

# Some Issues of Measurement of Impairment of Non-Financial Assets in the Public Sector

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**Abstract**—The economic value of the asset impairment process is quite large. Impairment reflects the reduction of future economic benefits or service potentials itemized in the asset. The assets owned by public sector entities bring economic benefits or are used for delivery of the free-of-charge services. Consequently, they are classified as cash-generating and non-cash-generating assets. IPSAS 21 - Impairment of non-cash-generating assets, and IPSAS 26 - Impairment of cash-generating assets, have been designed considering this specificity. When measuring impairment of assets, it is important to select the relevant methods. For measurement of the impaired Non-Cash-Generating Assets, IPSAS 21 recommends three methods: Depreciated Replacement Cost Approach, Restoration Cost Approach, and Service Units Approach. Impairment of Value in Use of Cash-Generating Assets (according to IPSAS 26) is measured by discounted value of the money sources to be received in future. Value in use of the cash-generating assets (as per IPSAS 26) is measured by the discounted value of the money sources to be received in the future. The article provides classification of the assets in the public sector as non-cash-generating assets and cash-generating assets and, deals also with the factors which should be considered when evaluating impairment of assets. An essence of impairment of the non-financial assets and the methods of measurement thereof evaluation are formulated according to IPSAS 21 and IPSAS 26. The main emphasis is put on different methods of measurement of the value in use of the impaired Cash-Generating Assets and Non-Cash-Generation Assets and the methods of their selection. The traditional and the expected cash flow approaches for calculation of the discounted value are reviewed. The article also discusses the issues of recognition of impairment loss and its reflection in the financial reporting. The article concludes that despite a functional purpose of the impaired asset, whichever method is used for measuring the asset, presentation of realistic information regarding the value of the assets should be ensured in the financial reporting. In the theoretical development of the issue, the methods of scientific abstraction, analysis and synthesis were used. The research was carried out with a systemic approach. The research process uses international standards of accounting, theoretical researches and publications of Georgian and foreign scientists.

**Keywords**—Non-cash-generating assets, cash-generating assets, recoverable value, recoverable service amount, value in use.

## I. INTRODUCTION

THE main purpose of holding assets in the public sector is to deliver the service to the public for free. Nevertheless, there are various circumstances when the public sector entities use some parts of the assets for gaining profit from the commercial activities.

Accordingly, a part of the assets are cash-generating, while others – non-cash-generating. Considering this specificity, the

International Public Sector Accounting Standards are developed, in which for the issues of impairment of non-cash-generating assets and cash-generating assets, different standards were allocated. These Standards are:

- IPSAS 21 Impairment of Non-Cash-Generating Assets,
- IPSAS 26 Impairment of Cash-Generating Assets.

These standards define the rules and requirements for identification, recognition, measurement and financial reporting of impairment of non-financial assets. The above-mentioned standards apply to all sectors of the public sector, except for government business enterprises, which use the IASs issued by the IFRSs.

It should be noted that the scopes of operation of IPSAS 21 and IPSAS 26 are not spread over the assets which are re-measured regularly at their fair value. These are the fixed means, investment property, commodity-material values, assets created as a result of construction contracts and financial assets applicable to IPSAS 29.

The subject of the study is to define the meaning of impairment, identification of the impaired assets, and measurement and recognition thereof according to IPSAS 21 and IPSAS 26, the differences between approaches considered by these two standards, and their evaluation.

The theoretical and methodological basis of the study is the International Accounting Standards, as well as the works, articles, and other Internet-disseminated materials of Georgian and foreign scientists and economists.

## II. THE ESSENCE OF IMPAIRMENT OF NON-FINANCIAL ASSETS

The main part of the assets of the public sector entities is intended for services that they offer to the public free of charge. They are not expected to receive economic benefits and correspondingly, they do not generate the cash flows. The assets that provide the main function of the state are mostly those which carry a service potential.

“They do not generate cash flows, but they create a material base for the implementation of the main functions of the state-owned organizations” [1].

The cash-generating assets are mainly aimed at obtaining economic benefits. Economic benefits from the assets are generated when these assets are continuously used in the economic activity or are realized at the end of useful service life.

Cash-generating assets are mainly aimed at obtaining economic benefits. Economic benefits are generated from assets when these assets are continuously used in the economic activity or are realized at the end of useful service life. Thus, assets are divided into two groups by their purpose

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in the operational activities:

- Cash-generating assets and
- Non-cash-generating assets.

In some cases, the asset can generate monetary funds, even if the main purpose of its possession is to deliver the service to the public for free. For instance, the educational institution serves at one and the same building for both free and paid groups [2]. In such a situation it is necessary to assess how important the cash flows created by this asset are. In order to determine this, the entity can independently establish criteria according to the requirements of the accounting standard, which will allow to separate from each other the cash-generating and non-cash-generating assets. This will allow you to determine which standard shall apply to them - IPSAS 21 or IPSAS 26. Thus, for the purpose of accounting impairment, the classification of the assets by cash-generating and non-cash-generating ones should be made not on the level of entity, but on the level of asset.

“The value of assets is constantly changing as a result of macroeconomic factors, and thus, in order to present realistic information on the value of assets in the financial statements, the assets are checked for impairment. The purpose of such inspection is to determine if the physical and economic potential of the assets are decreased and whether there is impairment. As a result, assets should not be reflected in the financial statements in a higher amount than their recoverable value is” [3].

The following factors are indicative of the depreciation of the asset: significant reduction of market value; reduced demand for services; deterioration of the use of the assets due to their physical or moral aging; changes in legislative or political environment that have a long-term negative impact on the economic benefits of the asset, etc.

“Reflecting such long-term assets at their historic value will lead to incorrect information in the financial statements. The latter cannot be the basis for making the correct economic decision. All this is due to the fact that at the modern stage, for the enterprises measurement of assets by their fair value is more acceptable” [4].

Under the concept of impairment, depreciation of the asset reflects the reduction of future economic benefits or the potential of the service which is itemized in the asset that is subjected to an entity's control. Definitions given in both these standards regarding the asset's impairment are fully compatible with the general concept of the asset's impairment.

The asset's impairment occurs when the carrying amount of an asset is higher than its recoverable value (recoverable service amount).

It should be noted that IPSAS 21 uses the term “Measuring Recoverable Service Amount”. The standard states that the non-cash-generating asset is impaired when the carrying amount of the asset is higher than the value of its use [5]. While IPSAS 26 uses the term “Measuring Recoverable Amount”.

Measuring Recoverable Amount and Measuring Recoverable Service Amount are equally determined by the

standards and is the higher of the asset's fair value and its value in use [5], [6]. The difference between them is in the value of the asset, for which measurement IPSAS 21 and IPSAS 26 recognize different methods. This is conditioned by the fact that for the non-cash-generating asset the value in use is determined by a remaining potential of its service, a while the value in use for the cash-generating asset is determined by future cash flows.

According to IPSAS 21: “the value in use of the non-cash-generating asset is the discounted value of the remaining potential of the asset's service” [5].

The value in use of the cash-generating asset is an economic benefit that the company expects to gain from the continuous purposeful use of the asset.

IPSAS 26 explains that is the present value of the estimated future cash flows expected to be derived from the continuing use of an asset and from its disposal at the end of its useful life [6].

For identifying the value in use, IPSAS 26 uses measurement and discount of those cash flows, which could be generated in the entity if its services or other products that are sold on the market.

In many cases the analogue of the service offered by the public sector is virtually lacking on the market. Thus, it is unlikely to determine the service price that would generate an entity using cash generated assets. So, IPSAS 21 determines the value in use not by measurement of the future cash flows but by depreciated replacement cost approach, restoration cost approach, and service units approach methods. Thus, although IPSAS 21 and IPSAS 26 offer different methods of calculation of the value in use, the essence of impairment of non-cash-generating assets and cash-generating assets is entirely consistent with the general model of impairment of assets. In both cases the asset is deemed impaired when the carrying amount of the asset exceeds its recoverable value or recoverable service amount.

### III. IDENTIFY POSSIBLE IMPAIRED ASSET

At the end of each reporting period, the entity must determine whether there are any major events and circumstances that can lead to an impairment of the asset.

IPSAS 21 and IPSAS 26 define the internal and external sources of factors that can be considered by the entity in determining the impairment of assets.

The external sources of information for the non-cash-generating assets are:

- Complete or almost complete termination of the demand or need on the services provided by the asset;
- Long-term or expected long-term changes in the technological, legal or political environment where this entity is functioning and, they have a negative impact on the entity.

Let us consider a case where an entity has a specialized military purpose warehouse, which is no longer being used. Depending on the specificity and location of the storehouse, it is less likely to be leased or sold. However, the asset still maintains the same potential of service. However, according

to the standard, the asset is deemed impaired because the demand for this service is no longer available [5].

The external sources of information for the cash-generating assets are:

- During the given period, the market value of the asset will be significantly reduced, compared with the expected expiry of time or normal use;
- Long-term changes that occur or will take place in the near future and will have a negative impact on the technological, legal or political environment in which the given entity is functioning;
- Increase in market interest rates in a given period that will affect the discount rate used to calculate the value in use of the asset and significant reduction of the recoverable value of the asset.

Thus, different emphasis on impairment indicators is made in IPSAS 21 and IPSAS 26. In particular, IPSAS 21 does not consider changes in the market value of the asset and market interest rates as a definite reference to impairment. While the facts mentioned in IPSAS 26 are an integral part of the minimum reference.

As for the internal sources of the asset's possible impairment, the indicators given in IPSAS 21 are relevant for cash-generating assets too. These include:

- Evidence of aging or physical damage of the asset;
- Long-term changes that affect the entity's activity or current or subsequent use of the asset;
- Decision to suspend the construction of the asset before it is completed or prior to reaching the asset's operating condition; and,
- The information in the internal report that shows that the asset productivity is significantly deteriorated compared to expectations or will worsen in the future [5].

#### IV. MEASURING RECOVERABLE AMOUNT AND MEASURING RECOVERABLE SERVICE AMOUNT

In order to assess whether the asset has been impaired, the entity should identify the signs of impairment for each reporting period, based on both internal and external sources of information.

When exposing the signs of impairment, the entity is obliged to determine the impairment loss and reflect the same in the financial statements.

The asset is deemed to be impaired if the carrying amount of the asset is higher than its recoverable value (recoverable service amount). Therefore, to determine the impairment loss, firstly it is necessary to measure the recoverable value (recoverable service amount) of the asset. The recoverable value (recoverable service amount) is determined as the higher of a non-cash-generating asset's fair value less costs to sell and its value in use.

According to IPSAS, the best indicator of the fair value of the asset is the price determined under the legal agreement concluded between the parties which are experts in this business. For determining the recoverable value, the fair value reduced by selling expenses is used. Such costs include additional expenses related to the expiration of the asset:

charges, taxes, legal services, deal-related and other similar expenses, as well as the asset dismantling and other direct costs which are required for the preparation of the asset for sale.

If there is no contract of sale of the asset, the fair value thereof is determined by the asset's market price.

If there is no buyer's price, the price fixed in the last deal can be used as the basis for determining the fair value of the sale cost. The entity will receive benefit from this situation if the economic conditions have not changed considerably since the date of the transaction.

If there is no contract of sale of an asset, an active market and information on the final transactions, the entity can take into account the similar transaction data implemented in the same field.

It is noteworthy that neither IPSAS 21 nor IPSAS 26 envisage a compulsory sale of the asset in the fair value reduced by the costs of sale of the asset.

It is not always necessary to evaluate both the values - fair value reduced by the costs of sale of the asset and the value in use of the asset, because if one of them is more than the asset's carrying value, it means that the asset is not impaired.

The second component, which is needed for measuring the recoverable value (recoverable service amount) of the asset, is the value in use.

The value in use of the non-cash-generating assets, as the discounted value of the remaining potential of the asset, is determined by IPSAS 21 by three methods [7].

According to the depreciated replacement cost approach, the value in use of the asset is determined by value of replacement or depreciated value of reproduction (replication) of the existing asset. The cost of replacement of the asset is determined as costs, through which it would be possible to create an asset or reproduce the existing asset. The above approach implies that the entity will replace the remaining potential of the asset only if the asset will no longer have this potential. Thus, according to the depreciated replacement cost approach, the value in use the asset is determined by cost of replacement or reproduction of the asset, with further correction by the accumulated depreciation.

According to the restoration cost approach, the cost of the asset is calculated by the value of the asset until; impairment from the current value of replacement, minus the costs of restoration. This method is used when the loss of impairment causes the physical damage of the asset, which reduces the economic benefit of the assets compared to the expected one.

Suppose a bus was damaged as the result of a road accident, its recoverable costs amount to 50,000 USD; the bus was purchased six years ago for 400,000 USD and its service life is 10 years. In this case, the impairment of the bus is obvious. The costs of replacement of the bus by another one of a similar class, is 450,000 USD. According to the above data, the value in use of the bus is 130,000 USD, which is calculated from its depreciation value of replacement  $[450,000 - (450,000 * 6/10)]$  minus the costs of restoration (50,000).

In the service units approach for determining the current discounted value of the remaining potential of the asset's

service, the depreciated cost of replacement must be corrected by predictable percentages of performance.

Suppose in 2013 the Department of Education bought printing machines worth 20 MIO USD. According to the department's estimates, during the 10-year (useful service life) period, the printers could print 20 million copies of books to be used by elementary school pupils.

The 2017 Internal Report indicated that one of the parts of the printers was not as functional as planned, which have resulted in 25% reduction in the annual performance of the printers during the remaining 5-year period. The replacement cost of a new printing press is 22.5 MIO USD in 2017 [5].

Since the performance characteristics of the device are worse than expected, the impairment of the printers is obvious.

According to the service units approach for determining the recoverable service amount, the replacement cost of depreciation is to be adjusted according to the predictable percentages of performance.

TABLE I  
CALCULATION OF THE RECOVERABLE SERVICE AMOUNT BY THE  
DEPRECIATED REPLACEMENT COST METHOD

No	Indicator	Year	Amount
A.	Historical cost	2013	20,000,000
	Accumulated depreciation ( $A * 5 / 10$ )	2017	10,000,000
B.	Carrying amount	2017	10,000,000
C.	Replacement cost of a storage facility of similar capacity		22,500,000
	Accumulated depreciation ( $C * 5 / 10$ )		11,250,000
D.	Depreciated cost of replacement on the remainder service units until adjustment		11,250,000
E.	Recoverable service amount ( $D * 75\%$ )		8,437,500
F.	Impairment loss ( $B - E$ )		1,562,500

Measurement of the value in use can be divided into two stages, according to IPSAS 26:

- Measurement of inflow and outflow of future money as a result of continuous use of the asset and its expiry;
- Determining the appropriate discount rate for future cash flows.

In determining the value in use of the asset, the emphasis should be made on the best assessment of the expected economic situation during the remaining useful service life of the given asset. Cash flow forecasts should also be based on the financial budgets/projections of the last period approved by the management of the entity. Prognosis should cover a maximum of five years [5].

In order to avoid the doubling of the accounting, future cash flows will not be taken into consideration, which are most likely not depending on the cash flows from the assets concerned. In measuring the value in use of the asset, it is necessary to reflect the following elements in the calculations:

- An estimate of the future cash flows the entity expects to derive from the asset;
- Expectations about possible variations in the amount or timing of those future cash flows;
- The time value of money, represented by the current market risk free rate of interest;

- The price for bearing the uncertainty inherent in the asset; and,
- Other factors, such as illiquidity, that market participants would reflect in pricing the future cash flows the entity expects to derive from the asset [6].

Annex "a" of IPSAS 26 is an integral part thereof, which deals with the traditional and the expected cash flow approaches for calculation of the discounted value.

With the traditional approach, the main focus is made on selection of the discount rate with the weighted risk. This approach is based on assumption that all the possible outcomes of the future cash flows and the added risk may be combined with one agreed discount rate [8].

The traditional approach is advisable when the comparative assets are directly or indirectly observed on the markets. This approach is not advisable for use when measuring such non-financial assets for which no direct or indirect market exists. The reason is that sometimes an asset with similar parameters of unique non-financial assets, which is essential when using a traditional approach, is not introduced factually on the market.

The discounted rate for forecasting the expected cash flows from the asset shall be calculated based on the analogous asset and operating interest rate analysis. At least two articles need to be analyzed:

- An asset which exists on the market and which has an active interest rate; and,
- An asset that should be assessed.

Conclusion on the discounted rate for the cash flows to be evaluated should be made by the current interest rate of the second asset.

Unlike the traditional method, the expected cash flow approach is effectively assessing the expected cash flows from the use of the asset. This method is based on all possible cash flows analysis, instead of one of the most likely cash flows. When using this method, the focus is made on relatively explicit assertions of direct analysis of the cash flows and the assumptions used in the measurement. For example, to calculate cash inflows from the asset's use, when the use of a cash generating asset is expected to be 100 dollars, 200 dollars, or 300 dollars, 10%, 60% and 30% of the likelihood, accordingly, the expected cash flow will be  $100 * 0.1 + 200 * 0.60 + 300 * 0.30 = 220$  USD [6]. In addition, such an approach can be applied even when the distribution of cash flows is characterized by indefinite time. For example, a cash flow of 100,000 dollars can be taken in one year, two years or three years, with 10%, 60% and 30% probabilities, respectively. The table below shows the calculation of discounted value of cash flows in the given situation.

TABLE II  
CALCULATION OF EXPECTED PRESENT VALUE (USD)

Present value	100,000		
	in 1 year at 5%	in 2 years at 5.25%	in 3 years at 5.50%
Discounted amount	95,238	90,277	85,164
Probability of Receiving	12%	55%	35%
Probability	11,428	49,652	29,807
Expected present value	$11,428 + 49,652 + 29,807 = 90,887$		

The expected present value of 90,887 dollars differs from the value obtained by the best traditional calculation - 90,277 (55% probability) [8].

The probability of evaluating the expected cash flows is an essential element. However, this element can be quite subjective, which is considered a defect of the review method. It should be noted that this disadvantage is not excluded when selecting a discount rate when using the traditional method.

In assessing the expected flow of cash, it is necessary to rationalize the principle of management. The unit must balance the cost of obtaining additional information with additional reliability of the information related to the assessment.

Depending on IPSAS 26, the discount rate should be the one before the tax rate, which reflects the current market measurements of the following data:

- The time value of money, represented by the current risk-free rate of interest; and,
- The risks specific to the asset for which the future cash flow estimates have not been adjusted [6].

Whichever approach is chosen by an entity for measurement of the value in use of the asset, the interest rates used to discount cash flows should not reflect the risks in which adjusted cash flows are given. In other cases, some admission will be doubled.

For determining the value in use, the entities will select the above-mentioned methods by considering the existing circumstances. The standard of replacement of depreciated cost and useful units method are recommended when impairment is caused by changes in technological, legal or political environment, or as a result of significant long-term changes in the use of the asset or the method.

Selection of the most appropriate method for determining the value in use depends on the availability of data on impairment and the nature of impairment. In all cases,

“the methods used for the measurement should be based on maximum use of the appropriate initial empirical data and minimum non-empirical initial information” [9].

#### V. RECOGNITION AND COMPENSATION OF IMPAIRMENT LOSS

The asset is impaired if its carrying amount exceeds its recoverable value (recoverable service amount).

The impairment loss is recognized as reduction of the carrying amount of the asset to the recoverable value (recoverable service amount). The difference between the carrying value and the recoverable value (recoverable service amount) is recognized in surplus or deficit.

Suppose the government-owned enterprise owns special equipment with carrying value 120,000 USD, accumulated depreciation 40,000 USD, and the carrying value of the asset is 80,000 USD [10].

Following the recognition of impairment, the original carrying amount of the asset changes, which in itself implies adjustment of accrued depreciation. Depreciation should be made and corrected in future periods. Depreciation does not require retrospective calculation.

TABLE III  
MEASUREMENT OF THE ASSETS IMPAIRMENT (USD)

IMPAIRMENT OF THE COST OF IMPAIRMENT (COST)		
Impairment Loss		
Hypothesis	Impairment	Carrying value of the asset
hypothesis 1		
Net fair value = 90,000	The asset is not impaired	80,000
Net fair value > Carrying amount		
hypothesis 2		
Net fair value = 60,000	The asset is not impaired by 10,000	70,000
Value in use = 70,000		
Recoverable value (Recoverable Service Amount) 70,000		
hypothesis 3		
Net fair value = 75,000	The asset is not impaired by 5,000	75,000
Value in use = 65,000		
Recoverable value (Recoverable Service Amount) 75,000		

TABLE IV  
REFLECTION OF THE ASSET IMPAIRMENT ON THE ACCOUNTS ACCORDING TO HYPOTHESIS 2

Account name		Amount
Debit	Deficit	10,000
Credit	Asset	10,000

In accordance with IPSAS, the public sector is obliged to reveal the asset's impairment signs for each reporting year. Signs that indicate the depreciation of the asset have changed for a given period of time. There are following minimum signs to compensate for impairment loss:

- The market value of the asset is significantly increased during the given period;
- The demand for the services produced by the asset became again available;
- In the technological market, economic or legal environment where the unit functions, significant changes have been made which have a positive impact on the entity

Significant long-term changes with a favorable effect on the entity have taken place during the period, or are expected to take place in the near future, that will have a positive effect on a current or future use of the asset [5], [6].

Impairment losses are subject to recovery when identifying these factors, which means that the carrying value of an asset is to be increased up to the recoverable value (recoverable service amount).

Explanatory notes: The Entity shall disclose those criteria which distinguishes the non-cash-generating asset from the cash-generating asset. And also:

- Characterization of the asset;
- Which one is a recoverable value – a fair value reduced by the costs of sale of the asset or its value in use;
- The amount of impairment losses and the restoration of the impairment loss for each class of the assets; and,
- The events and circumstances which have caused the recognition or restoration of the impairment loss.

If the entity submits the information by single segments, the explanatory notes shall disclose the information on which segment the impaired asset belongs. Thus, the difference in the functional purpose of the assets in the public sector is

preconditioned by the differences in the methods of measurement of the impaired assets. However, whichever method is used by an entity to measure the asset, presentation of realistic information regarding the value of the assets should be ensured in the financial reporting [1].

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