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Corruption risks and potential threats to the forestry sector in Peninsular Malaysia

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ABSTRACT
Corruption and forest disturbances represent substantial barriers to sustainable development in Malaysia's forestry sector. Working within this sector faces a variety of threats. This study explores key corruption risks within the forestry sector, analysing the motives and opportunities that drive forest offences in Peninsular Malaysia. Respondents from relevant agencies were primarily surveyed using questionnaires. Data analysis using SPSS revealed the corruption risks encountered within the forestry sector. Respondents identified fieldwork and reporting as potential areas susceptible to corruption, with their perceptions analyzed through central tendency and dispersion measures. Additionally, correlation analysis was conducted to determine the strength and direction of the relationship between motive and opportunity regarding forest offences, and to assess whether the correlation was statistically significant. The findings demonstrated a robust positive correlation (r = 0.66) between motive and opportunity, indicating a significant relationship. This suggests that motives for forest offences correspond to opportunities for such offences. This study highlights the need for targeted collaboration between the Forestry Department and relevant authorities to develop specialized training programs. These programs are crucial for effectively investigating and prosecuting forest violations, ultimately reducing corruption risks.
Keywords: Corruption, Forestry, Forest Offences, Peninsular Malaysia, Threats

1. Introduction

Malaysia is one of the world's richest countries in terms of forest biodiversity. Malaysia's total land area spans 13.18 million hectares, with forests covering 5.79 million hectares, or 43.9% of the land [1]. In Peninsular Malaysia, forestry administration is organized at the federal, state, and district levels. Apart from Malacca, each state in Peninsular Malaysia has its forestry department, led by the State Director of Forestry, who delegates to the state's Chief Minister. The state forestry department is in charge of carrying out the state's forest policy, including forest law enforcement, while the district office is in charge of forest law with recommendations from the state forestry office [2]. In addition, the Forest Department of Peninsular Malaysia (FDPM) is responsible for preventing illegal deforestation by affirming its commitment to sustainable forest management practices.

Corruption and forest offences have become an increasingly critical issue that every person, organisation, and global community should be aware of. Officers in the forestry sector also face various threats while on the job. Afterwards, forest-related corruption is widespread at all levels in many countries, from petty corruption up to

grand corruption, such as local forestry authorities accepting fees to disregard timber harvesting in protected areas and a Minister involved in taking bribes to allocate timber concession licences [3]. In addition, failure to effectively enforce legislation often leads forestry firms to engage in corrupt activities and make unlawful gains that exceed their legal income from their jobs. For example, [2] noted that Peninsular Malaysia's leading cause of illegal logging remains undetermined. Still, some NGOs claimed that unlawful logging in Peninsular Malaysia occurred due to corruption among forest authorities, weak law enforcement, and inadequate enforcement operations.

The total number of corruption cases reported during those periods is 535, with the highest recorded in 2015 at 127, and the lowest in 2020 at 65. Additionally, in 2015, the highest number of investigation papers, totalling 23 cases, were opened to ensure careful and fair judgments regarding the involvement of individuals in offences. Furthermore, there has been a decreasing trend in the number of reported, arrested, accused, and convicted corruption cases year by year, as reported by the Malaysian Anti-Corruption Commission (MACC). This decline may be attributed to increased awareness of the detrimental effects of corruption within the forestry sector and other institutions. The MACC has specifically focused on combating illegal logging, resulting in several arrests of individuals involved in corrupt forest authorities in Peninsular Malaysia. As part of this effort, the MACC has also participated in events organized by Transparency International Malaysia to underscore the importance of sound forest governance [4].

The Forest Department controls forest encroachment, unauthorized harvesting, and other illegal activities in Permanent Forest Reserves. However, illegal logging persists despite efforts to tighten forest law enforcement. According to [5], the National Forest Act was revised in 2010 to empower the Peninsular Malaysia State Forest Department to collaborate with the police and army in combating illegal logging, increasing penalties and imprisonment for offenders. Additionally, according to the World Bank in 2006, an effective model integrates means, motive, and opportunity to identify the rationale behind criminal activities. However, this study focuses solely on forest offences from the perspectives of motive and opportunity, overlooking various other factors influencing the prevalence of such crimes. Nonetheless, it highlights that forest crime remains a lucrative endeavour.

Regarding motive, forest offences typically stem from bureaucratic hurdles, demand for timber, and the lure of financial gain [6]. Small-scale logging companies may resort to illegal operations due to bureaucratic challenges, limited resources, and difficulties complying with enforcement laws [7]. Unclear regulations or high costs may hinder compliance, prompting operators to bypass legal channels [8]. Moreover, the high costs associated with logging concessions incentivize illegal operators to engage in unlawful activities to offset financial losses incurred through compliance with government regulations [9]. Consequently, the expense of compliance motivates operators to resort to illegal logging activities [10]. Illegality in small-scale logging operations has been observed in countries such as Indonesia, Papua New Guinea, and Brazil [8].

While the monetary gain is cited as the primary motive of the crime [7], the potential for an increased profit margin also serves as a reason for illegal logging. Therefore, illegal operators in forestry undertake illegal operations to profit in the short and long term. Forest offences usually include tax evasion, trafficking, and smuggling [11] to generate profit. The insufficient punishment of forest criminals may lead to further offences [12]. In Peninsular Malaysia, the offenders were charged a maximum penalty of RM 500,000 and imprisonment. For less than one year but not exceeding 20 years, the execution of Articles 15 and 40 of the National Forestry Act 1984 would constitute a dissuasive penalty. However, the punishment is not dissuasive for the offenders, and there is a high offender recurrence rate.

Paper-based documents can be fabricated [11]. The details can be changed in some documents before reusing and reselling them [6,13]. Research has shown that unlicensed loggers have used falsified paperwork to smuggle logs from prohibited areas. Further investigations revealed that bribes paid to officials led to the incorrect issuance of the removal permission. In other countries, faked documents or logging licences have shown that over 60% of permitted contractors use forged papers. Paper-based documentation violations include fraudulent inventories by forest engineers, fraudulent plans, and forged signatures. Multiple uses and falsifying removal passes were also reported [6]. For instance, in Malaysia, the wood monitoring system is primarily paper-based and utilises several logbooks to verify the lawfulness of the harvests.

However, a significant amount of perceived corruption remains in Malaysia, particularly in state governments' issuance of forest concessions. Many studies show that policymakers, state officials, family members, proxies, law enforcement officers, and businesspeople who have 'purchased' influence through 'unrecorded payments to officials, their agents, and the governing political party' are the primary beneficiaries of these concessions [4]. The fundamental factors that lead to forest crimes must be identified to resolve these issues. Thus, this study examines the potential corruption risks in forestry and elucidates the types of forest offences, particularly in terms of motive and opportunity, in Peninsular Malaysia.

2. Method

2.1. Study Approach

Two significant reasons justified this study as an appropriate methodological approach. Firstly, it addressed the research questions about the types of threats encountered in forest governance within this sector and the factors driving forest offence activities regarding motive and opportunity. Secondly, the study aimed to enhance the current understanding of corrupt activities in the forestry sector that posed the greatest threat to forest governance, particularly those with a significant impact and a high likelihood of occurrence.Consequently, the subsequent sections detail how the study was conceived and executed to significantly contribute to the academic discourse on corruption in the forestry sector. Figure 1 shows the study flowchart.

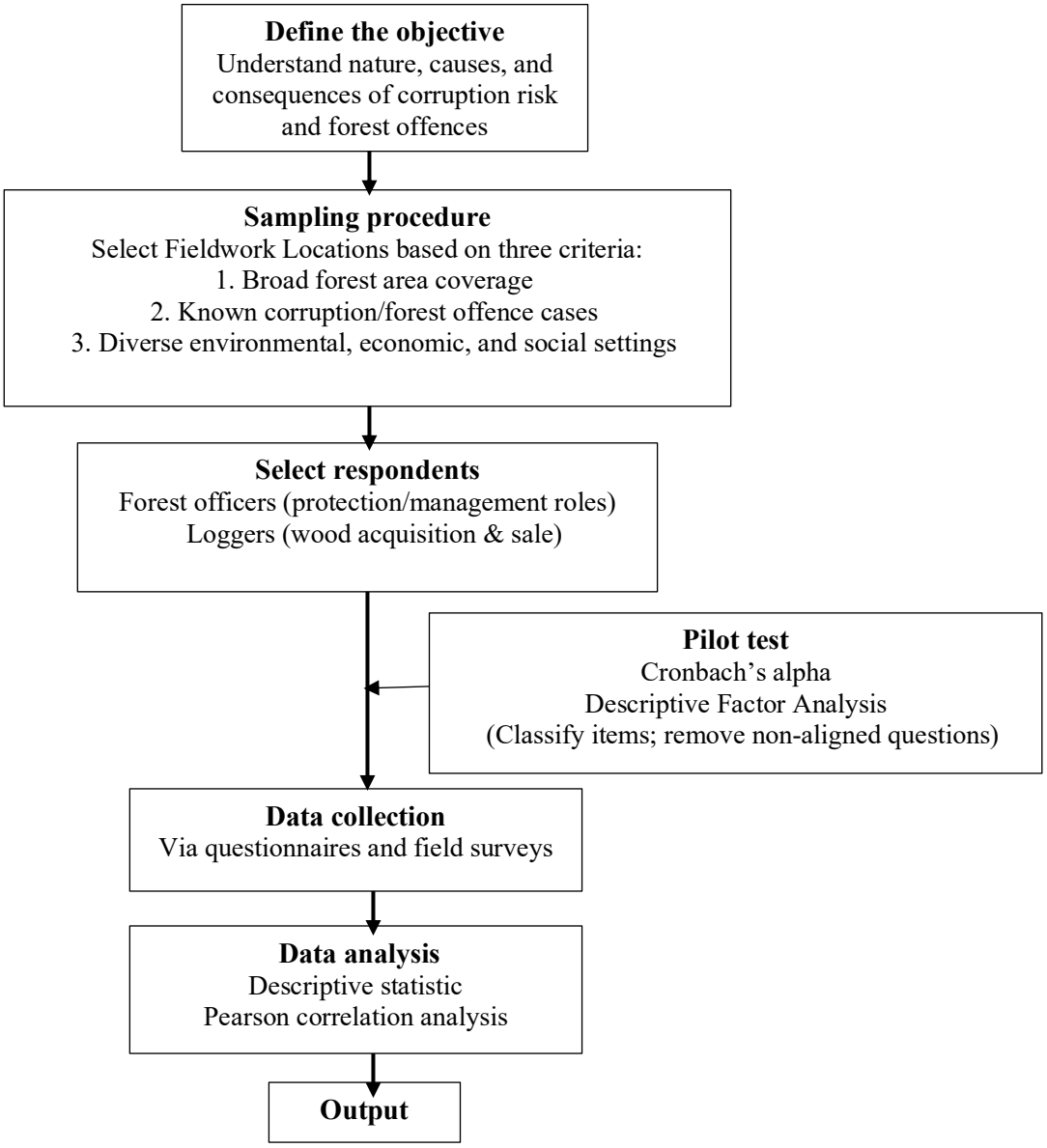

Figure 1. The flowchart of the study

2.2. Sampling Procedure

There are two primary levels of tasks in this study: observing the research site and sampling participants. [14] emphasized the importance of the sampling procedure in social research. The sample involves "selecting" the study sites, and participants were carefully chosen because their suitability aligns with the research objective.

Three main criteria were established beforehand to guide the selection of fieldwork locations. Firstly, the selected regions should encompass a broad forest area suitable for monitoring provincial forest management. Second, instances of corruption, regarding forest offences and criminal implications, provide valuable insights into the issue. Finally, the study sites should be situated in different locations, each characterised by distinctive environmental, economic, and social factors, offering diverse insights into the corruption problem.

Next, the selection of study participants constituted the second phase of the sample. The individuals chosen for this study were those believed to possess a profound insight into corruption risks and forest offences, with a high degree of relevance and depth. Questionnaires or survey forms were distributed to all officers in the FDPM across every state (Wilayah Persekutuan Kuala Lumpur, Selangor, Perak, Kedah, Pulau Pinang, Perlis, Pahang, Kelantan, Terengganu, Negeri Sembilan, Melaka, and Johor). Consequently, there was a unique rationale for choosing these two different categories of interviewees. Forest officers participated because of their involvement in forestry protection, management, and development, while loggers were selected because they were involved in the acquisition, processing, and sale of wood products.

2.3. Reliability and validity of questionnaires

A pilot test was undertaken before an extensive test on corruption risk and potential threats in the forestry sector. Questionnaires were distributed among lecturers and students from the Faculty of Forestry and Environment, yielding 20 responses. Ratings on a scale of one to five were collected for each series from Sections C and D. Subsequently, Cronbach's alpha was employed as a reliability test to ensure consistency within these sections. The objective was to identify the most significant corruption risk in the forestry sector. [15] suggests that Cronbach's alpha is suitable for constructs measured on a continuous scale, like the Likert scale.

Consequently, the scores for each section would reveal any correlation among individual items. Cronbach's alpha, known for its internal consistency, increases as individual item scores become more predictable relative to each other, nearing a value of 1. Descriptive factor analysis was applied to all items to ensure proper classification during the pilot test, with items not aligning with the study's parameters being removed. The reliability and validity of Sections C and D items were confirmed based on the Cronbach value, as shown in Table 1.

Table 1. The reliability analysis result

Section	Question Statement	Cronbach's Alpha Coefficient Value	Indication
C	Potential awareness of work/matters that have a risk of corruption	0.985	Good and high consistency
D	Type of forest offence in terms of motive and opportunities	0.965	Good and high consistency

2.4. Data Collection: Questionnaires

This survey comprises four sections: Section A, which covers respondent demographics; Section B, focusing on awareness of corruption and risk; Section C, which addresses potential awareness of work/matters susceptible to corruption; and Section D, exploring types of forest offences in terms of motive and opportunity. Items in Section B were measured on a dichotomous scale (Yes, No, Not sure). In contrast, Sections C and D utilized a 5-point Likert scale (1= totally disagree, 2=disagree, 3=just agree, 4=agree, 5= totally agree) to gauge respondent agreement or disagreement. The respondents included officers from the Forestry Department of Peninsular Malaysia (FDPM) and stakeholders from the forestry sector, who completed the survey between June and September 2021. Following [16], six weeks were allotted for questionnaire return, irrespective of sample size. The questionnaires were distributed to individual respondents at the Forestry Department via email, utilizing Google Forms to streamline data collection and ensure respondent privacy through anonymous settings. Respondents were individuals involved in various workplace scenarios, including office-based work, fieldwork, or a combination of both. Consequently, only 150 survey results were deemed suitable for data analysis.

2.5. Data Analysis

This study used quantitative data analysis methods, including descriptive statistics and correlation analysis. Descriptive statistics were used to identify significant corruption risks within the forestry sector, using mean, median, and mode measures. Additionally, correlation analysis was conducted to explore the connection between motives and opportunities. Pearson correlation is used to measure the strength and direction of the linear relationship between two continuous variables: motive and opportunity for forest offences.

3. Results and Discussion

3.1. Demographic Information

This section describes the demographics of the respondents who participated in the survey, detailing characteristics such as workgroup, state, age, gender, ethnicity, education level, job status, length of service, and workplace (Figure 2). 57.3% of respondents were from the Kumpulan Pegawai in the government sector. Additionally, 40% were from the Kumpulan Pelaksana in the government sector, with Executive and Non-Executive Group Officers in forestry-related industries comprising 1.3% each. The survey was distributed across 12 states in Peninsular Malaysia. Most respondents were from Wilayah Persekutuan Malaysia (16.7%), followed by Selangor (16%), Pahang (15.3%), Johor (10.7%), Perak (10%), and Terengganu (8.7%). Respondents from Negeri Sembilan, Kedah, Kelantan, Perlis, Pulau Pinang, and Melaka represented 6.7%, 6%, 4%, 2.7%, 2%, and 1.3% of the total, respectively.

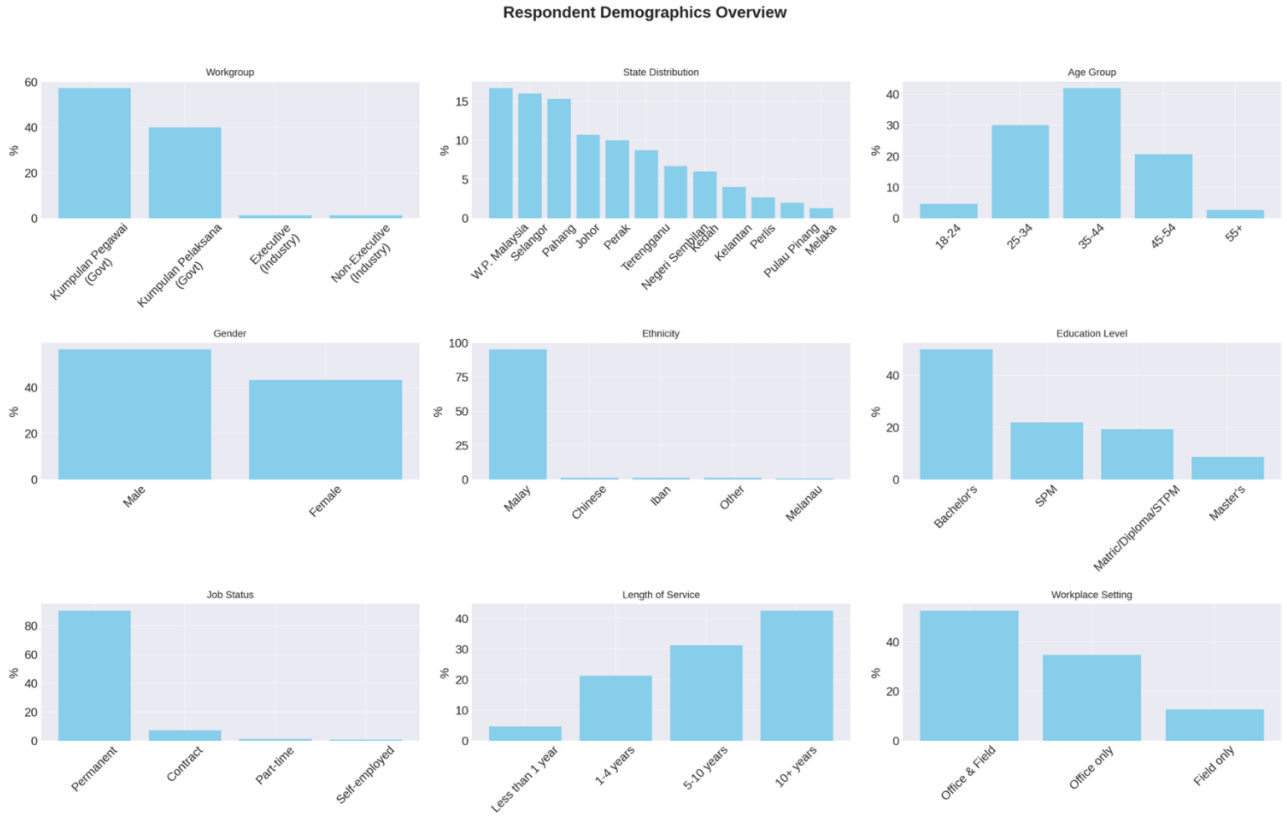

Figure 2. The demographics of the respondents (workgroup, state, age, gender, ethnicity, education level, job status, length of service, and workplace)

The age distribution of respondents was 4.7% between 18 and 24 years old, 30% between 25 and 34, 42% between 35 and 44, 20.7% between 45 and 54, and 2.7% were over 55 years old. Among the respondents, 56.7% were male and 43.3% were female. The majority ethnic group was Malay (95.4%), followed by 1.3% Chinese, Iban, or other ethnicities, and 0.7% Melanau. In terms of education, 50% held a Bachelor's degree, 22% had completed Sijil Pelajaran Malaysia (SPM), 19.3% had a Matriculation, Diploma, or Sijil Tinggi Pelajaran Malaysia (STPM), and 8.7% held a Master's degree.

Regarding employment status, 90.7% of respondents were permanent employees, 7.3% were contract employees, 1.3% were part-time workers, and 0.7% were self-employed. The length of service in the forestry

sector was distributed as follows: 42.7% had more than ten years of experience, 31.3% had 5 to 10 years, 21.3% had 1 to 4 years, and 4.7% had less than a year of experience. Workplace settings were as follows: 52.7% worked in both the office and the field, 34.7% worked solely in the office, and 12.7% worked exclusively in the field.

3.2. Awareness of Risk and Corruption

Awareness of corruption risk at the workplace was high, with 96% of the population acknowledging its presence, while 4% were uncertain about the corruption risk at their workplace. Integrity is a crucial component in the forestry sector to prevent corruption. 90.7% of respondents knew that forestry sector employees had been informed and trained on the importance of integrity. However, 0.7% were unaware, and 8.7% were unsure if they had received such information and training.

Furthermore, 90.7% of respondents recognized the potential for being offered bribes, even if unsolicited. In contrast, 4.7% believed they would not be offered bribes, and another 4.7% were uncertain about the likelihood of receiving such offers. Corruption punishment includes imprisonment and fines proportional to the value of money, products, or services obtained through deceit. Approximately 97.3% of forestry sector employees knew the penalties that could be imposed if convicted of corruption, while 2.7% were unsure if such punishments existed. Lastly, 98.7% of the staff who completed the questionnaire had been warned not to engage in corrupt practices, whereas 1.3% were unsure if they had received such warnings.

3.3. Awareness of Potential Work Division Matters That Have a Risk of Corruption

The questionnaire sought respondents' general opinions on their awareness of corruption risk and then asked specific questions about potential corruption in various work divisions within the forestry sector. Eleven items were presented to the respondents, resulting in varied responses, with some items receiving general agreement and others being disputed (Table 2).

Table 2. The awareness of corruption risk in the workplace

Item	Awareness of corruption risk	Mean ($\bar{x}$)	Standard deviation (s)
C1	Someone offered bribes to the forestry staff to cut down trees outside the legitimate area.	3.24	1.531
C2	Someone offers bribes to the forestry staff to expedite the approval process for logging and permit licenses.	3.25	1.310
C3.	Someone offered bribes to forestry staff to collect non-wood forest products from the forest.	1.93	1.112
C4	Someone offers bribes to reduce the timber tax (forging/changing timber species).	1.93	1.130
C5	Someone offered bribes to forestry staff to alter the boundaries, thereby increasing the logging area.	2.41	1.420
C6	Someone offers bribes to the forestry staff to transport timber without a permit or smuggle logs across state and international borders.	1.84	1.124
C7	Someone offered bribes to the forestry staff to leak confidential information about a bid to secure a concession area.	3.35	1.238
C8.	Someone offers bribes to obtain a fake log/timber production permit.	2.59	1.420
C9	Someone offered bribes to forestry staff to complete fieldwork and reports on time.	3.56	1.397
C10	Someone offered bribes to forest staff to avoid being fined for failing to comply with forest work guidelines.	2.61	1.528
C11	Someone offers a bribe to cheat/change the size of logs at the forest inspector station.	1.83	1.091

For instance, the risk of corruption while completing fieldwork and reports received a high mean score of 3.56, indicating significant agreement among respondents. This was supported by a high standard deviation (s = 1.397), indicating a wide range of responses. Respondents also recognized the risk of corruption in leaking

confidential information about bidding to secure concession areas, although this item had the lowest mean score ($\overline{x}$ = 3.35; s = 1.238). Two other items received notable agreement, with mean scores ranging from 3.24 to 3.25. These items included the possibility of forestry staff being offered bribes to cut down trees outside authorized areas ($\overline{x}$ = 3.24) and the practice of giving bribes to expedite the approval process for logging or permit licenses ($\overline{x}$ = 3.25).

There were four items for which the responses obtained were negative since the respondents generally disagreed with the items, as shown by the lowest mean score of 1.83, and the clustering of scores around the mean, as indicated by the high value of standard deviation, which was far from 0 (s = 1.091). The respondents disagreed with the other three items, obtaining mean scores ranging from 1.84 to 1.93. These include statements that someone offers bribes to the forestry staff to transport timber without a permit or smuggle logs across state and international borders ($\overline{x}$ = 1.84). Both bribes were used by forestry staff to collect non-wood products from the forest. Someone who offered bribes to reduce the timber tax (by forging or changing timber species) had the same mean, $\overline{x}$ = 1.93. In addition to measures of central tendency, the standard deviation values for those items were more than 1. This suggests many variations in the dataset, and most scores were dispersed far from the mean.

The respondents agreed that fieldwork and reports could create potential risks for corruption among the forestry staff. Previous research has shown that officers in the field are responsible for certifying compliance with the law, as forests are often far from the decision-making centres. They can be the only authority of the government to verify the quantities and species from forest concessions or conformity with the rules on sustainable management. Substantial discretion creates a favourable environment for unlawful activity. [7] mentioned that bribery and corrupt forest officers could potentially weaken enforcement efforts and promote occurrences of forest crime [12,17]. However, few forest offences involving corruption in the forests can be demonstrated due to the lack of transparency. Thus, there is an example of bribery while working in the forest in Nepal, where traders paid extra to obtain their permits. Traders are not legally obligated to pay anything more than the predetermined government fee. Still, if they refuse to pay a supplement, the process of acquiring their collection and transportation permits may be delayed. The use of 'speed money can help obtain relevant documentation from DFOs [18].

Hence, the respondents agreed that the process of concession awards could create a potential risk for corruption. Transparency International (2011) highlighted timber concession awards and logging permits as areas of vulnerability to corruption in Peninsular Malaysia. Forest products may be collected through tendering, concession, or general application. This is because state governments can provide preferred timber concessioners or logging licenses. The state permits the procedure but is not transparent, which can lead to corruption, nepotism, and cronyism [5]. Concessions in Peninsular Malaysia are classified according to their size, each with its own duration of tenure. The concessions area which is more than 1000 hectares are allocated for 1–2 years; concessions of 1,001–2000 hectares are issued for 1–5 years; concessions of 2,001–20,000 hectares are granted for 10–30 years; and concessions of more than 20,001 hectares are allocated for 20–30 years. Additionally, information about Malaysia's forest industry is limited in its openness, as evidenced by the lack of public disclosure of concession maps or sites, and the non-publication of harvesting and forestry management plans [7]. The exploitation of logging concessions as a way of rewarding allies can put lawful timber harvesting competitors at a disadvantage.

Also, potential corruption should be reduced by increasing competition in logging licenses and concessions procurement [10]. Therefore, improved public information on forest bidding procedures may enhance the openness and accountability of the choices made by the government. For instance, online permit or concession systems can also help increase transparency in license allocation management. When checking logging sites, frontline officials in the field must have access to the online permit system. Strong IT security is also necessary to prevent repeating previous incidents in which criminals compromised these systems.

While the respondents slightly agreed with items C1 (X = 3.24) and C2 (X = 3.25), they did not agree with the risk of corruption to forestry staff during the log review process at the inspection station. However, this interpretation contrasts with Transparency International (2012b), which argued that procedures and criteria such as annual allowable cuts or quotas are harmed by corruption. Most producer countries have a mechanism to document lawfully harvested logs, thereby avoiding tracking complications. Even though limitations are imposed on the volumes that can be logged per year for a particular timber company, the timber inventories on which those quotas are based may be manipulated, resulting in incorrectly calculated permitted amounts and the over-exploitation of forests. Then, due to the tagging requirement, there is a minimal chance that illegal timbers will be mixed with legal timbers under the tracking system [7].

3.4. Types of Forest Offences That Relate to Motive and Opportunity

Correlation analysis shows the relationship between forest offences regarding motive and opportunity (Table 3). The result showed that motive and opportunity have a strong positive relationship, r = 0.663. This indicates that changes in forest offences in motive were moderately correlated with forest offences in opportunity. There is also a statistically significant correlation, p = 0.00 < 0.01. This means that an increase in the motivation for forest offences is significantly related to a rise in forest offences in terms of opportunity. It indicated that forest offences in terms of motive are correspondingly related to forest offences in terms of opportunity. There will be fewer forest offences in the future when the forest offences in terms of motives are decreased. Forest offences in opportunity are influenced by forest offences in motive, according to the correlation study. Analytically, the finding is supported by the fact that when compared to forest offences in terms of motive, most respondents agreed with the occurrence of forest offences. Offenders commit forest offences for various reasons, including the high cost of logging, demand for logs, and the influence of monetary gain, which leads to them committing forest offences for reasons such as facilitating illegal activities, legislative loopholes, and enforcement challenges.

Table 3. Correlations between motive and opportunity of forest offences

Correlations		Motive	Opportunity
Motive	Pearson Correlation	1	.663**
	Sig. (2-tailed)		.000
	N	150	150
Opportunity	Pearson Correlation	.663**	1
	Sig. (2-tailed)	.000	
	N	150	150

**. Correlation is significant at the 0.01 level (2-tailed).

Due to bureaucratic issues, small-scale operators were motivated to engage in forest crimes, such as unlawful logging. Small-scale operators had fewer resources, a smaller workforce, fewer assets, and less financial capital available to run their businesses daily. According to Hoare (2015) [8], small-scale companies may find complying with legislation too expensive due to various licensing costs and lengthy procedures. As a result, many turn to illegal logging because they cannot afford the fees or obtain legitimate licenses, which can take a long time to acquire from forestry officials. Due to the high cost of logging concessions, operators resorted to unlawful logging to supplement their revenue and offset their monetary losses resulting from costly legal compliance [9].

Furthermore, the expectation of a bigger profit margin is one of the motivations for committing forest crimes. Such crimes occur throughout the post-harvesting stage, primarily when unlawful logs are transported and sold, which involves tax evasion, timber smuggling, and timber trafficking. Illegal operators may also be implicated in money laundering offences by profiting from illegal logging. The benefits an offender hopes to receive from committing forest offences should be proportional to the money they anticipate receiving from the sale or processing of stolen logs.

The widespread occurrence of these motives of forest offences means opportunities that allow offenders to commit forest offences. According to the 2009 audit report, previous research has revealed a lack of enforcement and control over forest management in Malaysia [8]. This comprises surveillance, transportation, communication, protective equipment, and checkpoint equipment. Due to a lack of trained enforcement staff, chances for criminal operations would arise [2]. The problem of insufficient equipment is due to the low budget for forest law enforcement. A low detection risk can provide a possible opportunity for criminal activity, and collaboration in joint operations can help eliminate that opportunity by minimizing the possibility of crimes going unnoticed. According to recent research by [7], respondents agreed that a low likelihood of prosecution presents a potential opportunity for forest offences. Also stated that Malaysia has a 60–70% success rate for successful prosecutions [19]. In practice, crimes may go undetected, investigations may not lead to prosecution, and even if charges are filed, cases may be dropped or convictions may not be successfully obtained in court [4].

Nevertheless, paper-based documentation still poses a risk of committing forest crimes. According to Wyn (2013) [4], a study about illegal logging and forest offences in Peninsular Malaysia, there were incidents of untagged trees obtaining removal passes and being carried to sawmills on rare occasions, but were fortunately prevented by forest officials. The further report stated that bribes paid to specific officials led to the fraudulent issuance of removal passes. Multiple removal passes were also used and falsified in certain circumstances. Forest offences are complex crimes and challenging to prevent or eliminate. As a result, this study might serve

as a foundation for the FDPM to design or revise forest policy and laws to manage and prevent forest offences from worsening. Furthermore, this study found that Peninsular Malaysia forest offenses are substantial in motives and opportunity. Thus, early action and awareness are critical because the problem is unexpected.

These findings may be necessary to strengthen the internal system supporting anti-corruption policies in the forestry sector. In addition, can advise employees to comply with laws, policies, and procedures related to the fight against corruption. Combating all forms of corruption and supporting anti-corruption initiatives by the Government of Malaysia and the Malaysian Anti-Corruption Commission (MACC) is possible. For example, the MACC and the Forestry Department of Peninsular Malaysia have agreed to establish a joint committee to strengthen the integrity of forestry and logging and to address corruption more effectively. Therefore, the study's findings may help raise awareness and inform policymakers to develop suitable policy responses to address the issue in the long run.

4. Conclusions

This study found that respondents were aware of corruption risks among workers in the forestry sector. Mean scores were used to rank their responses and identify the most and least significant corruption risks. Bribes were given to forestry staff to expedite fieldwork, and reports were identified as the most critical risk. Conversely, the risk of accepting bribes to alter the size of logs at inspection stations was deemed the least significant. Quantifying corruption is inherently challenging due to its concealed nature. Therefore, while it is not always necessary to quantify corruption precisely, understanding its impacts is crucial. Addressing corruption from the outset is essential because the large sums of money can motivate criminal activity in the forestry sector. Additionally, this study examined the potential causes of forest offences, focusing on motives and opportunities. Identified motives include promises of higher profit, bureaucratic issues, and timber demand. Opportunities arise from enforcement vulnerabilities, paper-based documents, and legislative weaknesses. Data analysis revealed that these limitations align with forest offences in this sector, with the lack of facilities and equipment for enforcement being the most significant limitation. Offenders commit forest offences for various reasons, including the high cost of logging, demand for logs, and the influence of monetary gain, which leads to them committing forest offences. Therefore, the Forestry Department should collaborate with relevant authorities to develop specialized training on procedures for investigating and prosecuting forest offences. Future research should confirm these findings and explore additional factors, such as enforcement and criminal justice challenges, to better understand the causes of forest offences. Breaking down these elements can provide valuable insights to inform policymaking and guide the evolution of anti-corruption reforms. For example, future studies should assess the likelihood of arrests for forest offences and analyze their consequences. More data and analysis are needed to evaluate corruption's impact on the forestry sector and understand the relationship between forest offences and corruption. Effective enforcement of forest regulations is crucial, as inadequate enforcement can lead to widespread illegal activities.

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