

## BIOLOGICAL ASSET DISCLOSURE UNDER MFRS 141: LONGITUDINAL EVIDENCE FROM MALAYSIAN PUBLICLY LISTED PLANTATION COMPANIES

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### ABSTRACT

**Background and Purpose:** Biological asset disclosure remains a significant reporting issue due to challenges in measurement, judgment, and financial reporting comparability. This study provides longitudinal evidence on the disclosure of biological assets among 41 Malaysian listed plantation companies, comprising over a 13-year period from 2010 to 2022. It investigates whether the adoption and subsequent amendments of IAS 41 have led to improvements in corporate disclosure.

**Methodology:** Data were manually collected using a disclosure index developed from the IAS 41 and Malaysia Financial Reporting Standards (MFRS) 141 requirements. The disclosure items include asset types, nature of business activities, measurement and evaluation methods, production cycles and risk-related information associated with biological assets. Each disclosure item was assessed using a binary scoring approach (1 = disclosed; 0 = not disclosed). The study comprised 533 firm-year observations from 41 Malaysian publicly listed plantation companies. Descriptive statistics and One-Way ANOVA were employed to analyse the disclosure level across four regulatory stages: pre-convergence, introduction, amendment, and post-implementation.

**Findings:** The findings indicate a progressive and statistically significant increase in biological asset disclosures over time, although full compliance remains limited due to measurement complexity, cost considerations and valuation challenges. One-way ANOVA results confirmed significant differences in disclosure levels across the four regulatory stages, with the post-implementation period exhibiting the highest level of disclosure. The results highlight persistent gaps in disclosure practices and suggest that regulatory enforcement plays a critical role in enhancing reporting transparency and comparability in emerging market contexts.

**Contributions:** This study provides important implications for regulators, standard setters and practitioners in improving the quality and consistency of biological asset reporting.

**Keywords:** IAS 41, MFRS 141, disclosure, biological asset, fair value measurement, plantation company.

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## 1.0 INTRODUCTION

Agricultural activities were historically dominated by small family-owned farms, and formal financial reporting practices within the sector were relatively underdeveloped. In earlier periods, regulatory bodies devoted limited attention to agricultural accounting because the sector contributed only marginally to national income (Marsh & Fischer, 2013). This limited focus was also influenced by the absence of specialised accounting framework, limited expertise in agricultural accounting, and the predominance of small-scale farming enterprises lacking formal reporting capacity (Argilés & Slof, 2001). However, the economic importance of the agricultural sector has increased significantly, particularly in economies where plantation activities contribute substantially to national growth and export earnings. As agricultural operations become more commercialised and complex, the need for transparent, consistent and comparable financial reporting has intensified. In response, the International Accounting Standards Board (IASB) introduced International Accounting Standard (IAS) 41 – Agriculture.

The objective of IAS 41 is to standardise accounting for agricultural activities by guiding the recognition, measurement, and disclosure of biological assets (i.e living plants and animals) including palm oil, forestry, livestock, orchards, aquaculture, and bearer or consumable assets (Lazar & Huang, 2012). IAS 41 introduces fair value measurement as an alternative to the historical cost model, providing more relevant and timely information on performance by capturing value changes throughout biological transformation (Tan, 2010). Unlike historical cost, which recognises profit only on sales, fair value accounts for growth, procreation, degeneration, and harvesting, reflecting the asset's stage-specific economic value. While fair value enhances relevance, empirical evidence highlights significant practical challenges in its implementation. These issues are rooted in the ongoing debate regarding the appropriateness of fair value relative to historical cost.

Bohušová et al. (2012) argue that IAS 41 provides only general principles and limited guidance for measuring biological assets at different stages of biological transformation, making asset valuation and comparability across firms challenging. Similarly, Feleagă et al. (2012) note that agricultural accounting guidance remains underdeveloped, particularly for forestry and livestock production, resulting in variations in measurement and reporting practices. Thurrun Bhakir (2010) reported that only a few Malaysian listed plantation companies adopted fair value measurement due to valuation difficulties. The lack of active markets for many biological assets further increases measurement uncertainty and subjectivity in fair value estimation (Elad, 2004; Aryanto, 2011). Masuku and Abeysekera (2013) further argue that assumptions regarding future cash flows and market conditions can introduce variability and bias across firms. These challenges have significant implications for the disclosure of biological assets. IAS 41/MFRS 141 requires fair value reporting, yet in practice, disclosures are often inconsistent or vague, reducing comparability and limiting investors' ability to assess reliability (Elad, 2004; Masuku & Abeysekera, 2013; Bozollon et al., 2015; Mohamed et al., 2026).

Although global research has examined IAS 41 adoption and disclosure, limited studies provide longitudinal evidence in the Malaysian context, particularly regarding balance sheet presentation and disclosure (see Herbohn & Herbohn, 2006; Theiss et al., 2014; Miranda et al., 2017; Bohušová et al., 2012; Lopes & Gonçalves, 2018; Ika et al., 2022; Ulfa et al., 2022). Previous studies have mainly focused on cross-sectional disclosure practices and their determinants, with limited attention to disclosure evolution across regulatory periods (Herbohn & Herbohn, 2006; Theiss et al., 2014; Bohušová et al., 2012; Lopes & Gonçalves, 2018; Phang & Mahzan, 2017). Consequently, changes in biological asset disclosure quality following regulatory transitions remain underexplored. To address this research gap, this study aims to examine biological asset disclosure practices among Malaysian publicly listed plantation companies during the early adoption and post-adoption stages of MFRS 141. Accordingly, this

study also seeks to determine whether there are significant differences in biological asset disclosure across regulatory stages of MFRS 141. It analyses financial statements across four chronological stages: pre-adoption (2010–2011), IAS 41 introduced (2012–2015), IAS 41 amendment (2016–2017) and post-implementation (2018–2022).

The study is significant for several reasons. First, from a theoretical perspective, agency theory suggests that managers may have incentives to manipulate or selectively report asset values, especially when fair value measurements involve significant judgement and estimation (see Ulfa et al., 2022). Therefore, understanding the disclosure of biological assets is particularly important in the context of corporate governance, transparency and financial performance. Second, in the agricultural sector, inconsistent disclosure of biological assets can increase information asymmetry between managers and investors, potentially affecting investment decisions, firm valuation, and overall market confidence. Empirical research is needed to demonstrate the level of compliance towards the accounting standards. Third, this study provides empirical evidence on compliance patterns and challenges faced by Malaysian plantation companies by systematically analysing the extent and quality of biological asset disclosure under MFRS 141. The study is significant because it demonstrates how fair value measurement affects transparency, comparability, and financial reporting quality in a plantation sector of an emerging economy. Finally, the study provides practical insights for standard setters and investors to enhance transparency and comparability in financial reporting. The remainder of this paper is structured as follows: Section 2 reviews the literature, Section 3 presents the methodology, Section 4 discusses the finding and section 5 concludes.

## **2.0 LITERATURE REVIEW**

### **2.1 Agency Theory and Biological Asset Disclosure**

Agency theory provides a useful theoretical foundation for understanding biological asset disclosure practices. Agency concerns become particularly important because the valuation of biological assets under IAS 41/MFRS 141 involves substantial managerial judgement and estimation. This study expects disclosure levels to vary across the IAS 41 disclosure items. Items requiring greater managerial judgement and measurement uncertainty are expected to exhibit lower disclosure levels than more straightforward mandatory disclosure items, providing a theoretical basis for interpreting the empirical findings. Agency theory also provides a basis for explaining variations in biological asset disclosure across different regulatory phases. Changes in IAS 41/MFRS 141 requirements influence managerial discretion, information asymmetry, and the monitoring role of financial reporting (Jensen & Meckling, 1976; Healy & Palepu, 2001). During the transition and adoption phases, uncertainty in fair value measurement, limited technical expertise, and implementation challenges may affect firms' ability and willingness to provide comprehensive disclosures (Abdullah & Minhat, 2019). As firms become more familiar with accounting requirements and regulatory enforcement strengthens, information asymmetry may decrease, leading to improved disclosure compliance (Barth & Israeli, 2013). Therefore, agency theory supports the expectation that biological asset disclosure levels may differ across regulatory phases.

### **2.2 Challenges in Implementing IAS 41**

The implementation of IAS 41 has been widely debated due to the unique characteristics of biological assets and the complexity of fair value measurement. Bohušová et al. (2012) argue that IAS 41 provides only limited guidance regarding the measurement of biological assets across different stages of biological transformation. Similarly, Feleagă et al. (2012) contend that agricultural accounting standards remain underdeveloped in addressing the specific characteristics of agricultural activities such as forestry and livestock production. A major

challenge arises from the requirement to measure biological assets at fair value less costs to sell. In many cases, active markets for biological assets do not exist, making valuation highly dependent on management estimates and assumptions (Elad, 2004; Aryanto, 2011). Furthermore, assumptions concerning future biological growth, market conditions, and expected cash flows may introduce subjectivity and reduce comparability between firms (Masuku & Abeysekera, 2013). As a result, companies may face difficulties in determining reliable asset values and providing consistent disclosures to stakeholders.

### **2.3 Biological Asset Disclosure Practices**

Numerous studies have examined biological asset disclosure practices under IAS 41 across different jurisdictions, highlighting persistent concerns regarding valuation uncertainty, disclosure complexity, and variations in compliance. Herbohn and Herbohn (2006) and Elad and Herbohn (2011) reported challenges in fair value measurement and differences in disclosure practices across countries, while PricewaterhouseCoopers (2009, 2011) identified variations in transparency and frequent omission of key disclosure requirements. Miranda et al. (2017) further demonstrated diversity in biological asset accounting practices among agricultural entities, whereas Lopes and Gonçalves (2018) found that confidentiality concerns and managerial reluctance contributed to incomplete disclosures. In Malaysia, Aliana (2014) and Jamil et al. (2019) reported gradual improvements in MFRS 141 compliance; however, several disclosure requirements, particularly those related to fair value measurement and detailed biological asset information, remained challenging. More recent studies continue to confirm that these issues remain relevant. Nikmah et al. (2022) and Yusuf et al. (2024) found that biological asset intensity influences disclosure practices among agricultural companies, while Abdullah and Minhat (2019) highlighted the role of CEO, CFO, and board characteristics in influencing fair value agricultural disclosure among Malaysian agricultural firms. Overall, prior studies indicate that biological asset disclosure remains uneven due to differences in firm characteristics, governance factors, regulatory environments, and enforcement mechanisms. Despite the increasing attention given to IAS 41 disclosure, challenges related to incomplete disclosure, inconsistent compliance, management judgement in fair value measurement, and disclosure quality continue to persist across jurisdictions.

### **2.4 Determinants of Biological Asset Disclosure and Research Gap**

Recent studies have shifted their attention towards identifying factors that influence biological asset disclosure. Duwu et al. (2018) found that biological asset intensity, firm size, ownership concentration, audit quality, and profitability significantly influence disclosure practices. Similarly, Ika et al. (2022) reported that biological asset intensity and public ownership positively affect the extent of biological asset disclosure among Indonesian agricultural firms. Nikmah et al. (2022) further found that firms with higher biological asset intensity tend to provide more comprehensive disclosures because biological assets constitute a substantial proportion of total assets. More recently, Campos-Llerena et al. (2025) conducted a systematic review of IAS 41 studies and concluded that existing research consistently highlights challenges relating to valuation subjectivity, limited market data, and disclosure quality. However, the review also noted a lack of longitudinal evidence examining how disclosure practices evolve over time, particularly for long-lived biological assets. Furthermore, evidence from emerging economies remains limited. Despite these findings, previous studies have provided limited insight into whether regulatory changes influence the evolution of biological asset disclosure practices over time. Most existing research has focused on disclosure determinants using cross-sectional approaches, leaving the impact of different regulatory stages on disclosure development insufficiently explored. Therefore, a significant gap exists in

understanding how companies respond to regulatory changes in biological asset reporting over extended periods. This study addresses this gap by examining biological asset disclosure practices among Malaysian plantation companies across different regulatory stages of MFRS 141 implementation, thereby providing longitudinal evidence on disclosure developments in an emerging economy.

### **3.0 METHODOLOGY**

#### **3.1 Research Population and Sampling Design**

The study population comprised all firms listed on the Main Market of Bursa Malaysia (formerly the Kuala Lumpur Stock Exchange [KLSE]), with a focus on publicly listed plantation companies. The Main Market was selected because it strictly regulates the reporting and disclosure practices of these companies, particularly in the agricultural sector. A purposive non-probability sampling approach was employed, selecting firms most suitable for addressing the research objectives (Saunders et al., 2009). Only publicly listed agricultural companies were considered, as IAS 41 (and its Malaysian equivalent, MFRS 141) applies specifically to such entities. Firms were further limited to those operating in Malaysia, given the country's alignment with IFRS and its significant agricultural contribution to GDP and export activities. From the initial population, 43 plantation companies were identified. Two firms listed after 2016 were excluded to maintain a consistent 13-year dataset (2010–2022), resulting in a final sample of 41 plantation companies. Lastly, the study focuses on Malaysian publicly listed plantation companies because IAS 41/MFRS 141 specifically applies to biological assets in the agricultural sector. The plantation industry was selected as it is the primary listed agricultural sector and a key contributor to the Malaysian economy (Malaysian Palm Oil Council [MPOC], 2024)

#### **3.2 Data Collection and Content Analysis**

This study employed content analysis to assess the disclosure of biological asset items under IAS 41/MFRS 141. Content analysis provides a systematic method to convert textual information from annual reports into quantitative data, bridging theoretical and empirical gaps (Drisko & Maschi, 2016; White & Marsh, 2006). Annual reports from the selected companies were collected and analysed to evaluate compliance with disclosure requirements. A descriptive analytical approach was applied, where each disclosure item was coded numerically using a binary scoring system:

1 = disclosed (YES)

0 = not disclosed (NO)

This method has been widely applied in prior studies on corporate transparency and IAS 41 disclosure (Sharif & Lai, 2015; Abidin et al., 2017; Shi et al., 2017; Bezares et al., 2017).

#### **3.3 Disclosure Items and Measurement**

The analysis focused on 12 mandatory disclosure items from the “Presentation and disclosure Requirement” of IAS 41/MFRS 141 (Mohamed et al., 2026; Jamil et al., 2019; MFRS 141, 2018; Miranda et al., 2017). These 12 disclosure items demonstrate content validity as they were directly derived from the mandatory disclosure requirements of IAS 41/MFRS 141 and have been adopted in prior biological asset disclosure studies (Miranda et al., 2017; Jamil et al., 2019; Mohamed et al., 2026). These items served as benchmarks for evaluating whether

companies disclosed information about biological assets in their financial statements. An equal weighting approach was adopted because all disclosure items represent mandatory requirements under IAS 41/MFRS 141, avoiding subjective judgement in assigning weights. Although binary scoring provides an objective measure of disclosure compliance, it does not capture disclosure quality or depth. A weighted index was not applied as assigning different weights may reduce comparability across firms. According to Mohamed et al. (2026) examine the total disclosure Index (DI) was calculated as:

$$DI = \frac{\sum cji}{Di}$$

Where,

Cji = “1” when the item is disclosed, or “0” if it is not disclosed.

Di = maximum number of items disclosed

### 3.4 Timeframe and Phases of Analysis

The study period (2010–2022) was divided into four key phases to capture the evolution of IAS 41/MFRS 141 adoptions:

The disclosure item was separated into four events:

- Pre-convergence of IAS 41 (2010–2011) –Malaysia had not yet aligned with IFRS; domestic standards were applied
- IAS 41 introduced (2012–2015) – Initial adoption period of MFRS 141.
- IAS 41 amendment (2016–2017) – IASB revised IAS 41, particularly regarding fair value measurement for long-lived biological assets (e.g., bearer plants)
- Post-implementation (2018–2022) – Mandatory compliance with the amended standard in Malaysia.

This phased approach allowed assessment of changes in disclosure practices over time, highlighting the impact of adoption and standard amendments on reporting quality.

### 3.5 Reliability of the disclosure Instrument

To ensure the reliability of the disclosure measurement, this study employed an inter-coder reproducibility approach. The biological asset disclosure items were independently coded by four coders (one researcher and three independent parties) using a binary scoring approach (1 = disclosed; 0 = not disclosed). The coding results were compared, and no discrepancies were identified among the coders, confirming the consistency and reliability of the coding process. This approach is consistent with prior content analysis studies (Sharif & Lai, 2015; Jamil et al., 2019), ensuring that the findings of this study are robust and replicable.

### 3.6 Rationale for Methodology

Content analysis was employed to systematically assess financial statements for disclosure quality and compliance with IAS 41/MFRS 141. Annual reports served as archival data, while a binary scoring system captured the presence or absence of required disclosure items, enabling comparison across companies and time periods. This approach provides a comprehensive evaluation of disclosure practices and their implications for transparency, comparability, and financial reporting quality.

### **3.7 ANOVA Procedure**

In addition to the primary analysis, a one-way ANOVA was performed to assess whether the degree of biological asset disclosure varied among regulatory phases related to adoption and development of MFRS 141. This analysis adopts a descriptive-comparative approach to examine differences in biological asset disclosure across MFRS 141 regulatory stages rather than to test causal relationships or theoretically predicted effects. Previous methodological studies suggest that descriptive and exploratory analyses may identify patterns and group differences without necessarily requiring formal hypotheses (Saunders et al., 2019). Since ANOVA is used to compare mean differences among independent groups (Hair et al., 2019), formal hypotheses were not developed for this analysis. Instead, ANOVA provides empirical evidence on whether disclosure levels differ across regulatory periods. After performing content analysis of annual reports according to the disclosure requirements of International Accounting Standard 41 (IAS 41) and dividing various information into four regulatory periods namely; pre-adoption period (PRE), introduction stage (INTRO), amendment phase (AMEND), post-adoption stage (POST), this study obtained the disclosure scores. Although longitudinal methods may provide further insights, this study focuses on comparing disclosure differences across regulatory stages rather than estimating causal effects over time. Therefore, One-Way ANOVA is appropriate for comparing mean disclosure scores across periods. The assumptions of ANOVA, including normality and independence of observations, were considered, while the limitations of disclosure scores were acknowledged.

### **4.0 RESULTS**

The objective of this study is to assess the accounting practices of 41 publicly listed plantation companies based on the provisions of the IAS/MFRS 141 in terms of the measurement of biological assets, financial statement presentations, and disclosure of biological transformation. Specifically, the result presents the profile of 41 publicly listed plantation companies in Malaysia and assesses their accounting practices by evaluating their level of compliance based on the provision of IAS/MFRS 141. The objective was to identify whether companies disclosed their financial reports. The disclosure index and items were obtained from the MFRS 141. The disclosure items refer to the disclosure index, as listed in Table 1.

Table 1: Provisions – Presentation and mandatory disclosure requirement (Mohamed et al., 2026; Jamil et al., 2019; MFRS 141, 2018; Miranda et al., 2017)

| Disclosure Items No. | Requirement                                                                                                                                                                                           |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.                   | The nature of activities involving each group of a biological asset                                                                                                                                   |
| 2.                   | Provide a quantitative description of each group of biological assets, distinguishing between consumable and bearer biological assets or between mature and immature biological assets as appropriate |
| 3.                   | The methods and significant assumptions used in determining the fair value of each group of biological assets and agricultural produce at the point of harvest.                                       |
| 4.                   | The fair value less the cost to sell agricultural produce at the point of harvest.                                                                                                                    |
| 5.                   | The present reconciliation of changes in the carrying amount of biological assets between the beginning and end of the current period.                                                                |
| 6.                   | The production cycle lasted for more than one year.                                                                                                                                                   |
| 7.                   | Disclosure of financial risk-management strategies related to agricultural activity                                                                                                                   |
| 8.                   | Disclosure of nature and number of events that give rise to a material item of income or expenses                                                                                                     |
| 9.                   | Additional disclosure where the fair value of a biological asset cannot be measured reliably                                                                                                          |
| 10.                  | Reconciliation of changes in the carrying amount of biological assets, showing separate increases due to purchase                                                                                     |
| 11.                  | Reconciliation of changes in the carrying amount of biological assets, showing separate decreases due to sales                                                                                        |
| 12.                  | Reconciliation of changes in the carrying amount of biological assets, showing separate decreases due to harvest                                                                                      |

The twelve disclosure items were assessed for 41 plantation companies over a 13-year period (2010–2022). The disclosure index measures compliance with IFRS requirements, particularly MFRS 141 and IAS 41, which remain contentious in the plantation sector. The results indicate varying levels of readiness among companies to fully adopt IAS 41, with observable changes in disclosure practices following its implementation. The “Presentation and Disclosure” requirements under the agricultural standard were incorporated, and the biological asset disclosure index was used to assess compliance with these standards.

#### 4.1 Summary Statistics and Descriptive Statistics

Forty-one companies were examined in the twelve disclosure items. The disclosure items were to be answered utilising a scale ranging from 1 (*yes, indicating disclosure*) to 0 (*no, indicating non-disclosure*). For this disclosure analysis, 41 companies were assessed across 12 disclosure items over a 13-year period, and the results are categorised into four events as follows:

- Pre-convergence of IAS 41 (2010–2011 )
- IAS 41 introduced (2012–2015 )
- IAS 41 amendment (2016–2017 )
- Post-implementation (2018–2022 )

The analysis of all 12 variables or themes yields diverse results based on company disclosures. Table 2 below presents the acronyms for each variable and name of the variable used in this study.

Table 2: Name of variables and acronym for variables

| Acronym Variables | Name of Variables               |
|-------------------|---------------------------------|
| ACTVT             | Principal activity of company   |
| DESBA             | Description of biological asset |
| METHBA            | Method of biological asset      |
| FVLESSCOST        | FV less cost to sales           |
| BA                | Biological asset                |
| PROD              | Production cycle                |
| MANSTRG           | Management Strategies           |
| DISEVENT          | Disclosure event of company     |
| DISFV             | Disclosure Fair Value           |
| DECSALES          | Disclosure on sales             |
| DISPURCHASE       | Disclosure on purchase          |
| DISHAVEST         | Disclosure on harvest           |

Table 3: Descriptive statistics (all years)

| Variable         | Obs | Mean  | Std. Dev. | Min | Max |
|------------------|-----|-------|-----------|-----|-----|
| ACTVT            | 533 | 1     | 0         | 1   | 1   |
| DESBA            | 533 | .987  | .114      | 0   | 1   |
| METHBA           | 533 | .421  | .494      | 0   | 1   |
| FVLESSCOST       | 533 | .391  | .489      | 0   | 1   |
| BA               | 533 | .998  | .043      | 0   | 1   |
| PROD             | 533 | .955  | .208      | 0   | 1   |
| MANSTRG          | 533 | .977  | .149      | 0   | 1   |
| DISEVENT         | 533 | 1     | 0         | 1   | 1   |
| DISFV            | 533 | .421  | .494      | 0   | 1   |
| DECSALES         | 533 | .204  | .403      | 0   | 1   |
| DISPURCHASE      | 533 | .198  | .399      | 0   | 1   |
| DISHAVEST        | 533 | .252  | .435      | 0   | 1   |
| TOTAL DISCLOSURE | 533 | 7.802 | 2.476     | 2   | 12  |

Table 3 provides a statistical summary and descriptive statistics that have 12 variables with 533 observation years for the 41 companies with 13 years (2010–2022). The summary shows that for disclosure items 1 (ACTVT) and 8 (DISEVENT), all the companies disclosed information regarding the principal or business activity that they do or have, and disclosure of nature and number of events that give rise to a material item of income or expenses with 100% disclosed. Regarding the disclosure items, 42.1% of the companies disclosed information on METHBA, while 39.1% disclosed information on the FVLESSCOST item in their financial reports. For disclosure items 2 (DESBA), 5 (BA), 6 (PROD), and 7 (MANSTRG), more than 95 to 99 percent disclosed the information in the annual report. The least percentage of disclosure presented by the companies were for disclosure items 10 (DECSALES), 11 (DISPURCHASE), and 12 (DISHAVEST) with a range from 18% to 25 %. The subsequent discussion focused on the four events in order to explore the number of companies that have made the disclosure within the 13 years (from 2010 to 2022).

#### 4.2 Pre-convergence of IAS 41 (2010–2011)

The period from 2010 to 2011 is referred to as pre-convergence. These two years precede Malaysia's alignment with the International Financial Reporting Standards (IFRS). As Malaysia declared its intention to converge with IFRS in 2012, this research aims to examine the period before this alignment. Specifically, it investigates whether agricultural companies listed on the stock exchange included information in their financial statements pertaining to International Accounting Standard 41 (IAS 41) during this pre-convergence phase. From 2010 to 2011, 82 observations were conducted over the two-year period.

Table 4: Descriptive statistics for pre-convergence of IAS 41 (2010–2011)

|              | N  | mean  | sd    | min | max |
|--------------|----|-------|-------|-----|-----|
| ACTVT        | 82 | 1     | 0.000 | 1   | 1   |
| DESBA        | 82 | .976  | 0.155 | 0   | 1   |
| METHBA       | 82 | .098  | 0.299 | 0   | 1   |
| FVLESSCOST   | 82 | .049  | 0.217 | 0   | 1   |
| BA           | 82 | 1     | 0.000 | 1   | 1   |
| PROD         | 82 | .854  | 0.356 | 0   | 1   |
| MANSTRG      | 82 | .951  | 0.217 | 0   | 1   |
| DISEVENT     | 82 | 1     | 0.000 | 1   | 1   |
| DISFV        | 82 | .098  | 0.299 | 0   | 1   |
| DESCALES     | 82 | 0     | 0.000 | 0   | 0   |
| DISPURCHASE  | 82 | 0     | 0.000 | 0   | 0   |
| DISHAVEST    | 82 | 0     | 0.000 | 0   | 0   |
| TOTALDISCLOS | 82 | 6.024 | 0.875 | 3   | 9   |

For disclosure items 1 all 41 of the companies disclosed the information using scale number 1. This study used two years of data evaluation to examine the business activities that the companies have. Regarding the number of disclosures for disclosure items 1, there were 82 disclosures, as shown in table 4 and table 5.

Table 5: Data disclosure for 2010–2011

|                                  |
|----------------------------------|
| Q= C x Y                         |
| Q1 = 41 x 2 = 82 data disclosure |
| Q= number of disclosure items    |
| C= number of companies           |
| Y= how many years data collected |

For disclosure items 1 (ACTVT), 5 (BA), and 8 (DISEVENT), all 41 companies reported full disclosure (100%), with item 1 recording a total of 82 disclosures during 2010–2011. Items 2 (DESBA), 6 (PROD), and 7 (MANSTRG) were disclosed by more than 85% of companies, while items 3 (METHBA), 4 (FVLESSCOST), and 9 (DISFV) recorded low disclosure levels of below 10%. Lastly, for disclosure items 10 (DESCALES), 11 (DISPURCHASE), and 12 (DISHAVEST), the findings show zero disclosure, indicating that no disclosure made by the companies. This happens because prior to 2012, Malaysia did not converge with the IFRS, and not many companies disclosed all items regarding biological assets although the country has its own standard, the Malaysian Accounting Standard (MAS). The next results revealed that IAS 41 was introduced even during 2012–2015.

#### 4.3 IAS 41 was Introduced (2012–2015)

This period marks Malaysia's convergence with IFRS, requiring compliance with international accounting standards and the transition from Malaysian Accounting Standards (MAS) to Malaysian Financial Reporting Standards (MFRS). As part of this convergence, IAS 41 was adopted as MFRS 141, with both standards containing equivalent requirements for accounting for agricultural activities. The adoption aimed to enhance the comparability of financial reporting with international practices by replacing the historical cost method with the fair value approach for measuring biological assets.

Table 6: Descriptive statistics for IAS 41 introduced (2012-2015)

|              | N   | mean  | sd    | min | max |
|--------------|-----|-------|-------|-----|-----|
| ACTVT        | 164 | 1     | 0.000 | 1   | 1   |
| DESBA        | 164 | .976  | 0.155 | 0   | 1   |
| METHBA       | 164 | .11   | 0.314 | 0   | 1   |
| FVLESSCOST   | 164 | .061  | 0.240 | 0   | 1   |
| BA           | 164 | .994  | 0.078 | 0   | 1   |
| PROD         | 164 | .933  | 0.251 | 0   | 1   |
| MANSTRG      | 164 | .97   | 0.172 | 0   | 1   |
| DISEVENT     | 164 | 1     | 0.000 | 1   | 1   |
| DISFV        | 164 | .104  | 0.306 | 0   | 1   |
| DESCALES     | 164 | 0     | 0.000 | 0   | 0   |
| DISPURCHASE  | 164 | 0     | 0.000 | 0   | 0   |
| DISHAVEST    | 164 | 0     | 0.000 | 0   | 0   |
| TOTALDISCLOS | 164 | 6.146 | 0.874 | 2   | 9   |

All companies were assessed against the 12 disclosure items using annual reports. As shown in Table 6, disclosure items 3 (METHBA), 4 (FVLESSCOST), 7 (MANSTRG), and 9 (DISFV) recorded the lowest disclosure rates, each below 15%. Although Malaysia had converged with IFRS through MFRS 141, full compliance was not achieved, particularly for disclosure items 10 (DESCALES), 11 (DISPURCHASE), and 12 (DISHARVEST). METHBA indicates whether companies measured biological assets using the historical cost or fair value method. These results show that for disclosure items number 3 (METHBA), 89% disclosed their method using the historical cost method as compared to the fair value method of only 11%. disclosure items number 9 (DISFV) pertains to the separate disclosure, by group or otherwise, of the change in fair value less costs to sell of biological assets included in profit or loss due to physical changes and price fluctuations. This disclosure items demonstrates a lower level of disclosure by companies, with 10.4% compliance, which is comparable to the percentage observed in disclosure items number three regarding the methods utilised by companies to measure biological assets. This happens due to the inactive market of biological asset trees.

However, the disclosure items 1 (ACTVT) related to the business or principal activity by company and events that happened in these particular years depict that 100% of companies disclosed all the information. The rest of the disclosure items number (2, 5, and 6) show more than 94% of the companies disclosed except disclosure items number 10 (DESCALES), 11 (DISPURCHASE) and 12 (DISHAVEST) companies are not disclosed with zero percentage. The reason why the companies disclosed disclosure items 10, 11, and 12 is that the standard gives an option to the agriculture companies to measure the biological asset with the cost method but with the condition of determining the fair value. Other reasons the result displays zero percentages because most companies are not ready to measure the biological asset with the fair value method, the guidelines are over-generalised and the controversial issues of IAS 41 by using the fair value method. Next, the result for the IAS 41 amendment will be displayed.

#### 4.4 Amendment of IAS 41 (2016-2017)

This event refers the amendment of IAS 41. Agriculture: Bearer Plants (Amendments to IAS 16 and IAS 41) adds a definition of a bearer plant and includes bearer plants within the scope of IAS 16 instead of IAS 41. A bearer plant is defined as a living plant that is used in the production or supply of agricultural produce, is expected to bear produce for more than one period and has a remote likelihood of being sold as agricultural produce, except for incidental scrap sales. This amendment aims to address challenges faced by agricultural enterprises, particularly concerning long-lived biological assets. Previously, concerns were raised about the fair value measurements of biological assets in the absence of an active market for valuation

purposes. Consequently, the standard prescribes a solution to the bearer plant put under IAS 16 (Plant and Property) which measures the cost method. The effectiveness of this standard must be followed in 2018.

Table 7: Descriptive statistics IAS 41 amendment (2016–2017)

|              | N  | mean  | sd    | min | max |
|--------------|----|-------|-------|-----|-----|
| ACTVT        | 82 | 1     | 0.000 | 1   | 1   |
| DESBA        | 82 | .988  | 0.110 | 0   | 1   |
| METHBA       | 82 | .159  | 0.367 | 0   | 1   |
| FVLESSCOST   | 82 | .11   | 0.315 | 0   | 1   |
| BA           | 82 | 1     | 0.000 | 1   | 1   |
| PROD         | 82 | .988  | 0.110 | 0   | 1   |
| MANSTRG      | 82 | .976  | 0.155 | 0   | 1   |
| DISEVENT     | 82 | 1     | 0.000 | 1   | 1   |
| DISFV        | 82 | .183  | 0.389 | 0   | 1   |
| DESCALES     | 82 | .024  | 0.155 | 0   | 1   |
| DISPURCHASE  | 82 | .024  | 0.155 | 0   | 1   |
| DISHAVEST    | 81 | .025  | 0.156 | 0   | 1   |
| TOTALDISCLOS | 82 | 6.476 | 1.199 | 3   | 12  |

Table 7 shows that there are an increasing number of percentages of companies that disclosed and complied with the standard rules. For disclosure items number 1 (ACTVT), 2 (DESBA), 5 (BA), 6 (PROD), 7 (MANSTRG) and 8 (DISEVENT), all companies disclosed all the information (more than 97% disclosures). This occurs when the amendment of IAS 41 requires that the bearer plant put under plant and property standard (IAS 16) measured with cost method and have accumulated depreciation. For disclosure items number 3 (METHBA), 4 (FVLESSCOST), and 9 (DISFV), an increasing percentage between 11% to 19% was noted as compared with the time IAS 41 was introduced between 6% to 11%, respectively. This could be due to the amendment of the standard; all the companies had to change their accounting policies, which incurred the cost of capital to execute the amendment of the standard.

#### 4.5 Post-implementation (2018–2022)

Post-implementation refers to the years 2018 to 2022. This year refers to the year after the standard makes amendments regarding the bearer plant, particularly the measurement of the biological asset. In this year, 41 companies announced to comply with IAS 41 within the five years. Some companies adopted it in 2018, whereas others adopted it in 2019, 2020, 2021, and 2022. These companies do not simultaneously adopt full standards because of their firm size, many types of biological assets, and the need to change the standard from IAS 41 to IAS 16 (accounting policy), particularly biological assets which involve the cost of capital. The changes in the standard from MFRS 141 to MFRS 116 affected the financial statement items that have been raised for agricultural companies.

Table 8: Descriptive statistics post-implementation (2018–2022)

|              | N   | mean   | sd    | min | max |
|--------------|-----|--------|-------|-----|-----|
| ACTVT        | 205 | 1      | 0.000 | 1   | 1   |
| DESBA        | 205 | 1      | 0.000 | 1   | 1   |
| METHBA       | 205 | .911   | 0.286 | 0   | 1   |
| FVLESSCOST   | 205 | .915   | 0.279 | 0   | 1   |
| BA           | 205 | 1      | 0.000 | 1   | 1   |
| PROD         | 205 | 1      | 0.000 | 1   | 1   |
| MANSTRG      | 205 | .995   | 0.070 | 0   | 1   |
| DISEVENT     | 205 | 1      | 0.000 | 1   | 1   |
| DISFV        | 205 | .906   | 0.293 | 0   | 1   |
| DESCALES     | 205 | .527   | 0.500 | 0   | 1   |
| DISPURCHASE  | 205 | .51    | 0.501 | 0   | 1   |
| DISHAVEST    | 205 | .652   | 0.478 | 0   | 1   |
| TOTALDISCLOS | 205 | 10.406 | 1.891 | 5   | 12  |

Table 8 indicates that all companies achieved 100% disclosure for business activities (ACTVT), description of biological assets (DESBA), biological asset value (BA), production life cycle (PROD), and significant events during the reporting year (DISEVENT). For other disclosure items, an increasing percentage of disclosure, especially disclosure items 3 (METHBA), 4 (FVLESSCOST), and 9 (DISFV) were noted with more than 90% disclosed by the companies. For this reason, even the post-implementation should be 100% because some of the companies fully adopted it in 2018, others in 2019 or 2020 even in 2021 or 2022. However, the increasing percentage here indicates that all the companies attempted to comply with the rules and make the disclosure in the financial report. In terms of management, the disclosure depicts MANSTRG recorded a consistently high disclosure level, with only a 0.5% difference from full disclosure.. Finally, for disclosure items 10 (DESCALES), 11 (DISPURCHASE), and 12 (DISHAVEST), a substantial increase in disclosure percentages from 0% to 50% was observed compared with previous periods. These results are discussed in the following sections.

#### 4.6 Additional analysis ANOVA

To complement the main analysis, a one-way ANOVA was conducted to examine whether the level of biological asset disclosure differs across the four regulatory stages associated with the adoption and implementation of Malaysian Financial Reporting Standard 141 (MFRS 141). Analysis compares the average disclosure scores of periods PRE, INTRO, AMEND and POST to understand whether changes in regulation are associated with variations in disclosure behaviour. This additional test in fact gives another look at how disclosure practices evolve through time by analyzing whether firms show different reporting patterns across regulatory stages. The findings from our ANOVA test show whether there are significant differences between the mean levels of disclosure for the four stages of accounting standards, thus further substantiating how a progression in accounting standards has potential implications on transparency with regards to biological assets.

Table 9: Summary of total disclosure

| IAS 41/ MFRS 141 | Mean   | Std. Dev. | Freq. |
|------------------|--------|-----------|-------|
| PRE              | 6.024  | 0.875     | 82    |
| INTRO            | 6.146  | 0.874     | 164   |
| AMEND            | 6.476  | 1.199     | 82    |
| POST             | 10.406 | 1.891     | 205   |
| Total            | 7.802  | 2.476     | 533   |

Table 10: Analysis of variance (ANOVA)

| Source         | SS       | df  | MS      | F      | Prob > F |
|----------------|----------|-----|---------|--------|----------|
| Between groups | 2222.595 | 3   | 740.865 | 381.45 | 0.0000   |
| Within groups  | 1024.198 | 529 | 1.936   |        |          |
| Total          | 3246.793 | 532 | 6.106   |        |          |

Table 11: Pairwise comparisons of means with equal variances

| Over: IAS 41   |           |          |        |       | Number of Comparisons: 6     |           |
|----------------|-----------|----------|--------|-------|------------------------------|-----------|
| TOTALDISCLOS   | Contrast  | Std.Err  | t      | P>t   | Tukey<br>[95% Conf Interval] |           |
| INTRO vs AMEND | -.3292683 | .1884894 | -1.75  | 0.301 | -.8150549                    | .1565183  |
| POST vs AMEND  | 3.930331  | .182484  | 21.54  | 0.000 | 3.460022                     | 4.40064   |
| PRE vs AMEND   | -.4512195 | .2176488 | -2.07  | 0.163 | -1.012158                    | .1097186  |
| POST vs INTRO  | 4.259599  | .1464843 | 29.08  | 0.000 | 3.882071                     | 4.637128  |
| PRE vs INTRO   | -.1219512 | .1884894 | -0.65  | 0.917 | -.6077379                    | .3638354  |
| PRE vs POST    | -4.38155  | .182484  | -24.01 | 0.000 | -4.851859                    | -3.911241 |

Table 9 presents the ANOVA results for summary of total biological asset disclosure items across the four IAS 41 stages, Table 10 summarizes the ANOVA of total biological asset disclosure across regulatory stages and Table 11 shows the post hoc Tukey comparisons for these items. The one-way ANOVA was conducted to examine differences in total biological asset disclosure across the four regulatory stages of MFRS 141 (PRE, INTRO, AMEND, POST). The results indicated a significant effect of regulatory stage on disclosure,  $F(3, 529) = 381.45$ ,  $p < 0.001$ . Mean disclosure increased from 6.024 in the PRE-adoption stage to 10.406 in the POST-adoption stage, reflecting a substantial improvement following full adoption of MFRS 141. Post hoc Tukey comparisons revealed that the POST stage differed significantly from all earlier stages (PRE vs POST,  $p < 0.001$ ; INTRO vs POST,  $p < 0.001$ ; AMEND vs POST,  $p < 0.001$ ), whereas there were no statistically significant differences among the PRE, INTRO, and AMEND stages. These findings suggest that the mandatory adoption of MFRS 141 had a strong positive impact on the overall level of biological asset disclosure in Malaysian plantation companies.

## 5.0 DISCUSSION

This study examines how biological asset disclosures evolve across four regulatory phases of MFRS 141 implementation. First, prior to convergence, Malaysia applied Financial Reporting Standards (FRS), which were largely aligned with IFRS but not fully converged. The process of IFRS convergence was challenging due to the intricacy of accounting standards, insufficient technical proficiency among preparers and auditors, underdeveloped domestic capital markets and inadequate guidance for initial IFRS implementation (Abdullah & Minhat, 2019). The low level of disclosure during the pre-convergence period suggests that, in the absence of mandatory regulatory enforcement, firms had limited incentives to provide detailed biological asset information. This indicates that firms were not fully prepared to comply with new reporting requirements at the point of FRS convergence in 2012. This finding highlights that regulatory convergence in emerging economies is not an immediate compliance process but requires sufficient institutional readiness, including technical expertise, implementation guidance, and stakeholder awareness.

Second, during the adoption phase, companies were facing transition challenges. Prior studies highlight internal constraints such as insufficient training, limited expertise, and weak implementation support, which help explain the slow adoption of IAS 41 (e.g. Abdullah & Minhat, 2019). The absence of active markets further complicates fair value measurement, reinforcing information asymmetry between managers and investors, as suggested by agency theory. Long-lived biological assets have extended production cycles that changes in asset value are more significant at end-of-period cost measurements. Given these challenges, plantation firms may opt for historical costs rather than fair value to avoid increased workload, substantial expenses associated with engaging independent evaluators, and extensive disclosure requirements (Mohamed & Mohamed, 2026). Disclosures were minimal during the transition period. This finding extends previous IAS 41 literature by demonstrating that the challenges associated with fair value measurement do not only affect valuation practices but also influence firms' willingness and ability to provide comprehensive disclosures. Furthermore, uncertainty in fair value estimation may provide managers with greater discretion in determining the extent of information disclosed, thereby maintaining information asymmetry between firms and external stakeholders (Jamil et al, 2019; Mohamed & Mohamed, 2026).

Next, the increase in disclosure following regulatory amendments suggests that formal enforcement mechanisms play a critical role in improving reporting transparency, particularly in sectors characterised by valuation uncertainty. During the amendment stage, the accounting standard was corrected. The IASB acknowledged that in certain instances, due to inactive

market issues, fair value might not be reliably measurable when market prices are unavailable, and alternative fair value estimates are deemed clearly unreliable. Thus, IAS 41 mandates that the entity assess the biological asset at its cost, reduced by accumulated depreciation, and any impairment losses. Once the fair value of the biological asset can be measured reliably, the entity is required to evaluate the biological assets at their fair value and lower the estimated costs associated with the point of sale. In all circumstances, agricultural produce should be measured at the point of harvest at its fair value and at lower estimated point-of-sale costs (Lazar & Huang, 2012). As a result, disclosures on biological assets were increasing during the amendment stage. The improvement in disclosure following the amendment indicates that standard revisions and clearer accounting requirements can reduce implementation uncertainty among preparers. However, the continued variation in disclosure levels suggests that regulatory changes alone may not completely eliminate challenges related to valuation complexity and managerial judgement.

Finally, during the post-implementation stage, all companies fully adopt IAS 41 and MFRS141. However, full adoption varies between companies, possibly due to the size of the biological assets and other company-specific factors. The ANOVA results reveal significant differences in biological asset disclosure across the regulatory stages of MFRS 141, thereby confirming that regulatory changes have influenced disclosure practices. Specifically, firms in the post-implementation stage demonstrate a significantly higher level of disclosure compared to the pre-implementation and transition stages. This finding is consistent with prior studies suggesting that mandatory accounting requirements enhance financial reporting transparency; however, this study extends existing evidence by providing longitudinal evidence of how disclosure practices gradually improve following regulatory implementation in an emerging economy context. Overall, the findings indicate that regulatory convergence and enforcement under MFRS141 have significantly improved disclosure practices. However, persistent challenges related to fair value measurement continue to limit full compliance. The results warrant explanation from agency theory, which suggests that managers may limit information when measurement involves significant judgement and uncertainty. The observed improvement in disclosures during post implementation period suggest that regulatory enforcement plays a critical role in mitigating agency-related issues. Nevertheless, the persistence of low disclosure items indicates that managerial discretion remains relevant, particularly when disclosure involves commercially sensitive information, high implementation costs, complex valuation processes, or requires specialised technical expertise (Abdullah & Minhat, 2019). A key limitation of IAS 41 lies in the absence of active markets for long-lived biological assets, which complicates fair value measurement and reduces reliability. Therefore, although IAS 41 has improved transparency and comparability, its effectiveness depends on supporting mechanisms such as professional training, technical guidance, and stronger monitoring practices, particularly in emerging economies where market-based valuation information may be limited (Abdullah & Minhat, 2019). A limitation of this study is that the regulatory stages coincide with calendar time and differ in duration, making it difficult to fully separate regulatory effects from broader improvements in biological asset disclosure over time. In addition, IAS 41 implementation remains challenging because the absence of active markets for long-lived biological assets complicates fair value measurement and may reduce reliability (Salehuddin et al., 2021).

## **6.0 CONCLUSION**

This study examines the evolution of biological asset disclosure practices among Malaysian publicly listed plantation companies following the implementation of MFRS141. The findings show a progressive and statistically significant increase in disclosure levels across different regulatory phases. This indicates that companies are gradually improving their reporting

practices in response to regulatory changes and enforcement mechanisms. The findings also indicate that companies do not fully comply with disclosure requirements for biological assets in financial statements. The complexity arises from the involvement of multiple stakeholders, including standard setters, auditors, accounting professionals, and industry practitioners. Discrepancies in fair value disclosures can undermine the credibility of financial reports and create challenges for users in evaluating firm performance and value. The study contributes to the literature by providing longitudinal evidence on biological asset disclosure in an emerging market context, highlighting the role of regulatory enforcement in improving reporting practices. The findings also demonstrate the usefulness of longitudinal content analysis in evaluating regulatory effectiveness and extend previous disclosure research beyond cross-sectional evidence. The study provides practical implications for regulators, standard setters, auditors, and plantation companies. Clearer guidance on fair value measurement, valuation-related disclosures, and greater attention to disclosures involving managerial judgement may enhance reporting transparency and investor confidence. This study is limited by its reliance on annual reports, Malaysian plantation companies, and binary disclosure measurement. Future research may incorporate primary and qualitative evidence, cross-country comparisons, and year effects to further examine IAS 41 disclosure practices in different institutional contexts.

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