Medico-Ecological Safety. *Biosciences, Biotechnology Research Asia*, 12(2), 1451-1458.
- Apsalyamova, S.O., Khashir, B.O., Khuazhev, O.Z., Tkhagapso, M.B., & Bgane, Yu. K. (2015). The Economic Value of Forest Ecosystem Services. *Journal of Environmental Management and Tourism*, 6(2), 291-297.
- Apsalyamova, S.O., Khashir, B.O., Khuazhev, O.Z., Bgane, Yu. K., & Kufanova, S.K. (2015). Legal Aspects of Ecosystem Services Related to Efficient Forest Exploitation. *Journal of Environmental Management and Tourism*, 6(1), 53-61.
- Apsalyamova, S.O., Khashir, B.O., Khuazhev, O.Z., Bgane, Yu.K., & Tkhagapso, M.B. (2015). "Green Economy" Ecosystems in the Forest Sector Services. *Biosciences, Biotechnology Research Asia*, 12(Spl. Edn. 2), 643-649.
- Food and Agriculture Organization of the United Nations. (2012). *Prognozrazvitiya lesnogo sektora Rossiyskoy Federatsii do 2030 goda* [Forecast of the Russian Federation's Forest Sector Development till 2030]. Rome. Retrieved September 11, 2016, from [www.fao.org](http://www.fao.org).
- Food and Agriculture Organization of the United Nations (2010). *Global' naya otsenka lesnykh resursov – 2010* [Global Assessment of Forest Resources – 2010]. Rome. Retrieved September 11, 2016, from [www.fao.org](http://www.fao.org).
- Food and Agriculture Organization of the United Nations. (2012). *FRA-2015. Terms and Definitions*. Rome. Retrieved September 11, 2016, from [www.fao.org](http://www.fao.org).
- Food and Agriculture Organization of the United Nations. (2014). *Sostoyaniye lesov mira 2014* [Condition of World's Forests 2014]. Rome. Retrieved September 11, 2016, from [www.fao.org](http://www.fao.org).
- Food and Agriculture Organization of the United Nations. (n.d.). *Country Reports*. Rome. Retrieved September 11, 2016, from [www.fao.org](http://www.fao.org).
- Fernholz, K., & Kraxner, F. (2012). Certified Forest Products Markets. In *UNECE/FAO Forest Products Annual Market Review (pp. 107-116)*. Geneva: The UN European Economic Commission. Retrieved September 11, 2016, from [www.unece.org](http://www.unece.org).
- United Nations. (2008). *International Standard Industrial Classification of all Economic Activities*. Statistical Papers, Series M, No.4, Rev. 4. New York: UN. Retrieved September 11, 2016, from [www.unstats.un.org](http://www.unstats.un.org)
- Bgane, Yu. K., Zyza, V.P., & Styagun, A.V. (2016). Formirovaniye kontseptsii sotsial'no-ekonomicheskogo razvitiya lesnogo sektora [Formulation of the Concept for Socioeconomic Development of the Forest Sector]. *Ekonomika i predprinimatel'stvo*, 1(2), 45-49.
- Bgane, Yu. K., Zyza, V.P., & Styagun, A.V. (2016). Aspekty ekonomiki ekosistem v sfere sluglesopol'zovaniya [Aspects of Ecosystems Economy in Forest Use]. *Ekonomika i predprinimatel'stvo*, 1(2), 49-51.
- Bgane, Yu. K., Zyza, V.P., & Styagun, A.V. (2016). Razvitiye fery prirodopol'zovaniya i obespecheniya mediko-ekologicheskoy bezopasnosti [Development of Natural Resources Management and Medical and Ecological Safety]. *Ekonomika i predprinimatel'stvo*, 1(2), 85-89.
- Bgane, Yu. K., Zyza, V. P., & Styagun, A.V. (2016). Otsenkavliyaniya investitsionnykh protsessov na prirodnyye sistemy [Assessment of Influence of Investment Processes on Natural Systems]. *Ekonomika i predprinimatel'stvo*, 1(2), 53-59.



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