# EVALUATION OF THE RELATIONSHIP BETWEEN SUSTAINABLE DEVELOPMENT INDICATORS AND STANDARDIZED ASPECTS THROUGH IAS 41

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**Abstract**

The objective of this paper is focused on the analysis of the performance of agricultural enterprises, namely of the exploitation of the forestry fund. The increasing importance of the role played by the forestry fund for society as well as for the economy in general implies a serious concern of the authorities regarding the regulatory process on the assessment and recognition of this invaluable resource with self-regenerative capacity.

The aim of the research is to identify a model for diagnosing the economic capacity of entities in the forestry segment in Romania, with 4 study objectives and 3 hypotheses being defined and the values of which were the basis of building the vulnerabilities chart. The methods used are prospective (observational analysis) and descriptive based on modeling statistical processes, the purpose of which is to construct the adjusted branch vulnerability chart. The study is an innovative one, based on structured research, and succeeds in an international framework that is proved to be insufficient to bring additional elements (plus value) and addresses in particular the public entities and authorities charged with supervising the land fund in Romania.

**Keywords:** IAS 41; Forest fund; financial performance

**JEL Classification:** Q23, M41, Q56

**Introduction**

The increasing importance of the agricultural sector in the national economy, as well as the presence of problems in the financial reporting of biological assets and agricultural production, have led the IASC in 2001 to develop a specific standard in this field, namely IAS 41 - Agriculture. The most important role of this accounting rule was to introduce the criterion of valuing resources of the nature of biological assets and agricultural products at fair value with certain well-grounded exceptions in which historical cost evaluation is allowed.

For example, in Romania, the forest - the green source of goods and services that both man and the whole society has, has the obligation, or rather the duty to take care of it as a whole. Its most important feature, we consider it to be self-reproducibility. Accepting the situation in our country, we can state that the 27% current share of the forest fund is under the one of

European Union, which has a 32% share. This, at present, does not prevent the multitude of forest-based societies from stopping their business, but in the field of accounting, things are not very transparent (Cosmulese and Mihai, 2019). This is due to the main reason that the forest fund itself is not evaluated, even if it actually meant the forests owned by the state and different categories of land, which in turn were also not registered in the accounting. We believe that accounting legislation still has serious gaps in the evaluation and recognition of this resource and it is likely to suffer changes from this point of view, otherwise evaluation, recognition criteria and accounting will remain questionable on a long term.

In this respect, IAS 41 - Agriculture was developed to support the economic entities that carry out agricultural activities. Basically, this standard represented a significant change in the optical range by the IASC (International Accounting Standards Committee), as compared to existing standards up to that point. This is justified by the fact that IAS 41 represents a radical change in the reporting of these types of assets, but at historical cost. At the same time, IAS 41 confirms for the first time the inclusion in the income and loss statement of the positive or negative component of the income, the profit or loss attributable to the variation in the fair value of a biological asset, basically the result of the exercise, which also includes the economic, positive but unrealized values.

The objective of our work is to analyze the financial performance of the agricultural enterprises that manage the forestry fund of our country. In order to achieve this objective, it is absolutely necessary to describe and analyze the distinctive features of agricultural enterprises, in particular those of the type of forestry bypass and forestry exploitation, which manage the forestry fund, in parallel with a detailed examination of IAS 41 standard (weak points and strong points) and a substantiated justification of the critical considerations regarding the application and modifications made by the IASB to this rule in June 2014.

**Literature review**

The objective of IAS 41 was to prescribe the fair value measurement of biological assets and agricultural products, with the exception of rare exceptions, properly explained, where a historical cost estimation is allowed (Grosu, 2016; Acuña, 2015). This accounting standard represents a significant change of direction by IASC in relation to the accounting principles previously issued: in fact, IAS 41 represents the most radical departure from accounting to historical costs (Mates and Grosu, 2008; Ciubotariu, 2013; Cosmulese and Socoliuc, 2018). Moreover, by confirming its innovative field for the first time, the profits and losses associated with changes in the fair value of a biological asset are included in the income and loss statement, including both the positive and the negative components of the income, thus creating a financial result which also contains the flows of economic elements with positive but unrealized values (Mates et al, 2015; Ciubotariu, 2016; Cosmulese and Ciubotariu, 2017). A fundamental characteristic of an agricultural enterprise is closely related to the fact that it carries out in a complete process most of the production steps (Radu et al, 2015). This is done in a rapid manner in the sense that biological assets are typically exposed to atmospheric phenomena which, viewed from the risk point of view, allow the identification of atmospheric risk as the only specific expression in the overall share of the global risk to which it is exposed an agricultural enterprise (Corbella, 2000). Regarding the distinctive features of an agricultural enterprise, such as the sequencing and mandatory schedule of production operations, the duration of biological cycles and the reduced attitude towards standardization, they allow us to state that agricultural activity is characterized by a rigidity of the activated processes. Moreover, the physical transformation processes due to the biological constraints to which they are subjected do not allow a significant change in the quantity or quality level of the obtained products (Corbella, 2001).

**Methodology**

In order to demonstrate the impact of regulations through International Accounting Standards IAS 41 in the forestry sector, the authors proposed to carry out a radiography of the main economic activities in the forestry sector on the principles of sustainable development and in this respect they dynamically analyzed in 2008-2017 the performances reported by a 48 forestry bypass activating in Romania in the Northeast region in the sectors of forestry related activity respectively: Forestry and other forestry activities (CAEN code 210); Forest exploitation (CAEN code 220); Collection of plants and fruits from spontaneous flora (CAEN code 230); Activities related to forestry services (NACE Code 240). The sustainability indicators analyzed are composite indicators defined as follows:

a) Sectorial development (noted Ds) of the main actors in the forestry field in Romania by activity classes (thousands of euros) - represents the achievements reflected by the turnover reported by the actors in the branch in dynamics during 2008-2017; b) Capitalization through Fixed Assets (noted Kaf) (thousands of euros) - represents the accumulations of fixed assets (forest fund) reported by the forestry bypass analyzed in the annual financial statements during 2008-2017; c) Economic performance (profitability rates) (%) (noted Pr) - reflected by the net profit/turnover ratio based on the financial data reported by the 48 entities in dynamics in 2008-2017; d) Systemic risk of the actors (insolvency risk) (%) (noted Ri) - calculated on the basis of the vulnerabilities analyzed as a ratio of the accumulation of debts/turnover of the 48 entities in dynamics in 2008-2017; e) Sustainable growth rates in the sector (%) (noted Rs) - represented by the ratio of the turnover and the capital of the 48 forestry bypass dynamics in the 2008-2017.

The present study has set the following objectives:

1)      Segregated analysis by domains of activity of sustainable development indicators, highlighting critical years and favorable years based on data taken from direct observation (Ministry of Finance website, financial information section); 2) Evaluation of the global index of sustainable economic development by sectors of activity and indicators of sustainable development as a result of the analysis from the direct observation, with drawing up the development chart by classes of activity; 3) Assessing the impact of accounting policies currently applied through IAS 41 on the basis of a rapid diagnostic model and building the current branch vulnerability table; 4) Identification of segments related to voluntary disclosure (IPSAS 27 standard) with allocation of image and structure benefits to the main vulnerabilities identified in objective 3, calculation of relative image increases by assimilation of the principles of voluntary reporting identified.

According to the objectives presented, the following working hypotheses are formulated:

Hypothesis 1: Sustainability indicators reflect in a directly proportional relationship the ability of the organization to implement the IAS 41 principles and to increase the quality of the presented accounting information.

Hypothesis 2: Economic vulnerability is reflected in accounting by the increase in the level of accounting errors, voluntary reporting activities being able to significantly reduce the inherent risk.

Hypothesis 3: Fair recognition of forest resources is an accounting principle that can help both entities and authorities to develop national forest fund protection policies and this recognition depends on assimilating the principles of voluntary reporting by the industry branch entities.

We built the rapid diagnostic model using the Excel and Gretl software (dedicated statistical software) based on the information gathered by direct observation.

The global branch development index (Ig) is a rapid diagnostic tool at the branch level and field of activity and is calculated according to the formula:

$$Ig_{NACE} = \frac{Ds_{NACE} + Kaf_{NACE} + Pr_{NACE} + Pi_{NACE} + Rs_{NACE}}{n}, \text{n=5} \tag{1}$$

Where:

$$Ds_{NACE} = \frac{\sum_{j=1}^{t} DsNACE_j}{t} = \frac{\sum_{j=1}^{t} \frac{\sum_{i=1}^{m} T_{ij}}{m_{NACE}}}{t} \qquad (2)$$

Where: **T** represents the achievements reflected by the turnover reported by the actors in the branch in dynamics in the 2008-2017 period; **m** represents the number of actors in the branch; **t** is the number of years for which the analysis was performed

$$Kaf_{NACE} = \frac{\sum_{j=1}^{t} KafNACE_j}{t} = \frac{\sum_{j=1}^{t} \frac{\sum_{i=1}^{m} FA_{ij}}{m_{NACE}}}{t} \qquad (3)$$

Where: **FA** represents the accumulations of fixed assets (forest fund) reported by the forestry bypasses analyzed in the annual financial statements for the 2008-2017 period; **m** represents the number of actors in the branch; **t** is the number of years for which the analysis was performed

$$Pr_{NACE} = \frac{\sum_{j=1}^{t} PrNACE_j}{t} = \frac{\sum_{j=1}^{t} \frac{\sum_{i=1}^{m} \frac{FN_{ij}}{T_{ij}}}{m_{NACE}}}{t} \qquad (4)$$

Where: **Pr** represents the net profit/turnover ratio (T) based on the financial data reported by the 48 entities in dynamics in the 2008-2017 period; **m** represents the number of actors in the branch; **t** is the number of years for which the analysis was performed

$$Ri_{NACE} = \frac{\sum_{j=1}^{t} RiNACE_j}{t} = \frac{\sum_{j=1}^{t} \frac{\sum_{i=1}^{m} \frac{DB_{ij}}{T_{ij}}}{m_{NACE}}}{t} \qquad (5)$$

Where: **Ri** represents the ratio of the accumulated debts (DB)/turnover (T) of the entities analyzed in dynamics in the 2008-2017 period; **m** represents the number of actors in the branch; **t** is the number of years for which the analysis was performed

$$Rs_{NACE} = \frac{\sum_{j=1}^{t} RsNACE_j}{t} = \frac{\sum_{j=1}^{t} \frac{\sum_{i=1}^{m} \frac{T_{ij}}{EQ_{ij}}}{m_{NACE}}}{t} \qquad (6)$$

Where: **Rs** is the ratio of the turnover (T) and the equity (EQ) of the entities analyzed in dynamics in the 2008-2017 period; **m** represents the number of actors in the branch; **t** is the number of years for which the analysis was performed

## Results

From the observational analysis were synthesized the data for the achievement of objective 1 of the research respectively the segregated analysis by domains of activity of sustainable development indicators with highlighting the critical years and the favorable years based on the data taken from the direct observation (Ministry of Finance website, section financial information).

**Table no. 1. Segregated analysis**

| Sustainable development indicators | CAEN CODE | Historical minimum thousand euros | Average in 2008-2017 | Historical maximum thousand euros | Minimum year of development | Maximum year of development | Global Economic Development Index |
|---|---|---|---|---|---|---|---|
| Sectorial development of the main actors in the forestry field in Romania by classes of activity (thousand euros) | 210 | 17 | 2,794 | 33,247 | 2008 | 2014 | 9.95% |
| | 220 | 3.40 | 1,349 | 17,478 | 2008 | 2014 | 30.01% |
| | 230 | 4.50 | 3,233 | 8,211 | 2008 | 2015 | -81.90% |
| | 240 | 1.65 | 203 | 1,956 | 2008 | 2017 | 60.10% |
| Capitalization through fixed assets | 210 | 0.60 | 448 | 4,762 | 2012 | 2017 | -10.28% |
| | 220 | 0.50 | 426 | 7,351 | 2008 | 2017 | 7.33% |
| | 230 | 20 | 230 | 853 | 2009 | 2017 | -11.68% |
| | 240 | 0.75 | 29 | 249 | 2008 | 2017 | -0.04% |

*Source: elaborated by the author*

The assessment of the global index of sustainable economic development by sectors of activity and indicators of sustainable development as a result of the analysis from the direct observation, with the creation of a development scoreboard on activity classes, revealed that at the level of the sustainable development the most favorable activity is the one related to the exploitation forestry (CAEN 220) which has absolute positive scores on most of the indicators of sustainable development, with the exception of the economic performance reflected in profitability rates whose vulnerability score is negative. The average value of the calculated aggregate index is 40.26% and it is based in particular on performance on sustainable growth rates in the branch by field of activity.

At the opposite end, there is the activity related to the collection of plants and fruits from the spontaneous flora (CAEN 230), which records negative sustainable development indicators in most cases except for the systemic risk of the actors (insolvency risk). The negative value of the global index of -125.41% is achieved amid the accumulation of negative sectorial growth and negative sustainable growth rates. The other 2 sectors have global sustainable development indicators of 16.54% for CAEN 240 (forestry related activities) and -1.42% for forestry and other forestry activities (CAEN 210). The segregated analysis (objective 1 of the research) and the assessment of the global index of sustainable economic development by sectors of activity (objective 2 of the research) translates into accounting indicators according to the IAS 41 standard by correlating the quantified sustainable development indicators for each branch of activity with the main provisions of the standard as it follows:

**Table no. 2. Current branch vulnerability table**

| Accounting aspects | CAEN 210 | CAEN 220 | CAEN 230 | CAEN 240 |
|---|---|---|---|---|
| Sustainable policies on transformation of biological assets | 0.02 | 1.17 | -2.38 | 0.05 |
| Assignment of subsidies for the increase in value of biological assets | -0.54 | 0.63 | -0.22 | -0.01 |
| Recognition of the separation of production of biological assets | 0.59 | 1.94 | -1.04 | 2.89 |
| Recognition of the economic result in the overall result | 0.01 | -0.01 | -0.01 | -0.66 |

*Source: elaborated by the author*

It is noted that from the accounting point of view, the best score based on the global indexes of development in branch calculated by the rapid diagnosis model is achieved by the forest exploitation branch (CAEN 220) and the lowest score is achieved by the branch regarding the collection of plants and fruits of the spontaneous flora (CAEN 230). The values in Table 3 reflect vulnerabilities especially on the grant financing segment whose dynamics in Romania has been affected by the frequent macroeconomic monetary and financial policy changes. Vulnerabilities were also identified by the model at the economic outcomes level (negatively quantified for 3 out of 4 branches) and at the level of sustainable policies that according to the chart are influenced by the specificity of the branch in which the economic agent operates (fact that demonstrates hypothesis 1).

We believe that the situation actually affected by the inconsistency of policies and strategies at branch level can be influenced by the voluntary reporting process. In order to implement standardization, it is recommended to identify optimal reporting structures, to adapt specific accounting methods and specific key performance indicators (KPI) to allow for a more effective communication of non-financial aspects. In this context, it has been found that the influence of the volum reporting process can be significant, more precisely by up to 47% through the process of assignment of significance thresholds for the aspects foreseen in IPSAS 27. Therefore, the following scoreboard on the influence of voluntary reporting on aspects derived from IAS 41 is drawn, highlighting the impact of the global sustainable development index.

**Table no. 3. Estimating the impact of voluntary reporting on the results obtained by applying IAS 41**

| Additional aspects introduced in the standards (IPSAS 27) | Impact | Additional aspects introduced in the standards (IPSAS 27) | Impact |
|---|---|---|---|
| Nominal fee for biological assets | 0.50% | Voluntary disclosure of internal consumption of biological assets | 2% |
| The delimitation of biological assets held for the provision of services | 1.20% | Accounting for commitments on biological assets | 8% |
| Limit currency risk in the field of biological asset transactions | 5% | Recognition of future economic benefits | 9% |
| Regulating the exchange of biological assets with recognition of their initial value | 2% | Recognition of service potential | 4% |
| Inventory at the time of reporting the biological assets | 3% | Recognition of the surplus or deficit of biological assets through voluntary disclosure | 8% |

*Source: elaborated by the author*

Impact coefficients have been applied to the results of the vulnerability table resulting in the vulnerability table adjusted with the indicators taken over by voluntary reporting.

**Table no. 4. Adjusted vulnerabilities table**

| Accounting aspects | CAEN 210 | CAEN 220 | CAEN 230 | CAEN 240 |
|---|---|---|---|---|
| Sustainable policies on the transformation of biological assets | 0.00954 | 0.55809 | 1.13526 | 0.02385 |
| Assignments from subsidies for the increase in value of biological assets | 0.25758 | 0.30051 | 0.10494 | 0.00477 |
| Recognition of the separation of production of biological assets | 0.28143 | 0.92538 | 0.49608 | 1.37853 |
| Recognition of the economic result in the global result situation | 0.00477 | 0.00477 | 0.00477 | 0.31482 |

*Source: elaborated by the author*

The values adjusted in absolute amounts were the basis for building the vulnerability model presented in the methodology and calculated as it follows:

$$\^{CAEN220} = +1{,}04*CAEN210 + 0{,}483*CAEN230 + 0{,}270*CAEN240 \tag{7}$$
$$(0{,}353) \qquad (0{,}0818) \qquad (0{,}0968)$$
$$n = 4, \text{R-squared} = 0{,}993, \text{(standard errors in parentheses)}$$

A regression model based on the smallest square method was used, the result of which is statistically high (99.3%) and we obtained confirmation of study hypotheses (hypotheses 1 and 2) by statistical tests of residual normality and heteroskedasticity which confirmed the absence of the phenomenon in the case of the null hypothesis thus demonstrating that the model is significant, well-defined and relevant to the objective under study.

Model 1: OLS, using the observations 1-4
Dependent variable: CAEN220

| | Coefficient | Std. Error | t-ratio | p-value |
|---|---|---|---|---|
| CAEN210 | 1,04319 | 0,353387 | 2,952 | 0,2079 |
| CAEN230 | 0,482955 | 0,0818248 | 5,902 | 0,1068 |
| CAEN240 | 0,269889 | 0,0967560 | 2,789 | 0,2191 |

| Mean dependent var | 0,447188 | S.D. dependent var | 0,390818 |
|---|---|---|---|
| Sum of squares of residues | 0,008508 | Standard error of regression | 0,092241 |

Breusch-Pagan test for heteroskedasticity -
 Null hypothesis: heteroskedasticity is not present
 Statistic test: LM = 4,50746
  with p-value = P(Hi square (3) > 4,50746) = 0,211626  (8)

**Discussions**

By studying the financial and accounting literature and the legislation in the field, it can be noticed that at international level there was a low interest from the world legislature for the financial reporting of agricultural enterprises. There is little intervention at national

economies level, where responsible authorities have shown interest in the financial reporting framework of entities operating in the agricultural sector. In the 1980s, the only statements on the matter were formulated by the American body (AICPA) and by the French government that compiled Comptable Generale Agricole (PCGA) where recommendations were made for the evaluation of agricultural assets using historical cost.

The accounting policies provided in IAS 41 require the recognition in the income and loss statement, among the positive and negative amounts of income, also the profit or loss attributable to the initial recognition of fair value of a biological asset and the variation for each financial exercise over the fair value attributable to the various items recorded in the balance sheet.

At international level, the set of International Public Sector Accounting Standards (IPSAS) has been established and acknowledged, but despite this, no Member State has fully implemented them at present (Socoliuc, 2018). Specific to this research is IPSAS 27 - Agriculture based on IAS 41 - Agriculture. Based on this statement, we will continue to present a comparison between the categories of standards in order to better identify the existing differences, because even if IPSAS is inspired by IAS, it should also contain specific notes that fit it among international standards (Socoliuc, 2018).

**Table no. 5. Comparison between IAS 41 and IPSAS 27**

| IAS 41 | IPSAS 27 |
|---|---|
| Objective: To prescribe accounting treatment and information on agricultural activity | |
| Agricultural activity is the management by an entity of the biological transformation and harvesting of biological assets for sale or for processing into agricultural products or additional biological assets. | Agricultural activity includes operations for the distribution of biological assets free of charge or for a nominal fee. |
| It does not include such a clarification. | The domain section clarifies that the biological assets held for the provision or provision of services are not addressed in this standard. |
| Includes requirements for government grants related to biological assets valued at fair value minus the costs for selling. | Does not include government subsidy requirements and guidelines because IPSAS 23 - *Revenue obtained from non-currency transactions* (taxes and transfers) provides the requirements and guidance on government grants outside currency transactions. |

*Source: elaborated by the author*

In conclusion, even if before the adoption of this order, the record of agricultural activity was impeded in the practice of professional accountants, at present these legislative changes were only partially made visible through the adoption of new accounting accounts. Regarding the recognition and assessment of the forest fund in accounting, practitioners and professionals from the domain have faced difficulties both at the public and private levels. Thus, the forest fund as such and its component elements are not registered in the accounting because there is no synthetic account so called; likewise, it is not recognized or evaluated.

**Conclusions**
The study carries out a clear diagnosis based on the information collected through the observational study of the forestry branch (on the four types of CAEN codes identified in the branch). The proposed model tests the hypotheses of study in the sense of their confirmation demonstrating that there is a relationship of interdependence between the development of the entity, financial reporting, voluntary reporting and economic performance. The study is an original approach to dynamic analysis on four CAEN codes, succeeding in positioning novelties on accounting regulations and identifying the added value of voluntary reporting at the accounting information quality and the materialization of the public authorities' action directions for the implementation of viable forestry fund protection and development policies. The limits of the study consist in particular in the fact

that the sample only included one branch, the authors proposing to expand their research to other branches geared towards biological assets.

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