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## HISTORICAL COST VS FAIR VALUE IN FOREST ACCOUNTING: THE CASE OF LITHUANIA

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**Abstract.** The accounting methods based on two concepts - accounting at historical cost and accounting at fair value - are responsible for the provision of information about the enterprise's assets in the financial statements. Taking into consideration the specifics of the national financial accounting regulation, the forests managed by the forestry enterprises can also be measured by using either of these two accounting methods. However, in terms of accounting, both of them pose certain problems or ambiguity. The purpose of the research is to evaluate the strengths and weaknesses of forest accounting methods based on fair value and historical cost and the practice of their use in Lithuanian forestry enterprises. The study examines scholarly literature and deploys the theoretical methods of comparative analysis, critical evaluation, systematisation, generalisation. The empirical research involved document content analysis, questionnaire survey. The article deals with the issues of the use of accounting methods for forestry accounting: traditional cost-based accounting methods do not reflect the biological forest transformation, hinders identifying the forest development costs and the end of their capitalisation, the method of a systematic derecognition. On the other hand, the essential complication of the use of the fair value method is that the forest largely lacks an active market with quoted prices. Thus, its fair value is determined on the basis of rather subjective assumptions by means of diverse valuation methods, resulting in unreliable and unverifiable information. The results of the research carried out into the forestry accounting policy observed in the Lithuania's private forestry enterprises revealed that forest accounting by cost is exclusively carried out by all the enterprises under investigation. Nevertheless, the method itself was interpreted quite differently. The article presents the modified forestry accounting methods by cost, which allow reducing the identified shortcomings.

**Keywords:** forest (stands); accounting methods; fair value; historical cost

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### 1. Introduction

The meaning of the information presented in the financial statements on the entity's resources and results achieved largely depends on the deployed accounting and evaluation methods which are based on two concepts: historical cost accounting and fair value accounting. None of the concepts is ideal: the fair value is misleading in

terms of the profit and loss account (or: statement of profit and loss), historical cost – in terms of the balance sheet (Alexander & Fasiello, 2014). The benefits of accounting at fair value are obvious, as the information presented in the financial statements is increasingly becoming more relevant and appropriate not only for making economic decisions and cash flow forecasts, but also for reflecting changes in the market and their impact on the enterprise's performance. The shortcomings of accounting at fair value are as follows: unrealised amounts presented in the financial statements distort the meaning of financial ratios and may mislead the users, and most importantly, an unreliable, subjective, costly estimate of fair value is observed when various valuation methods are applied. Accounting at historical cost provides more reliable information about the enterprise's operations: assets are valued at cost, which is an objective and legally documented value that provides less opportunity for management to manipulate financial information. Furthermore, when using the historical cost method, a number of data in the financial statements are subjective, based on certain assumptions, while the value of the assets in the financial statements is significantly different from their market price, financial information is less appropriate for economic decisions.

The choice of accounting concept determines the further use of accounting methods in the enterprise leading to the selected type of presentation of financial information in the financial statements. Different accounting methods can be used for accounting assets belonging to groups of different business entities. Therefore, the forests managed by business enterprises are no exception and can be accounted for in one way or another taking into consideration the entity's accounting concept and the allocation of forest to one or another asset group.

The purpose of the research is to evaluate the strengths and shortcomings of forest accounting methods based on fair value and historical cost and the practice of their use in Lithuanian forestry enterprises. The study examines scholarly literature and deploys the theoretical methods of comparative analysis, critical evaluation, systematisation, and generalisation. The empirical research involved document content analysis and questionnaire survey.

## **2. The strengths and shortcomings of applying cost and fair value methods to forest accounting**

The way forest information is presented in the financial statements is one of the key issues in the financial reporting carried out by forest managing enterprises. The solution of this problem depends, first and foremost, on the accounting concept applied by the enterprise. The use of cost-based accounting methods in forest accounting allows the presentation of reliable and verifiable information in the financial statements and reduces the manipulation possibility for management. Also, there is no need to periodically determine the fair value of the forest, i.e. to use time-consuming and / or financially exhausting procedures. The fair value accounting methods ensure the presentation of forests in the balance sheet at their fair value. This type of forest accounting is not only relevant to the users of information obtained from financial statements in the process of taking economic decisions, in particular, the decisions on the long-term prospects of the enterprise, the future cash flow forecast, but also enables the financial statements to reflect forest biological transformation and the impact of market conditions.

Cost-based accounting methods are traditional, common and known to financial report providers, therefore, they are popular. However, their application to forest accounting is ambiguous: it is difficult to identify the costs included in the cost of the forest, and in particular the final point in determining the cost. Apart from that, it is doubtful whether the concept of fixed assets depreciation is suitable for forest accounting if the forest is recognised as fixed assets. The specificity of forestry activities leads to a conflict when the traditional accounting methods based on historical cost and the realisation principle are applied because they do not reflect the fundamental event - the transformation of biological assets (forest), which essentially changes the assets. The valuation at cost may be less reliable than the valuation at fair value because it may be the result of an incorrect

allocation of costs and unjustified cost estimates during different biological transformation periods. In addition, the forest “production” cycle is long and does not coincide with the reporting period, therefore, the income is recognised after a fairly long period of time, thus, the information presented in the financial statements appears to be distorted (Bohušová et al., 2012; Gabriel, Stefea, 2013; Ignat et al, 2014).

The cost of fixed assets must include all the costs incurred on the assets until the time when they can be used in the manner prescribed by the management. Dvořáková (2011) notes that all the initial and later maintenance costs should be included in the costs of developing forests. Therefore, if the forest is (re-)planted, the initial planting costs, i.e. the costs of preparation of nurseries, the purchase of forest seedlings or plants and the planting process costs should be included in the cost of forest (stands). Later, forest stands must be maintained and preserved for at least 6-7 years until a nursery is formed and forest development cutting begins. During this period, the enterprise incurs the costs of clearing the earth covering the stands, the removal of overgrowing herbaceous plants, trees and shrubs, surface water drainage, the costs of reforestation of targeted tree species, as well as protection against pests and fungal diseases, rodents, beasts, mechanical damage and similar costs. In the case of forests, the costs that are necessary for a forest to grow and used in a way the management has projected, should also be included in the cost of the forest. But the costs of later maintenance, incurred over decades, during which the company can already earn revenue from harvesting, should be treated differently. According to Dvořáková (2011), mature trees do not necessarily have to be felled right away, but felling may take place much later, for example, upon the demand of customers, when the timber meets certain qualitative characteristics or the general parameters set by the wood industry. Therefore, a reasonable question arises: which event or indicator should be considered as the final moment of the forest costs capitalisation period?

The depreciation calculation is another key issue directly related to the use of cost method for forest accounting. The accounting standards require the fixed assets, accounted for at costs, to be depreciated, while the exception applies only to land as an asset of an unlimited useful life. However, there is a concern about the suitability of the depreciation concept to forestry accounting: the depreciation calculation is a reflection of the gradual deterioration of physical wealth and, at the same time, a decrease in value. Meanwhile, the value of forests that are being developed is not decreasing, on the contrary, it is continuously increasing and the physical properties of forests are improving. Thus, the depreciation calculation does not fully reflect the value changes impacted by forest biotransformation and the dynamics of the process of obtaining economic benefits. The concept of depreciation is appropriate in accounting of bearer plants, but the essential difference should be emphasised – according to the timetable for economic benefits, bearer plants are more similar to fixed tangible assets where initially significant costs are incurred, but later such assets are used continuously and generate annual economic benefits, i.e. the harvest. When such bearer plants mature, their biological transformation no longer matters for gaining future economic benefits, and their valuation at fair value would only distort the financial information of entities (Aryanto, 2011; Damian et al., 2014; Bohušová, Svoboda 2016). The cost accounting of bearer plants by depreciation over the time of their use is logical and reflects the processes of obtaining economic benefits, while the economic benefit of the forest, developed for harvesting and sale, is essentially obtained only once - by selling it, either standing or felled, in this case, it is impossible to identify the constant gain of the annual economic benefits and the gradual “consumption” of the asset.

According to the concept of the fair value, the forest in the balance sheet has to be presented at fair value less estimated costs to sell. However, the largest drawback of this method in the context of forest accounting is the fact that rather often the forest does not have an active market with quoted prices, therefore, diverse valuation methods are used to determine the fair value, sometimes based on quite subjective assumptions, thus, the information can be unreliable or difficult to verify. When forest is accounted at fair value, the profit and loss statement reveals the profit (loss) presented with the fair value changes as well as the costs related to forest planting, development and marketing. However, this version of the fair value model is not perfect, as the recognition of costs for

development and maintenance of forest stands as expenses of the reporting period triggers the revenue-expenditure asymmetry: during the first year of forest development, when most of the expenditure on forest development and maintenance incurred, the fair value of the stands is insignificant and a significant gain in the revenue is unlikely. In turn, relevant changes in the fair value of the forest are taking place, so the revenue, as a result of the increase in fair value, is presented in the profit and loss statement much later, when the expenditure of maintenance of the stands are decreasing. However, emphasis should be laid on the fact that neither the national nor international accounting standards contain mandatory requirements for the biological assets to be recognised as expenses during the reporting period, therefore, such costs could be capitalised.

So far, many authors have criticised the use of fair value for forest accounting and pointed out to significant shortcomings of this approach. Fischer & Marsh (2013) claim that, before IAS 41 *Agriculture* entered into force, the biological property accounting practices were based on historical cost: this practice was concrete, verifiable and understandable, while the use of fair value contradicts the main accounting principles, the financial statements are based on estimates and opinions rather than on evidence. The fair value of a biological asset at the balance sheet date may not be related to the price at which the asset will be sold. Therefore, there is no reason to measure that asset at its fair value (Fischer, Marsh, 2013). It should be recognised that forests most commonly do not have quoted prices in the active market, so their fair value is determined on the basis of certain valuation methodologies and, in some cases, on quite subjective assumptions. However, objections can as well be made to the following claim - the cost-based forest accounting practices are more appropriate: the evaluation at historical cost does not reflect the biological transformation of the forest, while the cost calculation itself can easily become the object of manipulation to managers. Although it can be verified, it is not necessarily objective and fair.

Herbohn (2009) criticised the forest accounting and valuations at fair value emphasising that the determination of the fair value of a forest is a very subjective process that creates favourable conditions for manipulation, while the possibility of using different valuation methods makes the evaluations incomparable. According to Jöbstl (2009 b), it is difficult to choose the appropriate forest valuation method, and the determination of its fair value poses a problem of predicting the future production prices and activity volumes. Tzcupke (2009) argues that the consequence of deploying different approaches is the incomparable outcome of the performance of enterprises. Elad & Herbohn (2011) emphasise that the costs of applying fair value in the accounting of biological assets exceed the informational benefits, increase fluctuations in the revenue or the disclosures in the explanatory notes provided by different enterprises are incomparable. Most enterprises opting to use the fair value method do not disclose the information about fair value determination methods and assumptions in the notes, thus the comparability and relevance of financial information to users is reduced. But enterprises who use accounting at cost approach, do not disclose data on their formation as well (Elad, Herbohn, 2011; Goncalves, Lopes, 2014). Goncalves & Lopes (2014) point out that mandatory information on biological assets is properly disclosed only by large enterprises with a significant comparative weight of biological assets. Meanwhile, Elad (2004), Herbohn (2009) emphasise another disadvantage in using the fair value method: recognising a fair value change in the profit and loss account/statement distorts the actual results of the performance of an enterprise, while the prior recognition of a fair value change in the revenue may result in erroneous profit distribution decisions and false interpretations of financial ratios. According to Fischer & Marsh (2013), Stárová et. al (2016), the application of the fair value method may lead to the publication of dividends that are not based on the required cash flows. However, the disclosure of unrealised (future) forest and timber profits gives users more relevant and timely information that is beneficial in assessing their investment and management work (Herbohn, 2009).

Despite the criticism and skepticism expressed by some authors about the fair value forest accounting, many of scholars acknowledge that the use of the concept of fair value enables forest enterprises to present “true and fair view” in their financial statements. Stárová et al. (2016) claims that the widespread cost-based forest accounting practices do not adequately reflect forests in the financial statements, so *de facto* accounting does not fulfill its

main function of providing beneficial information to the users. The main factor that determines the change (increase) of forest value is its biological transformation over a long period of growth, which can only be reflected by applying a fair value method. Meanwhile, the cost method does not disclose the true financial status of forestry enterprises, since forest development and maintenance costs are not a key factor in increasing the value of the forest and those costs, being linked to the amount of the unsustainable quality production identified only after felling the trees, cannot be allocated precisely (Dvořáková, 2011).

Epstein and Jermakowicz (2010) emphasise that forests, like some other plants, have a very long cycle of production, which determines the need to record changes in their fair value and to show them in the profit and loss account for each reporting period. Otherwise, the information would be distorted because, in applying the cost method, the revenue from such an asset would only be shown in the profit and loss account for a certain rather long period of time, which would not adequately reflect the enterprise's performance. It has to be accepted that each phase of the forest biological transformation process is important and influences later economic benefits, while the cost method does not reveal the relationship between the forest biotransformation and the future economic benefits. However, the requirement to value forests at fair value can be a significant burden for enterprises, especially if they prepare interim financial statements. It is also worth mentioning that forest accounting at fair value is not consistent with the valuation of other assets (e.g. inventory, receivables accounted for at cost).

### **3. Methodology of the research of forest financial accounting practice in Lithuania**

To make reasonable economic decisions, the users of financial reports need to have access to the financial information which must be relevant, reliable, comparable, validated, timely and understandable (Conceptual Framework for ..., 2015). Kaya (2013) points out the contradiction between the concepts of fair value and cost accounting which is essentially reflected in the incompatibility of the relevance and the reliability of the information, the two fundamental qualitative characteristics of financial information. In this context, special importance should be laid on the characteristic of comparability of information that can be implemented in forestry enterprises through the unified principles of recognition, classification, accounting and evaluation of forests. Only then it is possible to compare the financial status and performance of different forestry enterprises, analyse the real financial indicators of these enterprises, evaluate the efficiency of their operations and adopt rational management, investment and other economic decisions. This standpoint has posed the need to investigate the current practice of financial accounting of forest enterprises in Lithuania, which, can be diverse in the country due to a lack of regulation in this area.

In order to investigate the possibilities of selecting and applying forestry accounting methods in accounting practice, at the first stage of the research the method of the document content analysis was applied. The major focus of the document content analysis is the official legal documents of a high level of information reliability, in this case, the International Financial Reporting Standards (IFRS), approved by the EU Commission and Business Accounting Standards (BAS) approved by the Ministry of Finance of the Republic of Lithuania, that regulate forestry accounting. The document content analysis was performed by applying a traditional mechanism for understanding the document text.

At the second stage, the research was focusing on the forestry accounting practices gained by the Lithuanian forestry enterprises. The analysis was carried out into the accounting policies of these enterprises, i.e. the survey participants were chief accountants of forestry enterprises – the persons responsible for the formation and application of the accounting policy in their enterprise. The population of the research involved the enterprises engaged in forestry activities in Lithuania, except for legal entities of unlimited civil liability that, according to the Law on Corporate Financial Reporting, are not required to compile financial statements or apply the accounting



standards. The research population had a finite and known number of objects. According to the information provided by the Department of Statistics of the Republic of Lithuania, at the beginning of 2016, the number of enterprises attributed to the category of activities “Forest tree growing and other forestry activities” was as follows: 216 enterprises, of which 25 individual enterprises and 42 state forest enterprises. The latter were eliminated from the survey in line with the provisions of the Law on Forests of the Republic of Lithuania, as their accounting procedures do not include the value of forest land and forest - they do not perform the balance forest financial accounting. Therefore, the final population of the survey comprised 149 enterprises. In terms of the determination of the sample, a simple random sampling was used and a minimum sample size ( $n_{min}$ ) which would provide a satisfactory reliability of the survey was calculated according to the formula proposed by Kardelis (2016) [1]:

$$n = \frac{Z^2 \cdot SN^2}{\Delta^2 + \frac{Z^2 \cdot SN^2}{N}} \quad [1]$$

$n$  - number of cases in the sample

$Z$  – coefficient from the Student’s Distribution Tables (1.96 for a 95% confidence interval and 1.645 for a 90% confidence interval),

$SN$  – standard deviation (without data on the prevalence of the phenomenon and without a trial, with the most unfavourable option being 50)

$\Delta$  – maximum permissible inaccuracy (in social studies it can vary up to 10%)

$N$  – population size

According to the formula [1], having selected the standardised value of normal distribution by 95%, the deviation error of 10%, permissible in social research, with a population size of 149 enterprises, the estimated minimum sample was 58 respondents. The questionnaire survey was carried out from August through October 2016. The questionnaires were sent to respondents by e-mail. In all, 62 respondents (42%) completed questionnaires, i.e. the minimum projected sample size was reached. The structure of the questionnaire submitted to the respondents is presented in Figure 1.

Questions 1- 7	•General qualification questions
Questions 8-14	•Recognition of forests as assets and forest classification in accounting
Questions 15-17	•Measuring forest acquisition costs
Questions 18 - 25	•Forest accounting and valuation methods, disclosures used in practice
Questions 26-27	• Forest accounting and tax regulation compatibility aspects
Questions 28-31	• Area of the need for a forest financial accounting model

**Fig. 1.** Questionnaire structure

Source: Compiled by author

The general classification questions included in the questionnaire, related to the legal form and size of the enterprise, the accounting standards applied, the size of the forest managed, have enabled to identify the impact of accounting standards and the size of the company on the forest recognition, classification, accounting practices

and the accounting information amount disclosed to the potential users of the accounting information. The questions raised on recognition of forests as assets and forest classification in accounting aimed at investigating the application of balance and off-balance forest financial accounting model in the enterprises under analysis and aspects of forest recognition as an asset. The questions about the forest classification provided conditions for obtaining information on forest (stands) and forest land assigned to categories of fixed tangible assets, biological assets, inventory and the distribution pattern of these categories in the population, as well as the options for choosing the accounting methods used. The aim of identifying the cost of forest acquisition was to determine the costs that forestry enterprises add to the cost of the forest (stands) and the problem areas of the cost identification. The questions about the forest accounting and valuation methods used, were targeted at disclosing the prevailing forest accounting practices, problems and the extent of the disclosure of information about forests in explanatory notes. The area of the need for financial accounting model for forests managed by business enterprises, intended to investigate the opinion of the chief accountants of forestry enterprises on the establishment of a uniform financial accounting model for forests and its application in diverse size private forestry enterprises and state forest enterprises.

The survey data processing was carried out by the specialised statistical software - IBM SPSS Statistics. Depending on the purpose of the research, the analysis of frequency distribution was conducted to assess the assignation of forests to a certain category of assets, acquisition cost structure, diverse forest accounting and valuation methods, and the need for a forest financial accounting model.

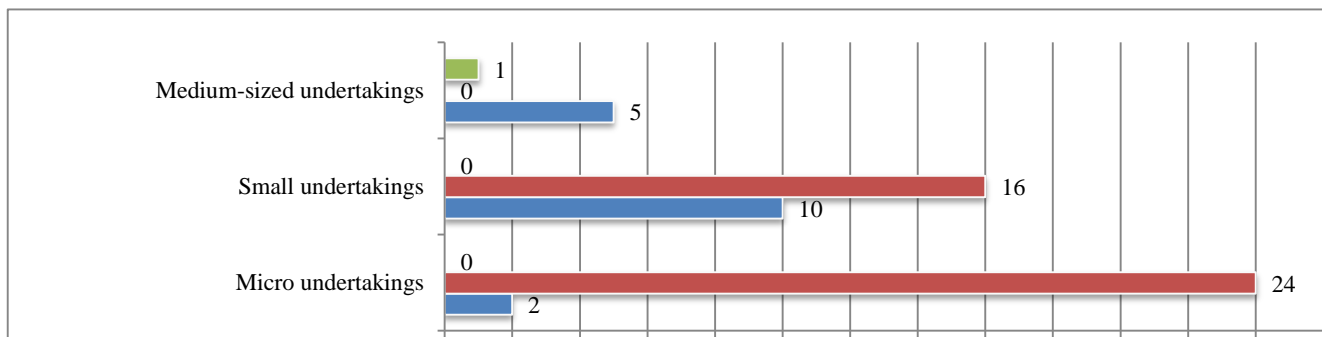
#### **4. Results of the research into forest financial accounting practices in private Lithuanian forestry enterprises**

The analysis of the content of the accounting regulations - national and international accounting standards - showed that the private forestry enterprises in Lithuania are likely to be confronted with the uncertainty with regard to the forest accounting principles and process in accounting regulations. The IFRS specify the general principles of presentation of forest and forest land in the financial statements - the stands are accounted for in accordance with IAS 41 *Agriculture*, which is applied over the period of harvesting to account for the biological assets (stands) and agricultural production (roundwood, harvested from stands). In accordance with IAS 41 forests (stands) at initial recognition and at each balance sheet date must be measured at fair value less estimated costs to sell, which must be determined on the basis of the active market, or, if not, using other methods for determining fair value. The profit or loss impacted by the changes in the fair value of a forest must be included in the profit or loss for the reporting period in which they have generated (Commission Regulation ..., 2008). Nevertheless, most Lithuanian business enterprises manage their accounts and prepare financial statements in accordance with the Business Accounting Standards (BAS) in which the financial accounting of forests is unspecified: BAS 12 "Non-current tangible assets" provides that the standard does not apply to the accounting of forest land and forest resources managed by state forest enterprises in accordance with right of trust, therefore, it can be assumed that other forestry enterprises must use BAS 12 and forest accounting at cost or revaluation model. On the other hand, the same standard stipulates that BAS 12 does not apply to the accounting of assets where that asset is the main business of the enterprise and is subject to BAS 9 Inventories. In fact, forest (stands) of forestry enterprises are acquired or developed for sale, therefore, they could be accounted for in accordance with the provisions of the standard in terms of cost (Verslo apskaitos..., 2015). Nevertheless, neither the standard nor its methodological recommendations define the accounting peculiarities for this specific asset. In turn, BAS 17 Biological Assets which provides for the accounting of biological assets at cost or fair value, applies to the accounting of biological assets used in agricultural activities but does not apply to the accounting of biological assets used in non-agricultural activities, therefore, the definition of agricultural activity does not include forestry activities. Thus, it can be concluded that the forests managed by the private Lithuanian forestry enterprises can be accounted for using any forest financial accounting system that is suitable for them, which automatically leads to the

incomparability of the information provided in the financial statements, the incomparability of the indicators used for the performance evaluation, poses doubts on the correct reflection of the enterprise's performance in the financial statements.

Of all the enterprises involved in the second phase of the research (survey), 57 were Ltd. or joint stock companies (91.94%), 4 – limited partnerships (6.45%) and one (1.61%) agricultural company. According to the classification of the size of enterprises specified by the Directive 2013/34 / EU of the European Parliament and of the Council, 45.16 per cent of the enterprises surveyed were small undertakings, the smaller part of enterprises (41.94%) were micro undertakings, the remaining 12.9% consisted of medium-sized private forestry undertakings. The data analysis revealed that, regardless of the size of enterprises, the accounting for all the enterprises was exclusively carried out and the financial statements were prepared in accordance with national Business Accounting Standards, and the majority of the chief accountants of the surveyed enterprises neither classify the activities of their companies as agricultural activities, nor apply the basic BAS 17, therefore, contrary to the widespread international accounting practice, do not classify the forest as biological assets. Although only forestry enterprises were questioned, 4 of the participating undertakings did not possess forests, therefore, did not apply forestry accounting policies.

The research showed that the Lithuanian private forestry enterprises apply balance accounting for acquired forests, but even 34.5 percent undertakings do not capitalise forest (re)planting costs and consequently don't recognise them as assets, but allocate the incurred costs to the expenses of the reporting period. Therefore, it can be stated that a significant difference can be observed among the results and financial indicators provided by the companies involved in the same activities. An important area in terms of the comparability of financial information is the assignment of stands to a certain category of assets, since it affects later accounting of assets, i.e. optional accounting and valuation methods. The results of the survey revealed different practices of companies in this area (see Fig. 2): stands are most commonly classified as inventories (68.96% of respondents) then as fixed tangible assets (29.31%).

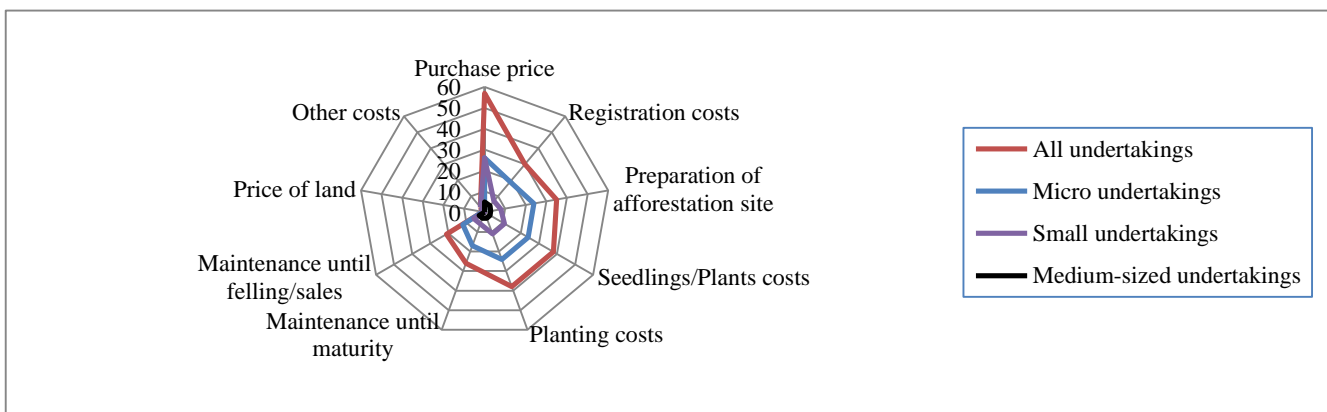


**Fig. 2.** Classification of stands in private Lithuanian forestry enterprises  
 Source: Compiled by author (based of survey results)

This distribution of the classification of stands has largely determined the choice of accounting methods used for forestry accounting: all respondents unambiguously indicated the *cost method* used, i.e. stands are presented at enterprise's balance sheet at acquisition cost minus the cost of felled stands, depreciation for forests is not calculated. This fact reflects the uncertainty of regulation in accounting for stands observed in the standards in forestry accounting. Also, it reflects an attempt of corporate accountants to use most common and simpler accounting methods.

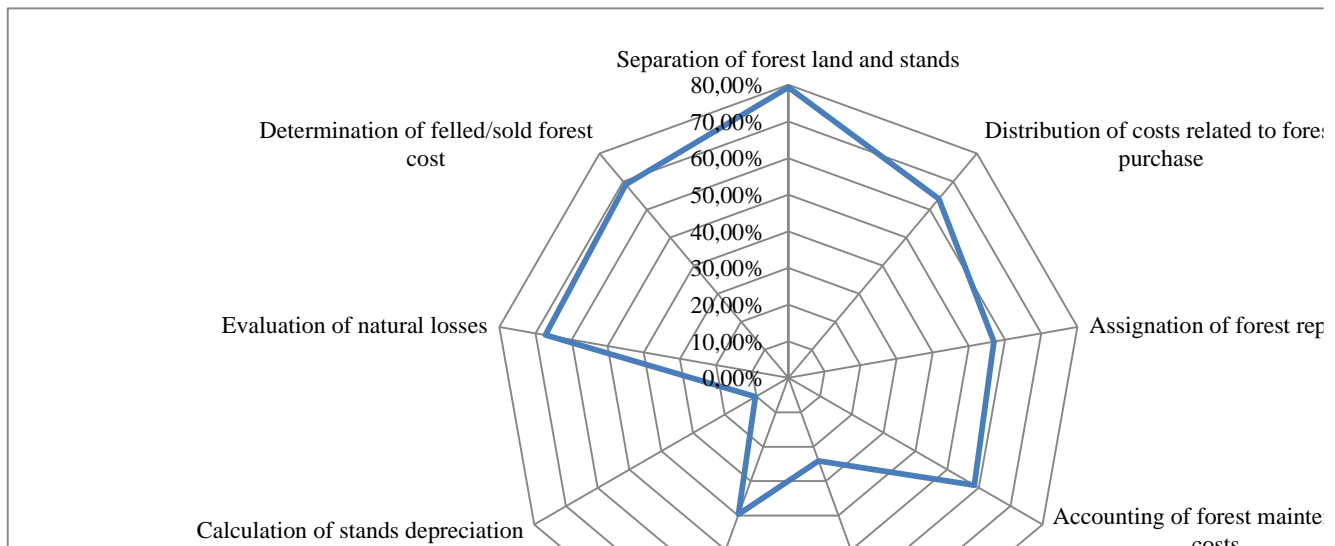


In response to the forest registration in accounting questions, all the respondents indicate that the acquired or (re)planted forest is recorded at the acquisition cost which takes into account quite different costs associated with acquisition, planting and maintenance (Figure 3). All the respondents unanimously (98.28 %) point out that the forest purchase price is included in the forest acquisition costs, except for one respondent who indicates that the enterprise does not possess purchased forest, but owns a planted forest. Meanwhile, in only 65.5% of the surveyed enterprises the cost of forest includes forest stands or seedlings and afforestation costs, 60.3% - afforestation site preparation costs. 51.7% of corporate accountants claim that acquisition costs include acquisition taxes, however, these taxes are unlikely to be significant, therefore, do not significantly affect the enterprise's performance results. It should be noted that only 44.8% of the respondents indicate that forest costs also comprise forest maintenance until maturity, while 36.2% include the maintenance costs until felling.



**Fig. 3.** Types of costs included in forest cost  
Source: compiled by authors (based on survey results)

The costs for the maintenance until maturity and felling cover a relatively significant part of the costs of forestry enterprises, therefore, their capitalisation or, conversely, the inclusion in the expenses of the reporting period can have a significant impact on the corporate financial performance indices. Thus, it can be argued that the accounting policies of private forestry companies are not harmonised in this respect and the financial information may be incomparable. It is assumed that smaller companies tend to apply simpler accounting rules. However, after assigning the forest costs to cost according to the size of the enterprise, we obtained an unexpected outcome: even 92.3 percent of micro enterprises assign the expenditures of afforestation, site preparation, the purchase of forest seedlings or sprouts, their planting costs to the cost of stands, while these costs are capitalised in only 50% of medium and in 42.3 percent of small enterprises. A similar trend has also been observed in the forest accounting for subsequent expenditures: even 65.38 percent of micro enterprises assign maintenance until maturity costs to the cost of stands, while they are capitalised in only 50% of medium-sized enterprises and 23.1% of small enterprises, which suggests that the general accounting principles in Lithuania are more accurately applied namely by micro forestry enterprises.

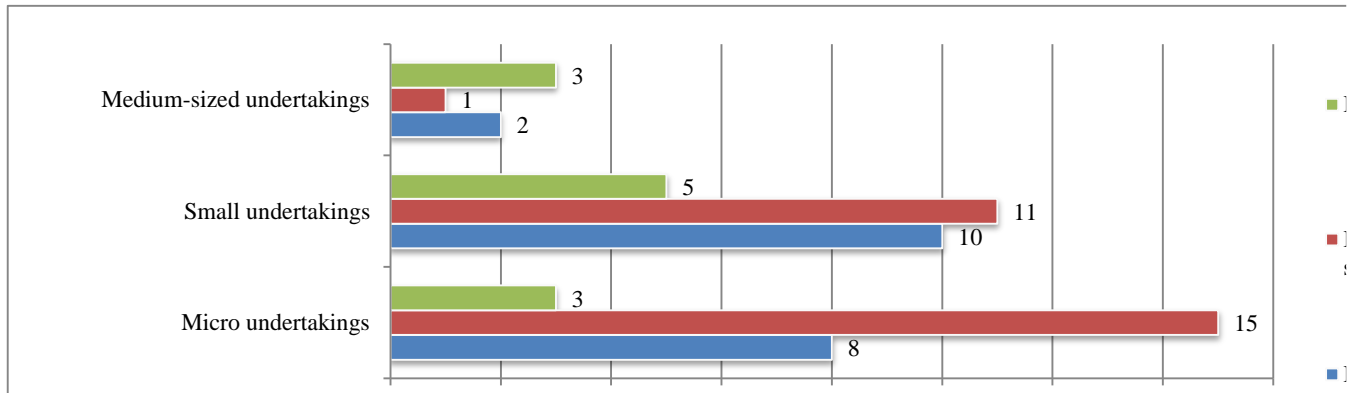


**Fig. 4.** Problem areas of forest acquisition cost and accounting after initial recognition  
 Source: compiled by authors (based on survey results)

In terms of the problem areas arising in determining the forest (stands) acquisition costs and accounting after initial recognition, almost all the respondents identified a range of problems shown in Figure 4. According to most of the respondents, it is difficult to separate the value of forest land and stands when buying a forest for a common price and in such cases some enterprises apply their own methodologies. In the opinion of 63.8% of the respondents, uncertainties arise when assigning forest purchase costs to the value of assets or expenses, while 56.9% of the subjects pointed out the ambiguous classification of reforestation costs. After conducting the analysis of the problem areas of forest accounting after the initial recognition, the most relevant areas were identified: natural losses (pests, fires, etc.) and the determination of costs of felled forest or costs of standing forest sale, while more conceptual areas like the interpretation of development costs, the use of valuation methods for the forest were identified as less relevant. Moreover, it should be noted that 24.1% of the respondents indicated that they encountered problems in determining the fair value of the stands. However, given that all the accounting for the enterprise's forest was carried out at cost, it is probable that the determination of the fair value of the forest is not relevant to its presentation in the financial statements, but for other reasons (for determining the sale price of the forest, etc.). Summarising the identified problem areas, it can be argued that they are related to the shortcomings of the forest accounting regulation (conceptual and more specific technical), which were determined by the analysis of the national and international accounting regulations.

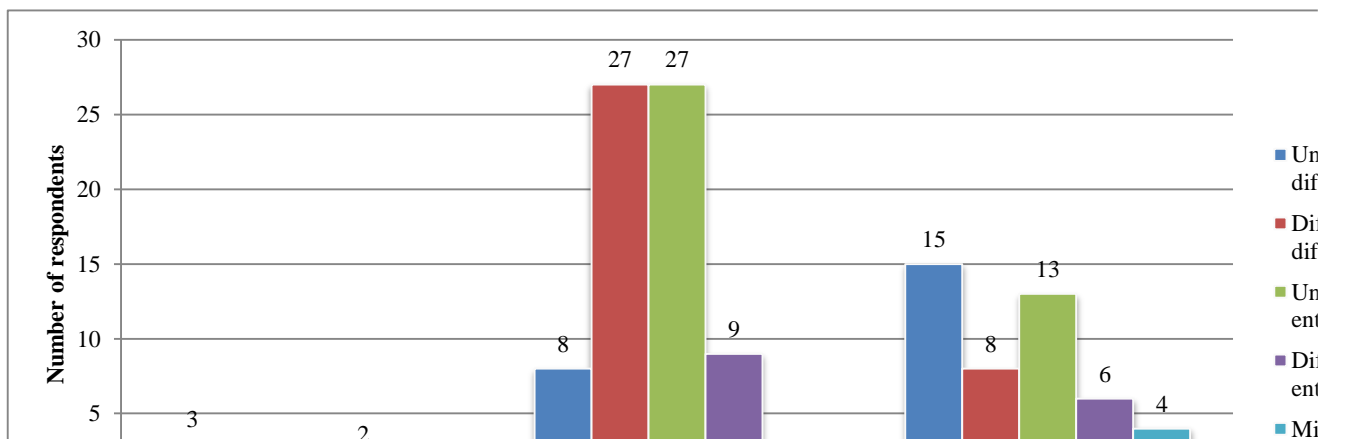
The detail level of the regulation of financial accounting is closely linked to the requirements of disclosing additional information about the activities of the enterprise in the explanatory notes, however, it is universally accepted that if any area is not regulated (insufficiently regulated) by accounting standards, the enterprises themselves should disclose the information related to this area in the notes so that the users understand the data included in the financial statements. After identifying the insufficient forest finance accounting regulation, the respondents were asked to reveal how much information about managed forest companies provide in the notes (see Fig 5). The results of the survey revealed that the respondents behaved differently: only 46.6% of the surveyed chief accountants indicated that they provide explanatory notes with not only the accounting information specified by the accounting standards, but also supplementary information that would help the users of the financial statements to better understand the company's financial information. However, 19% the respondents

claimed they disclose only the necessary required information, while even 34.5% of the subjects marked that in the notes, they provide no information on the managed forests.



**Fig. 5.** Disclosure of information on forests in explanatory notes  
 Source: compiled by the author (based on survey results)

It should be emphasised that such a situation implies a potentially false interpretation of the financial data on the corporate operations in the context of insufficient regulation of accounting of forests and different accounting practices, i.e. the financial information may be incomprehensible to users. After the respondents were asked to express their opinion on the need for a forest financial accounting model that defines the classification, valuation and accounting principles of forests (stands), 98.39% of the respondents agreed with the necessity of the existence of such a model. However, the respondents' viewpoints on the unification of the accounting methods for small and large enterprises, private forestry enterprises and state forest enterprises were slightly unexpected (see Figure 6).



**Fig. 6.** Respondents' opinion on the unification of forest accounting  
 Source: compiled by author (based on survey results)

According to the majority of respondents (56.45%), the financial accounting rules for forests should be different for small and large enterprises, because of “the differences in the scope of activities”, “more complicated accounting rules would increase the costs for small enterprises”, “small enterprises have limited financial possibilities”, “this isn’t relevant for small scale businesses”, “only the tax inspectorate is interested in the financial statements of small enterprises”. It should be noted that the respondents’ arguments are fully justified: small undertakings often have a rather narrow circle of financial reporting information users, and the users

themselves (owners, who are usually managers of these companies, banks, tax administrators, statistics institutions) have the opportunity to demand additional data from the company, so complicated accounting rules not only hardly justify, but also increase the costs of enterprises, and, if applied incorrectly, may distort information about the company's activities. However, 41.94% of the respondents believe that forest accounting rules should be the same for companies of different sizes, because "there is no difference what size enterprise acquires the forest", "there must be uniform legal provisions for all", "market conditions are the same for all", "accounting requirements must be the same for transparency". However, it should be noted that, unlike small ones, large companies have a much wider range of financial information users, and some of these users (owners who are not company managers, potential investors, non-financial creditors, community, etc.) can only receive information about the company's activities from financial statements. Therefore, more complex accounting methods and additional information disclosures are inevitable. The respondents' opinions were also diverse in relation to the unification of forestry accounting rules of state and private forest enterprises: 66.13% of the respondents believe that the forest accounting provisions should be the same in the private forestry enterprises and state forest enterprises, however, 27.42% claim that the accounting rules must be different. In assessing the respondents' arguments, it should be emphasised that the principles of formation of an enterprise accounting system can be influenced by the nature and extent of the activity, but not by the legal status of the company.

##### **5. The model of forest accounting at cost for micro and small enterprises**

A survey of the chief accountants of the Lithuanian private forestry enterprises revealed that none of the investigated enterprises applied fair value accounting methods regardless of their informational benefits to users. The fact of ignoring the fair value can partly be explained by the fact that 68.96% of the surveyed enterprises classify the stands into the category of inventories subject to accounting for the cost method. However, the enterprises that assign stands to fixed assets did not apply fair value-based methods too.

The use of the fair value concept for forest accounting is complicated due to the annual determination of forest fair value and could be proposed for medium and large local, especially international and listed forestry enterprises that are important for the public and/or the community, for those entities who have a large number of financial information users and sufficient financial and intellectual resources to properly implement this method. Meanwhile, the cost method can be applied to micro and small undertakings, which usually have lower financial and qualification possibilities, but are not so significant for the public because of their own size and have a smaller number of information users. This proposal is based on a changing view on the usefulness of accounting information. In the second half of the 20th century, the prevailing opinion on small companies was that they did not significantly differ from the large ones and should be subject to the same accounting requirements. In the 21st century it has been recognised that the needs of small and large enterprises differ, and small companies should not use complicated accounting models, i.e. they must be enabled to simplify their accounting. It should be noted that more than half of the interviewed chief accountants of the private Lithuanian forestry enterprises supported this view.

The results of the survey revealed that the majority of small (61.5 percent) and micro (92.3 percent) Lithuanian private forestry enterprises classify forests (stands) as inventory. However, such a classification raises serious doubts: although the forest is being developed for sale, but the time of its development is usually very long, it generates the revenue from developing felling, and the assets do not feature liquidity characteristic of short-term assets, especially if more than ten years are ahead until the maturity of the stands. Therefore, we tend to support the opinion of Wallner (2009), Jöbstl (2009), Grege - Staltmane (2010), Dvořáková (2011), Zamula and Shavurska (2015): in order to provide "true and fair view" of the financial statements, the forest under development should be classified as fixed (long-term) assets. In terms of the classification of stands according to the nature of the assets, the definition of biological assets in IAS 41 should be taken into account: biological

assets are plants and animals used in agricultural (including forestry) activities (Commission Regulation ..., 2008). Thus, it is advisable that the developing forest for sale, either felled or standing, should be classified as fixed biological asset until its felling (sale).

The research pointed out the essential problem of enterprises applying accounting at cost method: cost estimates for different companies assign different costs to the cost of stands, so the information about forests is not comparable. If only the initial costs were included in the (re)planted forest cost, it would be artificially reduced, as the costs of subsequent maintenance are a prerequisite for the further forest development and preparation for sale. The cost determined in this way would also significantly differ from the purchase price of a similar (of the same age and species) forest, which would be considered as the cost of the later acquired forest. Therefore, we suggest that forest (stands) cost include not only the initial costs, but also the subsequent direct costs of development and maintenance (thinning, development felling, replanting, etc.), which are necessary and incurred up to the time when the forest reaches the age of maturity and will be sold or felled. However, subsequent costs linked indirectly to forest development (animal and insect control, forest roads construction, fire protection, forest management personnel) that are difficult to distribute to different units of account, as well as sales costs to be recognised as expenses in the reporting period, should not be included in cost. Meanwhile, the costs of preparing for sale (felling, cutting, extraction, hauling) should be credited to the cost of wood production (inventory), but not forest (biological assets) cost.

The analysis of scientific literature with respect to the application of cost method in forest accounting, as well as the survey of chief accountants of forest enterprises suggest that the classic calculation of depreciation for a forest is an improper procedure in order to reflect the process of forest development and the schedule for obtaining an economic benefit. Therefore, consideration should be given to the alternative method in assigning forest value – depletion, i.e. a method of accounting that is commonly used to distribute the costs of natural resources (oil, gas, etc.) during the period of extraction of those resources. Depletion is very similar to depreciation, especially if the production method is used in calculating the depreciation, but, unlike depreciation, which is essentially the distribution of the costs of acquisition of fixed tangible assets during its useful life, while depletion reflects the actual (physical) consumption of natural resources (extraction). Forest depletion may be defined as the recognition of planting and other capitalised development and maintenance costs during the forest development period as the expenses of the reporting period when the forest is sold either standing or lost, or added to the cost of wood (production) after forest felling. The depletion (*D*) amount for the reporting period can be calculated according to the formula [2]:

$$D = \frac{I}{(A + P)} \times P \quad [2]$$

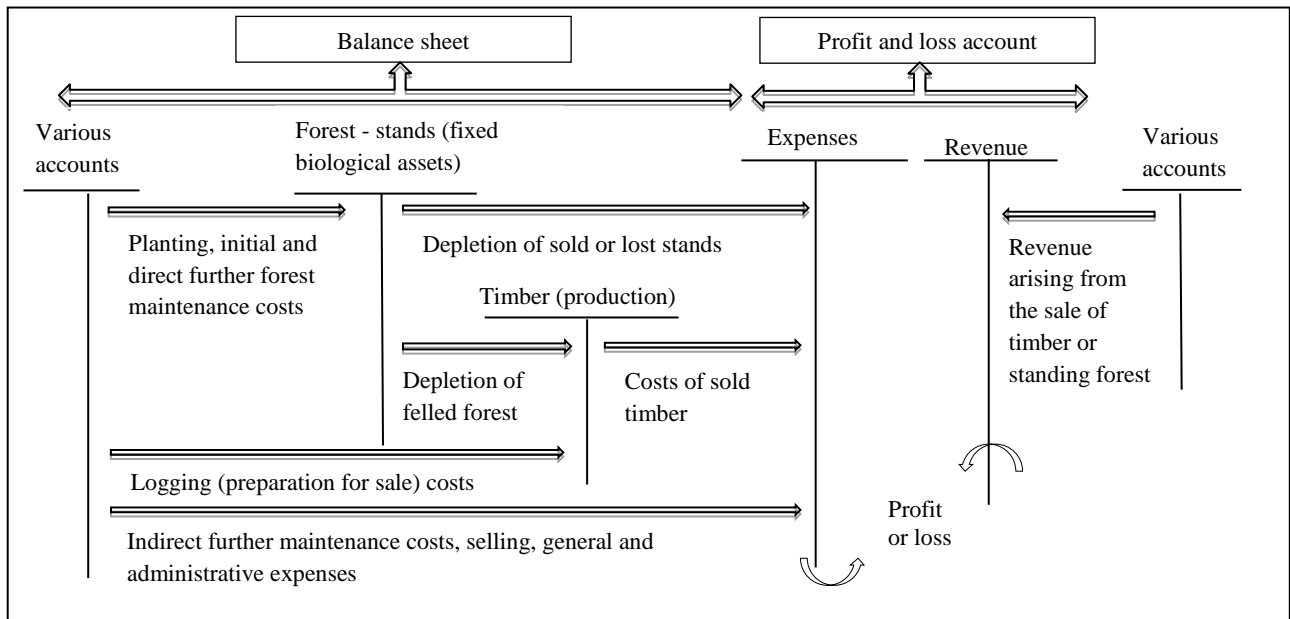
*I* - capitalised costs incurred of stands, minus amounts for forest depletion in previous years;

*A* - volume of timber (m<sup>3</sup>) expected to be produced in the future by stands existing/growing at the end of the reporting period

*P* - volume (m<sup>3</sup>) of timber (sold stands) received during the reporting period

Depletion should be calculated for each reporting period, and the estimated amount may vary each year due to the quantity of the sold (felled) stands as well as changes in variables *I* and *A*. This method of calculating depletion eliminates the complications triggered by the cost method applied, also the forest financial accounting is allowed to apply the classic methodology for fixed assets accounting. The diagram representing the process of applying the cost model to the financial accounting of forests is shown in Figure 7.





**Fig. 7.** A modified method of forest financial accounting at cost  
 Source: Compiled by the author

A presented model of forest financial accounting at cost eliminates the essential shortcomings of the cost method: depletion, unlike depreciation, is not related to the “useful time” of a forest, enables us to take into account the continuously changing forest cost, therefore, provides a solution to the end of costs capitalisation. Also, facilitates the application of the methodologically correct method of a systematic write-off of fixed assets.

## Conclusions

Accounting at fair value allows to present forests in the balance sheet at fair value less estimated costs to sell, which is considerably more relevant information to the users, in particular, regarding long-term prospects of the enterprise and enables to reflect not only the forest biological transformation, but also the impact of market circumstances. The main disadvantage of accounting at fair value is the fact, that, as a rule, there is no active forest market with quoted prices and the fair value is determined using different methods and assumptions, as a result of which the information may become incomparable and unreliable. When forestry enterprises use cost-based accounting methods, their financial statements provide reliable and verifiable information, there is no need to carry out a periodic determination of the fair value of a forest, which is a time-consuming procedure demanding additional worktime and (or) financial resources. However, the historical cost concept, which is traditionally clear, understandable and easily implemented, in the case of forest accounting poses the following complications: 1) forest reforestation and follow-up maintenance costs distribution and determination of the end point of capitalisation and 2) the selection of a systematic write-off mode after recognition of a forest as a fixed (long-term) asset.

The results of the empirical survey of forest accounting policies and practices used by the forestry enterprises in Lithuania show that the financial accounting for forests is different, thus the corporate financial information is incomparable. Although all the surveyed companies apply the Lithuanian Business Accounting Standards, their forests are exclusively accounted for at cost, in other areas the essential differences have been identified. Most of the enterprises capitalise the afforestation (reforestation) costs, but a significant number of them assign these costs

to the expenses of the reporting period. Significant differences were identified in the areas of classification of stands as well as in forest cost determination, accounting of maintenance and restoration expenses. In the context of uncertain accounting processes, it is important to provide additional information to users, yet, more than half of the surveyed enterprises do not provide any or additional information on forests in their explanatory notes. The results of the survey reveal that the enterprises do not opt to use fair value accounting methods, adapted in global practice, in order to provide users with more relevant information in their financial statements.

A model of forest accounting at cost was proposed to micro and small forestry enterprises. According to the model the forest acquisition cost should include not only the planting, initial forest maintenance costs, but also the direct further forest maintenance costs, incurred until the forest (stands) sale or felling moment, however, the indirect further forest development costs, related to the forest maintenance should not be included. To systematically write-off the stands, the depletion method is suggested, according to which the cost of stands should be included in timber cost after felling or should be recognised as expenses after the forest (stands) or part of it is sold.

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