

## Managing Harvesting for Forest Sustainability in Malaysia: An SFL Perspective

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### ABSTRACT

Forest management practices have been addressed widely in the forestry discipline but are rarely considered from a linguistic perspective. Linguistic exploration of the construction of meaning in forest discourses helps provide greater detail on how forest resources are governed through the forest management practices carried out by forestry professionals. This study adopted the approach from Systemic Functional Linguistics (SFL) and Halliday's *Introduction to Functional Grammar* to examine how lexicogrammatical resources are used by forestry professionals to institutionalise their narrative on sustainable forest management practices. Six field inspection reports issued by the Forestry Department of Peninsular Malaysia were selected as data for analysis. The reports were examined as a genre to ascertain their generic structure and the elements they contained. The findings show that the reports provide essential information concerning various aspects of forest management best practices, including technical information of the forest areas, their geographical and topographical conditions within and around the areas, the distribution of tree stands and other equally important aspects including their environmental, socio-economic and economic values. This paper suggests that a linguistic orientation employed in uncovering forestry matters such as the field inspection report allows concrete evidence of how forest management practices are communicated, especially in written reports and whether these practices are aptly represented through their language use.

**Keywords:** sustainable forest management; SFL; forestry discourse; Malaysian forest; professional report

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## INTRODUCTION

Tropical forests are home to more than 50 per cent of the world's species and store a significant portion of the world's carbon (Boscolo et al., 2009), which explains why implementing sustainable forest management (SFM) on the ground is such a high priority (Poore et al., 1989). SFM is “the process of managing forest to achieve one or more clearly specified objectives of management with regard to the production of a continuous flow of the desired forest products and services without undue reduction of its inherent values future productive and without undue undesirable effects on the physical and social environment” (International Tropical Timber Organization, 1990). Vast areas of forested land in Malaysia have been secured as a Permanent Forest Reserve (PRF) through Sustainable Forest Reserve Resource management under the supervision of the Forestry Department of Peninsular Malaysia (FDPM). State forestry departments (SFD) and district forest offices (DFO) in Peninsular Malaysia are responsible for implementing SFM at state level. Their work involves monitoring the implementation to protect the forest ecosystem from unsustainable logging practices that can affect inherent values and the future productivity of the forest and cause negative environmental impacts.

With respect to forest harvesting the objectives of SFM include conserving forest soils and water, conserving biodiversity, reducing carbon emissions, maintaining the renewal capacity of forest for the sustainable supply of timber while supporting the culture and livelihood of forest-dependent indigenous peoples and local communities. The SFD and DFO produce periodical resource reports on ongoing and future development planning and forest activities, in particular harvesting operations undertaken by loggers at state and district levels, so that action can be taken to address any issues raised. For example, regulating forest harvesting operations at the district level involves carrying out in-situ field inspections of specific forest areas, writing a report and submitting the report to the SFD for further action. Regular field inspections are carried out and reports submitted to ensure that logging operations comply with forest law and SFM best practice. This process of work is part of the effort undertaken by the Malaysian government to protect forests and forest resources, and to ensure that forest renewal and sustained yield can be achieved successfully (see e.g. Jusoff and Taha, 2008).

In Malaysia, research on forest management, forest resources and forestry community practice focuses primarily on the valuation of forest resources, and the provision of statistical accounts of forest resources (Islam et al., 2010). There is little evidence from the examination of forestry texts to show how forestry management practices are performed and how forests are being managed sustainably, especially with respect to forest harvesting to provide wood resources for sustainable development and economic growth. According to Leipold (2014, p. 19) deeper insights can be gained into “how control over forests and people is and can be organised” through the examination of language. However, she argued that “to arrive at these insights, more theoretical and methodological rigour and innovation seem to be required” (p. 19) which explains the use of Halliday's Systemic Functional Linguistics (SFL) to explore experiential meaning in discourse in the context of forest harvesting in Peninsular Malaysia.

There are relatively few studies examining forestry discourse from a linguistic perspective. This paper aims to fill the gap by analysing six field inspection reports using the approach drawn from Halliday's SFL (Halliday, 1978; Rose and Martin, 2012; see also Halliday & Matthiessen, 2014), focusing in particular on the lexicogrammatical choices that the writers make from the system of transitivity to construe their experience of the world. SFL provides concrete tools for making sense of textual data, and for examining “meaning in context through a comprehensive

text-based grammar” (Schleppegrell, 2012, p. 21) in order to understand the purpose it serves and the way it functions. We agree with the view of Matthiessen and Pun (2019) that text is language that functions in context, and varies considerably in its properties according to the context in which it operates, and “different contexts make very different demands on language, and language adapts accordingly.” (p. 2). In this connection, the analysis of data takes into account not only the broader context in which the reports were produced but also the local contexts in which the selected texts operate.

## DISCOURSE AND APPROACH

There was increased interest in the late 1990s in examining discourse on forests and forestry as evidence of the implementation of SFM to meet the societal demands on forests and forest resources, and in mitigating the negative impacts on the environment (see e.g. Seelig, 2019; Arnold, 2018). The rise in the importance of discourse to explain phenomena and social processes coincided with “two concurrent developments - a shift in general theorising of knowledge and a broadening of perspectives in linguistics” (Jaworski and Coupland, 2006, p. 4). Discourse has been defined broadly ranging from the linguistic perspective with the focus on language to post-modern theories.

The interest in theory and concept of discourse in forestry social science in the 1990s led to a growing body of literature on forestry and forest policy with contributions from a broad range of discourse-oriented approaches based on diverse theoretical underpinnings (Leipold, 2014). Forestry social scientists drew on the concept of discourse, discourse theory and discourse analysis to investigate forest and forestry related social processes and social actions and forest governance and policies (Hajer and Versteeg, 2005; Leipold, 2014). The definitions of discourse were adopted from post-modern theories and the focus of analysis was on power relationships in the social world constituted in discourse and expressed through language and other social practices. According to Arts et al. (2010) the interest in global forest issues to reconcile economic and environmental growth have shaped and have been shaped by environmental meta-discourses. The examination of global discourses on forest and forestry have been linked to other related issues including deforestation, forest degradation, sustainable forest management, and biodiversity conservation, which led to the development of wider discourses and narratives concerned with sustainable forest development (de Jong et al., 2017).

Texts on forestry and forest policy were analysed from a discourse perspective (Arts et al., 2010), using terms like discourse, power, knowledge and governmentality drawn largely from a Foucauldian perspective (Winkel, 2012). Poudel and Aase (2015), for example, used Laclau and Mouffe’s notion of discourse (1985) and Fairclough’s Critical Discourse Analysis (1995) to examine texts from the perspective of Reducing Emissions from Deforestation (REDD+) to look into the issue of forest management in Nepal. Takala et al. (2019) drew from Critical Discourse Analysis combining qualitative content analysis and quantitative multivariate methods to analyse the discourses of Finnish forest owners in the context of treating nature and biodiversity conservation, in order to explain the social reasons for persistent biodiversity loss.

Scholars including Winkel (2012), Leipold et al. (2019), Arts and Buizer (2009) and Arts et al. (2010) highlighted the lack of clarity in the definitions of concepts, and when applying discourse analysis to examine power relationships in discourse. According to Leipold (2014) many of contributions were motivated by ‘general ideas from discourse research’ applying the notion of discourse as an umbrella term with critical concepts not explicitly described and methods not

‘applied in a systematic manner’ (p. 18). Despite the claims made by other disciplines on the term ‘discourse’ as their own, it is generally accepted that discourse itself is primarily concerned with language, meaning and context (Jaworski and Coupland, 2006, p. xi). This suggests a need for a more systematically and theoretically grounded accounts to examine forestry and forest policy discourses from the perspective of discourse analysis (see e.g. Leibold et al., 2019).

## METHODOLOGY

The present study is based on the analysis of thirteen extracts taken from six inspection reports written in Malay. We analysed the Malay extracts, which were translated into English for the benefit of readers who do not know Malay. The Leipzig glossing rules (Croft, 2003) were used to accommodate the interlinear morpheme-by-morpheme glosses. These rules concern word-by-word alignment and provide a standard way of representing the morphological patterns of Malay.

The standard practice is that the inspection reports are issued when the state forestry department receives applications from licensed loggers to harvest particular forest areas within the district and state’s supervision and management. Subsequently, the state forestry department issues a letter to the relevant district forestry department to conduct a field inspection on the forest areas being applied for, and submits a report on their field inspection with comprehensive details regarding the forest areas, including an initial rough estimate (based on on-site tagging) of the forest resources in the particular forest areas. On average, at least three forest resource reports are issued every month, and up to ten forest resource reports can be issued in a month, depending on the number of applications received.

The field inspection report is regarded as a semantic unit created as a result of the selection and realisation of meaningful choices which are encoded in words and structures (Plemenitaš, 2004). This view of text as a semiotic system of meaning choice makes it necessary for the analysis to emphasise not only the system (meaning potential) and also how the system works within its context and culture. The system is represented as system network with meaning potential, and the text is its instantiation that constitutes the actual meaning choices from the potential (Halliday, 1994). The report was first examined as a genre to ascertain its generic structure and the elements it contained.

This study adopted as its approach Halliday’s Systemic Functional Linguistics, and used Halliday’s *Introduction to Functional Grammar* (Halliday & Matthiessen, 2014) to analyse the clause as a representation of experience. The representational dimension of discourse is examined to ascertain the choices made in the experiential function served mainly through the transitivity system (Hart, 2016). The process types which are used to construe experiential meaning are important elements in the grammar of the clause as representation. Halliday and Matthiessen (2004) identify six types of process: material, behavioural, mental, verbal, relational and existential, each construing its own domain of experience. The material process typically realised in English by verbal groups construes the language user’s experience of the world as actions and happenings. The relational process, typically realised in English by a ‘be’ type of verb, construes relationships and functions to identify and characterise an entity. The other types of process clauses are behavioural, which signals physiological and psychological behaviour; mental, which represents one’s consciousness or sense; verbal, which relates to what is being said and finally, existential, which, as the name suggests, represents something that exists.

SFL is used to provide resources for exploring how language is involved in meaning-making in context and to ascertain the choices language users make from linguistic systems to

construe experiential meanings (Schleppegrell, 2014) realised through the transitivity system. Experiential meanings are construed through a set of process types offering a range of options to present experiences as ‘doing-&-happening’, ‘saying’, ‘sensing’, or ‘being’ (Martin & Rose, 2003). In this article, we analysed the experiential grammar of the clause in the selected extracts, which construes the material, relational and existential processes. The analysis focused on the lexicogrammatical resources drawn from the Malay transitivity system to decode meanings defined in terms of “their syntagmatic and paradigmatic relations within the linguistic system” (Halliday, 2007).

### FOREST INSPECTION REPORT AS A GENRE

Martin describes genre as “staged, goal-oriented processes, textual forms or organisational structure used purposefully by the culture.” (1992, p. 505). Genre functions as a social process “because members of a culture interact with each other to achieve them” (Martin, 1984, p. 54) and are seen as a “recurrent configuration of meanings and that these recurrent configurations of meaning enact the social practices of a given culture (Martin & Rose, 2008, p. 6). From this perspective, the genre of the field inspection report is not only seen as a particular text but a socio-rhetorical tool and a social process involving forestry professionals collaborating with each other in meaning-making in the context of harvesting for SFM, conservation and rehabilitation. Eggins (2007, p. 70) views the analysis of genre as an initial and perhaps a very “powerful step” towards “making explicit the cultural and social basis of language in use”.

The field inspection reports are ideationally-oriented in the sense that language is used primarily in the declarative form to provide essential information and are action-oriented in that actions need to be taken to address the issues thus raised. The reports have identical forms in terms of their formatting and length and are written in formal letter writing conventions despite their communicative function of reporting on forest harvesting activities. They have a formal layout using headings and subheadings to indicate sections, including introduction, body and conclusion. Table 1 presents a summary of the elements of the six reports and their general functions.

TABLE 1. The elements in Forest Inspection Report and their functions

No	Element	Function
1	<b>Letterhead</b>	To provide relevant information on the department,
2	<b>Reference</b>	namely state logo, department logo, name, address and
3	<b>Date</b>	contact number
4	<b>Security Marker</b>	To encode the letter for filing, tracking and referencing purposes
		To show the date when the letter was written
		To indicate the status of the report
5	<b>Inside Address</b>	To identify the receiver’s job position and address
6	<b>Salutation</b>	To acknowledge the addressee
7	<b>Subject Line</b>	To indicate the content of the report
8	<b>Introduction</b>	To signal the beginning of the report
9	<b>Body</b>	To elaborate on the content of the report
	<b>Sub-elements of the body</b>	
	Area Location	To provide information on a specific location of the forest area in terms of its geographical border
	Terrain / Topographical Condition	To provide information on the topographical condition of the forest area
	Area Size	

	Forest Status	To provide information on specific measurements of the forest area
	Forest Density	To provide information on the harvesting activity status of the area
	Effects of Forest Harvesting Activities	To provide information on the type and size of trees in the area
	Log Access Road	To provide information on the possible effects of harvesting activities in the area
	Fieldwork	To provide information on the route that can be used to transport timber from the area
	Monitoring	To provide information on the people and station in charge of monitoring work done in the area
	General	To provide information regarding the area in general
	Information	To provide information on the review and decision made by the department on the authorisation of forest harvesting activities
	Review	To provide information on the review and decision made by the department on the authorisation of forest harvesting activities
10	<b>Closure</b>	To signal the closing of the report
	Preclose	To indicate additional information attached to the report
	Close	To acknowledge the recipient and to close the report
	Government Slogan	To signify the government's official slogan
	Department Slogan	To signify the department's official slogan
	Complimentary Close	To mark the closure of the report
	Signature and Sender Details	To acknowledge the sender of the report and the job position
	File Data	To encode the file data for referencing purposes

The reports consist of 10 main elements (highlighted in bold) and 16 sub-elements in all without any optional or repeated elements. These elements are obligatory in order to accomplish the text's purpose (Hasan, 1985), which suggests that the forest inspection report genre is highly standardised. The extracts for analysis are drawn from the Body, which consists of 10 sub-sections giving specific information on the forest area applied for forest harvesting.

### TEXTUAL ANALYSIS AND FINDINGS

Forest management at the state level involves the control and coordination of potential harvesting activities that are likely to take place, taking into consideration not only their potential economic benefits but also their effects on physical and biological environments at local levels and on local people who live in and around the potential area for harvesting. It is necessary to ensure that any decision about a possible site for timber harvesting should be in accordance with forest policies and legislation which protect habitats and conserve forest reserve areas for endangered species.

The 13 excerpts selected for analysis were based on three predominant themes related to timber harvesting: area location, topographical conditions and forest management planning. They are oriented towards the function of the representation of experience and were not only analysed as entities in their own right but also as resources for making meaning (Halliday and Matthiessen, 2014) in the context of forest harvesting to manage forests on a more sustainable basis. This explains the reason for analysing the lexicogrammatical resources involved in construing experience through the unit of the clause, which represents human experience and for examining the writers' grammatical choices to make meanings about their experience of social activity. The clause types (e.g., Material, Relational and Existential) are selected for analysis based on their occurrence in the texts and are analysed for experiential meaning with reference to the context in which they occur. Analysis for experiential meanings was undertaken to ascertain how the

experience was construed in terms of ‘doing’, identifying or classifying the relevant entities (e.g. forest areas, indigenous settlements, rivers, tributaries etc.), their state of being or existence, and their associated location and qualities.

#### AREA LOCATION

Area location gives information on specific geographical borders within which timber harvesting activities occur. An important aspect of SFM is identifying the location of the forest reserve area as a potential harvesting site answering the question ‘where (spatial) is the forest reserve area located?’ in relation to the surroundings. This is usually followed by opinions, as illustrated below:

Excerpt (1).

a. *Kompartmen 11 Hutan Simpan G tidak termasuk di dalam Kawasan Tadahan Air yang diwartakan dalam APN 1984.*

(Forest Reserve G Compartment 11 is not included in the Water Catchment area, which was gazetted in APN 1984.)

b. *Jika kawasan ini diusahahasilkan, ianya tidak memberi kesan pada kawasan ini.*  
(If this area is harvested, it will not affect this area.)

Excerpt (1) contains two sentences. The opening clause (1a) - *Kompartmen 11 Hutan Simpan G* - represents information about the location of the forest reserve as a fact, i.e., that it is not in the water catchment area, and the subsequent verbal clause - *Jika ini diusahahasilkan, ...* ‘If this is harvested...’ - is encoded in an open condition clause. Clause (1a) is an independent material clause representing the Goal *Kompartmen 11 Hutan Simpan G* as not being included in the water catchment area - *tidak termasuk di dalam Kawasan tadahan Air yang diwartakan APN 1984* ‘is not included in the Water catchment area gazetted in APN 1984’. The material process *tidak termasuk* represents a doing, namely not included which is directed at the Goal, and does not require agency which explains why the Actor is ellipsed. The outcome of the process is the status of *Kompartmen 11 Hutan Simpan G*, which is not included in the catchment area gazetted in the 1984 National Forestry Act (National Forestry Act, 1984).

Clause (1b) presents a view expressed unassertively *Jika ini diusahahasilkan, ianya tidak memberi kesan pada kawasan ini*. The Sayer expressing the view is ellipsed. Although it is a fact that the forest reserve area is not in the area that can affect water quality, the condition introduced by *Jika* ‘If’ is neutral in its expectations of whether the area is to be harvested or not. Instead, it leaves open the question of the fulfilment of the condition *Jika ini diusahahasilkan* ‘If this is harvested’, and of the truth of the proposition expressed by the independent clause *ianya tidak memberi kesan pada kawasan ini* ‘it (the harvesting) will not have an impact on this area’. The clause contains a non-animate Actor ‘*ianya*’ represented as not having an impact on the area *tidak memberi kesan pada kawasan ini*, a circumstantial element indicating location.

It is important to identify the locations surrounding the forest area to be used for timber harvesting, as this will affect the decision on the area's suitability for harvesting. The approval depends on whether or not the compartment (the division of land in a suitable management unit in a large forest area) and its surroundings are located near priority areas such as orang asli settlements, water sources including river or water catchment areas, or close to another area actively involved in harvesting. If the forest area is located within or in close proximity to these priority areas, the application is likely to be rejected. The description of the neighbouring areas surrounding the forest area includes determining whether the area is located near a reserve forest

or next to another area currently undergoing timber harvesting, in which case the state forestry department may consider whether some other harvesting activity could be undertaken.

Descriptions of the locations of forest areas for which harvesting applications are made are predominantly represented in relational clauses construing the experience as ‘being’ rather ‘doing’ (Excerpts (2) and (3)), and in existential clauses to represent something that exists (5). In (2), the static location in space is construed relationally – *Kawasan dipohon terletak di sebelah barat Kompartmen 12 Hutan Simpanan B* ‘The area applied for is located to the west of Compartment 12 Forest reserve B.’ There are in total 30 occurrences of locative relational process using *terletak* ‘is located’ and *bersempadan dengan* ‘on the border with’ to describe the location of the forest area. In (5), the Theme which is the feature of existence *terdapat* ‘there are’ presents information on location as New information – *terdapat penempatan orang asli* ‘there are orang asli settlements’ (see e.g. van Valin and LaPolla, 1997 on ‘existence clauses as presentational constructional, cited in Halliday and Matthiessen, 2014).

In Excerpt (2), the predominant clause type in describing location is Relational clauses of the circumstantial type which encoded the relationship between two entities - *kawasan dipohon and di sebelah barat Kompartmen 12 Hutan Simpanan B* - as one of location indicated by a prepositional phrase *di sebelah*. The Locative relational process contains a circumstantial element of place represented as an attribute with the circumstantial relation realised by a prepositional phrase (see Matthiessen, 2004; Halliday and Matthiessen, 2014). The locative relational process (e.g., *terletak* in (2); *bersempadan dengan* in (3) and (4)) identifies the geographical location of the specific forest area in relation to the surrounding area. The information on the location of the forest area identified for harvesting is important to enable the SFD to make a decision on whether licensing is to be approved or rejected as illustrated in Excerpts (2) to (4):

Excerpt (2).

*Kawasan dipohon terletak di sebelah barat Kompartmen 12 Hutan Simpan B.*  
(The area applied for is located to the west of Compartment 12 Forest reserve B.)

Excerpt (3).

*Bersempadan dengan Sungai Muda dan Perkampungan Asli Punan.*  
(On the border with the River Muda and Punan orang asli settlements.)

Excerpt (4).

*Bersempadan dengan Kompartmen 17 yang dilesenkan kepada Syarikat ABC Nombor Lesen 123 yang telah tamat perkhidmatan*  
(On the border with Compartment 17 Forest Reserve C which has been licensed to ABC company license number 123 whose logging activities have ended.)

Excerpt (2) is a circumstantial Relational clause containing information on spatial location, which is crucial for license application. The Carrier, *Kawasan dipohon*, i.e., the forest area applied for harvesting, is linked to a circumstantial element of location (*di sebelah barat Kompartmen 12 Hutan Simpan B* ‘to the west of Compartment 12 Forest reserve B’) which is encoded by an Adverbial element (a prepositional phrase *di sebelah*). *Kawasan dipohon* indicates that the applicant has applied for a license to carry out timber harvesting in Kompartmen 12 Hutan Simpan B. The locative relational process *terletak* identifies the location of the Carrier in relation to the

location of reserve forest *di sebelah barat Kompartmen 12 Hutan Simpan*, which is a common practice in a report of this nature.

Excerpts (3) and (4) are concerned with the geographical border of the area applied for harvesting. In (3), the location of the forest area, which is ‘on the border with’ a river and an indigenous settlement (*Bersempadan dengan Sungai Muda dan Perkampungan orang Asli Punan* ‘On the border with the River Muda and the Punan settlement’) may affect the livelihoods and well-being of the orang asli community. Timber harvesting may also pollute nearby streams and rivers and lead to the destruction of the environment, which means actions need to be taken to minimise silting and pollution. Applications for harvesting activities in this area are highly unlikely to be approved. In (4), the area applied for is *bersempadan dengan Kompartmen 17 Hutan Simpanan C* ‘on the border with Compartment 17 Forest Reserve C’. The Carrier is ellipsed. The clause begins with a locative process *bersempadan* ‘on the border’ followed by a prepositional phrase *dengan* ‘with’ Kompartmen 17 Hutan Simpanan C, where logging activities licensed to ABS company have stopped (*telah tamat aktiviti pembalakan*). In this case, it is highly likely that the application for timber harvesting activities in Kompartmen 17 Hutan Simpan C will be approved.

The SFD’s main concern is the welfare of the indigenous people and the preservation of existing forest ecosystems and endangered plants. The socio-economic value of timber harvesting is assessed in relation to the impacts of logging and timber extraction on the nearby indigenous communities, flora and fauna. Before applications for harvesting are approved, it is essential to determine whether or not there are orang asli settlements in close proximity to the area identified for timber harvesting. Excerpts (5) and (6) are analysed in this regard:

Excerpt (5).

*Terdapat penempatan orang asli Terowoh berhampiran dengan kawasan ini.*

(There is a Terowoh orang asli settlement close to this area.)

Excerpt (6).

*Tiada penempatan orang asli serta perkuburan orang asli di kawasan ini.*

(There is no orang asli settlement or cemetery in this area.)

While (5) identifies the existence of a Terowoh settlement nearby, (6) categorically represents the given information as a fact, namely that there is no orang asli settlement or cemetery in the area. This information will enable the SFD to make the decision either to reject an application for timber harvesting, which is most likely in the case of (5), or to approve it in the case of (6).

The existential clause *Terdapat penempatan orang asli Terowoh berhampiran dengan kawasan ini* (Excerpt (5)) has one participant the Existent - *penempatan orang asli Terowoh* -, which is represented as being in existence involving the use of the existential process *terdapat* ‘there’. ‘*Terdapat*’ indicates the existence of an entity (Existent: entity) in a specific physical space *berhampiran dengan kawasan ini* ‘in close proximity to this area’, identified by forest officers in their field work. The orang asli Terowoh settlement is represented as Existent in the clause (*penempatan orang asli Terowoh* – orang asli Terowoh settlement), and circumstance of Location is used in the clause to provide details regarding where the settlement is located (*berhampiran dengan kawasan ini* – nearby this area) which is a common practice in timber harvesting reports.

Excerpt (6) represents the Existent as being not in existence. The existential clause *Tiada penempatan orang asli serta perkuburan orang asli di kawasan ini* contains a negative verb *Tiada* ‘not in existence’ (an abbreviated form of *tidak ada* ‘does not exist’ or *tidak terdapat* ‘not in

existence’) which is linked to place, and encodes categorically that there are no orang asli settlements or cemetery in the area. According to Asmah (2014) *tiada* - the opposite of *ada* (exist) - is a verb that has a pseudo-transitive (*transitif semu*) function. Information about the presence of sacred places of the indigenous people is crucial to ensure that their rights are upheld and sites of spiritual and historical values are protected (Islam et al., 2010).

The evaluation of the socio-economic value of timber harvesting considers the threat to the forest ecosystem where the indigenous communities live, especially the threat to endangered plants and to areas which are sensitive to the indigenous people. Excerpt (7) below illustrates the point:

Excerpt (7).

*Di kawasan ini tidak ditemui tumbuhan-tumbuhan yang perlu diberi keutamaan khas atau kawasan sensitif kepada orang asli.*

(In this area, no plants are found that needs to be given special priority or sensitive areas to orang asli.)

The receptive material clause in (7) ‘*Di Kawasan ini tidak ditemui tumbuh-tumbuhan ... atau kawasan sensitif kepada orang asli*’ begins with a circumstance of Location: place, which is followed by a passive verbal group *tidak ditemui* marked by a negative marker *tidak* and Goal *tumbuh-tumbuhan* and *kawasan sensitif kepada orang asli*. The starting point of the clause is the location of the forest area in space -*Di Kawasan ini*- marked by a locative preposition *di*. The Actor who ‘is doing the act of finding out’ is ellipsed. The restrictive relative clause *yang* identifies *tumbuh-tumbuhan* as those that should be given special attention probably because they are endangered or are of social and economic value to the indigenous people. The outcome described in the clause *tidak ditemui tumbuh-tumbuhan* ‘no plants are found’ suggests that some investigation was undertaken, leading to the outcome that no plants were needing special attention or areas sensitive to the indigenous community.

#### TOPOGRAPHICAL CONDITION

Besides the geographical location of the potential harvesting area, another important factor for consideration is the terrain and topographical condition of the area. The information is important for effective forest management planning and enables forest managers and planners to evaluate the accessibility of forest resources. It is included in the report to help the SFD foresees the feasibility of monitoring work when harvesting occurs. This includes ensuring the area has accessible roads, or if the terrain involves crossing rivers and going over hilly roads, the SFD has to ensure that the foresters have the necessary equipment and transportation to monitor.

Findings from data analysis show that the description of the topographical conditions contains predominantly Relational (8), Existential (9) and Material (10) processes. While the resources of ‘Relational’ clauses are drawn on to identify and characterise an entity, Existential clauses are drawn on to represent that something exists or happens, and Material clauses are drawn on to construe actions (‘the doing’ in a transitive clause) and events (‘the happening’ in an intransitive clause). Here is an illustrative analysis using Excerpts (8), (9) and (10) to exemplify:

Excerpt (8).

*Keadaan muka bumi kawasan ini keseluruhannya adalah berbukit bukau, lurah berair.*

(The condition of the earth’s surface in this area is hilly and with watery ravines.)

Excerpt (9).

*Terdapat juga anak-anak sungai yang mengalir dalam kawasan ini yang mengalir terus ke Sungai Siput.*

(There are tributaries that flow in this area, that flow straight into the River Siput.)

Excerpt (10).

*Pencemaran air akan berlaku kerana aliran air ke Sungai Endau.*

(Water pollution will occur because of water flow into the River Endau.)

The relational clause in (8) represents the experience as being. The Carrier *Keadaan muka bumi* 'the condition of the earth's surface' ascribed evaluative attributes *berbukit bukau, lurah berair* 'hilly with watery ravines'. The relational process realised by a copula *adalah* 'is' construes the Carrier as an element in a relationship of being with qualitative attributes construed by an adjectival phrase *berbukit bukau* 'very hilly' and a nominal group *lurah berair* 'watery ravines'. The description of the terrain provides the SFD with essential information on the suitability of the area for timber harvesting, which explains the necessity for the harvesting to be monitored. This will also ensure that the foresters inspecting and monitoring the forest activities use suitable vehicles and have the necessary tools to carry out their duties during the monitoring period.

Topography which is concerned with the physical features of an area of land, also includes natural formations such as rivers. (9) is a clause complex containing an existential clause (*Terdapat juga anak-anak sungai* 'There are tributaries') linked structurally by *yang* 'that' to two relative clauses (*yang mengalir dalam kawasan ini yang mengalir terus ke Sungai Siput* 'that flow in this area, that flow straight into Sungai Siput'). Textually, the Theme *Terdapat* 'There is/are' encodes the feature of existence which introduces the phenomenon of tributaries flowing into Sungai Siput as new information. These two clauses of hypotactic elaboration function as descriptive elaboration introducing essential information about where the tributaries flow *dalam Kawasan ini* 'in this area' and where they flow to - Sungai Siput 'Sungai Siput river'. It is important to know the location of the tributaries and the destination river as they are likely to be affected by harvesting activities nearby. Forest reserve areas with water catchments, such as rivers, are generally closed for logging.

In (10), the DFO raised concern about the potential for harvesting to adversely affect the environment, in particular water quality caused by the flow of water into Sungai Endau. The clause complex encodes a cause-and-effect relationship. It consists of the effect *Pencemaran air akan berlaku* 'Water pollution will occur', and the cause clause *kerana aliran air akan turun ke Sungai Endau* 'because the water will flow downstream into the River Endau', a paratactic enhancement clause marked by an explicit conjunctive marker *kerana* 'because'. The intransitive Actor *Pencemaran air* 'water pollution' is predicted to be brought into existence in the future (*akan berlaku* 'occur') caused by the future happening - *aliran air akan turun ke Sungai Puteh* 'the water will flow downstream into Sungai Puteh'. It is assumed that logging will cause the pollution of the tributary, so that the flow of polluted water from the tributary pollutes the river.

As illustrated in (8), (9) and (10), the issues of concern with respect to topography include whether the topographic features of the area identified for timber harvesting make accessibility difficult or are more sensitive to soil disturbance and whether timber harvesting activities are in close proximity to water sources, e.g. tributaries and rivers which can affect the environment. The location of the harvesting close to water sources is the potential source of water pollution as a result of the flow of water downstream into the rivers. For example, in (10), *Pencemaran air* is

encoded in the form of a prediction as a future state of affairs ‘will happen’, the aim of which is to alert the forestry department to evaluate whether it is worth carrying out the harvesting if it is going to affect water quality adversely. River pollution affects not only the surrounding area but also the nearby community, whose clean water source may be threatened as a result of activities harmful to the environment.

#### FOREST MANAGEMENT PLANNING

Managing natural forests is concerned with monitoring future harvesting activities in the forest which involves making predictions and undertaking future actions. The former includes predicting the effects of uncontrolled harvesting on the environment, and the latter monitoring activities are undertaken once the application for a harvesting license is approved. Future actions typically include answering the questions ‘what will the state forestry department do?’ during the process of forest harvesting as illustrated in (11):

Excerpt (11).

a. *Kawasan ini akan dipantau oleh Pegawai Hutan Renj S bersama-sama dengan Unit Tugas-Tugas Khas M*

(This area will be monitored by the S Range Forest Officer together with the M Special Task Unit.)

b. *bagi mengawal Kawasan serta pemeriksaan aktiviti usahahasil yang dijalankan.*  
(to control the area as well as to make an inspection of harvesting activities that are conducted.)

Text (11a) is a Material clause representing the Goal of the process *Kawasan ini* and the Actor *Pegawai Hutan Renj S* in the passive (receptive) form. The Material Process, i.e. the process of ‘monitoring’ is construed as being located in future time, encoded as a future action by a future marker of time *akan* ‘will’ suggesting that monitoring is part of forest management planning. *Akan dipantau* ‘will be monitored’ is a passive verb phrase; the Actor is represented in the passive form and given a lower status of Adjunct indicated by *oleh* ‘by’ (oleh Pegawai Hutan Renje S) and may be ellipsed. *Unit Tugas-Tugas Khas* ‘The special Task Force Unit’ is construed as accompaniment stands in an extending relation to *Pegawai Hutan Renj S* ‘Forest Range S officer as a co-participant in the monitoring work *dipantau oleh Pegawai Hutan Renj S bersama-sama dengan Unit Tugas-Tugas Khas* ‘monitored by the S Range Forest Officer together with the M Special Task Unit’.

Text (11b), the Circumstantial of Purpose, is a continuation of (11a), the main clause. It is qualified hypotactically by a purpose clause marked by a purposive preposition (*bagi* ‘to’) *bagi mengawal kawasan serta pemeriksaan aktiviti usahahasil yang dijalankan* ‘to control the area and the inspection of the harvesting activities that are undertaken. The purpose clause presents information about the intention behind the monitoring of the area presented to take place in the future *akan dipantau* ‘will be monitored’. It contains a Material process *mengawal* ‘control’ involving two entities *kawasan* and *pemeriksaan* construed as sharing the same participant role with *pemeriksaan* represented as accompaniment conjoined by *serta* ‘as well as’. The harvesting activity is represented in the clause as the Goal (*aktiviti usahahasil yang dijalankan* – harvesting activities that are undertaken) to indicate the kind of work that will be monitored by forest officers in the forest areas.

SFM requires that issues relating to unplanned or poor planning timber harvesting be addressed. This is crucial for sustainable forest and preserving the environment in and around the harvesting areas. Excerpt 12 describes the effects of poorly planned timber harvesting, which will have a negative effect on water quality:

Excerpt (12a).

*Pencemaran air akan berlaku kerana aliran air ke Sungai Endau*

(Water pollution will take place because the water will flow into Sungai Endau'

Excerpt (12b).)

*Dan ini akan memberi kesan kepada alam sekitar*

(and this will have an impact on the environment)

The second main clause (12b) is structurally related by grammar to the first by the conjunction *-dan* 'and' - and extends beyond it, adding some new element predicting that 'Water pollution' represented by anaphoric *ini* 'this' will affect the environment (*dan ini akan memberi kesan kepada alam sekitar* 'and this will affect the environment'). The sentence analysed construes a future reality of the possible effects of harvesting on the environment, particularly water resources and quality.

The sentence contains two paratactically related clauses (marked (12a) and (12b)) introduced by *dan* 'and' indicating extension. Each clause is followed by a dependent clause, underlined in the extract. Clause (12a) consists of an independent material clause containing a material process *akan berlaku* which states that water pollution will happen. The subsequent dependent clause in (12a) implicates a direct reason relationship between the reason clause and the main clause provides marked by a marker of reason *kerana*, e.g., *kerana aliran air akan turun ke Sungai Endau* 'because the flow of water will go downstream to the River Endau'. The independent clause in clause (12b) contains a substitute pro-form *ini* 'this' which replaces the whole of clause (12a) and functions as Actor having impact on the environment *membawa kesan kepada alam sekitar*. The conditional clause which is initiated by a subordinator *sekiranya* 'if' represents that the situation in the main clause is directly contingent on that of the conditional clause, namely that '... this will take place if the harvesting work is not carried out systematically' *sekiranya kerja-kerja pengusahahasilan tidak dijalankan secara terancang*. This suggests the need for immediate action to be taken to address the negative effects of irresponsible logging activities.

Forest management planning also takes into consideration the economic contribution of timber harvesting in terms of the sale of timber products. This primarily involves identifying the tree species found in the area and estimating the potential revenues gained from the harvesting. The crucial information on the area identified as a potential harvesting site includes information on the species richness of plants and forest composition and information on the species valued for timber, including the standing volume of commercial trees and their diameter. Excerpt 13 draws on the resources of relational clauses to characterise the area in terms of the predominant tree species found in the area.

Extract 13.

*Taburan dirian pokok yang mendominasi hutan ini adalah dari spesis Kapur, Meranti tembaga, Meranti sarang punai, Meranti melantai, Meranti rambai daun, Keruing, Balau,*

*Kempas dan lain-lain jenis yang berdiameter 70cm ke atas dengan anggaran 26 tan seekar atau 36.71 meterpadu/ha.*

(Distribution of tree stands that dominate this forest consists of Kapur, Meranti tembaga, Meranti sarang punai, Meranti melantai, Meranti rambai daun, Keruing, Balau, Kempas and other species with a diameter of 70 cm and above with an estimation of 26 tonnes per acre or 36.71 square metres/ hectares.)

Extract 13 is a relational clause encoding a relationship of ‘being’ rather than ‘doing’ realised by a relational process, i.e., a copula *adalah* ‘is’ which is unmarked for tense representing the statement as a fact. The writer represents the clause complex in a Value-Token structure identifying the Value (*Taburan dirian pokok yang mendominasi hutan ini ...*) in terms of the Token specific entities (e.g., *spesis Kapur, Meranti tembaga, Meranti sarang punai, ... dan lain-lain jenis ...*) that realise it. The direction of identification is from general to specific, and *adalah* connects the two parts of the clause to represent class membership by reference to the identities of the entity that constitute the class. The clause relates a general class of entity ‘The distribution tree species’ to members of a class consisting of different types of trees (e.g. *spesis Kapur, Meranti tembaga, Meranti sarang punai, ... dan lain-lain jenis ...*) assigning the latter specific qualities in terms of tree species, tree diameter (*berdiameter 70cm*) and harvest volume (*26 tan seekar atau 36.71 meterpadu/ha*). Information about the predominant species of trees, the size of trees and the density of trees is important to estimate the economic value of an acre of timbre. It is necessary to estimate the economic importance or contribution of these tree species to the state and national economy and assess this against the impact of harvesting this area on the environment and the local community.

The two clauses are now analysed in terms of the experiential line of organisation. The main clause *Taburan dirian pokok yang mendominasi hutan ini* contains a defining relative clause beginning with a relative word *yang* ‘which’, which offers information to identify *Taburan dirian pokok* as one that dominates the jungle. The second clause also contains a relative clause *yang* (underlined in the given text) which uniquely identifies the tree species grown in this area in terms of diameter and volume per acre (*adalah dari spesis Kapur, Meranti tembaga, Meranti sarang punai, Meranti melantai, Meranti rambai daun, Keruing, Balau, Kempas dan lain-lain jenis yang berdiameter 70cm ke atas dengan anggaran 26 tan seekar atau 36.71 meterpadu/ha.*) The specific characteristic of the trees, for example, those with a diameter of 70 cm or above, is important because only trees with a diameter of 30 cm and above are allowed to be felled, which is the requirement for sustainable forest management in West Malaysia. The provision of readily available information which identifies tree species for which a strong consensus exists regarding their use for timber is important for decision-making at the state level.

## DISCUSSION AND CONCLUSION

Forest resources in Malaysia are a significant natural asset to generate revenues to support not only economic development but also the development of forestry policies and programmes which can have a considerable impact on the implementation of SFM. The aspect of SFM in focus is concerned with awarding licenses to loggers to carry out harvesting that meets the objectives of SFM. The study focuses on ‘real-life’ natural forest management in the context of timber harvesting in Malaysia, which is an active process requiring careful planning for two main reasons. The first is to ensure future economic benefits to the national economy, and the second is to

safeguard long-term sustainable management of the forest to achieve a balance between timber production and social and environmental objectives. It is important to make certain that the forest is ecologically sustainable, economically viable and socially acceptable, especially to the local community, which are, in most cases, the indigenous community.

As illustrated in the literature reviewed, past studies show that forestry-related discourse studies lack empirical findings on how texts are written, what functions they serve for the community, and how these functions are achieved in meeting its communicative purposes (see, e.g. Arts et al., 2010; Winkel, 2012; Leipold, 2014; de Jong et al., 2017). The present study attempts to fill the gap and address the concern for the lack of linguistics-oriented discourse studies. It examines field inspection reports as a sub-genre of forest resource reports in the forestry discipline created to carry out a particular purpose, namely to provide essential information about forest areas identified as potential timber harvesting sites to assist the authority concerned in making the decision. The data consists of six field inspection reports; the approach adopted is Halliday's SFL, and Halliday and Matthiessen's (2014) clause of representation has been drawn on to analyse how the reports construe experience in the organisation of the clause. Thirteen excerpts in Malay were examined to ascertain how language was used to communicate information about the forest areas involved in applications for harvesting.

The analysis is language-oriented, focusing on the grammatical resources of transitivity for construing our experience of the world both around and inside us (Halliday, 1994). Given the nature of the reports, an important aspect of constructing experience includes classifying an entity (e.g. *Kawasan dipohon* 'the area applied for'), identifying the location of the entity (e.g. *terletak di sebelah timur dalam Hutan Simpanan D* 'located on the west of Forest Reserve D'), and providing information about the status of harvesting activities (e.g. *telah tamat aktiviti pembalakan* 'the logging activities have come to an end'). The primary concern is to provide factual information regarding the forest area in terms of its location, topographical conditions, surrounding areas, distribution of tree stands and possible socio-economic values which are to be taken into consideration when decisions are made on whether to approve or reject the application for license for timber harvesting.

The excerpts were examined to illustrate how the Malay language provides the writers with lexicogrammatical resources to construe their experience of social activity in terms of a configuration of a set of process types: material, relational and existence. The findings reveal how the writers' lexicogrammatical choices construes experience as 'doing', 'relating' and 'being' or 'existing'. For example, the geographical location of the forest area is dominated by locative relational clauses (e.g., *Kawasan dipohon terletak di sebelah barat.*) characterised by a few favoured prepositional phrases such as *di sebelah*, *bersempadan dengan*. The existence of an entity is, for example, predominantly construed by 'existential' clauses (e.g., ... *terdapat penempatan orang asli*) indicated in particular by *terdapat*. With respect to topographical condition, the experiential meaning expressed in terms of actions is predominantly construed using the material clause (e.g., *Pencemaran air akan berlaku*), and of existence using the existential clause (e.g., *Terdapat juga anak-anak sungai yang mengalir*). The management of forest involves undertaking future actions presented in material clauses which construe the experience as doing (e.g. (*Kawasan ini akan dipantau oleh Pegawai Hutan Renj S.*).

The present study hopes to contribute to the body of knowledge with respect to how detailed textual analysis can provide concrete evidence about the way forest management practices are communicated in the genre of field inspection report through the writer's grammatical choices. This study highlights the importance of using a standardised report to document the information

obtained from in-situ field inspections, the function of which is to provide essential information to the authority to respond appropriately to the timber harvesting application. Such a decision is expected to be made in accordance with forest policies and legislation to protect the forest ecosystem and conserve forest reserve areas. The generic structure of field inspection reports identified in the study can be used as a guide to present the report of forest site inspections in the conventional form to reflect the socio-rhetorical contexts in which they exist.

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