

Development of a Mechanism of Projects Implementation for Forest Complex Development in the Irkutsk Region and Northern Territories of Mongolia

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Abstract – This article describes the model developed by the authors of introducing innovative projects in the forest complex of the Irkutsk region. The mechanism proposed by the authors for introducing innovative projects includes a sequence of six stages, creating tools to ensure effective management of the continuous process of introducing innovative projects according to a pre-planned scenario, thereby improving the quality of life among the population, efficient organization of managerial work, and also minimizing costs associated with the cost of their management.

Keywords–*innovation, innovation project, mechanism, management*

I. INTRODUCTION

Forest is the most important strategic natural resource on our planet. The role of forest in human life is enormous and various. Forest is the main component of the natural environment and the natural regulation of the processes occurring in it, forest contributes to the survival of humanity. At the same time, forest is important for the socio-economic development of our society. International agreements in which the Russian Federation participates, speak about the need of the world community for sustainable development [1]. The goal of the sustainable development strategy is a balanced solution of social, economic tasks and problems of preserving the natural resource potential in the interests of current and future generations.

The moderate use of forests, which does not lead to depletion, is the key to preserving and enhancing the ecological and resource potential of forests. At the same time, the reproduction of renewable forest resources implies their use (including removal) within the limits ensuring the replenishment of resources while preserving forest as an ecological system.

In the world, forest occupies 4 billion hectares of land or about 30% of the land area. In the past 25 years, forest area has

decreased by 3%. More than 50% of all forest areas are located in 5 countries: Russia, Brazil, Canada, USA and China.

These countries possess the majority of the wood reserves. Hardwoods account for 155 billion cubic meters, and coniferous are 127 billion cubic meters. Forests of the Russian Federation constitute more than 20% of global forest cover. Forests help industry with forest resources, perform essential environmental, environmental and other useful functions, such as recreation, tourism, hunting, water protection and soil protection, harvesting of food forest resources and collection of medicinal plants. [2].

The last two decades of political and economic reforms have shown that the forest sector of the country has long and difficult adapted to market relations and the demands of world markets. The forest sector is not a national economic policy priority. Russia has over 20% of global forests, but its share in the world timber trade is only 4%. At the same time, over half of the exports are from round wood and sawn timber (54%) [3]. Forests occupy more than half of the country's territory, but the share of the forest sector in gross domestic product (GDP) is only 1.3%, in industrial products it is 3.7%, in employment it is 1%, and in export currency earnings of the country it is 2.4%. In fact, the huge forest potential of the country is not used. State policy underestimates opportunities and prospects of the forest sector [4].

The Irkutsk region has one of the largest forests in the country (71.4 million hectares) and is distinguished by the high forest cover of its territories (92%). The total stock of stands is more than 9 billion m³, including the stock of ripe and over-mature stands. It is 5 billion m³. Estimated cutting area is currently used by only 36%. At the same time, the region has significant reserves for increasing timber logging. They constitute more than 32.5 million m³, including about 21.5 million m³ in coniferous farming and about 11 million m³ in hardwood farming. [5, 6].

Today the Irkutsk region has certain stagnation in the development of the forest complex. First of all, the factories of the region cut down the forest and export it to China. For 40–50 years of their work, reconstructed enterprises largely use the experience in the extraction of raw wood, which was used in Soviet times. Further effective work of these enterprises is associated with an increase in the distance of timber transportation and its appreciation. [7].

Forestry enterprises, which were built in the middle of the last century, need to be completely reconstructed. The reconstruction will allow creating new enterprises of the 21st century and excluding the things that the leaders of the world forest complex have had over the past decades. In other words, the forest complex of Russia has to “step over” through the stages that the forest complex of advanced countries went through in recent decades. The implementation of this model of

technological and intellectual achievement requires serious scientific and personnel support, the study of markets and development trends for several decades to come.

The use of innovative technologies can be the basis for building a new economy that can become a competitor in global market. [8].

In our opinion, the breakthrough technologies of the forest sector include information, nanotechnologies and biotechnologies. (Fig. 1).

The analysis of the promising list of innovations for the development of the forest sector of the Irkutsk Region should start by analyzing the development of the forest sector in the world over the past two decades. This analysis will allow selecting areas that are relevant for the Russian forest complex in the period up to 2030 and beyond.

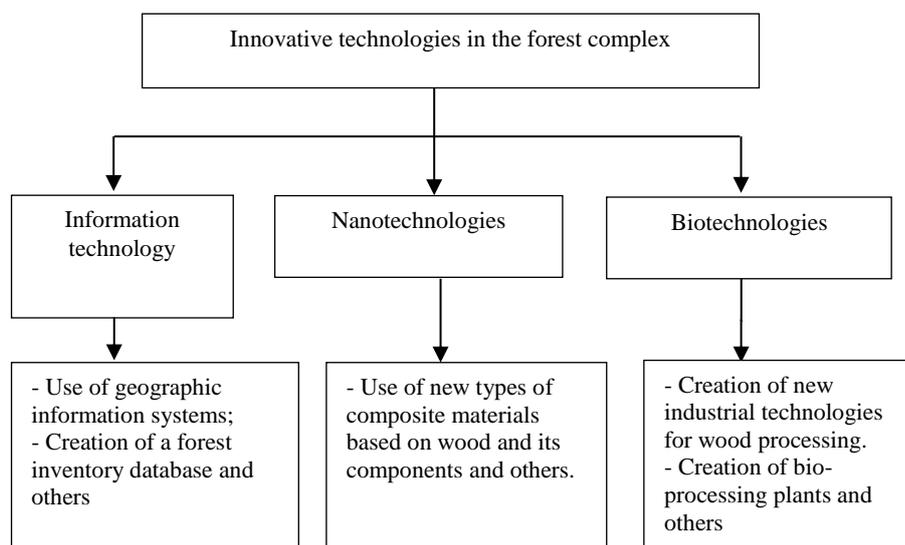


Fig.1. Use of innovative technologies in the forestry complex

The program for the development of biotechnology in the Russian Federation for the period up to 2020 (Bio-2020) was approved by the Chairman of the Government of the Russian Federation in April 2012. It is based on the best world experience and domestic developments in the creation of high-tech production.

The development of forestry is based on a number of breakthrough innovations, including the development of scientific bases and technologies that combine the use of forests and plantations. This combination is important for the sustainable provision of the pulp and paper industry, especially in the context of the reconstruction of the existing enterprises. For 40–50 years of work, reconstructed enterprises used the existing forest raw material experience. Further effective work of these enterprises is associated with an increase in the distance of transportation of wood and its appreciation. The program “Bio-2020” provides an increase in the area of fast-growing forest plantations up to 100 thousand hectares by 2020. [9].

The strategic goals of bioenergy and renewable energy are:

- replacement in the consumption of mineral fuel and energy resources;
- reducing the environment burden of the fuel and energy sector;
- providing fuel to businesses in regions with long and seasonal delivery;
- reducing the cost of delivery of imported fuel.

The resource for the development of bioenergy is wood waste that is unclaimed in the production of sheet materials and pulp and paper products [10].

In the future, the domestic market will remain the main consumer of biofuel from wood. Export is provided only for areas where there are necessary economic and transport conditions.

In the future, until 2030, wood and waste from the timber industry will mainly be used as technological raw materials and fuel in forest-rich areas, where the delivery of mineral energy resources is difficult or requires seasonal delivery. Energy

resources of increased capacity are planned to be produced in the form of charcoal, fuel briquettes and pellets, motor fuel from wood and technological fuel chips.

The development of rules and methods for substantiating the forms, types and ages of logging of forest plantations, taking into account the assessment of their impact on the conservation of useful functions of forests, provides for:

- scientific substantiation of the felling age of forest plantations in target farms;
- development of advanced logging technologies;
- development of scientific bases and principles of forestry management in 'energy' forests;
- development of multipurpose use and reproduction of forests, cultivation of plantations to meet the needs of the Russian forest industry, as well as increasing the level of forest protection.

It is especially effective to use innovations in developments within the forest complex for various sectors, as well as to do this together with other sectors of economy. [11]

The innovation plan can only be realized through the use of breakthrough technologies and innovations in the forest sector. The Russian forest sector is focused on the multipurpose, continuous use of forests, looking at their biodiversity and global ecological significance. The key principle of modern forest policy is the permanent management of forests, the preservation of environment-forming, water protection, protective, sanitary and hygienic, health and other useful functions of forests [12]

The staffing and training of personnel to work with innovative technologies is important for the successful implementation of innovation. The important aspect of this problem is the staffing, which includes engineering personnel and the creation of an innovative system of training and retraining of engineers and scientists. In connection with the transition to new technologies, the specialists with extensive knowledge in the field of innovative technologies are needed as well as in the field of creating new materials and technologies, etc.

Innovative methods of research organization and activity development include the use of a public-private partnership mechanism, combining fundamental, applied and experimental-technological works, developing an experimental base, scaling from laboratory research to experimental -industrial testing, system analysis state and trends of world forestry markets development. The innovative approach involves the integration of the scientific potential of universities and academic institutions in Russia, systematic involvement of leading foreign scientists and specialists, the use of modern research equipment of domestic and international research centers, and the involvement of students, graduate students and young scientists to work.

II. RESULTS

The authors developed a mechanism for the implementation of innovative projects based on the use of the forest complex of

the Irkutsk region. It will help to introduce innovative projects based on the use of the regional forest complex. The proposed mechanism (Fig. 2) includes a sequence of six stages and allows covering the entire list of regional works, as well as organizing effective management for the implementation of innovative projects in the forest industry.

Next, the authors will analyze the stages of the mechanism for introducing innovative projects in the forest complex of the Irkutsk region.

The first stage is "Prediction and planning of forest complex development in Irkutsk region". The first step of this stage is the development of a strategy for the development of the regional forest complex in the long term.

The management of the regional forest complex should determine strategic planning, which explores the internal and external environment, the competitive advantages of the forest complex, as well as its functionality [13].

In order to develop a strategy for the development of the forest complex of the Irkutsk region, it is necessary to focus on the formation of human capital, the modernization of technological processes, the creation and launch of new products on the market. The choice of strategy is determined by the availability of resources and opportunities (production, technological, scientific, etc.), production and economic condition (financial performance, product quality, workload of production capacity) and external circumstances (state science and technology policy, market conditions, technology development) [14]. The strategic priorities of the development of the forest complex are:

- improving the efficiency of forest resource use and reducing the proportion of wood that is not used;
- expansion of additional pulp production by expanding production in Ust-Ulimsk and Bratsk;
- modernization of existing industries;
- development of new wood processing technologies;
- expansion of new chemical and mechanical wood processing;
- biofuels and etc.

The next step will be the approval of the development strategy of the forest complex with the legislative and executive authorities of the region.

The second stage - «Monitoring and accounting of existing developments, equipment and technologies in the region» It is necessary to analyze the existing production for the development of the forest complex in the region. It is necessary to explore the strengths and weaknesses of existing projects. It is necessary to analyze the enterprises of the Irkutsk region, which are engaged in the harvesting and processing of wood, as well as to determine their competitive advantages.

The third stage - «Selection of the list of projects for implementation». This stage consists of developing a feasibility study for the project.

The feasibility study of the project is carried out according to the following basic scheme:

1. Justification of the need to implement the project;
2. Project description;
 - Organizational and economic structure of the project
 - Cash flow plans,
 - Competitive advantages
 - Analysis of global competitors
3. Project implementation costs;
4. Planning revenue from the project;

5. Positive changes in the region;
6. Risk minimization strategy;
7. Conclusion.

It is necessary to present evaluation of efficiency and financial feasibility to drawing up a list of potential projects.

The fourth stage - «Search for investors and resources for projects» is the main stage of the implementation of innovative projects in the forest complex of the Irkutsk region, because it affects the effectiveness of all the activities of the region.

One of the ways to attract investors can be the development of public-private partnerships. [15].

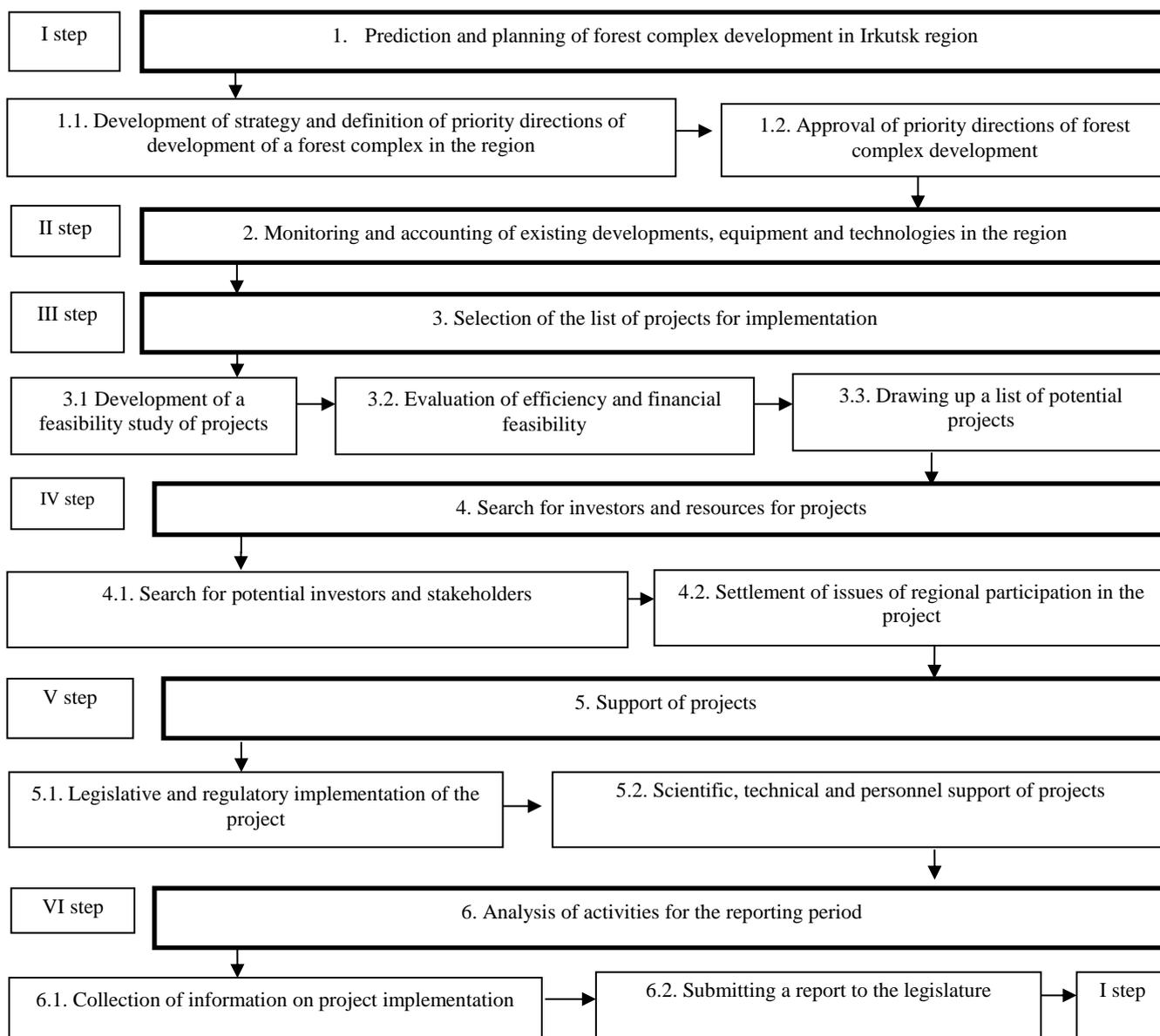


Fig. 2. Mechanism for the implementation of innovative projects in the forest complex of the Irkutsk region

An example would be the project "Listvennitsa". This is a joint project of OJSC Ilim Group and St. Petersburg State Technological University of Plant Polymers. The project "Listvennitsa" is an example of innovative development of the forest complex on the basis of public-private partnership. The state has allocated a subsidy of 150 million rubles. The same amount was spent by OJSC Ilim Group. The project implementation will allow the Russian forest sector making a fundamentally new step in the use of resources of the Irkutsk region [16].

The fifth stage - «Support of projects».

If interested companies are found, the region implements the legislative and regulatory implementation of the project, as well as scientific, technical and personnel support. As legislative support, the rent for the forest area can be reduced. [17].

Scientific support and staffing can be most effectively implemented on the basis of public-private partnerships through technology platforms. [18, 19].

Scientific and technical work is necessary for the start of industrial operation. For this purpose the experts from the Irkutsk Scientific Center of the SB RAS, specialists of educational institutions of the Irkutsk Region and other companies may be invited.

The improvement of forest education is possible in the following areas. The resource centers of vocational education can be formed on the basis of vocational schools, colleges and technical schools. General educational functions should be transferred to the general education system. Existing non-state training centers can become a full part of the national vocational education system. New educational institutions should be created on the basis of state and business participation. According to the results of the competition, all vocational education institutions will be able to receive budget funding for educational institutions development programs. The representatives of the professional community should be entered into the governing bodies of educational institutions. In the future, it is necessary to provide for the possibility of internship by students and the conclusion of contracts on subsequent employment [20, 21].

The network of higher education institutions should be optimized due to the concentration of resources to pay for the services provided by leading universities. Until 2030, 8–10 leading research and educational centers integrating advanced scientific research and educational programs will receive state support. The role of social and professional accreditation of universities will increase. The introduction of an educational loan will help ensure the accessibility of higher professional education and the development of competition between institutions of higher education. The scholarship fund in educational institutions will increase substantially [2, 22, 23].

The sixth stage is «Analysis of activities for the reporting period».

At this stage, it is necessary to analyze the effectiveness of measures for the implementation of innovative projects in the forest sector of the Irkutsk region. The next step is submitting a report to the legislature, which is presented and discussed at a

meeting of the executive and legislative authorities of the region. In case of a positive decision and a good assessment of the project implementation, further support for the project may be considered.

III. CONCLUSION

Thus, the use of a mechanism for introducing innovative projects allows creating a set of measures to ensure effective management of innovative projects according to a pre-planned scheme. This helps to improve the quality of life of people, effective organization of managerial work, and also allows minimizing costs.

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