



## BIOLOGICAL ASSETS IN FINANCIAL STATEMENTS: CHALLENGES AND APPLICATIONS OF IAS 41 IN SERBIA<sup>1</sup>

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### Abstract:

Due to several specific characteristics, agricultural activities are regulated by a separate standard – International Accounting Standard 41 – Agriculture, which clearly distinguishes between biological assets and agricultural products. The purpose of this paper is to examine how biological assets are presented in the financial reporting of public companies in the Republic of Serbia. We also analyzed the audit reports of these companies to determine if their financial reporting of biological assets complied with the regulatory framework. The research was conducted on two samples. The first included 582 public companies listed on the Belgrade Stock Exchange in 2017, and the second involved a content analysis of audit reports of 397 public companies in 2018. The results of the research show that in the sector of agriculture, forestry and fisheries, the most common item is the value of biological assets, where 17 public companies disclosed the value of biological assets according to IAS 41. The analysis of auditor reports revealed that, in general, sampled companies complied with IAS 41 and other regulatory frameworks when reporting on biological assets.

### Keywords:

agricultural sector, fair value, IFRS, IAS, financial reporting.

### JEL Classification:

M41, M42

## INTRODUCTION

This paper is a result of a brief presentation and subsequent discussion of a conference paper related to the financial reporting of biological assets (Kljajic *et al.*, 2024). The paper was presented at the FINIZ International Scientific Conference held in Belgrade towards the end of 2024. Agriculture is one of the oldest human activities and continues to play a crucial role in the global economy (Fischer & Marsh, 2013; Mates, 2008). Unlike other industries that experience market fluctuations, the demand for agricultural products remains consistent.

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In Serbia, agriculture is a key economic sector characterized by unique features arising from the biological transformation of resources. This transformation involves the development of biological assets, ultimately leading to agricultural production (Andrasic *et al.*, 2018). Businesses engaged in agriculture must record and report financial changes related to their operations throughout the year. Consequently, financial reporting practices need to be adapted to accommodate these specific requirements (Kljajic *et al.*, 2021). Given the distinct nature of agricultural activities, a tailored accounting framework is essential to optimize the use of agricultural resources (Vukmirovic *et al.*, 2012). At the international level, the field of agriculture is regulated by the provisions of the International Accounting Standard (hereinafter IAS) 41 – Agriculture (Khushvakhtzoda & Nazarov, 2021). Financial reporting in agriculture is not just a regulatory requirement but a fundamental tool for ensuring business sustainability, securing investments, and enhancing market competitiveness. By adopting standardized accounting practices such as IAS 41, agricultural enterprises can improve financial transparency, facilitate informed decision-making, and strengthen their position in the global market. In accordance with the Law on Accounting in the Republic of Serbia, public companies are required to apply International Financial Reporting Standards (IFRS), including IAS 41. As a result, entities engaged in agricultural activities must familiarize themselves with this standard and integrate it into their financial reporting processes. The primary objective of IAS 41 – Agriculture is to facilitate the global comparability of agricultural operations by establishing guidelines for accounting treatment and disclosure. By adhering to this standard, public companies in Serbia can enhance their competitiveness on the international stage, thereby improving their overall business performance. This paper focuses on addressing the challenges associated with the proper application of financial reporting standards, emphasizing the significance of IAS 41 compliance. Accordingly, the contribution of this study lies in supporting financial reporting professionals and underscoring the importance of accurate implementation. Based on these considerations, the central research question can be formulated as: How effectively do Serbian public companies disclose and value biological assets in accordance with IAS 41, and what challenges arise in ensuring transparency and compliance? The following section of the paper will outline the fundamental legal and professional regulations regarding financial reporting related to biological assets. This will be followed by a review of relevant literature, an overview of the research methodology, and a summary of the study's key findings. After a brief discussion, the paper will conclude with the main takeaways and suggestions for future research directions.

## BASIC PROVISIONS OF IAS 41 – AGRICULTURE

It is important to note that IAS 41 defines agriculture somewhat differently than the official classification of economic activities. Specifically, under this standard, agricultural activity refers to overseeing the biological transformation of resources or gathering biological assets for sale, processing them into agricultural products, or fostering the growth of additional biological assets (Deloitte, 2019). This definition is closely linked to the concept of biological assets, which are considered part of an entity's property and encompass living organisms such as plants and animals. Notably, biological assets are classified as renewable resources (Yahiya Radhi Saleh, 2022). The primary objective of this standard is to define accounting principles for agricultural activities, focusing on the management of biological transformation in biological assets as they are converted into agricultural products. Biological transformation includes processes such as growth, characteristic changes, production, and reproduction, all of which contribute to qualitative and quantitative modifications in biological assets. As previously noted, biological assets consist



of living plants and animals, while agricultural products refer to the harvested or collected outputs of these assets. In this regard, IAS 41 – Agriculture is specifically applicable to agricultural products at the moment of harvest. However, after harvest, IAS 2 – Inventories or other relevant accounting standards govern the treatment of these products (IFRS, 2019; Fischer & Marsh, 2013; Deloitte, 2019). From the perspective of the standard, agricultural activities are strictly those that influence the growth, development, or decline of biological assets. Other activities fall outside this classification. For example, hunting wild animals or fishing in open waters do not qualify as agricultural activities under this standard and are therefore not subject to its provisions. This distinction differs from the classification found in the official register of economic activities in the Republic of Serbia.

A biological asset or agricultural product can be recognized when the reporting entity has control over the asset as a result of past events. Additionally, there must be a reasonable expectation that the entity will derive future economic benefits from it. Another requirement is that the asset's fair value or cost can be measured reliably. The standard assumes that fair value can generally be determined for biological assets, except in cases where market price data is unavailable or alternative valuation methods are considered unreliable. If an active market exists for a biological asset or agricultural product, the prevailing market price serves as the appropriate basis for establishing its fair value. Furthermore, the standard allows biological assets to be valued using historical cost, which represents the original acquisition price or production cost (Savic & Obradovic, 2020). The valuation of a biological asset occurs at three stages: upon initial recognition, at the end of each reporting period, and at fair value less selling costs, unless the fair value cannot be reliably determined. Furthermore, agricultural products are valued at fair value less selling costs, but only when harvested (IFRS, 2019; Deloitte, 2019).

## LITERATURE REVIEW

Although agriculture is a crucial sector in the global economy, it has long been neglected by regulatory bodies (Anevski & Tamelkovksa-Anevskaa, 2017). The standard previously mentioned, dedicated exclusively to the agricultural field, was published relatively recently, in December 2000. Numerous studies have explored the impact of implementing IAS 41 – Agriculture on national economies, as well as the pros and cons of shifting from historical cost to fair value accounting. In the following sections, some of the most notable studies in this area will be discussed. There are studies that have examined the ideological role of IAS 41 – Agriculture in legitimizing social conflict, particularly concerning companies that are required to adopt a fair value measurement model (Elad, 2007), or the increased volatility, manipulation, and subjectivity of reported earnings according to this standard (Herbon and Herbon, 2006; Penttinen *et al.*, 2004; Dowling and Godfrey, 2001). Lotfy, *et al.* (2018) suggest that fair value measurement of biological assets enhances the efficiency and effectiveness of financial statements, as supported by research showing significant statistical relationships. Given the economic importance of biological assets and their sensitivity to natural factors, adopting fair value accounting improves transparency and decision-making in agricultural companies. Goncalves, *et al.* (2017) explore the value relevance of fair value accounting for biological assets in accordance with IAS 41 Agriculture. The findings indicate that biological assets measured at fair value are value relevant, with a stronger impact observed in firms that provide higher levels of disclosure. Similar results were obtained for bearer biological assets. However, in the case of consumable biological assets, the findings suggest that investors do not attribute higher value to recognized biological assets in firms with more extensive disclosures.



The accurate valuation of biological assets is essential for the successful operation of agricultural enterprises in a competitive environment, particularly in providing reliable financial information to potential investors. Dobrunik and Volchek (2024) emphasize that fair value measurement, when precisely determined, offers more relevant insights into the financial position and performance of agribusiness entities compared to other valuation methods. Proper application of fair value in financial reporting ensures transparency and provides a more comprehensive representation of an enterprise's financial performance.

Dowling and Godfrey (2001) and Elad (2004) argue against measuring biological assets at fair value, suggesting instead that historical cost should be used for such assets. Herbohn (2006) criticizes the fair value approach, deeming it inappropriate and overly theoretical. Elad (2004) highlights that the significant shift away from the historical cost method introduces theoretical and practical challenges that could hinder its acceptance, making it difficult to implement in various national regulations. Conversely, Barlev and Haddad (2003) and Athanasios *et al.* (2010) contend that valuing biological assets at fair value ensures full disclosure and supports transparency. These authors also point out that fair value reporting draws attention to the value of shareholders' capital and improves management functions.

One common criticism of IAS 41 – Agriculture is the lack of clear guidelines on when biological assets should be valued during the reporting period. Mates and Grosu (2008) highlighted that IAS 41 does not specify how frequently biological assets should be assessed, concluding that valuations must occur at each reporting date since there are no regulations requiring more frequent assessments. Additionally, Aryanto (2011) points out that IAS 41 provides a general approach to assessing the fair value of all biological assets, regardless of their different purposes, which can lead to inaccurate information and affect the quality of financial reporting. In territorial studies, Argilés and Slof (2001) observe that the historical cost method is the primary method for valuing biological assets in the EU. However, they advocate for the fair value approach. Argilés *et al.* (2009) studied the agricultural sector in Spain and found no significant differences in the revenues of entities using fair value to measure biological assets compared to those using historical cost, nor was there an increase in volatility. This research provides further insight into the incorrect accounting practices associated with the historical cost method in the agricultural sector and concludes that the fair value method could be a more attractive option for small farms within the European Union's agricultural sector. Koiv (2001) investigated the impact of IAS 41 on Estonia's agricultural sector, focusing on the challenges faced in developing financial reporting guidelines for the industry. Sedláček (2010) analyzed the valuation of biological assets and agricultural production for companies in the Czech Republic, comparing two approaches: the Czech approach and the international approach. While international accounting standards favor fair presentation, Czech financial reporting prioritizes the principle of prudence. The study also notes that the historical cost method used in Czech reporting is considered an objective standard for valuing biological assets only at the time of purchase, but it becomes asymmetric in later periods. From an international perspective, IAS 41 – Agriculture supports the fair value model as the correct approach for valuing biological assets and agricultural products. Mates *et al.* (2015) and Feleagă *et al.* (2012) highlight that financial reporting among agricultural companies in Romania follows two different paths: some adopt IAS 41 retroactively, while others adhere to national accounting standards. The authors point out that this flexibility in choosing valuation methods creates challenges in ensuring comparability and objectivity in financial reporting for biological assets. Regarding Serbia, Savić and Obradović (2020) identify significant issues in the recognition and accounting treatment of biological assets, especially in applying the fair value model. The authors also note that the presentation of financial information is neither reliable nor relevant.



On the other hand, Mirovic *et al.* (2020) emphasize that the quality of financial statements, particularly the disclosure of biological assets by agricultural companies, is crucial for enabling international business activities and ensuring transparency in financial reporting. Additionally, the study's results highlight critical deficiencies in meeting international regulatory requirements for biological asset disclosures and identify key determinants of disclosure quality. Also, Savic and Obradovic (2020) discussed the challenges of financial reporting on biological assets in the Republic of Serbia during the period 2015–2017. In the context of entities in the Republic of Serbia, research findings reveal significant deficiencies in the accounting treatment and recognition of biological assets, as well as weaknesses throughout the financial reporting process. These shortcomings highlight the need for considerable efforts to enhance the fundamental qualities of financial information, relevance and reliability. While entities strive to provide relevant disclosures on biological assets by applying the fair value concept as the measurement basis, this approach alone does not guarantee high-quality reporting. The notes to the financial statements often lack essential supporting information that would facilitate a clearer interpretation of the balance sheet figures. Additionally, the reliability of these disclosures is compromised due to incomplete data and material errors in financial statements. To improve the quality and usefulness of financial information, it is crucial to strengthen professional judgment and ethical practices among accountants and auditors, as well as to ensure the proper implementation of IFRS disclosure requirements in the reporting of biological assets.

## RESEARCH METHODOLOGY

Based on the paper's objective, two research samples were established. The first research sample included all public companies listed on the Belgrade Stock Exchange and their 2017 financial statements. This sample was analyzed to assess the representation of biological assets within financial statements. The research sample consisted of 582 public companies for which financial statements were publicly available. The financial statements were obtained from the website of the Business Registers Agency of the Republic of Serbia. The companies were classified into one of 18 sectors according to their registered business activities. Subsequently, the financial statement values were converted to euros, which served as a stable currency for the analysis. This conversion was performed using the average exchange rate provided by the National Bank of Serbia as of December 31, 2017. The second sample included 397 public companies listed on the Belgrade Stock Exchange in 2018. Financial statements and accompanying audit reports for sampled companies were gathered from the website of the Business Registers Agency of the Republic of Serbia. A content analysis of audit reports was conducted to identify misstatements concerning biological assets that were identified by the auditor. The main purpose of this research was to determine whether the analyzed companies followed IAS 41 in their financial reporting of biological assets.

## RESEARCH RESULTS AND DISCUSSIONS

The biological assets discussed earlier are reported in the financial statements under various balance sheet categories, such as Biological assets, Biological assets in preparation, Advances for biological assets, Forests and perennial plantations, and Breeding stock. These balance sheet categories were analyzed to evaluate how well biological assets are represented in the financial statements. The following table presents the total disclosed values of the aforementioned categories categorized by sectors for public companies in 2017.



**Table 1.** Share of Biological Assets (in euros) in Financial Reports of Public Companies (2017)

| Sector   | Biological assets | Biological assets in preparation | Forests and perennial plantations | Breeding stock | Total biological assets | Percentage share |
|--|-------------------|----------------------------------|-----------------------------------|----------------|-------------------------|------------------|
| Agriculture, forestry, and fishing                             | 481,054           | 78,270                           | 82,519                            | 320,265        | 962,107                 | 87.42%           |
| Mining   | 8                 | 0                                | 8                                 | 0              | 17                      | 0.00%            |
| Manufacturing Industry   | 64,024            | 5,330                            | 57,542                            | 1,152          | 128,048                 | 11.64%           |
| Construction   | 2,852             | 0                                | 2,836                             | 16             | 5,704                   | 0.52%            |
| Wholesale and retail trade and repair of motor vehicles        | 319               | 11                               | 308                               | 0              | 638                     | 0.06%            |
| Real estate  | 87                | 0                                | 0                                 | 87             | 173                     | 0.02%            |
| Professional, scientific, innovative, and technical activities | 1,913             | 0                                | 1,913                             | 0              | 3,827                   | 0.35%            |
| Total  | 550,257           | 83,611                           | 145,126                           | 321,520        | 1,100,514               | 100.00%          |

Source: Authors' data

As observed, the agriculture, forestry, and fishing sectors represent the largest portion of the value of biological assets, followed by the manufacturing sector. Other sectors either did not disclose the value of biological assets, resulting in their exclusion from the table, or reported minimal amounts. Among individual companies, 35 disclosed the value of biological assets, while 10 reported biological assets under preparation. Additionally, 21 companies disclosed the value of forests and perennial plantations, and 13 reported the value of breeding stock. Of the companies that reported biological assets, 17 were from the agriculture, forestry, and fishing sector, accounting for half of the companies that disclosed biological asset values. The category of Advances for biological assets was not represented among the sampled companies in 2017. Upon reviewing the Notes to the financial statements of the sampled public companies, the research found that all entities that disclosed biological asset values used fair value for their valuation, providing additional explanations about the fair value and the methods used for measurement. Furthermore, all companies complied with the disclosure requirements of IAS 41 – Agriculture.

Based on the research conducted using data from 2017, it can be inferred that public companies in the Republic of Serbia employ fair value for the valuation and disclosure of biological assets, in line with IAS 41 and other relevant regulations. These findings contrast with the study conducted in the EU, where different approaches to biological asset valuation may have been observed (Koiv *et al.*, 2001). Certainly, the significance of accounting regulations in the valuation and disclosure of this particular accounting group cannot be overstated. These regulations ensure consistency, transparency, and comparability in financial reporting, which is crucial for stakeholders to make informed decisions about the value and performance of biological assets (Beke-Trivunac, 2019). Reporting transparency in agricultural activities increases investor trust, leading to improved conditions for financing agricultural activities from both private and public funding sources (Cvetković & Marić, 2019).

Regarding the results of the second research sample, in-depth analysis of auditors' opinions on the valuation of biological assets across various sectors of public companies is shown in Table 2.



Table 2. Auditors' Opinions on the Valuation of Biological Assets

| Industry   | Number of entities |         | Auditors' opinions on valuation of property, plant and equipment |         | Auditors' opinions on the valuation of biological assets |         | Biological assets | Total fixed assets | Biological assets to fixed assets |
|--|--------------------|---------|--|---------|--|---------|-------------------|--------------------|-----------------------------------|
|  | No                 | %       | No   | %       | No   | %       |                   |                    |                                   |
| Manufacturing industry   | 128                | 32.24%  | 50   | 30,30%  | 1  | 25,00%  | 64023,91          | 8046019,984        | 0,80%                             |
| Mining   | 7                  | 1.76%   | 3  | 1,82%   | 0  | 0,00%   | 8,428571          | 356150059,4        | 0,00%                             |
| Financial activities and insurance                             | 11                 | 2.77%   | 1  | 0,61%   | 0  | 0,00%   | 0                 | 0                  | 0,00%                             |
| Wholesale and retail trade and repair of motor vehicles        | 61                 | 15.37%  | 34   | 20,61%  | 0  | 0,00%   | 319,2295          | 3167057,918        | 0,00%                             |
| Real estate business   | 12                 | 3.02%   | 5  | 3,03%   | 0  | 0,00%   | 86,5              | 19921624           | 0,00%                             |
| Construction   | 49                 | 12.34%  | 25   | 15,15%  | 1  | 25,00%  | 2851,939          | 3435724,469        | 0,04%                             |
| Agriculture, forestry, and fisheries                           | 29                 | 7.30%   | 8  | 4,85%   | 2  | 50,00%  | 455065,3          | 8142101,679        | 5,66%                             |
| Transport and storage  | 20                 | 5.04%   | 8  | 4,85%   | 0  | 0,00%   | 0                 | 9155291            | 0,00%                             |
| Professional, scientific, innovative, and technical activities | 22                 | 5.54%   | 9  | 5,45%   | 0  | 0,00%   | 1913,364          | 1970968,136        | 0,02%                             |
| Accommodation and food services                                | 23                 | 5.79%   | 11   | 6,67%   | 0  | 0,00%   | 0                 | 3859596,609        | 0,00%                             |
| Information and communications                                 | 14                 | 3.53%   | 3  | 1,82%   | 0  | 0,00%   | 0                 | 3172298,714        | 0,00%                             |
| Administrative and support service activities                  | 9                  | 2.27%   | 0  | 0,00%   | 0  | 0,00%   | 0                 | 194874,7778        | 0,00%                             |
| Education  | 3                  | 0.76%   | 2  | 1,21%   | 0  | 0,00%   | 0                 | 899008,25          | 0,00%                             |
| Other service activities                                       | 4                  | 1.01%   | 2  | 1,21%   | 0  | 0,00%   | 0                 | 296367,5           | 0,00%                             |
| Arts, entertainment, and recreation                            | 1                  | 0.25%   | 1  | 0,61%   | 0  | 0,00%   | 0                 | 1855060            | 0,00%                             |
| Water supply and waste management                              | 3                  | 0.76%   | 3  | 1,82%   | 0  | 0,00%   | 0                 | 231122,3333        | 0,00%                             |
| Healthcare and social protection                               | 1                  | 0.25%   | 0  | 0,00%   | 0  | 0,00%   | 0                 | 55017              | 0,00%                             |
| Total  | 397                | 100.00% | 165  | 100,00% | 4  | 100,00% | 524268,7          | 420552191,8        | 6,52%                             |

Source: Authors' data



A content analysis was performed on the audit reports of the sampled companies, with all reports containing a comment on the valuation or presentation of biological assets being marked. The previous table shows proportion of companies that report biological assets and the share of biological assets in total fixed assets. Consistent with the findings presented in Table 1, the agriculture, forestry, and fishing sector shows the highest involvement of biological assets in financial reporting. In addition, this sector holds the highest percentage of biological assets relative to total fixed assets, at 5.66%. This finding aligns with the nature of agricultural activities, where biological assets form a crucial part of operational resources and production. In contrast, other sectors show a strikingly low level of disclosure and the valuation of biological assets. The table also sheds light on the auditors' opinions regarding the valuation of biological assets. It indicates that four companies across all sectors received specific auditor comments on this matter. Two of those come from agriculture, forestry, and fisheries sector, and the remaining two come from manufacturing industry and construction sectors. Considering that 206 audit reports were analyzed within these three sectors, it can be concluded that, in general, the observed companies complied with regulatory requirements for the valuation and presentation of biological assets. On the other hand, out of 397 reports analyzed, almost half of them contained remarks related to the valuation of fixed assets (165 reports).

## CONCLUSIONS

This paper examined biological assets as an essential accounting group for which financial reporting is required. It provided an overview of the key provisions of IAS 41 – Agriculture, focusing on the recognition, valuation, and disclosure of biological assets. The findings indicate that public companies within the Agriculture, Forestry, and Fishing sectors, along with a small number from the Manufacturing sector, are primarily responsible for disclosing information related to biological assets. In terms of valuation, the sampled companies generally use fair value less estimated selling costs, which is consistent with professional and legal regulations. However, this valuation method is not the most prevalent in the region or across Europe. Future studies could investigate how the shift from historical cost to fair value influences small and medium-sized agricultural enterprises, and explore whether alternative valuation approaches might offer solutions to some of the challenges highlighted in this research.

Additionally, the content analysis of audit reports further indicated that the companies generally complied with the requirements of IAS 41 and the relevant regulatory framework for the reporting of biological assets. In conclusion, while considerable progress was made in the valuation and disclosure of biological assets in Serbia, ongoing efforts to improve regulatory guidance and company practices remain essential for enhancing the quality and reliability of financial reporting within the agricultural sector. This will ensure better alignment with international standards and foster greater investor confidence. Ultimately, further refinements in reporting practices, supported by robust regulatory frameworks, will contribute to a more transparent and efficient agricultural market, facilitating improved access to financing and supporting the sector's growth. Continuous adaptation and updates to accounting regulations, along with education and awareness campaigns, will be crucial for addressing emerging challenges in the evolving agricultural landscape.





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## BIOLOŠKA IMOVINA U FINANSIJSKOM IZVEŠTAVANJU: IZAZOVI I PRIMENA MRS 41 U SRBIJI

### Rezime:

Zbog svojih specifičnih karakteristika, poljoprivredne aktivnosti se regulišu posebnim standardom – Međunarodnim računovodstvenim standardom 41 – Poljoprivredne aktivnosti, koji pravi jasnu razliku između biološke imovine i poljoprivrednih proizvoda. Ovaj rad za cilj ima da prikaže i vrednuje biološku imovinu u finansijskom izveštavanju javnih preduzeća u Republici Srbiji. Izvršena je analiza sadržaja revizorskih izveštaja uzorkovanih društava kako bi se utvrdila usklađenost finansijskog izveštavanja o biološkoj imovini sa regulatornim okvirom. Istraživanje je sprovedeno na dva uzorka, pri čemu je prvi obuhvatio 582 javnih preduzeća sa Beogradske berze tokom 2017. godine, dok je drugi uključio analizu sadržaja revizorskih izveštaja 397 javnih preduzeća iz 2018. godine. Rezultati istraživanja pokazuju da je u sektoru poljoprivrede, šumarstva i ribarstva najčešća stavka vrednost biološke imovine, pri čemu je 17 javnih preduzeća iskazalo vrednost biološke imovine u skladu sa MRS 41. Analiza revizorskih izveštaja otkrila je da su uzorkovana preduzeća generalno bila usklađena sa MRS 41 i drugim regulatornim okvirom prilikom izveštavanja o biološkoj imovini.

### Ključne reči:

poljoprivredni sektor,  
fer vrednost,  
MSFI,  
MRS,  
finansijsko izveštavanje.

### JEL klasifikacija:

M41, M42