



TOWARDS SUSTAINABILITY: ANALYSIS OF CONVICTIONS AMONG MALAYSIAN AGRICULTURE ENTERPRISES

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ABSTRACT

This study explores Malaysia's regulatory landscape on corporate sustainability commitments. Using data from the Department of Environment (DOE) and the Department of Occupational Safety and Health (DOSH) from 2018 to 2023, this study reviews the environmental, safety, and health convictions involving Small and Medium-sized Enterprises (SMEs) in the agricultural sector. The documented convictions are proxies for corporate sustainability gaps that allow for compliance-based analysis such as of the Environmental Quality Act 1974 (EQA) and the Occupational Safety and Health Act 1994 (OSHA). Descriptive analyses outline the characteristics of the frequently committed transgressions, and the penalties imposed on the misconducts. The DOE and DOSH data, which were crosschecked, reveal 46 violations by 33 agricultural SMEs from 469 violations across all sectors. Section 16(1) of the EQA was the most frequently violated with a total of 31 cases, which represent 67.4% of total violations. This was succeeded by Section 15(1) of the OSHA with 10.9% (5 cases) of the violations. This study highlights concerns on regulatory convictions towards positive changes among SMEs through sustainable approaches to conserve the environment and promote safe and healthy workplace. The findings offer input for the policymakers in improving sustainability regulatory instruments in the Malaysian agricultural sector.

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Introduction

Sustainability issues in Small and Medium-sized Enterprises (SMEs) are gaining attention following the increase in global issues on environmental pollution, natural resource depletion, and social demands. SMEs play a vital role within the economies of every nation as they contribute towards the Gross Domestic Product (GDP) of the nation and provide employment opportunities. In Malaysia, SMEs comprise 98.5% of total business entities and generated 38.3% of Malaysia's GDP as of 2020 (SME Corp. Malaysia, 2020). Despite their contribution towards the economy, the incorporation of environmental and social sustainability practices into the operations of

SMEs has not expanded as expected due to low financial resources, inadequate expertise, and high costs of sustainable practices (Latip *et al.*, 2022). This study focuses on understanding the Malaysian regulatory landscape associated with sustainability practices of agriculture-based SMEs by analysing regulatory convictions levied by the Malaysian Department of Environment (DOE) and the Department of Occupational Safety and Health (DOSH). By analysing environmental and safety and health convictions, this study seeks to offer insights into the sustainability landscape among agricultural SMEs.

Large disparities arise when addressing SMEs, especially in emergent economies such as Malaysia. Despite being the pillar of the economy, the SMEs have little to no effective ways of integrating with Environmental, Social, and Governance (ESG) practice. The absence of standard ESG frameworks targeting such companies prevents them from showcasing their sustainability and therefore, from reaching their potential for increased competitiveness over the long term in terms of attracting investors. The necessity of developing ESG descriptor for SMEs can be explained by the absence of efficient indicators for them in currently existing systems of ESG standards, that are mainly targeting big business.

SMEs face various issues in relation to sustainability. In the aspect of agricultural enterprises, their main challenges revolve around the use of natural resources for production. The utilisation of land, water, and energy involve non-renewable resources and agricultural operations typically cause pollution through excessive use of pesticides, injudicious uses of fertilisers, and waste disposal that has adverse effects on the environment (Rajapakse *et al.*, 2022). Further, many agricultural SMEs lack the resources or experience to put into practice sustainable technologies such as water conservation systems or bio farming techniques, since most of them are costly to install (Permatasari & Gunawan, 2023).

The costs of transitioning to more sustainable technologies, like drip irrigation to conserve water or renewable sources of energy to power the production unit, are expensive for SMEs (Hoogendoorn *et al.*, 2015). In a survey conducted by Permatasari and Gunawan (2023) involving agricultural SMEs from Southeast Asian countries, 60% of the respondents mentioned the difficulty in securing the upfront costs needed for sustainable technologies.

The financial barrier is further exaggerated by the reality that, compared to large enterprises, SMEs have slimmer profit margins and therefore, long-term investments involved in sustainability are hard to comprehend. As Latip *et al.* (2022)

highlighted, similar to the agribusiness value chain, most SMEs in the agricultural sector work under the average of 20% to 30% reduced margins compared with larger industrial enterprises and are unable to afford long-term investments risks for sustainable use of resources. Moreover, managing sustainability usually takes several years before such effort can reward the enterprises with good returns. For example, the costs related to adopting the organic farming practices that can reduce chemical fertiliser by up to 50% will cause five years for SMEs to get back from increment in market demand for organic products (Fauzi *et al.*, 2022). In sum, the high cost of implementation of sustainable strategies is made worse by the low levels of profitability common with SMEs.

At the same time, increasing importance and expectations being placed on food producers to ensure that the foods come through sustainable means are both an opportunity and threat to agricultural SMEs. According to Pramudya *et al.* (2022), consumers in Malaysia are ready to pay a 13% higher price for green agricultural produce, but there are no sufficient resources in SMEs to meet consumer demand. SMEs that do not adopt green practices will continue to be at a disadvantage because large and multinational companies prefer to work with environmentally friendly suppliers. This highlights a critical issue if SMEs view sustainability as an expense and not an opportunity in sustainable markets, where environmental and social views are considered a strategic weapon (Fadly, 2020). Therefore, under certain pressures or factors, companies may exaggerate or mislead their social or environmental actions through a superficial practice. Such a behaviour is referred to as greenwashing.

Recent research confirms that greenwashing erodes customer trust and loyalty, frequently translating into negative word-of-mouth and in some cases, overt brand avoidance (Bladt *et al.*, 2024). For instance, Nguyen and Duong (2025) showed that green deceptive claims increase the customers' boycott intention towards companies, particularly when their validity is

doubtful or unknown. Similarly, an analysis of the sustainability efforts of companies facing legal convictions by the DOE and DOSH raises an important research question regarding the credibility of their reported practices.

This study uses a legal-compliant framework to measure corporate sustainability commitment, rather than relying on the voluntarily disclosed CSR/ESG information as used in many prior studies. The framework focuses on documented environmental and social improprieties that include violations reported by the DOE and the DOSH, in relation to the legal framework such as of the Environmental Quality Act 1974 and the Occupational Safety and Health Act 1994 in Malaysia.

Being based solely on legal misconduct, this framework offers tangible, easy to substantiate means of evaluating ESG performance, against the vices of unavoidably subjective and potentially manipulative nature of voluntarily declared CSR/ESG information. In this study's context, legal compliance serves as a measurable indicator of an SME's sustainability positioning over time. While legal violations are used here as a proxy for ESG non-compliance, it is not taking the view that those with no reported violations are well-performing in ESG. Rather, it uses reported legal violations as an indicator of where sustainability and compliance culture are poor.

Therefore, the research objective of this study is to explore the regulatory convictions about sustainable initiatives that Malaysian agricultural SMEs espouse. By understanding how convictions differ in terms of their societal carry-out and their utility in eradicating non-sustainable behaviour as well as their use in encouraging sustainable practices, this study presents findings for future sustainable practices. In addition, this study identifies the limitations of SMEs in complying with regulatory measures and comes up with recommendations on the way forward by improving support measures for sustainability, including financial incentives and technical assistance.

Materials and Methods

Background on Safety and Health Convictions in Malaysia

In the Malaysian setting, there are two agencies that govern the promulgation of laws on environment and social concerns. First is the DOE, which serves as the primary agency responsible for implementing environmental legislation in Malaysia as well as governing on laws that aimed at controlling emissions, waste generation, and disposal and usage of natural resources, among others. Second is the DOSH, the agency that pays attention to the compliance of standards set in occupational safety, which has social sustainable development impacts. Over the years, both the DOE and the DOSH have taken a proactive stance in enforcing regulations, particularly through the imposition of penalties aimed at motivating firms to implement sustainable practices. Enforcement primarily occurs under the Environmental Quality Act 1974, overseen by the DOE, as well as the Occupational Safety and Health Act 1994, administered by DOSH.

Environmental violations are addressed under various sections and regulations, notably the PPKAS (Environmental Protection) Regulations 2009 and several sections of the EQA 1974 (such as Sections 16(1), 25(1), 29A(1), 31(1), and 37(1)(b)). In terms of social compliance, offenses are prosecuted under Regulation 5(1)(a)(aa) of the OSH (Notification of Accident, Dangerous Occurrence, Occupational Poisoning and Occupational Disease) Regulations 2004 (NADOPOD) and Section 15(1) of OSHA 1994. These key pieces of Malaysian legislation play a crucial role in curbing greenwashing by holding companies accountable for both their environmental claims and their actual impacts. As noted by Fadly (2020), such regulatory frameworks ensure that firms are responsible not only for what they promote but also for the tangible outcomes of their operations.

The two agencies have, in the recent past, stepped-up scrutiny of operations of businesses, particularly SMEs, in a process that has seen

the government scale up sustainable practices across several sectors including agriculture. According to Department of Environment (2022), agricultural sectors in Malaysia have seen an up-surge in fines for environmental violations to 15% between the year 2019 and 2021, with most of the violations arising from poor waste disposal and over polluting of water. Likewise, DOSH's penalties for occupational health and safety violations such as unsafe working conditions or no adequate training of personnel have also increased during the period under review with non-compliance citations in the agricultural industry increasing by 12% (Marzuki *et al.*, 2023). Due to increased regulatory scrutiny and enforcement actions, most SMEs have adopted formal environmental and safety management systems. For instance, a growing number of firms are now implementing frameworks such as the Eco Management and Audit Scheme (EMAS), ramping up recycling efforts, and improving workplace safety protocols. These measures primarily aim to ensure regulatory compliance and mitigate the risk of financial penalties (Rajapakse *et al.*, 2022).

The convictions that companies receive from authorities like DOE and DOSH reflect the areas that lack sustainability as these convictions indicate their inability to meet the environment and social expectations. The convictions bring out the notion that companies have not embraced suitable sustainability measures since such convictions are tied to stern environmental offences, which include wrong disposal of wastes, high discharges, or dangerous working conditions. For instance, the DOE in its 2022 report on convictions associated with excessive water pollution and illegal dumping of waste, pointed out how companies were off from achieving Sustainable Development Goals (Department of Environment, 2022).

Marzuki *et al.* (2023) confirmed that a large number of SMEs that are being imposed penalties in workplace safety received an unsatisfactory

score as an outcome of demonstrating a low commitment to social sustainability when restricting workers' welfare. Meanwhile, DOSH convictions focus on the social aspect of sustainability, mainly the labour aspect. Penalties given to risky working environments show that the majority of agricultural SMEs have not complied with basic means and facilities for protection of their employees' welfare.

Hence, the use of regulatory sanctions is a critical factor that helps determine the sustainability deficiencies in SMEs and their impact. The convictions effectively unmask some sectors that are definitely utilising unsustainable practices and signal that these businesses are not implementing due diligence on environmental or social responsibility measures. Government penalties, for example from DOE or DOSH, uncover possible sustainability holes on account of environment and social aspect failures. Penalties for the crimes like emissions or wrong disposal of wastes indicate that companies are relying on the non-sustainable techniques that pose a profound threat to the environment (Piñeiro *et al.*, 2020).

Thus, penalties do not only reveal erroneous patterns but also show the companies' inability to adapt to the emerging sustainable development trend. Increasingly, large multinational corporations, especially in manufacturing and retail are pushing their suppliers, often based in emerging economies, to comply with stricter environmental and social standards (Rahdari *et al.*, 2020; Villena *et al.*, 2021). This shift places even greater pressure on SMEs hoping to access global markets. Companies that fail to adhere to these strict environmental and social standards may lose potential partnerships with the large companies and miss out on international business opportunities (Rajapakse *et al.*, 2022). In contrast, SMEs that comply with environmental rules can get new business opportunities, as sustainability is already a competitive notice in today's environment (Permatasari & Gunawan, 2023).

Review of Literature on Convictions and Sustainability

The convictions that firms receive from authorities like DOE and DOSH examine the areas within a firm that lacks sustainability as these penalties indicate firms' inability to meet the environment and social expectations. These convictions show that penalised firms are less sustainable because their presumptions, such as excessive utilisation of non-renewable resources or lack of green technologies, are made clear. Penalties can therefore be seen as a clear signal of sustainable failures amongst these firms.

Yet, the function of convictions is not only punitive; they shape change in the SMEs and force sustainability to become a part of the company's strategic plan. For instance, penalties for violations in environmental change make companies incur the expenses of green technologies and enhance their performance. According to Asiedu-Ayeh *et al.* (2022), the integration of these technologies is projected to lower operational costs over time. In the same manner, adherence to the social sustainability requirements assists in satisfying customer expectations of environmentally friendly products, hence, giving these businesses a competitive edge within a more sustainable market. While initial implementation of punitive measures may incur significant expenses, the research suggests these actions could yield unforeseen strategic and financial advantages in the long term.

Thus, while rising costs and operational inefficiencies have been presented as barriers, convictions have a strong influence on SMEs to adopt sustainability strategies. Abdull Manaf and Ahamat (2022) stated that organisations with environmental breaches faced increasing probability of embracing green technologies, for instance renewable energy, in the coming year. Further, Yeow *et al.* (2020) found that companies that had been fined more than one time have a 50% higher propensity to adopt long term sustainable development solutions like organic farming or water efficient irrigation systems.

From these findings, it can be argued that, besides being deterrents, convictions could also redirect SMEs towards greater sustainability in the long run. Smith *et al.* (2019) observed that most SMEs employ sustainable measures like energy effective technologies or better disposal techniques only if they are penalised, which again proved the need for penalties to promote sustainable environments.

In this respect, the legal sanctions are not only punitive but are also effective encouragement of the change of behaviour. They urge SMEs to move beyond compliance, prompting them to invest in long-term sustainability initiatives that align with international environmental and social standards. For instance, penalties levied by DOE on organisations for poor wastes handling or high pollution have resulted in most SMEs implementing an improved systems on wastes recycling and disposal (Abdull Manaf & Ahamat, 2022). In the same way, consequences for failing to adhere to DOSH's safety regulations have done a lot to enhance the general development of safety standards for workers in the agricultural sector. Realising the risks of non-compliance with DOSH safety provisions, many businesses have come up with safer systems of working and training for their people to minimise hazardous exposures to circumstances at the workplace (Pramudya *et al.*, 2022).

Nevertheless, these convictions have to be imposed within legal structures and frameworks and backed up by supporting structures. Regulations are numerous, often when standard requirements are set, they differ across regulatory organisations, and this is a challenge that SMEs face in their compliance. SMEs are revealed to have inadequate capital or manpower to address these requirements, resulting in higher costs that discourage sustainability (Fadly, 2020). Lamoureux *et al.* (2019) conducted a scoping review to identify the role of regulatory bodies and found that regulatory bodies should offer

technical support and potentially, funding to assist SMEs in achieving sustainability compliance.

Hence, it is important to revisit how convictions do not only serve the purpose of compliance but also steer SMEs towards sustainable practices. The threat of penalties causes immediate reaction (Piñeiro *et al.*, 2020). SMEs, especially in agriculture, are likely to enhance the sustainability practices to avoid penalties compared to potential sustainable revenues because penalties were deemed as a more potent motivator than revenues from sustainability (Johnstone & Hallberg, 2020). There are generally high risks involved in agriculture, and regulatory compliance has pressed most enterprises to enhance labour protection, wages for their personnel, and overall staff well-being (Pramudya *et al.*, 2022). Even when companies implement changes primarily in response to regulatory pressure, these actions often lead to more substantial and enduring improvements in corporate sustainability. Regulatory requirements, be they directed at working conditions, pay, or the health, safety, and environmental issues, create substantive paths for firms to align their practices with internationally accepted sustainability frameworks.

Within the Malaysian and Southeast Asian contexts, the compounding pressure of regulatory and stakeholder pressures has accelerated adoption of ESG reporting, governance reform, and stronger accountability mechanisms, all in accordance with international standards like those of the Global Reporting Initiative (GRI) and the United Nations Sustainable Development Goals (SDGs) (Kamaludin *et al.*, 2022; Ming *et al.*, 2024). Empirical research confirmed the view that improved governance in sustainability not only reinforces compliance, but is also associated with increased financial performance, which in turn motivates companies to internalise the reforms (Fransisca *et al.*, 2025). Lastly, evolving regulatory contexts are pushing corporates towards increasing adoption

of global standards for corporate accountability and responsibility (Pham & Chiu, 2021).

Data and Sources

For the dataset, secondary data is employed. Secondary data refers to datasets that were not directly collected by the researcher but were gathered by others for different purposes (Martins *et al.*, 2018). Secondary data exists, usually in databases, annual reports, or public statements. This study employs secondary data obtained from the authoritative sources, specifically from the DOSH and the DOE websites. The data obtained are the convictions imposed on Malaysian SMEs for environmental and social violations. The data serve as a proxy for ESG commitment, representing the extent of compliance to sustainability practices. The data can be analysed using quantitative method and hence, reliance on data in this manner facilitates objective quantification and statistical interpretations.

Secondary data were used due to their cost-effectiveness and reliability. In this study, the alignment with legal records, rather than self-reporting-biases, make the data highly suitable for compliance-based analysis as compared to primary methods such as interviews or surveys (Martins *et al.*, 2018). Nevertheless, as noted by Martins *et al.* (2018), using secondary data in academic research requires careful evaluation of the database's appropriateness. For instance, when examining governmental sources such as the DOE and the DOSH in Malaysia, several important factors justify their selection.

First, governmental agencies are often viewed as transparent and reliable, which are essential criteria for ensuring the credibility of the data (Martins *et al.*, 2018). This allows the study to utilise existing datasets from authoritative sources that include legal information on environmental and social violations and penalties, forming a strong basis for further analysis. Additionally, these agencies regularly conduct surveys, yielding comprehensive datasets that align well with the study's objectives (Martins *et al.*, 2018).

Therefore, using secondary data is both time-efficient and cost-effective compared to gathering primary data, allowing researchers to concentrate on the main elements of their research (Martins *et al.*, 2018).

The dataset used in this study confines to the penalties given by the DOE and DOSH from 2018 to 2023. Generally, the information includes penalties for environmental offences, misuse of wastes and emissions, and occupational safety and health violations, as well as inadequate/stuttering working conditions/unprotected employees. Data were obtained from the published official reports of the DOE and DOSH, the agencies under the Ministry of Natural Resources and Environmental Sustainability and Ministry of Human Resources, that bear the responsibility of implementing the laws such as the Environmental Quality Act 1974 and the Occupational Safety and Health Act 1994 (Marzuki *et al.*, 2023). The information is posted to DOE and DOSH websites. These sources offer information on environmental compliance, safety compliance, name of the company involved, details of the legal proceedings in SMEs, violation details, regulatory response etc., which are essential in analysing SMEs' environmental and social non-compliance.

Hence, our datasets contained environmental offences recorded by the DOE and occupational health and safety violations tracked by the DOSH. The DOE website offers comprehensive information concerning court actions, dates, exact violations, and penalties. The DOE dataset is mainly concentrated on environmental wrongdoings such as illegal dumping of wastes, non-conformity to water pollution laws and regulations, and emission beyond legal parameters.

The DOSH website focuses on safety compliance by presenting legal actions and measures, violations by sectors, and penalties that would enable the user to appreciate occupational safety practices. For the DOSH dataset, we identified the workplace safety violations prevalent in the agriculture sector such as lack of property, plant and equipment,

inadequate training for the workers about safe practices, and unsafe workplace. These data points were gathered from the documented convictions to proxy for corporate sustainability gaps in representing corporate sustainability commitment.

Sample Selection

For this study, the selection criteria focused on SMEs that had previously faced penalties from the DOE or the DOSH specifically for violations related to their agricultural operations. Non-agricultural enterprises were excluded to ensure a concentrated examination of sector-specific sustainable development challenges.

The selection of the Malaysian agricultural sector was based on its relevance in the country's economy and its impact on the environment because of its dependence on natural resources. More specifically, agriculture enterprises have huge relevance in sustaining food security needs, coupled with employment and economic development of Malaysia's sector. Employment through the agriculture sector is more than 16% and contributes 7.1% to the total GDP of the nation and therefore, is a significant sector (Muhsin *et al.*, 2021; Sulaiman, 2023).

Moreover, the sector sustains the rural and appropriate resources of people and plays its role in poverty reduction by investing in agricultural business and all agriculture-related sectors (Alam *et al.*, 2019). Another important aspect is the environmental implication of the sector, in relation to Malaysian agricultural practices in resources conservation and environmental management. As example, policy interventions practised in the palm oil industry prove that agricultural modernisation can provide stimuli for improvement and economic growth of the sector along with the generation of rural employment (Shehu *et al.*, 2020).

Further, the critical role of the agricultural sector cuts across most objectives involving food security including efforts to address the impacts of global warming. Global warming affects agricultural production in Malaysia and thus, using sustainable techniques to increase

farms' yields is crucial (Muhsin *et al.*, 2021). Leading policies for agricultural practices and calling for additional applications within technology development are additional proofs that agriculture remains one of the crucial sections within the Malaysian context of sustainability (Adnan *et al.*, 2020). As such, there is a need to concentrate on the agriculture sector because of its importance to Malaysia's sustainability in the dimensions of economic, social, and environmental sustainability.

Analysis

For the analysis, cross-checking was first made between the two sets of data. Although the data from DOE and DOSH were gathered separately (as they are from different websites), there were no redundancies in the type of violations as there are specific legal frameworks identified for each violation (Table 1). Nevertheless, similar SMEs were identified from the two sets of data by referencing the company name and address. We then went through an in-depth

Table 1: Summary of key regulations and their scopes from DOE and DOSH

Regulation/Act	Definition	Scope Description
Section 16(1), Environmental Quality Act 1974	16. Licensee to comply with licence. (1) The holder of a licence shall comply in every respect with the terms and conditions thereof.	Discharging industrial wastewater into rivers, drains, or directly onto land without obtaining the appropriate license from the Director General.
Section 25(1), Environmental Quality Act 1974	25. Restrictions on pollution of inland waters. (1) No person shall, unless licenced, emit, discharge, or deposit any wastes into any inland waters in contravention of the acceptable conditions specified under section 21.	Disposing of substances such as chemicals, sewage, or solid waste directly into bodies of water.
Section 29A(1), Environmental Quality Act 1974	Section 29A. Prohibition on open burning. (1) Notwithstanding anything to the contrary contained in this Act, no person shall allow or cause open burning on any premises.	Conducting open burning of waste, biomass, or similar materials, which leads to significant air pollution.
Section 31(1), Environmental Quality Act 1974	Section 31. Power to require occupier to install, operate, repair, etc. (1) Where any environmentally hazardous substances, pollutants, or wastes are being or are likely to be emitted, discharged, or deposited from any vehicle, ship, or premises irrespective of whether the vehicle, ship, or premises are prescribed under section 18 or otherwise, or from any aircraft, the Director General may by notice in writing require the owner or occupier of the vehicle, ship, or premises, or aircraft.	Operating factories, incinerators, or machinery that release excessive amounts of smoke, dust, or harmful gases presents significant environmental concerns.
Section 37(1)(b), Environmental Quality Act 1974	Section 37. Owner or occupier to furnish information. (1) The Director General may by notice require the owner or occupier of any vehicle, ship, premises or aircraft to furnish to him within the period as may be specified in the notice	Disregarding or failing to comply with official directives aimed at addressing environmental issues.

	information relating to- (a) the ownership of the vehicle, ship, premises, or aircraft; (b) the use of raw materials, environmentally hazardous substances, or any process, equipment, control equipment or industrial plant found on the vehicle, ship, premises, or aircraft.	
Environmental Quality (Industrial Effluents) Regulations 2009/PPKAS (EP) 2009	These regulations govern the discharge and treatment of industrial effluent.	Discharging untreated waste, operating without the necessary authorisation, or disregarding established effluent standards.
Regulation 11(1)(b), Environmental Quality (Industrial Effluents) Regulations 2009/PPKAS (EP) 2009	Regulation 11. Acceptable conditions for the discharge of industrial effluent other than parameter of Chemical Oxygen Demand (COD). (1) No person shall discharge industrial effluent which contains any parameter in concentration greater than the limits of: (a) Standard A, as shown in the third column of the Fifth Schedule, into any inland waters within the catchment areas as specified in the Sixth Schedule or (b) Standard B, as shown in the fourth column of the Fifth Schedule, into any other inland waters or Malaysian waters.	Operators are obligated to consistently monitor effluent quality and submit accurate reports to the Department of Environment. Failure to submit required monitoring reports or falsifying data on effluent discharge.
Section 15(1), Occupational Safety and Health Act 1994	15. General duties of employers and self-employed persons to their employees. (1) It shall be the duty of every employer and every self-employed person to ensure, so far as is practicable, the safety, health, and welfare at work of all his employees.	Neglecting to ensure a secure work environment, insufficient training, lack of appropriate safety equipment, or failing to conduct thorough risk assessments.
Regulation 5(1)(a)(aa) Occupational Safety and Health (Notification of Accident, Dangerous Occurrence, Occupational Poisoning and Occupational Disease) Regulations 2004	Regulation 5. Notification and reporting of accident and dangerous occurrence. (1) Whenever any accident arising out of or in connection with work, which caused any person either— (a) death or (b) serious bodily injury, as specified in First Schedule, which prevents the person from following his normal occupation for more than four calendar days or where a dangerous occurrence, as specified in Second Schedule, takes place in any place of work, the employer shall— (aa) forthwith notify the nearest Department of Occupational Safety and Health office by the quickest means available and (bb) within seven days send a report thereof in an approved form.	Neglecting to promptly report incidents at the workplace such as injuries, exposure to hazardous substances, or significant hazardous occurrences within the mandated timeframe.

Note: Key provisions on environmental protection, labour safety, and regulatory compliance.

Source: EQA 1974; EQA (PPKAS-EP) 2009; OSHA 1994; OSHA (NADOPOD) 2004

review to categorise the violations according to the established legal frameworks in Table 1. The legal provisions in Table 1 address a range of environmental and workplace health and safety obligations of particular interest to SMEs in the agricultural industry. The categorisation process considered the specific nature of the offence, for instance, unauthorised effluent discharge or lapses in worker safety.

Then, quantitative content analysis was employed to systematically classify the violation records. In quantitative research, observations are transformed into numerical variables that can be summarised with statistics (e.g., frequencies, percentages, medians) and used to examine patterns over time (Creswell & Creswell, 2018). In this study, the quantitative content analysis is used to explore the nature and trend of regulatory convictions set by the DOE and DOSH. Quantitative content analysis specifically applies structured coding to textual records so that categories are measured and analysed statistically (Krippendorff, 2022). In this study, our unit of analysis is the conviction record where each record was coded for year, agency (DOE/DOSH), section violated, and penalty imposed. This design is quantitative because all outcomes are numeric (counts and amount of penalty imposed) and are subjected to descriptive statistics and trend summaries across 2018 to 2023.

A set of predetermined criteria was established to systematically extract key variables and code them. The criteria used refer to the nature of the violations such as types, frequencies, and year of occurrence of the violation as well as the amounts of penalties. The coding process involves sorting the data into thematic categories using Microsoft Excel such as by specifically distinguishing between environmental and occupational safety and health violations. This process facilitated a more comprehensive examination of the violations, beyond the basic classifications present in the original datasets.

The process is followed by the descriptive analysis based on the data point that have been

systematically classified. The analysis enables the study to identify recurrent noncompliance patterns, sectors with frequent repeat offenses, and commonly violated legal provisions. It also allowed for an overview of enforcement trends over time and highlighted firms demonstrating consistently low regulatory compliance. This approach presents a quantitative assessment of compliance among Malaysian agricultural SMEs, drawing attention to key regulatory issues and those areas where non-compliance appears likely to persist.

Results

This section presents the findings in relation to the analysis of the environmental, safety, and health non-compliance involving SMEs in the agricultural sector, where the convictions from 2018 to 2023 are assessed. The interpretation of the results was guided by a legal-compliance framework, using documented penalties as proxies for sustainability gaps. It also looks at the rates of violations, the amounts of penalties, and their changes with time. The major areas of these investigations include environmental offences such as ill disposal of wastes, wrongful emissions, and social offences involving hazardous working conditions. The analysis also took a closer look at the nature of the penalties given and how these convictions exposed sustainability shortcomings within such companies.

Types and Trend of Convictions

The analysis reveals a total of 46 convictions among agricultural SMEs in Malaysia from 2018 to 2023. As shown in Table 1, there are nine type of convictions against those SMEs: Seven type of convictions under the environmental aspects and two type of convictions under the social aspects. For environmental convictions, the regulations that were offended by the SMEs are PPKAS (EP) 2009, Regulation 11(1)(b) PPKAS (EP) 2009, Section 16(1) EQA 1974, Section 25(1) EQA 1974, Section 29A(1) EQA 1974, Section 31(1) EQA 1974, and Section 37(1)(b) EQA 1974. Meanwhile, the regulations

that were offended by the agricultural SMEs in terms of social convictions are Regulation 5(1) (a)(aa) OSH (NADOPOD) Regulations 2004 and Section 15(1) OSHA 1994.

Meanwhile, as shown in Figure 1, Section 16(1) of the Environmental Quality Act 1974 was the most frequently violated with a total of 31 cases, which represent 67.4% of total violations. This was succeeded by Section 15(1) of the Occupational Safety and Health Act 1994 with 10.9% (5 cases) of the violations. The remaining 21.7% included other regulations for environmental regulation and regulation of workplace accident reporting. As observed from this distribution, there is a strong indication of high instances of environmental quality violations, which could indicate system failure

in environmental compliance by agricultural SMEs.

Table 2 presents the descriptive statistics for the type of convictions against the SMEs in the agriculture sector. For the environmental aspect, Section 16(1) of the Environmental Quality Act 1974 was the most frequently convicted with a total of 31 cases, which represent 67.4% of the SMEs found guilty of discharging industrial wastewater into rivers, drains, or directly onto land without obtaining the appropriate license from the Director General. Section 16(1) of EQA 1974 states that “The holder of a licence shall comply in every respect with the terms and conditions thereof”, which refers to the regulation relating to licensee’s compliance with licence. Non-compliance with Section 16(1) of

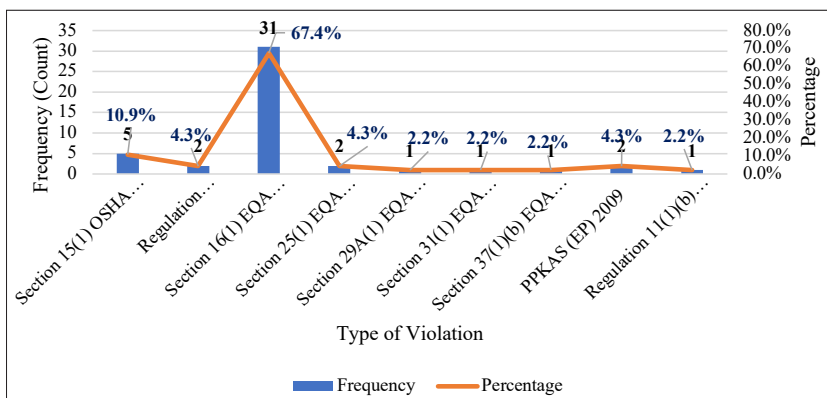


Figure 1: Type of violations and frequencies of convictions among agriculture SMEs (2018–2023)
Source: Author (2025)

Table 2: Descriptive statistics for type of violations

Type of Violations	Frequency	Percentage (%)
Section 16(1) EQA 1974	31	67.4%
Section 25(1) EQA 1974	2	4.3%
Section 29A(1) EQA 1974	1	2.2%
Section 31(1) EQA 1974	1	2.2%
Section 37(1)(b) EQA 1974	1	2.2%
PPKAS (EP) 2009	2	4.3%
Regulation 11(1)(b) PPKAS (EP) 2009	1	2.2%
Section 15(1) OSHA 1994	5	10.9%
Regulation 5(1)(a)(aa) OSH (NADOPOD) Regulations 2004	2	4.3%
Total	46	100.0%

Source: Author (2025)

EQA 1974 indicates that a company breach the condition of obeying the terms and requirements specified in its environmental license. For example, companies might not be able to meet emissions limits, dispose of waste improperly, fail to submit necessary reports or falsification thereof, use devices that violate the requirements for type-approval, and delete destruction conditions that reduce environmental impact.

The conviction analysis (untabulated) further indicated that water pollution was the most frequent issue among agricultural SMEs and mostly connected to Section 16(1) of the Environmental Quality Act 1974. This finding supports previous studies that focused on the challenges that SMEs encounter while implementing efficient water management practices, as highlighted by Rajapakse *et al.* (2022). While effluent discharge management remains a struggle for many enterprises operating in this area, closer examination reveals temporal trends and underlying challenges. Recurrent infringement may be due to poor wastewater treatment facilities, poor technology, or poor financial resource base to put in place strong water management systems.

The following common violation was related to Section 15(1) of the Occupational Safety and Health Act 1994 with 10.9% (5 cases) of the violations from the social aspects. Section 15(1) of the OSHA 1994 provides that “Every employer and the self-employed person shall

ensure, so far as is practicable, the safety, health, and welfare at work of all his employees”. This pertains to the provision and maintenance of safe workplaces, plants and machinery, work systems, necessary training, supervision, and protective measures to prevent accidents and occupational health hazards. The offences can also include not being considerate on the appropriate handling of equipment used, ignoring health hazards such as bad air quality or over-abundant noise, and failing to provide appropriate welfare provisions, including clean site toilets. Similarly, not inspecting work accidents or addressing safety issues leads to the offences of law due to increased security risks for workers.

When it comes to the number of convictions, the trend over time is far more interesting. Table 3 shows yearly violation trends among agricultural SMEs from 2018 until 2023. The results of the analysis suggest an increase in 2019 that could be due to increased scrutiny or increasing non-compliance. However, the subsequent decline from 2020 to 2021 may be due to pandemic distraction from normal business processes. On the other hand, new policies that were developed or awareness campaigns could have gradually increased in the compliance to guidelines as earlier deterrence sets in slowly. Occupational safety breaches further highlight the prevailing environmental and social sustainability issues that agricultural small businesses continuously aim to remedy. Pramudya *et al.* (2022) also

Table 3: Yearly violation trends among agricultural SMEs (2018–2023)

Year	Total Violations	Most Frequent Offence
2018	14	Section 16(1) EQA 1974 (11), Section 25(1) EQA 1974 (2), PPKAS (EP) 2009 (1)
2019	17	Section 16(1) EQA 1974 (10), Section 29A(1) EQA 1974 (1), Section 31(1) EQA 1974 (1), Section 37(1)(b) EQA 1974 (1), Section 15(1) OSHA 1994 (2), Regulation 5(1)(a)(aa) OSH (NADOPOD) Regulations 2004 (2)
2020	9	Section 16(1) EQA 1974 (6), Section 15(1) OSHA 1994 (3)
2021	6	Section 16(1) EQA 1974 (4), Regulation 11(1)(b) PPKAS (EP) 2009 (1), PPKAS (EP) 2009 (1)
2022	-	-
2023	-	-

Source: Author (2025)

highlighted that environmental and social issues are interrelated in the agricultural industry. The number of these violations as compared to the environmental ones might indicate that there is better compliance in this area or that enforcement of the occupational safety violations is not as strict as the environmental ones.

Amount of Penalties

The following analysis looks into the amount of penalties of the convictions incurred. As shown in Figure 2, the minimum and maximum amounts are RM1,000 and RM 85,000, respectively. These show the existence of a scale that could be based on the type of the violation, the size of the enterprise, and possibly its previous record on this matter. As for the penalties that ranged from RM3,500 to RM40,000 with most of the

penalties being levied around the median of RM12,500, the figure implies a standard penalty for routine violations.

As shown in Table 4, the amount of penalties imposed on the violating SMEs ranged from RM1,000 to RM85,000, with a mean of RM15,923.911 and a median of RM12,500. The standard deviation of RM15,071.67 shows that the ranges of fine amounts are rather volatile. The most common fine imposed was RM15,000 for the violations incurred as it is the most frequently occurring fine amount. This distribution suggests a graduated penalty system, with most fines clustering around the median but with significant outliers for more severe or repeated violations. The variation in fine amounts implies penalty imposition based on violation severity and circumstances.

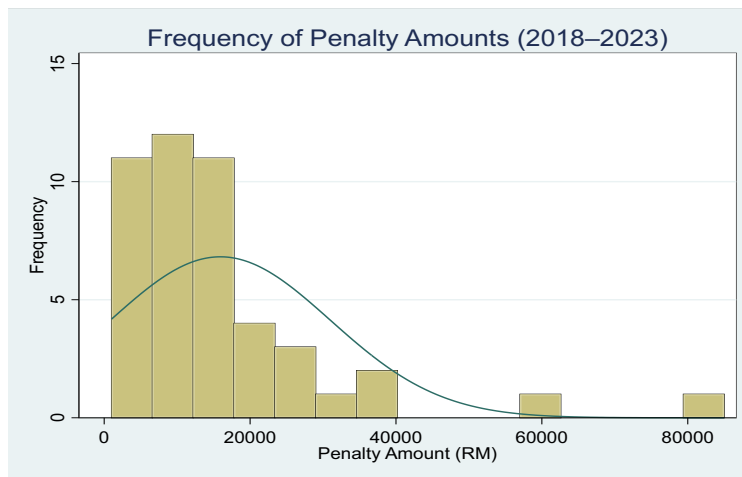


Figure 2: Amount of penalty and frequencies of convictions among agriculture SMEs (2018–2023)

Source: Author (2025)

Table 4: Descriptive statistics for amount of penalties

Descriptive Statistics	RM
Mean	15,923.91
Median	12,500.00
Mode	15,000.00
Standard Deviation	15,071.67
Minimum	1,000.00
Maximum	85,000.00

Source: Author (2025)

Further analysis (untabulated) indicates an increase in penalties over the years of observation and the dramatic spike in 2021 denotes an alteration in the method of implementation. This amplification can be interpreted as both a heightening in the frequency and harshness of non-adherence, as well as a sign of strengthened enforcement intended to transform the conduct of SMEs. It may also imply that authorities have adjusted their tact to utilise more punishing penalties as an effective instrument of implementation. This emerging trend coincides with the study of Abdull Manaf and Ahamat (2022) that reporting sanctions have been used proactively recently to encourage companies, particularly those belonging to the small and medium category, to adhere to sustainability. This pattern suggests an escalating focus on monetary-based incentives to increase compliance with sustainable practices.

Discussion

The findings highlight that the worst year was 2019, while the number of violations declined in subsequent years, and this may be due to the COVID-19 pandemic, or stricter compliance measures. However, there was an overall trend of improvement in sums of penalties where a massive jump was observed in 2021. A significant increase in average fines in 2021 suggests that enforcement became stricter, aligning with broader regulatory trends to incentivise sustainable practices.

Further, the pattern emerging from the conviction records is undeniable, where penalties are highest when the environmental harm is direct and visible, particularly in cases involving air pollution and the improper management of effluents. This mirrors the observation by Fauzi *et al.* (2022) that regulators have intensified punitive action in domains with immediate and conspicuous ecological impacts. In contrast, occupational-safety offences attract comparatively lower fines in our sample. While those amounts are not insignificant, the differential signals a potential deterrence gap on the social-sustainability front. If the aim

is to reduce injuries and unsafe practices as vigorously as emissions and effluent breaches, the penalty structure for workplace-safety infringements may warrant recalibration to better align with the gravity and frequency of risks encountered by agricultural workers.

As a result of the numerous breaches of environmental legislations, agricultural SMEs ought to orient towards the implementation of more effective environmental management systems and technologies. This may involve embracing sustainable agriculture, enhancing waste disposal management, cutting down on pollution, and employing less invasive technologies in order to reduce environmental degradation and resource use.

Moreover, measures such as the application of pollution free technologies and replacement of fossil fuels with cleaner energy sources should be incorporated to control pollution. SMEs should also pay attention in developing environmental management systems that incorporate all aspects of sustainability. Furthermore, improving occupational safety training and promoting safety culture among the employees is crucial to decrease the specified safety violation. Some of the limitations might be addressed by involving large companies or industries or industry associations to share practices and resources in implementing these measures, which is likely to be beyond the reach of many SMEs (Kumar *et al.*, 2022).

However, relying solely on punitive measures does not fully address the challenges faced by SMEs, which often operate with lack of resources or specialised knowledge. Instead, enforcement authorities ought to consider a more strategic approach that blends enforcement with genuine support. For example, alongside issuing penalties, offering consultancy or advisory services can help businesses understand where they went wrong and more importantly, how to fix it. Agencies should also improve their ability to gather and analyse data to better detect new trends and to better focus their enforcement activities. Moreover, the more transparent enforcement actions and outcomes are, the

greater the additional deterrent effect, as well as the more trust between the regulators and the regulated is created (Piñeiro *et al.*, 2020).

Implications

The findings offer several important implications. To the policymakers, it is suggested that a more refined approach be adopted in increasing sustainability compliance among agricultural SMEs. First, development of the guidelines that would be more specific to the industry and that would consider specific challenges that SMEs face in the agricultural sector may provide more direction for compliance. Second, establishing a hierarchical structure of the administrative system that takes into account the scale and solvency of SMEs when applying sanctions might guarantee equity while maintaining a deterrent effect. Third, the provision of monetary incentives or tax exemptions for SMEs that invest in sustainable technologies or initiatives may help to offset the costs of compliance and encourage more positive action. Fourth, fostering partnerships between the governing bodies, investigation bodies, and business associations could help to promote the sharing of information and dissemination of sustainable innovations among the agricultural SMEs in Malaysia.

Limitations

The limitations of this study are points worth discussing. First, the use of secondary data has clear limitations, including the absence of contextual insights. For example, the problem with using only documented evidence is that it does not capture the cases where the companies have not complied with sustainability standards or other challenges that SMEs encounter. Second, concentrating on a certain period may conceal the trends of a longer period of time. While the quantitative analysis of patterns proves beneficial, it does not offer a complete picture of the reasons for noncompliance or the qualitative effects of enforcement. Other than that, focusing on one country, Malaysia, may restrict the ability to generalise the results to

other agricultural settings due to the differences in industry structure and rules across countries. Further, the study lacks post-transgression follow-up or examining if penalties do lead to better ESG and this is a shortcoming and a prospect for future longitudinal work. Our study does not have the data and analysis demonstrating a direct shift toward specific ESG practices post-enforcement, but it does operate under the premise that regulatory actions, especially those with financial or punitive consequences, which hold significant potential to drive improvements in environmental and social performance.

Future Research

Considering the limitations of the study, future studies are recommended to consider the following approaches. Future researcher should employ qualitative studies to establish the reasons behind the non-compliance and the experiences of the agricultural SMEs in addressing sustainability standards. Cross-sectional studies that assess the impact of various pro-social enforcement strategies on compliance conduct over time are of value as well.

Ultimately, further empirical study is necessary to examine patterns of non-compliance within the wider discourse on sustainability enforcement, questioning whether these interventions may foster more robust ESG engagement among SMEs in the future. Further, comparing one area to another or one nation to another could also allow in exploring how other nations or states have managed to ensure that agricultural SMEs are practising sustainable practices. Such analysis could highlight some of the key factors that make it difficult to enhance environmental and social sustainability in the context of the small agricultural enterprises in Malaysia.

Conclusions

The focus of this study is to explore the level of compliance to environmental and social sustainability among agricultural SMEs in Malaysia. This study sought to identify

frequently observed environmental, safety, and health violations documented in the DOE and DOSH databases for the period between 2018 and 2023. The violations were categorised based on the legal framework and key data were extracted based on predetermined criteria such on the type of violations and amount of penalties. Findings from this study reveal some key understandings for future policy on the topic and in improving sustainable agriculture, to fill the gap left by other published research, on small business sustainability in developing countries. In sum, the analysis highlighted the challenges of environmental and social sustainability in the agriculture sector. The convictions and the associated penalties reveal interesting patterns of recurrence. The analysis on the violation types and penalties gives the understanding of where and how the regulation focuses on the various aspects of sustainability.

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Conflict of Interest Statement

The authors declare that they have no conflict of interest.

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