Counting in Plain Sight: Natural Capital and Biodiversity in Financial Statements for Accountants

Abstract

In 2023, the World Bank concluded that agriculture companies contributed $4.36 trillion[i] to the global economy – 4.0% of global GDP. Production-related activity within the sector has contributed to around 13% of carbon dioxide (CO_2), 44% of methane (CH_4) and 81% of nitrous oxide (N_2O) of total emissions from human activities globally.[ii] By either measurement, agricultural companies are important to both the global economy and our planet.

Natural capital drives economic value for companies in the $4.36 trillion agriculture sector. More than 140 countries globally use the International Accounting Standards Board (IASB)[iii, iv] to value their economic capital, based on its underlying natural capital, across a cascading set of accounting standards, including IAS 41: Agriculture[v] and IAS: Inventories[vi]. How companies apply IAS 41[vii] and related standards matters for how market participants evaluate the natural capital risk associated with agricultural companies. Natural capital risks such as forest loss, soil depletion, water purity, and sustainability and biodiversity loss impact the value of the biological assets owned by corporations. However, the stakes are larger given that the production processes of these firms can also impact the environment. Reliable financial reporting of biological assets also allows market participants to evaluate corporate actions and their impact on the stability of international food systems and how these food systems impact our planet.

In this paper, we examine how palm oil companies apply accounting standards to their biological assets and agricultural produce, revealing potential discrepancies between reported values and natural capital realities.

Introduction

Ensuring global food system stability requires companies to use consistent and accurate approaches to their financial accounting of agriculture, so that reported values are reliable. Firms are subject to various accounting regulations under International Financial Reporting Standards (IFRS), or their local accounting standards.

Naturally, markets, analysts, and portfolio managers rely on audited financial information to better understand the financial valuation and overall investment thesis in the palm oil sector. Crucial then to this understanding is accurate information. Yet, market participants may receive inaccurate, and potentially misleading information about the economic benefits and consequences of palm oil production.

Questions financial accountants and analysts ask frequently:

- Are biological assets – *the oil palm tree* – and agricultural produce – *the fresh fruit bunch (palm oil fruit)* – consistently and accurately reported on, and in compliance to accounting standards, so that natural capital is valued accurately?[viii, ix]
- Are companies consistently and accurately valuing their agriculture businesses based on a transparent and accurate analysis of their value underpinning their businesses, and their related assets and liabilities?

In answer to these questions, our examination focused on firms operating in the global palm oil industry. We checked to ensure that their implementation of key accounting regulations relating to their production of palm oil is compliant with these standards.

Details

To aid in understanding the accounting issues discussed in this report, some background on palm oil firms is useful. Each company is responsible for transforming *living plants or animals* – biological assets, a form of natural capital – into *agricultural produce* - either harvested plants or meat. Together these constitute *biological assets*. Natural capital: The stock of renewable and non-renewable assets from which humans derive benefits through ecosystem services.

Natural capital serves as a critical input to agricultural companies' production and supply chain. Companies in the agriculture sector rely upon natural capital to maintain their growth and yield production curves.

For example, agricultural producers rely on functioning soils and hydrological systems, healthy biotic environments and pollinators, and many other natural capital factors to increase the value of their assets, to improve their cash flows, to grow their businesses, and finally to compete against their peers in the marketplace. As such, how a company manages the natural capital risk of its biological assets affects both the profitability and value of these assets.

By examining agricultural production through a financial accounting lens, it is possible to understand more clearly how companies use their biological assets. The audited and unaudited financial information provided by agricultural firms yields a variety of useful information relating to biological assets that helps analysts and portfolio managers better understand the benefits and costs of production and how they are addressing natural capital constraints.

Model One

In the first model, when entering a formal arrangement with smallholders, companies (the nucleus) must assist in the development and cultivation of smallholder lands by facilitating or guaranteeing loans, through profit sharing or other agreed-upon arrangements. Under the 2004 law, the Indonesian government facilitates the establishment of public-private partnerships, with private financial institutions to provide credit facilities and loan guarantees to smallholders to grow agriculture products to be inventoried by the companies.

In some cases, these companies provide direct loans to the farmers to help grow crops. In exchange, companies take possession of the smallholders' land title and become the sole party to which smallholders must sell their products. The companies, essentially, outsource the production of their inventory but typically supply fertilizers, training, and other forms of support. After harvest, land title reverts to smallholders once they fulfil their credit obligations and provide their harvests over the terms of the arrangement.

Model Two

The second model is like the first but has a notable exception. The second model allows companies to take legal possession of and manage the farmers' land. We have concluded that this arrangement is a long-term lease of the land until harvest. The smallholders are treated as shareholders of the companies and receive dividends from profits periodically instead of lease payments on their land.

Last of the important background details is that the palm oil sector usually finances itself through two cash flow sources, investing and financing activities. Consequently, mergers and acquisitions (M&A), and other highly leveraged buyouts, are common in the sector.

Methodology

The research methodology was to carefully select the following parameters, in sequence.

Geographies

We limited the investigation to firms headquartered in Indonesia, Malaysia, and Singapore. These countries account for 85% of palm oil production and trade worldwide. Thus, they are responsible for a significant portion of regionally harmful greenhouse gas (GhG) emissions and cause-related deforestation, biodiversity loss, air pollution and water quality risks. That is, their use of natural capital is important to evaluate and to understand.

Companies

We identified palm oil companies to study: Astra Agro Lestari, Eagle High Plantations, Noble Group, London Sumatra, and Indofood Agri Resources.

Disclosures

We analyzed the specific disclosures of selected palm oil producers and traders.

Time Frame

The period examined is 2013-2018.

Why It Matters

Identified here are the key accounting standards and principles that may be material to market participants' understanding of the economics underlying palm oil production with the following impacts on financial rations, as shown in Table 1.

Despite certain inconsistencies and lack of comparability among the standards, we assumed for the purpose of this analysis that the IFRS is universally accepted and that the PSAK and SFRS standards are considered to have IFRS equivalents. We also point out differences where applicable.

Table 1: Categories of Financial Ratios and Natural Capital.

Categories of ratios with examples	Why it matters
Liquidity ratios include: • **Current** • **Quick**	**Liquidity ratios** describe a firm's ability to pay its short-term obligations without raising external capital. Solvency ratios are similar to liquidity ratios while solvency ratios assess a company's long-term ability to pay

	ongoing debts. *Liquidity ratios can measure a company's short-term risks from natural capital-linked revenue production.*
Turnover ratios include: • **Accounts receivable** • **Inventory** • **Accounts payable** • **Fixed asset**	**Turnover ratios** primarily measure a firm's effectiveness at managing working capital. Working capital is money invested by a business to generate revenues. Examples are capital tied up in inventories; sales made on credit (accounts receivable); and fixed assets like property, equipment, and factories. Firms that pay back their suppliers more slowly (accounts payable) use less capital in generating sales.
Leverage ratios include: • **Debt** • **Debt-to-equity** • **Interest coverage**	**Leverage ratios** describe what proportion of a firm's capital are debts that must be paid regardless of the operating performance of the business. Higher levels of debt are considered riskier.
Performance ratios include: • **Gross profit margin** • **Operating profit margin (aka EBIT)** • **EBITDA** • **Net profit margin (NPM)** • **Return on assets (ROA)** • **Return on equity (ROE)**	**Performance ratios** describe a company's profitability at various stages of its activities. Gross profits measure the proportion of money a company earns from selling its products. Operating profit margin (EBIT) measures the proportion of money a company earns from the entirety of its business activities, but prior to any value add from its investing and financing activities (exception: firms whose operations are exclusively about investing and financing, like banks and insurance). Because depreciation & amortization are considered non-cash expenditures, the amounts charged to revenues are sometimes added back to approximate how much cash a firm has created from its operations (EBITDA). After all income and expenses sources are reconciled, net profits are derived. The percentage net profit margin is what proportion of revenues is left over after this reconciliation. One way to measure the success of a business is to compare its net profits to its total assets (ROA). ROA answers the question about how successful a management team is at converting 1 unit of assets into profitability. By contrast, return on equity looks at a firm's ability to generate returns for its equity shareholders. For a profitable firm, ROE is always greater than or equal to ROA, depending on the amount of debt capital used to finance the business.
Valuation ratios include: • **Price to earnings (P/E)** • **Price to free cash flow (P/FCF)** • **Price to sales (P/S)** • **Price to book (P/B)** • **Enterprise value**	**Valuation ratios** are measures that compare the financial markets' estimate of firm value (i.e. price per stock share) to important accounting line items of the firm, such as sales (i.e. revenues), profits (i.e. earnings), total equity capital (i.e. book value), or free cash flow (an estimate of how much cash a firm creates each year after investments have been made to maintain firm profitability). These ratios allow for quick comparisons with other firms and their valuation ratios.

The below specific standards were reviewed during the analysis.

IAS 1: Presentation of Financial Statements (section 1.69: Liability Prescription)

It prescribes conditions under which liabilities are to be classified as current; that is, owed in the near term. Companies affected: Eagle High Plantations.

IAS 17: Leases

It prescribes the accounting policies and disclosures applicable to leases, both for lessees and lessors. Leases are required to be classified as either finance/capital leases or operating leases. Finance leases transfer substantially all the risks and rewards of ownership and give rise to asset and liability recognition by the lessee and a receivable by the lessor. Whereas operating leases

result in expense recognition by the lessee, with the asset remaining recognized by the lessor. Companies affected: Astra Agro Lestari, London Sumatra.

IAS 39: Financial Instruments: Recognition and Measurement

This section provides that guarantors of liabilities shall report the portion of the liabilities secured as their own liabilities even though affiliates will make repayments – similar to IFRS 4 for insurance contracts. Companies affected London Sumatra, Indofood Agri Resources.

IAS 41: Agriculture

It details the conditions to be present for assets to be classified as agricultural or biological and how to measure. Companies affected: Eagle High Plantations, Noble Group.

IAS 41 can inform if a company is valuing its biological assets and agricultural produce accurately given the natural capital risks faced. Specifically, IAS 41 requires companies to reassess the fair value of these assets given changes in thier natural capital risks. These risks include climate change, diseases, or other natural risks:[x]

> "climatic, disease and other natural risks … If an event occurs that gives rise to a material item of income or expense, the nature and amount of that item are disclosed in accordance with IAS 1 Presentation of Financial Statements".[xi]

IFRS 4: Insurance Contracts

This section applies, with limited exceptions, to all insurance contracts that an entity issues and even to reinsurance contracts that it holds. Companies affected: Astra Agro Lestari.

IFRS 7: Financial Instruments

It requires disclosure of information about the significance of financial instruments to an entity, and the nature and extent of risk arising from those financial instruments, both in qualitative and quantitative terms. Companies affected: London Sumatra.

IFRS 9: Financial Instruments

This is IASB's replacement of IAS 39 Financial Instruments: Recognition and Measurement. The Standard includes requirements for the recognition of and measurement of impairment, derecognition and general hedge accounting for financial instruments. Companies affected: London Sumatra.

IFRS 13: Fair Value Measurement

It covers biological assets (including agricultural assets and livestock). Both standards require that Fair Value Measurement be the result of an exit price, make use of a fair value hierarchy (level 1,2 and 3 inputs), resulting in a market-based value, rather than entity-specific. Companies affected: Eagle High Plantations.

IFRS 16: Lease Disclosures

It specifies how leases will be recognized, measured, presented, and disclosed. Companies affected: Eagle High Plantations, London Sumatra.

PSAK 30: Leases

Has been superseded by PSAK 73 as of 1 January 2020. Companies affected: Astra Agro Lestari, London Sumatra.

PSAK 60: Financial Instruments: Disclosures

Similar in all respects to IFRS 7. Companies affected: London Sumatra.

PSAK 71: Financial Instruments

Similar in all respects to IFRS 9. Became effective 1 January 2018.

PSAK 73: Leases

Similar in all respects to IFRS 16. Became effective 1 January 2020. Companies affected: London Sumatra.

SFRS 16: Lease Disclosures

Similar in all respects to IFRS 16. Companies affected: Indofood Agri Resources.

SFRS 39: Financial Instruments: Recognition and Measurement

Similar in all respects to IFRS 39. Companies affected: Indofood Agri Resources.

SFRS 41: Agriculture

Similar in all respects to IFRS 41. Companies affected: Indofood Agri Resources.

Astra Agro Lestari

This case study concerns IAS 17 and PSAK 30.

As of 2017, Astra Agro Lestari had a total planted area of 290.961 hectares[xii] in Indonesia. By 2017, Astra had entered into nucleus-plasma partnerships (Plasma Scheme) involving a total of 73,099 individuals, subdivided into 2,736 farmer groups[xiii], and covering 178,379 hectares[xiv] of the 297,000 hectares of landbank controlled by the group.[xv] Our study suggests that Astra Agro's financial reports may not have been applied correctly relative to IAS 17 Leases (in Indonesia the regulation is PSAK 30).

Thus, Astra's reported Plasma Plantation assets 2013–2017 may have been required to be accounted for as operating leases amortized over the course of the length of time to produce palm oil into marketable inventories (typically 5 to 7 years). Astra's 2015–2017 notes[xvi] to its financial statements over this period concerning the recognition of long-term assets as originally presented partially read:

- "In accordance with Indonesian government regulations, the nucleus is granted plantation land rights if the nucleus develops plantations for local plasma farmers." These usage rights have specific expiration dates between 2021 and 2099 at which point legal ownership revert to its lawful owners."
- Under the "scheme, the cooperation agreements are signed by the plasma farmers through local cooperatives. When the plasma plantations are mature and meet certain criteria required by the government, the plasma plantations will be handed over to the plasma farmers."
- "The handover value is generally determined at the inception of the cooperation agreement agreed by the nucleus and the plasma farmers."
- "After the handover of the plasma plantations, the plasma farmers are obliged [emphasis ours] to sell their corps to the subsidiaries as nucleus. The funded plasma plantations will be repaid through certain percentage amounts withheld by the subsidiary on the related sales."
- "The funded plasma plantations are secured by plasma plantations and all assets located on the plantations, future receivables from sales of the plasma crops."
- The development of plasma plantations is self-funded or can be financed by investment credits, the funds for which are given directly to the subsidiary by the banks.

Meanwhile, IFRIC notes that the accounting treatment of certain arrangements requires substance over legal form depending on which party maintains the right of control. IFRIC 4[xvii] defined the right to control if any of the below conditions are present (IFRIC 4 was superseded by IFRS 16: Leases on 1 January 2019):

- "The purchaser has the ability or right to operate the asset or direct others to operate the asset." Based on the notes above, because the plasma farmers must pass the plasma plantations' crops upon maturity and receive instructions from the nucleus, then the nucleus seems to have control.
- "Facts and circumstances indicate that it is remote that one or more parties other than the purchaser will take more than an insignificant amount of the output or other utility that will be produced or generated by the asset during the term of the arrangement, and the price that the purchaser will pay for the output is neither contractually fixed per unit of output nor equal to the current market price per unit of output as of the time of delivery of the output." The above explicitly indicated that a previously agreed price is reached at the signing of the cooperation agreement, which is further proof that not only will the nucleus buy the entire plantation yields, but also at a lower than market price.

All expenses pertaining to the cooperation agreement, in our opinion, should have been accounted for under the requirements of IAS 17 or PSAK 30 Leases. Since the crops are expected to be handed over upon maturity and because it takes 4 to 7 years for oil palm trees to mature, these expenses, in our opinion, should have been amortized over 4 to 7 years.

Thus, Astra's approach to accounting for its leases may have resulted in it overstating its retained earnings and income 2013–2017. This, in turn means that investors might have overstated their financial strength as measured by debt to equity, debt to total capital, and return on equity ratios.

Additionally, increases in income would inflate net income (e.g., profits), and have the effect of increasing the return on equity ratio.

Eagle High Plantations

This case study concerns IAS 1, IAS 41, IFRS 13, and IFRS 16.

In 2015, Felda Global Ventures – now FGV Holdings – (FGV) hired KPMG to conduct a fair market valuation due diligence on Eagle High in connection with FGV's acquisition of a minority stake in Eagle High. KPMG's report[xviii] found that Eagle High generated over 80% of its revenues by selling crude palm oil (CPO) at the time.

It also noted that Eagle High, a large publicly traded firm, was in urgent need of cash to fund its operations; had violated loan covenants due to poor past performance; and, that 17 of its plantations' permits and land rights had expired. KPMG advised FGV to revise down its valuation to $680 million to better account for the reported ESG, sustainability, and credit risks.[xix]

In 2015, KPMG warned Eagle High Plantations about its material concerns[xx] regarding the company's proposed partial sale, inability to pay smallholders, not paying the Government of Indonesia income taxes payable, and other financial concerns. At issue was Eagle High Plantation's potential misapplication of IFRS 16: Leases. [Note: IFRS 16 replaced IAS 17 on 1 January 2019.]

IFRS 16 specifies how leases are to be recognized, measured, presented, and disclosed within financial statements. IFRS 16 stipulates that leases are required to be classified as one of the two following types:

- Finance leases: These transfers substantially all the risks and rewards of ownership and give rise to asset and liability recognition by the lessee and a receivable by the lessor; in some jurisdictions, such as the United States, these are known as capital leases.
- Operating leases: This results in expense recognition by the lessee, with the asset remaining recognized by the lessor.

KPMG noted that Eagle High Plantations' proposed sale of 37% to FGV Holdings for $680 million was based on Eagle High's listed planted area of 136,677 hectares valued at $17,400 a hectare. However, KPMG noted that the 136,677 hectares were overstated by the inclusion of smallholders' land of (est.) 3,259 hectares. KPMG went on to conclude that the information provided by management identified a potential shortfall of 8,000 hectares.[xxi]

Eagle High Plantation noted that the deficiency in hectares[xxii] related to Indonesia's plasma program stating: "[T]here are planted nucleus areas to be allocated for plasma programmes, pending the formation of plasma cooperatives, which can take up to a few years to complete."

Eagle High's 2016 annual report clarified its holdings after accounting for its leases within the plasma program under IFRS 16. As part of its new reporting,[xxiii] Eagle High Plantation lowered its reported land holdings from 136,677 to 133,457 hectares. The leases are also secured by the Plasma farmers' crops and the company's inventory of crops.

KPMG stated:[xxiv]

> "We noted potential breaches of financial ratios for certain subsidiaries as of 31 December 2014. Total outstanding loan balances in relation to these facilities amounted to $239.7 million."
>
> "Total planted area for certain entities were higher than the land concession area, which may result in land disputes (e.g., claims made by third parties) – KPMG comment – FGV to adjust their valuation as appropriate."

Eagle High's issues involving IFRS 16: Leases resulted in an understatement of its total liabilities. In turn, this would result in investors underestimating its leverage and financial position, overestimating its operating performance, and overestimating its valuation.

IAS 1.69 requires that, if an "entity does not have an unconditional right to defer settlement beyond 12 months," then liabilities should be classified as current. The KPMG due diligence report found violations of covenants, which essentially strip Eagle High's right to defer settlements. Therefore, long-term notes with violated covenants should have been reported as short-term liabilities. The classification as long-term caused the company to misrepresent its liquidity risk and long-term solvency. Consequently, all investors, not just FGV were likely to understate the risks to the company, and to overvalue Eagle High's equity.

IAS 41 falls within the general definition of assets, which only includes the resources from which the entity has full title and rights. The fact that plantations with expired rights were reported as assets undermined the company's legal risk exposure, which generally would allow Eagle High to borrow at a lower rate. Because valuation models for financial assets take as key inputs market borrowing rates, investors were likely to, again, misunderstand the financial condition of Eagle High.

IFRS 13 requires the disclosure of information that permits companies to arrive at the amounts reported for biological assets in their financial statements. Had Eagle High disclosed this information, readers would have been able to independently verify the assumptions and results of valuation models.

Indofood Agri Resources

This case study concerns IAS 17, IAS 39, IAS 41, IFRS 16, SFRS 16, SFRS 17, SFRS 39, and SFRS 41.

IFRS 16/SFRS 16

Singapore's Accounting Standards Council (ASC) has in recent years aligned itself in synch with all IAS/IFRS standards. Some firms continue to report under the previous standards, however. SFRS 16 paragraph B9 defines a lease as any contract that conveys the right to control the use of an identified asset for a period of time in exchange for consideration.

Indofood participates in Indonesia's Plasma Scheme and has many relationships with Smallholder farmers. Under both the terms of Indonesia's PIR Trans and the KKPA (e.g., credit granting) arrangements:

- The Inti (Indofood) is committed and contractually required to buy all inventories produced by its plasma scheme farmers

- Farmers are required to sell all their production to the Inti by law, and by extension
- The Inti controls or advise on the process – from seedlings to inventories.

Indofood reported Plasma Receivables of Rp 1,209 billion[xxv], which represents the sum of the development costs extended to farmers over the years. Based on SFRS 16, the capitalization of these costs (in part or full) appears to be inappropriate and may have resulted in an overstatement of assets and income over the years such expenditures incurred.

SFRS 16 Paragraph B9 of the standard further outlines 5 requirements that must be present before a lease can be classified as a finance/capital lease. The plasma scheme does not seem to include any of these requirements.

A PWC report issued in 2009 also supports this analysis. It concludes that the plasma scheme does indeed contain a lease arrangement for accounting purposes. Consequently, the development costs reported under plasma receivables most likely fall under the criteria for operating leases and should have been expensed by Indofood in the period incurred.

IAS 39/SFRS 39 SFRS 39

This establishes standards for loan guarantee reporting. Indofood's 2017 and 2016 disclosure appropriately noted the circumstances under which recognition would be required. However, our investigation did not come across evidence that the Plasma Scheme loan principal amounts collectively guaranteed by the group of Rp 805 billion in 2017[xxvi] and Rp 719 billion in 2016[xxvii] were recognized as liabilities. Instead, the group seems to have treated these amounts as off-balance sheet items requiring more disclosures.

IAS 41/SFRS 41

Indofood's accounting disclosures acknowledge that the group employs SFRS 41 as the basis for reporting agricultural and biological assets. Identical to IAS 41[xxviii], the standard describes the conditions required for assets to be classified as biological assets or agricultural produce. The standard also specifies how these assets should be valued.

Specifically, IAS 41 requires companies to assess the fair value of their natural capital over time, including revaluing for gains and losses.

IAS 41's guiding principle[xxix] is that the increase in value associated with capital assets should be recognized as the asset grows, and not solely at the date of harvest or sale. In determining value of the future agriculture crops, agriculture companies can outsource this estimation of the value to external experts who apply a three-level approach to estimating the fair value of these agriculture assets:

- **Level 1 assets**: Assets whose value is measured according to readily observable market prices. These assets require a liquid market with multiple and consistent pricing sources, such as stocks, bonds, or any assets, which have a regular "mark-to-market" mechanism for setting a fair market value. Level 1 assets "mark-to-market" values must be easily observable, have transparent prices and therefore are a reliable, fair market value.
- **Level 2 assets**: Assets who lack a liquid market with multiple and consistent pricing but can be given a fair value based on quoted prices in inactive markets, such as interest rate swaps

or securities that are not actively traded including loans, municipal bonds, currency swaps, loans and derivatives.

- **Level 3 assets**: Assets that are not actively traded and are the least "mark-to-market" of the three levels, where assets are priced based on expert opinion, estimates, mathematical models and unobservable inputs. Level 3 uses a process called "mark-to-management" to value assets. Examples of level 3 assets include complex derivatives, mortgage-backed securities, distressed debt, land, private equity shares and many assets valued under IAS 41.

Companies that employ a Level 3 approach to agriculture asset valuation typically value their natural capital using discounted cash flow (DCF) models. DCF modelling estimates the fair value of natural capital by reference to the expected future cash flows generated from the use of this capital.

Applying DCF modelling lets companies account for direct costs, such as maintenance, harvesting, overhead and transportation. However, these additional considerations can introduce uncertainty into concluded valuation if they are based on unreliable assumptions. The risk can be greater for agricultural firms who also need to incorporate assumptions relating to the impact of weather and environmental changes, such as global warming, into their forecasts.

SFRS 41 states that the biological assets shall be measured initially and at the end of each reporting period if 3 distinct conditions are present:

- the entity controls the asset as a result of past events
- it is probable that future economic benefits associated with the asset will flow to the entity
- the fair value or cost of the asset can be measured reliably.

SFRS 41 identifies level 1 inputs (quoted market prices) as the most reliable set of data for that purpose. By contrast, Indofood in its valuation of biological assets uses level 3 inputs. These require highly subjective economic and market assumptions about outcomes many decades into the future.

With regard to IFRS 16/SFRS 16: Leases, it is our belief that Indofood's capitalization of development costs spent on plasma farmers were likely inappropriate and may have resulted in overstatement of assets and income over the years such expenditures incurred. Consequently, investors would have misunderstood the financial position, operating profitability, and overvalued Indofood.

A lack of evidence of Indofoods' loan principal guarantees to plasma farmers of Rp 805 billion in 2017[xxx] and Rp 719 billion in 2016[xxxi], as required by IAS 39/SFRS 39, probably means the firm classified this as off-balance sheet. Consequently, liabilities were likely underreported. This, in turn, would have led to an overestimate of its financial position as measured by ratios such as debt to equity, or total debt to total capital, among others.

Finally, with regard to IAS 41/SFRS 41, our assessment concluded that Indofood's choice of Level 3 reporting likely relies on flawed assumptions in its valuation models. These include unexpected crude palm oil (CPO) price movements; a frequent need to restate financial information after issuance; and the need to book impairment losses after increasing asset value. We do not believe management's use of fair market value is appropriate under the circumstances.

London Sumatra

This case study concerns IFRS 7, IFRS 9, IFRS 16, PSAK 30, PSAK 60, PSAK 71, and PSAK 73.

A PwC report comparing Indonesia's Financial Accounting Standards Board (DSAK) and its PSAK standards with IFRS standards found mostly consistency between the two sets of standards. But there continue to be notable differences which have material effects on comparability.

London Sumatra, an Indonesian palm oil company, prepares its financial statements in accordance with the Indonesian Financial Reporting Standards (PSAK). These standards use historical cost accounting, rather than fair value accounting. Indonesia's partial adoption of IFRS and London Sumatra's use of PSAK not only affect comparability with peer companies, but also means that their financial reporting makes comparisons more difficult, or even risky. For this example, we assume that the standards employed to produce London Sumatra's financial statements were consistent with IFRS, unless otherwise specified.

IFRS 9 and PSAK 71

IFRS 9 is an accounting standard for financial instruments. It includes guidance for accounting for their recognition, measurement, impairment, and derecognition. It also covers hedging assets which are important in agricultural production.

IFRS 9 improves disclosure, requires earlier recognition of impairment losses on receivables and loans, and trade receivables, and requires that more assets be measured at fair value. Changes in fair value are recognized in profit and loss as when occurring. IFRS 9 seeks to improve the reporting accuracy of a company's current condition.

Between 2013 and 2017, London Sumatra's "other receivables – related parties" rose from Rp 5,772 million[xxxii] to Rp 103,930 million[xxxiii]. However, these balances include loans made to related parties. The company discloses that this increase is partly attributable to additional loans issued and accrued interests.

As an example, a loan was extended to PT Sumalindo Alam Lestari (SAL), a related party, to assist with funding their operational needs. London Sumatra disclosed that among the features of this loan is the ability of either party to terminate it at will, and to automatically extend it as often as needed.

Likely the company employed Indonesia's IFRS 9 equivalent – PSAK 71 – for classifying this loan. Yet, there are no specific disclosures on cash flows from prior interest payments and principal amounts received.

These missing important disclosures make it nearly impossible to objectively determine whether the economic substance of these transactions constitute a loan or equity investment. In turn, this means the firm's balance sheets are likely not representative of its true financial condition, especially with regard to liabilities. Investors relying on these amounts would be likely to underestimate their levels of debt and overestimate their creditworthiness.

IFRS 7 and PSAK 60

PwC's comparability report[xxxiv] also found that PSAK 60, an additional financial instruments standard having to do with disclosure is equivalent to IFRS 7. The standard requires that

companies provide quantitative and qualitative details about the nature and extent of exposure to risks arising from financial instruments. More specifically, under IFRS 7.33 and 7.34[xxxv], management should disclose, among other things:

- Valuation inputs, including discount rates, forecasted period and cash flows
- Risks involved (credit, liquidity & market risks)
- And disclosures about management's objective policies and processes for managing those risks

These disclosures allow investors and other stakeholders to evaluate the quality of the underlying assumptions for estimating the fair value of a firm's financial instruments.

In 2016, London Sumatra reported a Rp 60,027 million[xxxvi] ($5 million) debt stake in a US non-public company, Heliae Technology Holdings. In 2017, the company reduced its investment in Heliae to Rp 19,439 million[xxxvii]. When reducing the value of the notes London Sumatra did not provide an explanation for the change in reported value.

Further, they did not provide details on their Level 3 inputs which are needed to check the restatement of value of its investment in Heliae as required under IFRS 9's Fair Value Through Profit & Loss method (FVTPL) method. This omission is a potential violation of IFRS 7 and PSAK 60.

Without the required disclosures mandated by IFRS 7 and PSAK 60, it is not possible to verify the appropriateness of the reduction in value of Heliae Technology Holdings. It could be that the values reported should have been higher, or lower. Financial statement effects would include: the balance sheet, including assets reported; as well as the income statement, most likely in other comprehensive income.

IAS 17 and PSAK 30

IAS 17 and its PSAK 30 equivalent relate to the reporting of leases. London Sumatra reported Plasma Scheme Receivables of Rp 68,935 million[xxxviii] and Rp 66,620 million in 2017 and 2016, respectively. These amounts are the sum of the development costs extended to farmers under the plasma scheme over the years. in 2017 and 2016, respectively. These amounts are the sum of the development costs extended to farmers under the plasma scheme over the years.

According to IAS 17 (PSAK 30), the capitalization of these costs (in part or full) appears to be inappropriate because they do not meet the conditions necessary for capitalization. Instead, they appear to be operating leases. This is because, while the farmers are legally required to ultimately reimburse the financial institutions by selling their harvests to the intis, London Sumatra remains the ultimate owner and beneficiary of their labor and their land. As such, we can conclude that these costs represent a lease, which gave London Sumatra legal right to the crops, the land, and to manage production both directly and indirectly.

The plasma scheme does not seem to include the conditions that must be present for a capital lease under IAS 17 (now IFRS 16). Consequently, the development costs reported under plasma receivables most likely fall under operating lease and should have been expensed as incurred. Consequently, profitability of London Sumatra was likely overreported. Furthermore, common financial ratios that measure performance, such as return on equity would have been overstated, too.

IAS 39 and SFRS 39

SFRS 39[xxxix] (equivalent in all ways to IAS 39) also relates to financial instruments and their recognition and measurement. With regard to a financial guarantee contract, it states:

> "[A] contract that requires the issuer to make specified payments to reimburse the holder for a loss it incurs because a specified debtor fails to make payment when due in accordance with the original or modified terms of a debt instrument."

The standard further requires that an entity shall measure it at its fair value plus, in the case of a financial asset or financial liability not at fair value through profit or loss, transaction costs that are directly attributable to the acquisition or issue of the financial asset or financial liability.

These loans which were intended to fund the operations of plasma farmers actually benefit intis, like London Sumatra. This is because the company maintains legal title to harvests with plasma farmers legally required to pass all the harvests to London Sumatra, and at below market costs.

Yet, our analyses did not find evidence that the loan principal amounts of Rp 71,199 million in 2017[xl], and Rp 65,371 in 2016[xli], issued under the plasma scheme, and collectively guaranteed by the group were recognized as liabilities to London Sumatra. Instead, the group treated these amounts as off-balance sheet and only required disclosures. By contrast, the inventories and biological assets which these loans help funded were recognized.

Granted, financial reporting grants discretion to companies and their executives. However, it seems that the financial guarantees arising from the legal and contractual requirements of the Plasma Scheme represent a liability under SFRS 39 for the Intis. If so, London Sumatra's liabilities are underreported, and their balance sheet quality is overstated.

Noble Group

This case study concerns IAS 41, IFRS 5, IFRS 7, IFRS 9, and IFRS 13.

A complex transaction conducted by Noble Group in 2014 serves as a good case study for understanding multiple accounting standards and how they impact the values recorded in financial statements. Here is a timeline of the events with discussion.

	2017 USD '000	2016 USD '000
Property, Plant and Equipment	$62,027	$197,034
Intangible Assets	$9,461	$9,461
Agricultural Assets	$368	$349
Cash and Cash Equivalents	$799	$540
Prepayments, Deposits and Other Receivables	$18,805	$17,092
Inventories	$2,675	$3,781
Assets in Subsidiaries as Held for Sale	$94,135	$228,257

- **2014**: Noble Group stated its intention to divest/sell its interest in NAL Group. A fair value for NAL Group of $224 million. was then recorded in Noble's financial statements as an asset "held for sale." However, Noble Group wanted to retain NAL's palm oil business. In exchange for these palm oil assets, the company issued a promissory note/debt of $64.4 million[xlii] to NAL Group. This promissory note carried a contingent value right under which Noble would remit the proceeds of the sale of palm business, less certain expenses, to the NAL Group once sold.

This transaction falls under multiple accounting standards. First, IFRS 5: Financial reporting for non-current assets held for sale and discontinued operations. This governed the conditions and treatment of the $224 million of NAL Group assets held for sale. Second, IFRS: Financial Instruments, Disclosures dictated that Noble Group disclose the qualitative and quantitative information about the transaction and how it affected the company's risks. Third, IFRS 9 provides the comprehensive technical criteria for reporting the details of financial instruments. Fourth, as discussed in a previous case study, proper fair value accounting is covered by IFRS 13. Last, recall from earlier that IAS 41 dictates how agricultural assets are reported.

- **2016**: Noble Group continued to own NAL Group assets at the end of 2016, reporting it with a fair value of $228 million[xliii] in its audited 2016 financial statements. This represented a $4 million increase. Of this $228 million "asset held for sale," $197 million was the fair market value of property, plant and equipment (PPE) related to the palm assets.
- **2017**: Noble Group's second-quarter report noted a $60 million "non-cash impairment to noncurrent assets"[xliv] on its two palm oil assets held for sale. These palm oil assets had been retained by Noble Group as part of its divestiture of NAL Group. This represented a steep decline just two quarters after its recorded value as of the end of 2016.
- **2017**: At the end of 2017, Noble Group recorded the fair value of its PPE-related palm assets as $62 million. This was a decrease of $135 million from the $197 million reported at the end of 2016, just one year prior.

Noble Group's Q2 interim impairment of $60 million[xlv] explains less than one-half of the total impairment experienced between 2016 and 2017. Noble Group's annual statement does not explain the additional $75 million in impairment to its palm oil related PPE.

Furthermore, Noble Group's recognition of impairment occurred only after its creditor HSBC, the Roundtable on Sustainable Palm Oil (RSPO), and others requested that Noble Group review its valuation of its concessions in West Papua, Indonesia. Of interest to market participants was the fact that Noble Group had stated that one of the plantations – PT Pusaka Agro Lestari, certified to RSPO, was only 11% forested as opposed to actually being 90% forested[xlvi].

As a condition of this RSPO certification was requirement that Noble Group adhere to the RSPO's application of the High Conservation Values, an indirect measure of natural capital, where Noble Group misstated the forested percent in its concession[xlvii], contradicting Noble Group's own stated intention from its 2016 Annual Report[xlviii].

Since costs of production increase if an area is forested due to forest clearance costs, market participants wanted to know if the $228 million reported had factored in the additional costs associated with the increase in forested habitat.

Noble Group's impairment charge of its palm oil related assets calls into question the reliability of its application of IAS 41 in prior years. While write downs are required under IAS 41 to mark biological assets to market, impairment charges caused by factors such as the amount of forest to be cleared are measurable ex ante.

- **2018**: These and other accounting irregularities led to Noble Group's shares being suspended[xlix] from trading in November 2018 from the Singapore Stock Exchange. Ultimately, Noble Group would declare it was defaulting on debt obligations and undergo an extensive restructuring process that led to the creation of Noble Group Holdings Ltd.
- **2019**: Noble Group finally sold its two palm oil concessions for $67 million[l] in 2019.

Noble Group's accounting disclosures were poor or non-existent relative to IFRS 5, 7, 9, and 13, as well as IAS 41. Investors relying on these disclosures would have overstated the value of its assets held for sale and undervalued its liabilities on its balance sheet.

Conclusion

Our analysis indicates that these companies operating in the agriculture sector disclose potentially false and misleading accounting information to market participants. These firms require additional analytical scrutiny to better understand their accounting disclosures and actual business performance.

It is evident that the accounting technicalities surrounding the reporting of palm oil assets on financial statements are beyond the comprehension or interests of the layperson. Regardless, forensic accounting can help understand the problem and present the evidence in an objective manner.

Below are some of the reasons and ways that a financial accounting investigation of certain companies in the palm oil sector can be of help:

- Financial accounting may help determine whether financial reports reflect activities on the ground performed by laborers and whether smallholders' assets are being recorded as assets by corporations, instead of their true owners.
- Financial accounting investigation may include tasks not performed by auditors. Therefore, it may identify financial statements misrepresentations by management and collect evidence for motives.
- Financial accounting may help address the problem of climate change by revealing to the public the environmental costs and liabilities that are not being reported on the financial statements.

[i] World Bank national accounts data, and OECD National Accounts data files (2023). Agriculture, forestry, and fishing, value added (current US$). Agriculture (code is NV.AGR.TOTL.CD).

[ii] IPCC (2019). *Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems.* Paragraph A.3. Agriculture, Forestry and Other Land Use (AFOLU) activities accounted for around 13% of CO_2, 44% of methane (CH_4), and 81% of nitrous oxide (N_2O) emissions from human activities globally during 2007-2016, representing 23% (12.0 ± 2.9 $GtCO_2eq$ yr-1) of total net anthropogenic emissions of GhGs (medium confidence). This assessment only includes CO_2, CH_4 and N_2O. The natural response of land to human-induced environmental change caused a net sink of around 11.2 $GtCO_2$ yr-1 during 2007–2016 (equivalent to 29% of total CO_2 emissions) (medium confidence); the persistence of the sink is uncertain due to climate change (high confidence). If emissions associated with pre- and post-production activities in the global food system are included, the emissions are estimated to be 21% to 37% of total net anthropogenic GhG emissions (medium confidence). {2.3, Table 2.2, 5.4}. Global food system in this report is defined as 'all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the output of these activities, including socioeconomic and environmental outcomes at the global level'. These emissions data are not directly comparable to the national inventories prepared according to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

[iii] Marsh and Fischer, Journal of Business & Economics Research (2013). *Accounting for agricultural products: US versus IFRS gaap.* P. 84. "The main difference between US agricultural reporting and IAS 41 is reporting the fair value for agricultural assets and products as inventory. US GAAP allows the option to disclose their property, plant and equipment assets, biological assets included, at fair value. However, once elected, the entity may not revert to historical cost values. Historical costs are widely used because of the difficulty of determining a fair value of biological assets, as many do not have a liquid market, or may be valued lower than the historical cost. Neither US GAAP or Non-GAAP guidance allows appreciation valuation for agricultural products. This contrasts to IAS 41 that requires the use of fair value reporting for purchased as well as produced biological assets. The use of fair value reporting has invoked a mixed response from the users of agricultural financial statements."

[iv] The International Accounting Standards Board (IASB) is organized under an independent foundation named the IFRS Foundation responsible for developing a single set of high-quality global accounting standards, known as IFRS Standards, applied globally. IFRS refers to international financial reporting standards. Their mission is to develop standards that bring transparency, accountability and efficiency to financial markets around the world. IFRS is mandated in more than 140 countries. Notes: Standards published before December 2000 are known as International Accounting Standards (IAS) with standards published afterwards known as International Financial Reporting Standards (IFRS).

[v] IFRS Foundation. *International Accounting Standard 41: Agriculture.* Paragraph 3. IAS 41 is "applied to agricultural produce, which is the harvested produce of the entity's biological assets, at the point of harvest. Harvest means is the detachment of produce from a biological asset or the cessation of a biological asset's life processes. Thereafter, IAS 2 Inventories or another applicable Standard is applied. Accordingly, this Standard does not deal with the processing of agricultural produce after harvest; for example, the processing of grapes into wine by a vintner who has grown the grapes. While such processing may be a logical and natural extension of agricultural activity, and the events taking place may bear some similarity to biological transformation, such processing is not included within the definition of agricultural activity in this Standard." (IFRS Foundation. *International Accounting Standard 41: Agriculture).*

[vi] IAS 2: Inventories covers inventories, the movement and storage of agriculture assets, is not addressed here. Accordingly, IAS 41 does not deal with the processing of agricultural produce after harvest; for example, the processing of grapes into wine by a vintner who has grown the grapes. While such processing may be a logical and natural extension of agricultural activity, and the events taking place may bear some similarity to biological transformation, such processing is not included within the definition of agricultural activity in this Standard. Products that are the result of processing after harvest that are excluded from IAS 41, and instead, are included in IAS 2 Inventories, include: yarn, carpet, logs, lumber, cheese, sausages, cured hams, thread, clothing, sugar, cured tobacco, tea, wine, processed fruit, palm oil (crude palm oil; refined, bleached, deodorized palm oil; etc.), rubber products, etc.

[vii] The International Accounting Standards Committee (IASC) was established in June 1973 and issued international accounting standards (IAS) rules until the International Accounting Standards Board (IASB) replaced the IASC in 2001 with the remit to harmonize accounting rules globally. Since 2001, as IASB issues new rules they are called International Financial Reporting Standards (IFRS). Thus, IAS and IFRS rules are harmonized.

[viii] *International Accounting Standard 41: Agriculture. Paragraph 3. IAS 41 is "applied to agricultural produce, which is the harvested produce of the entity's biological assets, at the point of harvest. Harvest means is the detachment of produce from a biological asset or the cessation of a biological asset's life processes. Thereafter, IAS 2 Inventories or another applicable Standard is applied. Accordingly, this Standard does not deal with the processing of agricultural produce after harvest; for example, the processing of grapes into wine by a vintner who has grown the grapes. While such processing may be a logical and natural extension of agricultural activity, and the events taking place may bear some similarity to biological transformation, such processing is not included within the definition of agricultural activity in this Standard." (IFRS Foundation. International Accounting Standard 41: Agriculture).*

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[x] Roper, Ph.D., and Thoumi, CFA, FRM, Certified Ecologist. Financial Accounting in the Agriculture Sector: From Natural Capital to Accounting to Valuation – Commentary on IAS 41 Agriculture, Planet Tracker 2020.

[xi] IFRS Foundation. *International Accounting Standard 41: Agriculture*. Paragraph 53.

[xii] https://www.astra-agro.co.id/wp-content/uploads/2018/03/AR_AAL2017_19maret_completeLK-2.pdf

[xiii] https://www.astra-agro.co.id/wp-content/uploads/2018/03/AR_AAL2017_19maret_completeLK-2.pdf

[xiv] https://www.astra-agro.co.id/wp-content/uploads/2018/03/AR_AAL2017_19maret_completeLK-2.pdf

[xv] In 2004, the Government of Indonesia updated the 1987 Plantation Law (further updated in 2014) and established the *Plasma Scheme* to empower its smallholder farmers. Divided into two models, The Plasma Scheme aimed to promote cooperation among multiple stakeholders:

- The smallholder farmers (plasma farmers)
- The plantation companies (nucleus or inti)
- Financial institutions (banks)
- Regional and national governments in Indonesia.

[xvi] https://www.astra-agro.co.id/wp-content/uploads/2018/03/AR_AAL2017_19maret_completeLK-2.pdf

[xvii] http://www.slaasc.com/files/IFRIC 4 Determining whether an Arrangement Contains a Lease (superseded by IFRS 16 as of 1 January 2019) Determining whether an Arrangement contains a Lease.pdf

[xviii] https://www.sarawakreport.org/2018/04/najib-ignored-kpmg-warnings-against-feldas-purchase-of-his-pals-plantation-expose/

[xix] https://www.sarawakreport.org/2018/04/najib-ignored-kpmg-warnings-against-feldas-purchase-of-his-pals-plantation-expose/

[xx] https://www.sarawakreport.org/2018/04/najib-ignored-kpmg-warnings-against-feldas-purchase-of-his-pals-plantation-expose/

[xxi] https://www.sarawakreport.org/2018/04/najib-ignored-kpmg-warnings-against-feldas-purchase-of-his-pals-plantation-expose/

[xxii] https://theedgemalaysia.com/article/leaked-report-casts-doubt-eagle-highs-valuation

[xxiii] https://www.eaglehighplantations.com/en/investor/tahunan

[xxiv] https://www.sarawakreport.org/2018/04/najib-ignored-kpmg-warnings-against-feldas-purchase-of-his-pals-plantation-expose/

[xxv] https://investor.indofoodagri.com/misc/ar2017/files/assets/common/downloads/Indofood%20Agri%20Resources%20Limited%20-%20Annual%20Report%202017.pdf

[xxvi] https://investor.indofoodagri.com/misc/ar2017/files/assets/common/downloads/Indofood%20Agri%20Resources%20Limited%20-%20Annual%20Report%202017.pdf

[xxvii] https://investor.indofoodagri.com/misc/ar2017/files/assets/common/downloads/Indofood%20Agri%20Resources%20Limited%20-%20Annual%20Report%202017.pdf

[xxviii] Accounting Standard Codification Section 905 Agriculture. In the US, however, Accounting Standard Codification (ASC) 905 takes the conservative approach by mandating the lower of costs or market approach. Although ASC 905 is beyond the scope of this analysis, it's worth noting that it closely aligns with paragraph 30 of IAS 41, which requires historical cost recognition less depreciation and impairments. Furthermore, paragraph 30 explicitly notes that "there's a presumption that fair value can be measured reliably."

[xxix] Under IFRS 41, assets are ranked by their difficulty in valuation: Level 1, Level 2, and Level 3. Each level is distinguished by how simply assets be valued accurately and efficiently.

Level 1: Level 1 assets are those valued according to readily observable market prices. These assets require a liquid market with multiple and consistent pricing sources.

Level 2: Level 2 assets lack a liquid market with multiple and consistent pricing but can be given a fair value based on quoted prices in inactive markets.

Level 3: Level 3 is the least marked to market of the three levels, where assets are priced based on estimates, mathematical models and unobservable inputs, often based on assumptions from the market participants themselves. Level 3 assets are not actively traded.
Estimating Level 3 asset prices is called "mark to management".

[xxx] https://investor.indofoodagri.com/misc/ar2017/files/assets/common/downloads/Indofood%20Agri%20Resources%20Limited%20-%20Annual%20Report%202017.pdf

[xxxi] https://investor.indofoodagri.com/misc/ar2017/files/assets/common/downloads/Indofood%20Agri%20Resources%20Limited%20-%20Annual%20Report%202017.pdf

[xxxii] https://www.ticmi.co.id/datapasarmodal/ED/ar/viewsingle/65255/annual-report-pt-perusahaan-perkebunan-london-sumatra-indonesia-tbk-lsip-2013

[xxxiii] https://www.idx.co.id/StaticData/NewsAndAnnouncement/ANNOUNCEMENTSTOCK/From_EREP/201804/acda144973_2be862ffa7.pdf

[xxxiv] https://www.pwc.com/id/en/publications/assurance/psak-2018.pdf

[xxxv] https://www.ifrs.org/issued-standards/list-of-standards/ifrs-7-financial-instruments-disclosures/

[xxxvi] https://cdn.indonesia-investments.com/bedrijfsprofiel/231/Perusahaan-Perkebunan-London-Sumatra-Indonesia-Annual-Report-2016-Company-Profile-Indonesia-Investments.pdf

[xxxvii] https://cdn.indonesia-investments.com/bedrijfsprofiel/231/Perusahaan-Perkebunan-London-Sumatra-Indonesia-Annual-Report-2016-Company-Profile-Indonesia-Investments.pdf

[xxxviii] https://www.idx.co.id/StaticData/NewsAndAnnouncement/ANNOUNCEMENTSTOCK/From_EREP/201804/acda144973_2be862ffa7.pdf

[xxxix] https://www.ifrs.org/issued-standards/list-of-standards/ifrs-9-financial-instruments/

[xl] https://www.idx.co.id/StaticData/NewsAndAnnouncement/ANNOUNCEMENTSTOCK/From_EREP/201804/acda144973_2be862ffa7.pdf

[xli] https://www.idx.co.id/StaticData/NewsAndAnnouncement/ANNOUNCEMENTSTOCK/From_EREP/201804/acda144973_2be862ffa7.pdf

[xlii] https://links.sgx.com/FileOpen/Annual%20Report%202017.ashx?App=ArchiveAnnouncement&FileID=496687&AnncID=7V00THPN5IRV4QZL

[xliii] https://diyinvestor.de/wp-content/uploads/2021/01/noble-group-annual-report-2016.pdf

[xliv] https://www.hkexnews.hk/listedco/listconews/gem/2017/1110/gln20171110109.pdf

[xlv] https://www.hkexnews.hk/listedco/listconews/gem/2017/1110/gln20171110109.pdf

[xlvi] https://chainreactionresearch.com/report/noble-group-cost-of-capital-and-deforestation-risks-under-priced-revised/

[xlvii] https://chainreactionresearch.com/the-chain-noble-groups-deforestation-risks-further-sinks-the-ship/

[xlviii] https://diyinvestor.de/wp-content/uploads/2021/01/noble-group-annual-report-2016.pdf

[xlix] https://www.businesstimes.com.sg/companies-markets/sgx-regco-seeks-tougher-standards-audits-and-property-valuations

[l] https://go.gale.com/ps/i.do?id=GALE%7CA586487784&sid=sitemap&v=2.1&it=r&p=EAIM&sw=w&userGroupName=anon%7Eef0933eb&aty=open-web-entry