OLSZTYN ECONOMIC JOURNAL
Abbrev.: Olszt. Econ. J., 2012, 7(2)

ISSUE OF VALUATION AND PAYMENT OF FEES, CHARGES AND RESTITUTION COSTS OF THE FOREST ECOSYSTEM USED FOR ROAD PROJECTS

Damian Januszewski, Teresa Maria Łaguna, Agnieszka Osiecka

Department of Spatial and Environmental Economics
University of Warmia and Mazuryin Olsztyn

K e y w o r d s: environment, valuation, resources, protection of agricultural and forest lands, fees, charge, compensation, restitution costs, space.

A b s t r a c t

This paper presents the issues related to the fees paid by entities for exclusion of a forest from production. Forests and forest lands are covered by statutory protection against change in use for purposes other than forest. The government has introduced fees and yearly charges for which the method of computation is included in the Act on Protection of Agricultural and Forest Lands (Act of 3 February 1995 on protection of agricultural and forest lands, Dz.U. of 2004 No. 121, item 1266). The total fees include a one-time fee, yearly charges and compensation for the early felling of standing timber if it has not reached felling age.

The problem of valuation of the statutory fee, once-only fee, the year fees, compensation for early felling of standing timber and the problem of possible ecosystem restitution costs are all analysed in this work.

The study also aimed at determining the amounts of fees and charges paid by a private entity for exclusion of 1 ha of forest land from production.A case study covering 1 ha of riparian forest excluded from production permanently was used as the method of study. The amounts of fees and charges due for exclusion of the forest from production and the costs of ecosystem restitution were computed.

The study showed that the fees and charges imposed by the government do not satisfy the criterion of equivalency according to the principle that "the user pays" because of the omission of the costs of restoring the ecosystem.

WYCENA NALEŻNOŚCI, OPŁAT, ODSZKODOWAŃ I KOSZTÓW RESTYTUCJI EKOSYSTEMU WYKORZYSTANEGO POD INWESTYCJE DROGOWE

Damian Januszewski, Teresa Maria Łaguna, Agnieszka Osiecka

Katedra Ekonomii Przestrzennej i Środowiskowej
Uniwersytet Warmińsko-Mazurski w Olsztynie

S ł o w a k l u c z o w e: środowisko, wycena, zasoby, ochrona gruntów rolnych i leśnych, należności, opłata, odszkodowanie, koszty restytucji, przestrzeń.

Abstrakt

W pracy poruszono problematykę opłat ponoszonych przez podmioty za wyłączenie lasu z produkcji. Lasy i grunty leśne są objęte ustawową ochroną przed zmianą przeznaczenia na cele inne niż leśne. Ustawodawca wprowadził obowiązek uiszczania należności i opłat rocznych, których sposób obliczania zawarto w ustawie o ochronie gruntów rolnych i leśnych (Ustawa z dnia 3 lutego 1995 r. o ochronie gruntów rolnych i leśnych, Dz.U. 2004, nr 121, poz. 1266). Na całość opłat składają się: należność jednorazowa, opłaty roczne i odszkodowanie za przedwczesny wyrąb drzewostanu w przypadku nieosiągnięcia wieku rębności.

Przedmiotem rozważań były problemy wyceny należności ustawowej, należności jednorazowej oraz odszkodowań, opłat rocznych za przedwczesny wyrąb drzewostanu, nakładanych zgodnie z przepisami prawa, oraz ewentualnych kosztów restytucji ekosystemu.

Celem pracy było ustalenie wysokości opłat ponoszonych przez podmiot prywatny za wyłączenie 1 ha gruntu leśnego z produkcji oraz ocena praktyki gospodarczej w tym zakresie w odniesieniu do nowoczesnych metod wyceny ekosystemów. Zastosowano metodę studium przypadku, obejmując zasięgiem 1 ha lasu łęgowego trwale wyłączonego z produkcji. Policzono wysokość opłat za wyłączenie lasu z produkcji na podstawie wytycznych zawartych w ustawie oraz z uwzględnieniem kosztów restytucji ekosystemu.

Badanie wykazało, że opłaty nakładane przez ustawodawcę nie spełniają kryteriów ekwiwalentności w myśl zasady „korzystający płaci". Przyczyną jest pominięcie kosztów odtworzenia ekosystemu.

Introduction

Allocation of forest or agricultural lands for uses other than forest and agricultural uses requires obtaining a permit for a change in the intended use in the local physical development plan. Following the change of the land intended use in the above-mentioned plan, before issuing the "building decision", the land should be excluded from production according to the procedure stipulated in the Act on Protection of Agricultural and Forest Lands (op. cit. item. 1) and the Act on Physical Planning and Development (Act of 27 March 2003 on physical planning and development (Dz.U. of 2012, item 647). According to the provisions of the acts on forests (Act of 28 September 1991 on forests (Dz.U. of 2011 No. 12, item 59) and on real estate management (Act of 21 August 1997 on real estatem anagement (Dz.U. of 2010 No. 102, item 651), exclusion of land from production requires lodging an application with the Director of the Regional Directorate of State Forests (areas of national parks are an exception) with the required documents. Exclusion of forest land from production (depending on the owner) also involves the statutory requirement of paying the fees and charges by the applicant. In case of permanent exclusion of forest land from production, these include: a statutory fee, a year charge and compensation for early felling of standing timber. In the case of projects that use space at the expense of ecosystems, the fee, charges and compensation should be included in the project costs. However, according to the Act on Forests, exclusion of lands owned by the State Treasury does not generate the above costs for the investors, particularly if the land used for the project is

public property (of the State Treasury or territorial government). Those costs are included in the costs of land acquisition. For road projects that are classified as projects for public goals other regulations are available. In that case, the applicant does not bear the statutory costs of excluding the land from production.

For commercial projects, the investor pays the fee, charges and compensation. The fee and charges paid by the investor depend on the current price per 1 m^3 of timber. This means that the valuation considers only the costs of the timber raw material without considering other factors. The forest is not just a formation of trees but a compact and complete ecosystem. Exclusion of forest from forest production results in complete destruction or reorganisation of the ecosystem. According to the effective legal regulations, the value of the destroyed ecosystem and restitution costs – costs of moving and restoring the ecosystem in a different location – are not considered in determining the fees and costs.

The government fee paid once and the annual fees were determined based on the Act on Protection of Agricultural and Forest Lands (op. cit. item 1) and executive acts for it. The costs of restitution of an ecosystem were determined based on the Legal Property Act (op. cit. item 4) and relevant executive acts. Detailed procedures of evaluation were highlighted in Chapter 3.

Review of literature on functioning of forest ecosystems

In the past, forestswere a basic resource for satisfying human needs and were seen as a free good, which under natural conditions is available in unlimited quantities and satisfies the human needs fully. There was no need for making outlays for using free goods and man was not forced to restrict consumption of such goods, as was the case with rare goods (SAMUELSON, NORDHAUS 2009). The forest was the source of food (animals, plants), materials for clothing production (animals), building materials (trees) and fuel (timber). In the modern economy, forest cannot be classified as a free good because the functions of the forest have also changed. The habitat-creating, recreational, aesthetic and landscape-creating functions are particularly highlighted. Forests also perform a protective function through water and carbon dioxide retention (ŁOJEWSKI 2007).As the forest is not a free good, the outlays of factors of production are necessary to maintain values satisfying human needs. The costs of outlays necessary for maintaining those characteristics of forests should also be subject of valuation. The concepts of sustainable development aim at considering such costs in the process of restitution of a given good that others could use. If restitution is not possible, financial compensation should

be considered. Consequently, valuation of the costs of outlays would represent a tool for internalisation (including the costs into own account) of external costs related to destroying the forest ecosystem by the "one responsible for" the investment project.

Forests and the concepts of sustainable development and eco development

The concept of sustainable development appeared for the first time in the Report of the World Commission on Environment and Development[1] of 1987 where it was defined as satisfying the current needs without bearing the risk that the future generations will not be able to satisfy those needs. The concept considers the issue of long-term development ability coupled with simultaneous satisfaction of the criterion of inter-generational justice (KOŚMICKI 2010). Sustainable development may be defined as the process of searching for, checking and implementing new forms of economic development, technology, forms of energy, social communication and forms of extra-economic activities of society to ensure high living standards of many generations and possibly rapid resignation from the achievements of current civilisation unfriendly to the natural environment and man (GÓRKA et al. 2001).

Eco-development is a narrower notion which is contained within the notion of sustainable development (GÓRKA et al. 2001). In 1975, at the Third Session of the United Nations Environment Programme Governing Council, the thesis was accepted that a society implementing the idea of eco-development accepts the supremacy of ecological requirements that cannot be disturbed by civilisation growth or cultural and economic development. Society must be capable of self-control of its development for the purpose of maintaining homeostasis and symbiosis with nature, consequently respecting economic production and consumption and using waste and take responsibility for the future consequences of the actions undertaken, whichincludes the needs and health of future generations (*Ochrona*... 1984).

An ecologically valuable ecosystem is not precisely defined. Consequently, it can be defined as a naturally valuable area within which an organism, species or a group of organisms or an inanimate object, habitat, ecosystem or landscape occurs (*Ekologiczne*... 1984). An ecologically valuable area may be influenced by characteristics such as rarity, typicality, usefulness, symbolism

[1] Gro Harlem Brundtland – three times the Prime Minister of Norway (1981, 1986–89, 1990–96), Director General of the World Health Organisation (1998–2003). As of 2007, one of the three Special Envoys on Climate Change for the United Nations Secretary-General Ban Ki-moon. Chairperson of the World Commission on Environment and Development (1984–1987).

or aesthetic values of a given component of the environment. According to the economic criterion, such an area is characterised by biological and landscape diversity (measured by appropriate methods and indicators) or it may be a factor of economic activity or limit the conventional forms of economy to a significant extent (LIRO 2000).Consequently, the benefits lost because of the possible limitation of the freedom of management can be the measure of the value of ecologically valuable areas.

While performingthe selected and necessaryfunctions of the forest, the remaining forest functions should also be retained. The forest economy should be based on sustainable development and consider the future functions of the forest (that the forest will fulfil) considering the long period needed for the development of the forest ecosystem. The use of any of the forest functions means intervention in the forest ecosystem. Excessive economic use of that resource may lead to irreversible degradation of the ecosystem or the risk to natural reconstruction of the forest ecosystem. The principles of forest economics based on sustainable forest development lead to rapid regeneration and restoration of useful values (PASCHALIS-JAKUBOWICZ 2011).

Sustainable development of forests requires compromisesbetween its major functions (PŁOTKOWSKI 1994). The following functions are identified as the major forest functions: production (economic), social (recreational) and ecological (habitat-creating). In intensifying a chosen forest function, one should expect increasing alternative costs and the necessity of limiting the other functions (HOLLAND et al. 1994).

Valuation of forest resource issues and the valuation of environmental resources

The aim of environment resource valuation is to determine the level of outlays that have to be incurred to use those goods. Free goods are becoming economic goods and it is necessary to incur the outlays of labour and capital to give those goods the values of usability. The transition of free goods into the domain of economic goods is represented in figure 1.

Project environmental impact assessment is important for an increasing number of institutions financing investment projects. Institutions taking such decisions require environment impact assessments to present the quantified results. Determination of fees that organisations must pay to compensate society for using the natural environment represents another issue. Use includes through air pollution, inappropriate water management, soil pollution, production of solid and liquid waste, emission of noise and other forms of externalisation of costs. In such cases, valuation represents a necessary element for internalisation of the external costs.

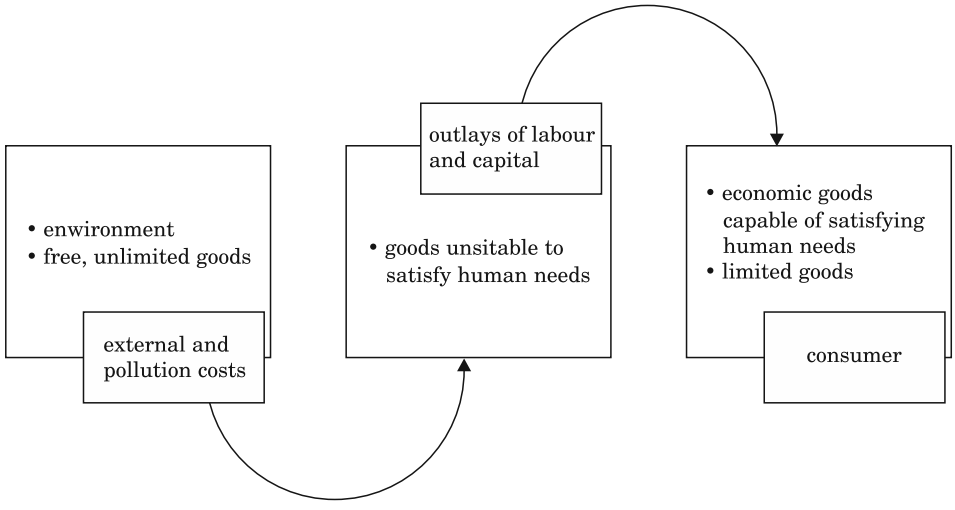

Fig. 1. Process of the transition of free goods into the domain of economic goods
Source: own work.

The difficulty with environment resource valuation is a consequence of, first of all, an absence of the procedures, methods and techniques of valuation implemented formally in economic practice. In most cases, the value of environment values results just from their existence (KOŚCIK 2000) and there is no market for such goods which, in turn, makes determining the market value and price that the consumers would be willing to pay for them impossible.

Provisions of Polish law requireentities to pay fees for using the natural environment. The Act on Protection of Agricultural and Forest Lands (op. cit. item 1) imposes on the applicant the duty to pay fees and charges for exclusion of forest lands from production. The process of exclusion involves two stages (CYMERMAN 2012): (1) planning, whichinvolves change of the land use in the local physical development plan and (2) administration, involving obtaining consent for exclusion of forest lands from production. At that stage, the amount of fees and charges for exclusion is determined (CYMERMAN 2009).

In case of permanent exclusion of forest lands from production, the applicant must pay a once-only fee, bear the yearly charges (at 10% of the fee paid once) and pay compensation for the early felling of standing timber, if the forest was excluded from production prior to the achievement of felling age. In case of temporary exclusion of forest land from production, the applicant is required to pay yearly fees representing 10% of the fee for exclusion during the period of exclusion, not longer, however, than 20 years. As in the case of

permanent exclusion, the applicant must pay the compensation for early felling of standing timber. The types of fees and charges depending on whether the exclusion is permanent or temporary are presented in figure 2.

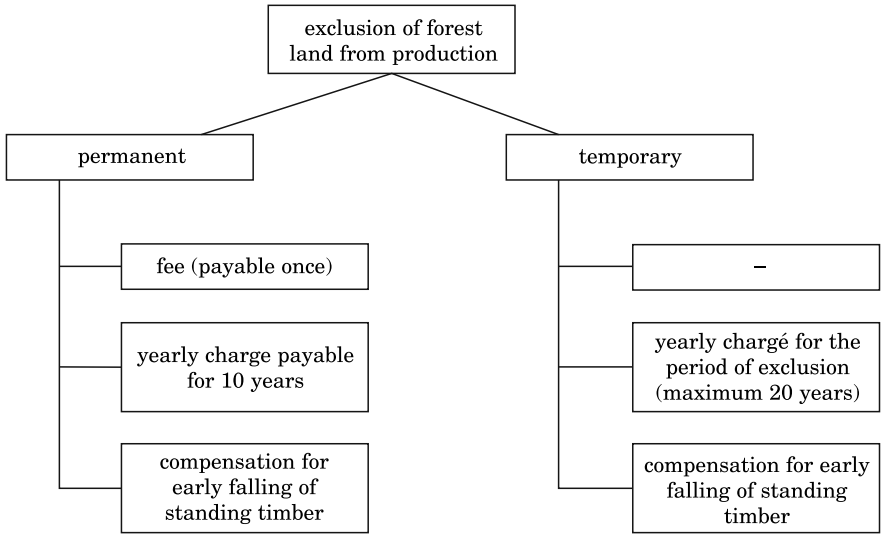

Fig. 2. Types of fees and charges payable for excluding forest land from production
Source: own work based on the Act of 3 February 1995 on protection of agricultural and forest lands (op. cit. item 1).

The amount of the fee payable once depends on the area being excluded, coefficient determining the quantity of cubic metres of timber for a given type of habitat (multiplied) and the price per 1 cubic metre of timber announced by the Central Statistical Office (GUS), which is presented in table 1.

Table 1

Indicators determining the price equivalent of 1 cubic metre of timber

Forest habitat type	Price equivalent for 1 cubic metre of timber announced by the GUS
Forests: fresh, humid, riparian and mountain as well as sycamore forest and mountain alder carr	2,000
Mixed forests: fresh, humid, highland, mountain and alder carr	1,500
Mixed coniferous forest, fresh, humid, highland, mountain	1,150
Coniferous forest: fresh, humid, mountain	600
Coniferous forest: dry and marshy	250

Source: Act of 3 February 1995 on protection of agricultural and forest lands

The amount of the fee for exclusion is computed according to the formula:

$$N_u = p_g \cdot R \cdot C \tag{1}$$

$$N_j = N_u - W_r \tag{2}$$

where:
N_u – statutory fee,
N_j – fee payable once,
p_g – area of excluded land,
R – multiplicity of the equivalent of the price for 1 cubic metre of timber dependent on the forest habitat type,
C – current price per 1 cubic metre of sawmill pine timber as announced by the GUS,
W_r – land value determined according to the market prices applied at the given locality in trade in land on the date of actual exclusion of the land from production.

The yearly charge is correlated directly to the amount of the once-only fee. In case of permanent land exclusion from forest production,a yearlycharge equivalent to 10% of the once-only fee is paid for 10 consecutive years. The fees and charges represent revenues of the forest fund and they are accumulated in a separate account. Those funds are used for financing actions focused on protection, reclamation, improvement of the quality of land, disbursement of damages and others.

The compensation for early felling of standing timber is equal to the difference between the expected standing timber value at the felling age and the standing timber value at the time of actual felling. The expected standing timber value is recorded in the forest development plan. In the case of young forests that do not qualify for felling, the compensation is equal to the value of costs incurred for establishment and care for the standing timber. Those relations can be described by the formulas:

$$O = (W_i - W_s) \cdot Z \cdot P \cdot C \tag{3}$$

or

$$O = W_k \cdot Z \cdot P \cdot C \tag{4}$$

where:
O – compensation amount in PLN,
W_s – indicator of the value of 1 ha of standing timber at the age of early felling of that standing timber,
W_i – indicator of the expected value of 1 ha of standing timber at the felling age defined in the forest development plan,

W_k – indicator of the value of costs incurred for establishment and cultivation of 1 ha of standing timber,
Z – degree of forest land coverage with tree at the age of early felling of standing timber,
P – area of standing timber in ha,
C – current sales price per 1 cubic metre of timber given in the Communique by the President of the GUS.

Provisions of the Act on Protection of Agricultural and Forest Lands (op. cit. item 1) allow the Director of the Regional Directorate of State Forests remission of the fees and charges on condition that the future investment project is of public utility for education, culture, religious, health protection or social reasons. Remission of payment is also eligible if the land under roads is publicly owned and the excluded land is the property of the State Treasury or territorial government (of provinces, counties, communes). Consequently, fees and charges are levied on forest lands belonging to private owners when the exclusion from forest use takes place for commercial purposes.

Valuation of ecosystems

In the literature (e.g. ŁAGUNA, WITKOWSKA-DĄBROWSKA 2010),proposals can be found for valuation of ecosystems that are not introduced to practice by statutory regulations. For most methods, it is assumed that the good (environment) is worth as much as somebody is able to pay for it. Consequently, those methods are based on two economic categories (POSKROBKO 2011):

– willingness to pay for the good -the amount that an entity would be willing to pay to obtain the given good to maintain the same level of affluence as in the situation of possessing the money and not the good;

– willingness to accept – the amount that would have to be paid to the entity for transfer of the good to maintain the same level of affluence as in the situation of not obtaining the money and retaining the good.

Among the valuation methods, the following are mentioned: cost and benefit analysis, outlay effectiveness analysis, external costs, environmental costs, minimisation of costs, production outcomes, preventive outlays, restitution costs, human capital costs, hedonic costs, travel costs and the declared preferences. Those, however, are the methods described in the literature. They are not used in practice because of the absence of legal recommendations, e.g. in the Act on Protection of Agricultural and Forest Lands. The fact that it is easier to use the standardised and unified method for all ecosystems than to select a separate valuation method in case of each of them also supports that tendency.

Material investments using space are implemented at the expense of ecosystems in the environment. Economic use of space involves destruction of natural and primeval values. Consequently, the restitution costs method investigates the costs involved in moving the ecosystem to a different location or reintroducing it in a different one.

The restitution costs method is the most appropriate for valuation of the forest ecosystem because it offers the possibility of considering the entire costs of ecosystem restoration. It is based on valuation of the outlays necessary to introduce the destroyed ecosystem in a different location.

The aim of the restitution is:

a) moving the existing ecosystem to a different location, or

b) possibly the most accurate reproduction of the ecosystem in a different location.

Given the high level of ecosystem complexity, a complete restitution may not be possible. The complete forest ecosystem develops over a long time and not all the elements and relations between them may be completely known. Consequently, determination of the restitution costs for a given area may be unreliable.

Valuation of fees, charges, compensations and ecosystem restitution costs based on the example of 1 ha of ordinary forest – case study

Computations were conducted for determination of the total liabilities by an entity applying to the Director of the Regional Directorate of State Forests for permanent exclusion from production for a forest offelling age. The analysis covered 1 ha of the riparian forest.

Fees, charges and compensations

The fee paid as a single payment (statutory) is the product of the area excluded from production, the equivalent of the price per 1 cubic metre of timber as announced by the GUS and the coefficient for the forest habitat type. The coefficient for the riparian forest is 2,000 m^3 (tab.1).According to the Act on Protection of Agricultural and Forest Lands (art. 12, point 6), the amount due is decreased by the market value of land as of the moment of actual permanent exclusion of the land from production. According to the Communique by the President of the GUS[2], the average price per 1 cubic metre of

[2] Communique by the President of the Central Statistical Office of 20 October 2011 on the average sales price of timber computed according to the average timber price achieved by forest superintendent offices for the first three quarters of 2011 (Monitor Polski of 25 October 2011, item 970).

timber is 186.68 PLN. The average price per 1 ha of agricultural land according to the GUS (Statistical Yearbook of Agriculture for 2011) amounts to 18,037 PLN. The yearly charges are paid during the period of 10 years in the case of permanent exclusion of forest land from production. The amount of a single instalment is 1/10 of the fee paid as a single payment.
The single payment fee:

$$N_u = 1 \text{ ha} \cdot 2{,}000 \text{ m}^3/\text{ha} \cdot 186.68 \text{ PLN/m}^3 = 373{,}360 \text{ PLN},$$

$$N_j = 373{,}360 \text{ PLN} - 18{,}037 \text{ PLN} = 355{,}323 \text{ PLN}$$

Yearly charges:

$$\left(\frac{N_j}{10}\right) \cdot 10 = O_r = 35{,}552.3 \text{ PLN} \cdot 10 = 355{,}323 \text{ PLN}$$

The yearly charges may be paid in instalments for 10 years or in a single payment.

Compensation:

As (according to the assumption) the forest has reached felling age, the investor does not have to pay the costs of compensation for early felling of standing timber designated for sale. According to the regulation of the Minister of Environment of 20 June 2002 regarding the compensation paid as a single payment for early felling of standing timber (Dz.U. of 2002 No. 99, item 905), the compensation is computed as the product:

$O = (W_i - W_s) \cdot Z \cdot P \cdot C$, if the indicator W_s has been determined, or

$O = W_k \cdot Z \cdot P \cdot C$, if the indicator $W_s$has not been determined,

where:

O – amount of compensation in PLN,
W_s – indicator of the value of 1 ha of standing timber at the age of early felling of that standing timber,
W_i – indicator of the expected valueof 1 ha of standing timber at the felling age,
W_k – indicator of costs incurred for establishing and care for 1 ha of standing timber,
Z – degree of coverage with standing timber which is the quotient of the actual thickness of standing timber at the age of early felling and the thickness that could potentially be achieved by that standing timber,

P – standing timber area in ha,
C – current sales price per 1 cubic metre of timber according to the Communique by the President of the Central Statistical Office announced in the Official Journal of the Republic of Poland "Monitor Polski" for the purpose of the forest tax.

Indicators W_i and W_s are included in the annex to the regulation.

The sum of fees and yearly charges would amount to 686,720 PLN. This is the cost additional to the investment project cost for the investor.

Ecosystem valuation by means of the restitution (replacement) cost method

The aimof restitution is to move the existing ecosystem to another location or to restore it from the beginning at another location. Determination of the replacement costs may be achieved by means of three techniques: detailed, aggregated elements and indicator techniques. Those techniques are described in the literature concerning valuation (ŁAGUNA 2001). Such valuation requires a standard basis in the form of catalogues, price lists and indicators containing information on unit prices for individual works and materials or aggregated elements of such works and materials. The amount of ecosystem replacement costs is determined according to the following formulas:

– for the detailed technique:

$$W_o = \sum_{i=1}^{n} J_i \cdot C_i \cdot (1 + K_d) \tag{5}$$

– for the integrated element technique:

$$W_o = \sum_{i=1}^{n} J_e \cdot C_e \cdot (1 + K_d) \tag{6}$$

– for the indicator technique:

$$W_o = P \cdot K_j \tag{7}$$

where:
W_o – value in the replaced state,
J_i – individual works (e.g. tillage),

C_i – prices of individual works,
J_e – aggregated elements (e.g. preparation of the surface for planting),
C_e – prices of aggregated elements,
K_d – additional costs, e.g. profit,
P – area,
K_j – unit cost of replacement and cultivation (1 ha).

Determination of ecosystem value may also be achieved by applying the formulas used in forestry when the indicators of actual costs incurred for establishment and cultivation of 1 ha of plantation are available.

$$W_o = P \cdot K_j \tag{8}$$

where:
P – area,
K_j – unit cost of replacement and cultivation (1 ha).

The indicator technique was chosen for computation of restitution costs. The price indicators concerning the costs of planting and cultivation for 1 ha of the forest applied by companies participating in tenders were applied (ŁAGUNA 2012).The tenders are organised by offices of the forest superintendent and cover the works involved in the preparation of land, planting and cultivation of the forest.

$$W_o = P \cdot K_j = 1 \text{ ha} \cdot 24 \text{ PLN/m}^2 = 10{,}000 \text{ m}^2 \cdot 24 \text{ PLN/m}^2 = 240{,}000 \text{ PLN}$$

Consequently, the total cost that should be included in the investment project costs calculation is:

– the cost of fee paid as single payment, yearly charges and the compensation computed in point 3.1. amounting to 686,700 PLN;
– the ecosystem restitution cost amounting to 240,000 PLN.

Data concerning the costs of establishing and cultivation for forest plantation were obtained from the Kudypy Forest Superintendent's Office (2012). The costs depend significantly on the character of the land restored for afforestation (non-agricultural, after fire, after flood, after long snow coverage, after removal of the artificial bearing surface).

The data obtained from the Kudypy Forest Superintendent's Office for 2011 indicate that the funds allocated to establishment and cultivation of the forest amounted to 27,220.73 PLN per year, which gives for the 10-year period:

$$W_o = 10 \text{ years} \cdot 27{,}220.73 \text{ PLN/ha} = 272{,}207.30 \text{ PLN/ha}.$$

In total, the investor should consider in his investment effectiveness computations the fee paid as a single payment, yearly charge, compensation and ecosystem restitution costs. According to the effective legal regulations, the destroyed ecosystem restitution costs are not considered in the calculation of costs for the implemented road investment projects.

Summary and conclusions

Construction or modernisation of road, railway and similar infrastructure requires obtaining an area. It should be an area representing the lowest usability. It is impossible, however, to bypass forests. Exclusion of forest land from production as a consequence of construction of a road or other infrastructure involves paying a fee, yearly charges, compensation and, sometimes, restitution costs. The duty of computing and paying the charges imposed by the Act on the Protection of Agricultural and Forest Lands (op. cit. item1) depends on whether the project is implemented for public or commercial goals and whether a public or private entity is the forest owner.

In the case of a public entity and public investment project, the possibility of exemptions and remission exists. According to the legal regulations in force, in case a public entity is the owner of forest land and the project is of a public character, the amounts of fees, charges and compensations are not included in the calculations of costs for such projects. Additionally, the investors do not pay the ecosystem restitution (reproduction) costs.

If a private entity is the owner or the project is of a commercial nature, fees, yearly charges and the costs of compensation may be charged. The determination of who pays whom and when may vary widely. Nevertheless, the public should be informed about the total investment project costs.

Translated by JERZY GOZDEK

Accepted for print 3.09.2012

References

CYMERMAN J. 2012. *Analiza wyłączania gruntów leśnych z produkcji na przykładzie Regionalnej Dyrekcji Lasów Państwowych w Szczecinie w latach 1998-2011*.Studia i Materiały Towarzystwa Naukowego Nieruchomości, Olsztyn.

DUBEL K. 2000. *Uwarunkowania przyrodnicze w planowaniu przestrzennym*. Ekonomia i Środowisko, Białystok.

Ekologiczne, metodyczne i socjologiczne przesłanki kształtowania obszarów przyrodniczocennych. 1984. Warszawa, Poznań.

Ekonomiczne i prawne aspekty odrolniania i odlesiania gruntów. 2009. Ed. R. Cymerman. Educaterra, Olsztyn.

Geografia gospodarcza Polski. 1994. Ed. I. Fierli. PWE, Warszawa.

Gospodarowanie energią na poziomie lokalnym. Podręcznik dla gmin. 2011. Ed. B. Poskrobko. WSE, Białystok.
Górka K., Poskrobko B., Radecki W. 2001. *Ochrona środowiska*. PWE, Warszawa.
Holland D.N., Lilieholm R.J., Roberts D.W. Gilles J.K. 1994. *Economic trade-offs of managing forests for timber production and vegetative diversity*. Canadian Journal of Forestry, 24(6): 1260–1265.
Koszt odtworzenia 1 ha lasu. 2012. Manuscript. Nadleśnictwo Kudypy.
Kościk B. 1999. *Wycena środowiska – rozwiązania światowe i europejskie a praktyka polska*. In: *Wycena środowiska rolniczego i krajobrazu kulturowego*. UWM. Olsztyn.
Kośmicki E. 2010. *Zrównoważony rozwój w warunkach globalizacji gospodarki*. Białystok.
Liro A. 2000. *Ochrona środowiska w rolnictwie*. Fundacja Programów Pomocy dla Rolnictwa, Warszawa.
Łaguna T. M. 2001. *Wycena nieruchomości i gospodarstw rolnych* (wyd. II). Zachodnie Centrum Organizacji, Zielona Góra.
Łaguna W. 2012 *Koszt jednostkowy zadrzewień i pielęgnacji*. Manuscript D.W. Łaguna. Sopot.
Łojewski S. 2007. *Ekonomia zasobów środowiska*, Kujawsko-Pomorska Szkoła Wyższa, Bydgoszcz.
Ochrona środowiska człowieka – humanistyczne widzenie świata. 1984. Kraków.
Paschalis-Jakubowicz P. 2011. *Teoretyczne podstawy i realizacja idei zrównoważonego rozwoju w leśnictwie*, SGGW, Warszawa.
Płotkowski L. 1994. *Konsekwencje ekonomiczne polityki kompleksowej ochrony zasobów leśnych*. In: *Polska polityka kompleksowej ochrony zasobów leśnych*. Warszawa.
Samuelson P.A., Nordhaus W.D. 2009. *Ekonomia*, t. 1. PWN, Warszawa.
Wskaźniki ekorozwoju. 1999. Ed. T. Borys. Ekonomia i środowisko, Białystok.
Zarządzanie zasobami środowiska. 2010. T.M. Łaguna, M. Witkowska-Dąbrowska. Wydawnictwo Ekonomia i Środowisko, Białystok-Olsztyn.

Communique by the President of the Central Statistical Office of 20 October 2011 on the average sales price of timber computed according to the average timber price achieved by forest superintendent offices for the first three quarters of 2011 (Monitor Polski of 25 October 2011, item 970).
Act of 3 February 1995 on Protection of Agricultural and Forest Lands (Dz.U. of 1995 No. 16, item 78)
Act of 27 March 2003 on Physical Planning and Development (Dz.U. of 2003 No. 80, item 717)
Act of 28 September 1991 on Forests (Dz.U. of 1991 No. 101, item 444)
Act of 21 August 1997 on Real Estate Management (Dz.U. of 1997 No. 115, item 741)
Statistical Yearbook of Agriculture for 2011, 2012, GUS. Warszawa.
Regulation of the Minister of Environment of 20 June 2002 on the compensation paid as a single payment for early felling of standing timber (Dz.U. of 2002 No. 99, item 905).