Classification of lands infrastructure forest fund

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Abstract. The infrastructure on forest land plays an important role in cadastral valuation of forest land. The existing methods of cadastral valuation of forest land did not take into account forest infrastructure. The construction and operation of forest infrastructure facilities on forest land is necessary for the use, protection, conservation and reproduction of forest resources. Russia has over 20% of the world's forest reserves, which occupy more than two thirds of its territory. At the same time, the real contribution of forest land to the country's economy has not yet corresponded to the potential of the forest fund. The share of the Russian Federation in world timber trade is about 4%. The contribution of the forest complex to the country's GDP is about 0.5%, the number of people employed in this area is 0.8% of those working in the economy, and no more than 30% of the harvested wood is produced. Of particular importance for improving the efficiency of use and intensification of forest reproduction is forest infrastructure, the presence and density of forest roads for various purposes.

1. Introduction

To date, there is no classification of forest infrastructure facilities that could be used in the assessment of forest land. The problems of transport accessibility of forest land are being actively addressed, but a systematic approach to solving problems of transport infrastructure has not yet been noted. The construction and maintenance of transport infrastructure is poorly regulated by forest legislation. The rights of tenants are not defined, which are engaged in the construction and operation of forest roads. Forest roads are not included in the list of regional and local roads. Moreover, forest roads are not shown on spatial planning plans. The mechanisms for co-financing the construction of forest roads from budgetary and extra-budgetary sources have not been worked out. The system problem of the forest complex is the use of outdated technologies, machinery and equipment [1].

The classification of forest roads is presented in the most detailed literature sources. The classification of other forest infrastructure facilities has not been developed previously. Forest roads provide access to forest resources and allow year-round supply of wood in various sectors of the economy [1, 2].

The economic effect of the presence of transport routes in the forest fund is achieved at different stages of forest management activities. Such activities include: maintenance felling, main use felling, fire protection, protection from pests and diseases, forest regeneration. Modern resource-saving technologies of building and preserving forest roads contribute to mitigating the negative impact of transport on natural ecosystems. In accordance with the current legislation, “forest roads” are allocated to a special category of forest infrastructure facilities. Forest roads can be created for all uses of forest land.
The importance of infrastructure in determining the cadastral value of forest land is proposed to be determined through the costs of logging, by entering the appropriate established and reasonable coefficients. V Kovyzin, A Romanchikov [3] considered the problem of cadastral valuation of forest lands, taking into account the forest fund infrastructure, however, the specifics of the coefficients calculation and their justification are not presented in scientific work.

The presence of an unsolved problem is a prerequisite for conducting a new study, which, thus, emphasizes the relevance of this study, which proposed a classification of forest infrastructure.

2. Materials and methods

The rates of payment per unit volume of woody forest plantations were approved by Decree of the Government of the Russian Federation. As the results show, an increase in the distance of removal of harvested timber by 10-15 km increases the initial auction price of a unit of forest resource by 10% The results was studied in the related articles[4].

The article[5] show, that in the Perm Territory, the remoteness of spruce plantations from existing roads reduces its initial starting price by 15-20% rub. per m3. In this paper, a classification of forest infrastructure by purpose has been proposed for ease of use and further consideration of forest infrastructure objects in cadastral valuation of forest land (see Figure 1).

![Figure 1. Forest Infrastructure of Land Forest Found](image)

As a rule, the objects of transport and logistics forest infrastructure form a developed network of roads, due to which the distance of transportation of forest products is shortened, and access to the land plots is made. Accordingly, the cadastral value of such land plots is not equivalent to the cost of forest plots that are far from the forest infrastructure, to which passage and passage are difficult. The following objects are referred to the transport and logistics infrastructure: forest roads, railway bridge; highway bridge; pedestrian bridge; combined bridge; forest passage, which are specified in the law [6].

The main task of protective forest infrastructure facilities is to maximize forest protection efficiency with the least expenditure of funds for their construction and to minimize the loss of valuable forest lands. Such objects include: fire break; mineralized strip; platform for water intake; tank (tank), reservoir, other land and underground tanks; relay tower to provide departmental radio and telephone communications; platform for turning fire equipment; fire observation post (tower, mast, pavilion); in the hot water reservoir (including an underground tank and an equipped place for campfire and rest; a landing pad for airplanes, helicopters used to accomplish the tasks assigned to specially protected natural territories; fire well; device for collecting water for fire needs; shield and a shed for placement of firefighting equipment; a system for draining or irrigating forest areas (dams, bypass structures, gateways, water level control devices); a security guard point with auxiliary
facilities eniyami; hospital for the field of research with the auxiliarying facilities; building fire-
chemical stations, garage for patrol and forest-fire equipment; pier for the service water transport,
construction of erosion control, hydraulic, and preventing, the construction of landslide, which are
specified in the law [6].

Some of the objects of forest infrastructure are, according to our classification, (Figure 1) to the
economic infrastructure, which includes the following objects: a glade; trail; hive; hedge, lumber yard;
quarterly clearing; quarter pillars. The presence of such forest infrastructure facilities is necessary for
the normal functioning of logging and other activities on the forest lands of the forest estate. Such
objects are most often found in the forest area and their main task is to maintain the following objects
in proper condition: excursion ecological paths with elements of the benefit-device; viewing platforms
and towers; equipped tourist campsites, places for making campfire and rest; full house, well; barrier;
forestry, forest inventory sign, information board, canopy, other objects providing recreational use,
which are specified in the law [6].

The availability of recreational infrastructure on forest land is an important factor for their
assessment. Recreational forest infrastructure creates advantages for the socio-economic development
of territories. For business such objects create a favorable environment for tourists and an opportunity
for business development in rural areas.

The list of forest infrastructure facilities is approved by the Government of the Russian Federation
for protective forests, production forests, reserve forests, and the design, creation, maintenance and
operation of such facilities is approved by an authorized federal executive body [6].

3. Results and discussion
As practical results show [7], one of the problems of forest use is the construction of forest
infrastructure facilities through water protection zones, spawning belts and spawning rivers.

When creating forest infrastructure, in particular, during the construction of forest roads and
bridges through water protection zones, spawning belts and spawning rivers, this is one of the most
complicated and problematic aspects of forest management. Forestry can only be intensive if there is a
developed network of forest roads. Today, the construction of forest roads is almost entirely funded by
tenant enterprises.

In addition to the cost of road construction, in a number of entities forest users bear additional costs
associated with the development of project documentation, registration of rights to forest areas and
obtaining all kinds of permits and approvals in various departments. This problem becomes especially
acute during the construction of roads crossing the protection zones, spawning belts and spawning
rivers. And in the subjects of Russia there was a completely different practice of law enforcement.

From the point of view of the economic impact on nature was presented the authors [7], there is no
difference in the construction of forest infrastructure on the lands of the forest fund, whether leased or
not. In practice, these are absolutely two different procedures.

Forest infrastructure, as a rule, is not designed for long-term functioning. For example, in the
conditions of the Far East, sections of roads and bridges are often washed off during periods of rain
floods, sometimes several times per season. However, if permission or approval for the construction of
the road has already been received, then when restoring a section of the road or erecting a new bridge,
it is not necessary to receive it.

Another serious problem of creating a forest infrastructure is the need to formalize the cutting of
trees under the road bed in those cases when the laying of communications is carried out on forest land
not leased, this problem was addressed in the article [8]. The forest management authorities oblige to
lease the forest area for the purpose of construction and operation of linear objects, especially if it is
located in a water protection zone and / or spawning strip. But cutting trees under the roadway is not
considered a timber harvesting activity. This means that felled timber does not become the property of
the tenant and cannot be sold as a commodity. In addition, the construction of a linear object requires
the development of project documentation and the passage of state expertise of the project, which
entails additional costs, some of which are described above. Other types of legal registration of felling
under the canvass but roads on the lands of the forest fund, which are not leased, are not provided for by the legislation.

There is another problem that occurs quite often. This is the lack of a clear legal decision-making mechanism in cases where the development of a forest area is possible only if the road is built through a section of another tenant. As a rule, in this case business entities agree among themselves, and the lessor represented by the state has no legal opportunity to intervene in this process. There are also cases when the negotiation process between economic entities for one reason or another (including due to unfair competition) comes to a standstill and the development of the forest area is frozen indefinitely. This state of affairs is clearly contrary to the interests of the state, impedes the realization of the legal rights of an economic entity and generally impairs the investment attractiveness of the forest complex.

According to the authors [9], there are several other problems in the development of the forest fund infrastructure. Wood removal from the forest is a part of the business of harvesting wood, which can be carried out on the basis of lease agreements. Citizens and legal entities for the purpose of harvesting wood are entitled to build forest roads, timber depots and other buildings and structures. Consequently, the creation of forest infrastructure can be carried out on the basis of a lease agreement for a forest plot for timber harvesting. However, this rule is not reflected in direct legal norms.

The absence in the current regulatory framework of direct regulations governing the construction of forest roads on forest land not leased restrains the development of forest infrastructure and leads to additional costs for economic entities. The legitimacy of the requirements of local authorities to conduct assessments of possible damage to fisheries and bioresources by specific organizations subordinate to the same authorized bodies, as well as forcing to pay the estimated amount of possible damage, is very doubtful.

In order for the state in the person of the landlord to influence the process of creating forest infrastructure in forest areas that are leased to develop adjacent areas, this right should be fixed in the lease agreement.

4. Conclusions
1. Weak development of forest infrastructure of rural lands negatively impacts on rural population’ working and living conditions. Forest infrastructure condition of rural lands is important factor for social and economic development of regions. Recreation potential and development of recreation infrastructure are very meaningful for socio-economic evaluation of rural regions development;

2. As seen in practice, impossibility of forest exploitation (including commercial forests) is connected with weak development of forestry road infrastructure;

3. Technological development of forestry is not well-developed even on global level. Firstly, it caused by lack of innovation projects for forestry in Russian regions. The main aim of these projects is usually the reduction of forestry development limitations, improving of forest production properties. Also, creation and development of innovation projects stimulates the amount of investment for forest infrastructure;

4. Forest infrastructure affects on technological growth and renovation increment. Technological renovation increment for Russian forestry is several times lower than global one. It leads to weak competitiveness of Russian forest products.

5. It is essential to modernize all sectors of Russian forestry, to implement new innovative scientific technologies. Main aims for development of forest infrastructure are:

   1. To adopt the 2030 Forestry Development Strategy;

   2. To make changes in Forest Code of Russian Federation – to divide the authorities of different government bodies in the field of forestry roads construction;

   3. To develop and implement forestry transport infrastructure development program “Forestry development 2013–2020”. It is also aimed to forestry and fire-protective roads construction;

   4. To increase the development of transport infrastructure for leased forest sites;
5. To both technically and technologically modernize the forestry complex by forestry infrastructure investment activation;
6. To provide the accounting of forest roads and to include them to the State Road Register;
7. To include forest sites to Unified State Register of Immovable Property and to provide state cadastral evaluation of these sites;
8. The classification of infrastructure on forest land proposed in this article can be taken into account in the cadastral valuation of forest land to increase investment in the development of forest infrastructure, including the construction of forest roads (see Figure 1).

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