Non-use Value of Forest Ecosystem Services in Russia

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Abstract In recent decades, close relations between economic development and environmental degradation have become increasingly evident. As part of the transition toward sustainable development with a particular focus on effective environmental management and the maintenance of steady-state ecosystems, the activities of all economic and political actors should be reconsidered in order to conserve biodiversity and mitigate the effects of global warming. In this regard, the economic assessment of forest ecosystems is gaining increasing attention. This paper presents the review of methods for estimating the economic value of ecosystem services for forest biomes. While methods for determining use value of forest ecosystem services are well-discussed, the monetary estimation of non-use value is more complex as there are no traditional markets for them.

Keywords Sustainable development · Sustainable use of natural resources · Ecosystem services · Forest ecosystem · Non-use value

1 Introduction

Forests are significantly important due to the biodiversity they contain and to the ecological functions they supply. As defined by [1], a forest has three main services: provisioning, regulating, and cultural. The first one is wood and non-wood products extracted from natural or managed forested areas. The service of regulating includes benefits obtained from the regulation of ecosystem processes such as air quality regulation, climate regulation, water regulation, erosion regulation, and natural hazard regulation [2]. Cultural service means nonmaterial benefits that people can get from the ecosystem through aesthetic experience, reflection, recreation, and spiritual enrichment [3].

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The value that a forest provides arises from the fact that the current level of deforestation is about 3.3 million hectares per year (2015). Scientists also suggest that the loss of forest areas could accelerate in the future as an effect of climate change that causes forest diseases, change in productivity, and carbon budget of forests [4]. On the other hand, the role of the forest in climate regulation as an important carbon storage reservoir has been officially recognized in the Kyoto Protocol. The international community emphasized that each country should support policy action toward a sustainable use of forest resources worldwide, promote sustainable forest management, and afforestation [5]. This means that the forest economic assessment challenge has incrementally reached the international agenda.

Concerns about this problem in Russia was reflected in the Government Resolution "Fundamentals of State Policy in the Field of Use, Protection, and Reproduction of Forests until 2030" (2013). The main objective of the state forest policy is to strengthen forest fire management, forest protection against diseases, and insects, as well as the reproduction intensification [6]. This explains the fact that, recently, great attention has been paid to forest conservation projects. According to the information platform Ecosystem marketplace, forest ecosystem projects, and other projects in the field of land and forest management have become absolute leaders at the voluntary market in 2015, which is 50.24% of the total number of transactions [7].

Based on the data of the Russian Statistical Yearbook, there is a tendency of deforestation in the period 2010–2016, the main cause of which is forest fires [8]. Burnt forest areas have increased by 88% over the past six years, while the costs of protecting forests from fires remained almost at the same level, which indicates that the management of forest fires is not fully funded.

The ineffectiveness of forest management in Russia as proved by the above data shows that policies for effective reduction of deforestation are not yet clear. In this case, proper economic assessment of forest services can facilitate the policy-making process.

2 Methods

This paper provides a literature review of non-market values of forest services. Researchers consider Total Economic Value to be the most common concept for the economic assessment of forest ecosystem services. It includes several categories: use value (direct or indirect), option values, and non-use value (bequest, existence). The latter is recognized to be an under-investigated, but not less important, component of the total economic value of ecosystems, which should be considered in decision-making [9].

3 Results

Direct and option values can be easily monetarily evaluated by market methods, while economic assessment of non-use value (bequest, existence), which is correlated with the cultural services of the forest, is more complex as there are no traditional markets for them.

At the same time, in Russia, the assessment of forest ecosystems is made in terms of their resource value (use value). Cost approach, based on theories of labor cost, market price, and methods of differential rent are widely used. However, these methods fail to reflect the social significance and environmental functions of the resources, therefore, they are inefficient—low pay does not stimulate rational forest use [1].

Foreign literature states that non-market methods for assessing non-use value of forest biomes appeared from the neoclassical welfare theory. This theory is based on the assumption that people have clearly defined preferences among alternative sets of goods, which consist of a different number of both market and non-market goods. It also assumes that people know their preferences and that these preferences are substitutable [10].

In the framework of this theory, evaluation models based on substitutability can be expressed in the form of either willingness to pay or willingness to accept compensation including both the contingent valuation method and discrete choice experiments [11]. Such indicator as willingness to pay can be assessed by either observing the behavior of people in real conditions, where they should live with the consequences of their choice (the method of revealed preference) or conducting interviews and surveys (method of stated preference) [10].

To make the monetary estimation of non-use value an easier task, [4] suggest to rely on the full body of knowledge already available in the environmental economics literature to gather estimates that cover, for each service to be valued, the highest variability in terms of countries and forest types. On this matter, a critical role is played by the use of research synthesis techniques, such as meta-analysis and value transfer, within the non-market valuation.

4 Conclusions

The paper represents possible methodologies for the monetary evaluation of the non-use value of forests. It is fair to say that the monetary estimation of ecosystem services still represents a very challenging task for researchers, firstly, because they are not traded in markets, secondly, due the lack of original valuation studies providing reliable estimates of the willingness to pay for forest values.

Forests have a significant impact on the economy and its development, whereby applying methods for the monetary assessment of non-use value of forest ecosystem

services is particularly necessary to emphasize its importance. The economic assessment of forests, taking into account the impact of climate change, is extremely accurate, as it can be used in choosing strategic approaches for forest management policies.

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