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ISSUES RELATED TO THE IMPROVEMENT OF FOREST LANDSCAPE MANAGEMENT IN TAVUSH REGION

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The article refers to anthropogenic conflicts occurring in the forest landscapes of Tavush region of Armenia. It is shown that a number of environmental issues have emerged as a result of unsustainable management of forest landscapes leading to a decrease in the continuous flow of forest ecosystem services. This analysis can have a great practical importance for solving the existing problems.

Forest landscapes – anthropogenic conflicts – sustainable forest management

Հոդվածը վերաբերում է Տավուշի մարզի անտառային լանդշաֆտներում առկա մարդածին կոնֆլիկտներին: Ցույց է տրված, որ մարզի անտառային լանդշաֆտների ոչ կայուն կառավարման արդյունքում ի հայտ են եկել բնապահպանական բազմաթիվ հիմնախնդիրներ, որոնք հանգեցրել են անտառի կողմից տրամադրվող էկոհամակարգային ծառայությունների շարունակական հոսքի նվազմանը: Այս վերլուծությունը կարող է կարևոր գործնական նշանակություն ունենալ առկա հիմնախնդիրների լուծման համար:

Անտառային լանդշաֆտներ – մարդածին կոնֆլիկտներ – անտառների կայուն կառավարում

Статья относится к антропогенным конфликтам в лесных ландшафтах Тавушского региона. Показано, что в результате неустойчивого управления лесными ландшафтами возникло множество экологических проблем, которые привели к уменьшению непрерывного потока услуг лесных экосистем. Этот анализ может иметь большое практическое значение для решения существующих проблем.

Лесные ландшафты – антропогенные конфликты – устойчивое управление лесами

Numerous natural and anthropogenic conflicts do exist in the forest landscapes of Tavush region of Armenia. While the region is distinguished by almost half forested territory and the absence of industrial enterprises, nevertheless, the main environmental problem of the region is considered to be relating to the unsustainable forest resources use. It can be stated that due to ineffective management and unsustainable use of forests various negative phenomena have emerged. Taking into consideration the above-mentioned, the article highlights the existing anthropogenic conflicts in the forest landscapes of the region proposing ways of solving them, which are to contribute to the improvement of the management of forest landscapes and the increase of the flow of ecosystem services provided by forests in the region.

Materials and methods. Forests of Tavush region cover an area of 139980 hectares, which are under the subordination of two state administration bodies, namely the Ministry of Agriculture (represented by the four branches of “Armforest” SNCO covering 115150 hectares) and the Ministry of Nature Protection (Specially Protected Areas (SPA) system covering 24830 hectares) [8-10].

An analysis of the present-day management system of forest landscapes in Tavush region, informational materials on forest inventory and forest management plans have been prepared. Anthropogenic conflicts have been identified and methods to resolve them have been suggested using these materials in combination to the field studies. This work is based on historical, statistical, modern cartographic (GIS), and comparative-geographical methods.

Results and Discussion. The article identified the following anthropogenic conflicts in the forest landscapes of Tavush region:

1. Adjustment and demarcation of boundaries of forest enterprises, SPAs and forests adjacent to communities,
2. Absence of clearly separated functional and transitional (buffer) zones of specially protected natural areas,
3. Illegal and unregulated felling, planned felling in non-production forests (on high slopes, water protection buffer zones of rivers, in protected areas, green zones, and etc.),
4. Lack of information on the location and condition of natural monuments, absence of information signs. Often natural monuments cannot be found and clearly separated and recognized,
5. Scarcity of integrated information sources on forests and sometimes their complete absence.

The first precondition for improving forest management is the adjustment of borders of the forest enterprises. Correction of the borders of the forest enterprises using and combining different sources of forest related information, including satellite images of the given area, topographic maps, cadastral maps of land use and ownership forms, forest tablets, etc. is a priority. In addition to these works, field studies using global positioning system (GPS) and topographic conditions should be carried out aiming at the correction of borders of the forest enterprises.

Demarcation of borders in natural conditions through development of demarcation scheme and placement of border posts is necessary to be carried out after the adjustment and mapping of the borders of the forest enterprises and protected areas. Border posts should be installed not only between community lands and forest enterprises (or protected area), but also between forest enterprises and specially protected areas.

Currently, UNDP-GEF “Mainstreaming Sustainable Land and Forest Management in Mountain Landscapes of North-Eastern Armenia” project carries out the adjustment of borders of Ijevan and Noyemberyan forest enterprises. Within the framework of the said project 200 border posts were installed on the borders of community lands and forest enterprises, as well as on the borders of forest enterprises and SPAs [5].

Protected areas under the subordination of the Ministry of Nature Protection (“Dilijan” National Park and “Zikatar” SS) encompass 24830 hectares of Tavush region forests, while Ijevan Sanctuary is within Ijevan Forestry Enterprise. Most forest SPAs in the forest enterprises are currently treated as part of the forest enterprise without the use of appropriate conservation regime with no special attention being paid to the existing biodiversity and ecosystem values. Since forest ecosystems do exist not only in the territory of the SPAs, but also beyond their boundaries, it is expedient to separate the

buffer zone with an appropriate protection regime for the complete protection of the ecosystems outside the protected areas. Conservation zones adjusted around the SPAs [6, 7] are intended for the conservation of the biodiversity, but most often do not have clear boundaries and no respective protection regimes are being applied.

Important anthropogenic conflicts include irregular and illegal forest logging, which has resulted in significant degradation of forest landscapes, intensive erosion of the soil cover, activation of landslides, reduction of the carbon dioxide absorption potential by 50% [2, 3] and violation of the continuous flow of forest ecosystem services. Irreversible damage has been done to valuable tree species, especially beech and oak. Preserved low-value tree species cannot ensure the regular forest regrowth and healthy regeneration of the desired species.

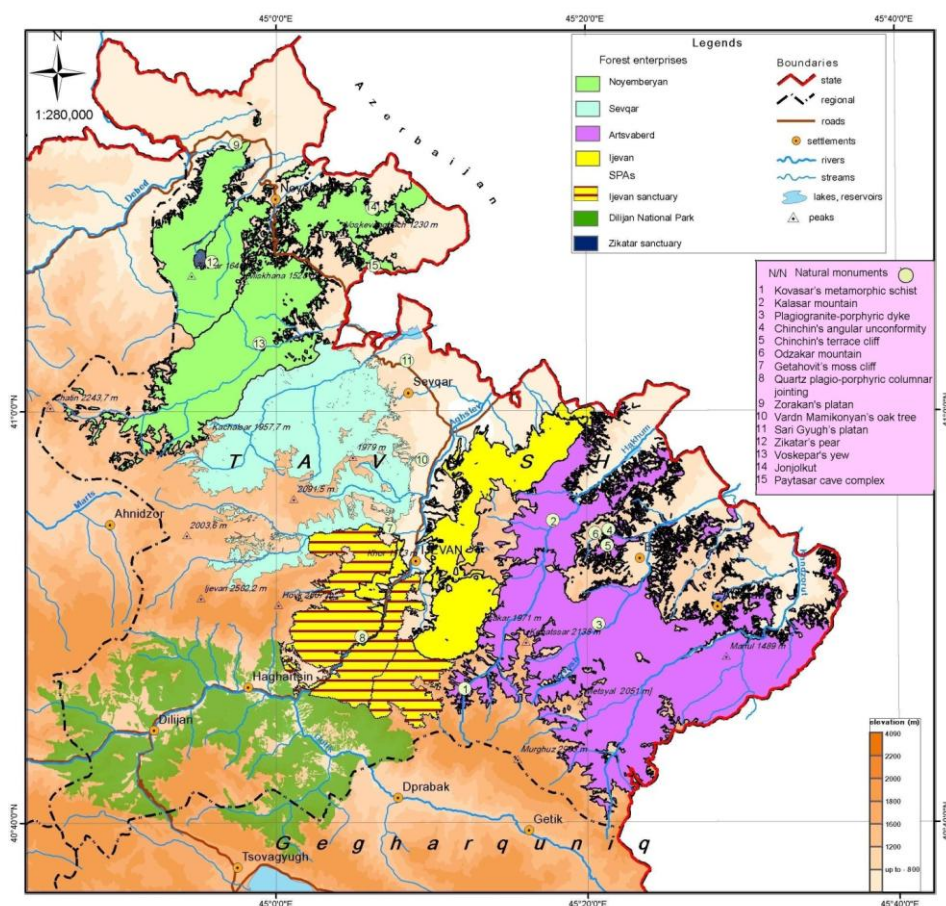


Fig.1. Forests and nature monuments of Tavush region

Elimination of vegetation contributed to the weakening of surface flow regulation, which led to increased activation of landslides and mudflows [4]. At present, irregular logging continues and is particularly active in nearby communities and on forest roads. This conflict is also a social issue, as the population of the forested communities receives firewood from the forest while the wastewood available for sale in the forest meets the 30 % of the minimum demand of the firewood of the population.

Programs aiming at the revenue increase are necessary to be implemented so the population of the adjacent communities will be able to use gas during the heating season which will decrease the minimum demand for firewood in rural areas per 1 household from 7 cubic meters to 3-4 cubic meters leading to a significant reduction in illegal logging. It is also necessary to establish planting of fast growing tree and shrub plantations (poplar, acacia etc.), which will replace some of the population's firewood demand.

In some cases forest landscapes are also damaged by the planned logging implemented by the forest enterprise, this includes logging on 30° degree and higher slopes and in the water-protective buffer zones of the rivers. Endemic and Red book species existing in the area are not considered and being carelessly destroyed during these works.

There is a lack of adequate information about the natural monuments in Tavush region. These are generally excluded from the tourist routes and information signs, signboards are not at place which makes the nature monuments of the area unrecognizable. Most of the monuments are in poor state. It is necessary to make investments in improving the area of monuments, making them recognizable through installation of booths, information signs and engagement in tourist routes.

It is required to create an integrated forest database (based on the GIS), integrating the results of the programs implemented by the various national and international organizations in the forest sector.

Thus, the solution of these anthropogenic conflicts will contribute to the improvement of the management of forest landscapes and to the increase of the continuous flow of ecosystem services provided by the forests in the Tavush Region. In particular, it is possible to increase the recreational potential of forest landscapes by increasing the recognition of natural monuments, preventing illegal felling and increasing the flow of touristic services (spiritual and cultural ecosystem services). Elimination of illegal logging and the improvement of the forest protection will result in the increase of carbon dioxide (CO₂) absorption by forest and the flow of regulating services of the forest. Meanwhile, the means collected through the introduction of ecosystem services payment system in the forest sector can be directed to the protection of forests and natural monuments.

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