

Adoption of Sustainability Practices by Smallholders: Examining Social Structure as Determinants

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ABSTRACT

Global palm oil consumption, registering at 77 million metric tons annually, presents a significant ecological challenge. The importance of fostering sustainable production is paramount. Yet, issues of deforestation and other unsustainable practices cast doubt over this objective. Sustainable certification schemes such as the Roundtable on Sustainable Palm Oil (RSPO) and the Malaysian Sustainable Palm Oil (MSPO) aim to improve sustainable practices among stakeholders, including smallholders. A low achievement rate of only 30% certified smallholders suggests impediments beyond financial constraints. This study investigates the impact of social structure, specifically communication elements like social interaction ties and shared identity, on smallholders' adoption of sustainable certification—a viewpoint aligned with innovation diffusion theory. Employing a quantitative design and a questionnaire survey, data was collected from 300 independent smallholders and analyzed via Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings illuminate that communication through social interaction ties and shared identity significantly influences the adoption of sustainable-certified schemes by smallholders. This suggests that innovation diffusion within this sector is socially motivated, emphasizing the influential role of communication in facilitating adoption of sustainable practices among small farmers. This novel understanding offers valuable insights for researchers and practitioners in utilizing social dynamics to endorse sustainable practices within the palm oil industry.

Keywords: *Sustainable certification, communication, smallholders, innovation diffusion, social structure.*

INTRODUCTION

The term “smallholder” refers to a group of farmers who own 40% of the Malaysian oil palm plantations (in terms of land area). There are more than two million farmers in Malaysia. Smallholder inclusiveness and participation are necessary to realise sustainability changes at a production level as they are the gatekeepers in the palm oil industry. Smallholders, however, are vulnerable (Mol, 2007; Rizal & Nordin, 2022). First, because they very often experience uncertainties in market accessibility and are often confronted with price fluctuations (Vermeulen, Goad, Morfaw, & Costa Rica, 2006). Second, oil palm smallholders are dependent on companies or middlemen to sell their products (Ishak et al., 2017; Suraiya et al., 2016), which implies a low bargaining power compared to other actors in the value chain. Moreover, palm oil smallholders lack capital and up-to-date agronomic knowledge, and consequently, their productivity is far below its potential (Brandi et al., 2015; Hidayat, Glasbergen, & Offermans, 2015). Participation of smallholders in sustainability standard systems and certification could generally accelerate a

transformation towards more sustainable palm oil production and simultaneously improve smallholders' livelihoods.

Sustainability certification on palm oil is increasingly becoming an important form of governance over palm oil production in the past several years. Establishment of Roundtable of Sustainable Palm Oil (RSPO) in 2004 as a voluntary form of sustainable certification had been challenged by the emerging of almost similar standards owned by the respective government where the oil-palms are planted. The certificate, Malaysian Sustainable Palm Oil (MSPO), is mandatory for producers in each level of palm oil production (Mohd Firdaus et al., 2016; Hidayat, Offermans, & Glasbergen, 2018). Despite the existence of several different sustainable certifications, all of them face the challenge in obtaining participation by smallholders.

Multiple initiatives have been implemented to attract smallholders' participation in sustainability schemes. RSPO, for instance, has allocated USD 1.75 million since 2012 to help smallholders obtain their certification (RSPO, 2017). MSPO in another way through the Malaysian government provided USD 35 million in the form of subsidy for smallholders to obtain their certification (Kushairi, 2017). Furthermore, Malaysia Palm Oil Board (MPOB) has been extensively educating and regulating smallholders on sustainable production. First, an area that consists of multiple independent smallholders was selected for supervision of extension officers. The area is known as the Sustainable Palm Oil Cluster (SPOC), which aims to provide better organisation among the smallholders. The extension officers, known as '*Pegawai Tunjuk Ajar Sawit (TUNAS)*', are recruited specially for this purpose (Mohd Firdaus et al., 2016; Singh & Kumaran, 2016). Second, a regulation was imposed to inhibit selling of fresh fruit bunch (FFB) by the smallholders if they do not register by the end of Dec 2020 (MPOCC, 2018)

Despite the effort, the empirical evidence still shows a small amount of participation from smallholders. Up until January 2021, there are only 170 units certified amounting to 331,740 hectares of independent smallholders plantation that had obtained MSPO certification (Rizal & Nordin, 2022). The number is relatively small in comparison to the total land area owned by independent smallholders which are around 986,331 hectares (MPOCC, 2018). Regardless of the rigorous effort and regulation created which span more than 7 years, only around 30% of the independent smallholder's plantation have successfully obtained MSPO certification.

Current works of literature are unable to explain the fundamental questions of why smallholders participate and do not participate in sustainable certification. The result obtained from the previous studies is inconclusive. Researchers initially believed that a lack of financial support was to be the main barrier to smallholders' participation. Brandi and colleagues, for instance, mentioned that "*...intensive preparations for certification are necessary—but smallholders often lack the financial means to shoulder these costs without financial support*" (Brandi et al., 2015, p. 302). However, as mentioned earlier, even with strong financial assistance from either the state government or private institutions, the number of participants is still small. Researchers then began to examine different problems. Multiple research findings highlighted that lack of awareness could be a major factor which leads to non-participation issues. Several other studies support such findings (Brandi et al., 2015; Cheyns, 2014; Markne, 2016; Ni et al., 2016; Rietberg & Slingerland, 2016). Despite the thorough initiatives, there is still low response from the smallholders.

Henceforth, there is a need for further examination to identify other determinants that could affect smallholders' participation in obtaining sustainable certification. Overdependence on a single factor such as awareness or financial support (known as utility factors) as determinants could lead to misunderstanding of how smallholders behave in this matter. Hence, this current study is positioned as solution-based research to examine the impact of multiple determinants on smallholders' participation in sustainable certification schemes. This study goes beyond the current belief of rational choice theory (i.e., awareness, financial support and threat of laws) towards examining how sociological elements such as social structure and deliberative communication impact participation behaviour.

Thus, the main objective of this study is to investigate the impact of social structure on smallholders' participative behaviour in sustainable certification schemes and the mediating effect of deliberative communication. The arrangement of this article is as follows. First, it will discuss the background of the study which led to the emerging need of research, Then, it will discuss the supporting literature and hypotheses. The following section will describe methodology used in this study and followed by a section that presents the findings of the study. The last two sections will produce the discussion and conclusion of the findings.

The findings from this article will not only benefit academics but also practitioners such as extension agents and rural development policy makers. It provides insights to resolving the current perplexing condition of lack of smallholders' participation in sustainable policy despite overwhelming support and threat of strict regulation. Therefore, audiences and readers of this study would be able to understand more on the effect of social structure towards smallholders' participative behaviour in sustainable policy. The results of the study reported in this paper would provide readers ample empirical findings to draw a conclusion whether social structure and interaction affect smallholders' participative behaviour.

Sustainable Certification and Smallholders

It is an important fact where smallholders are amongst important producers of palm oil beside larger plantation companies. It is reported there are approximately three million smallholders globally that produce around 4 million tonnes of palm oil, accounting for 40% of the total global production (RSPO, 2015). The similar situation is also reported in Malaysia, from a total of 5.72 million hectares of the planted area, 2.20 million of it is produced by smallholders (Kushairi, 2017). Independent smallholders alone own 930,000 hectares of plantation. Despite their importance, the process of getting smallholders certified is still lacking. As of January 2021, after 6 rigorous years of promoting and assisting smallholders to obtain sustainable certification, there are only around 331,740 hectares of independent smallholders' plantation are certified with MSPO certification (MPOCC, 2020). Around 25% of the overall amount of plantation area (979,758 hectares). Figure 1 shows a comparison between the overall area and the amount that has been certified.

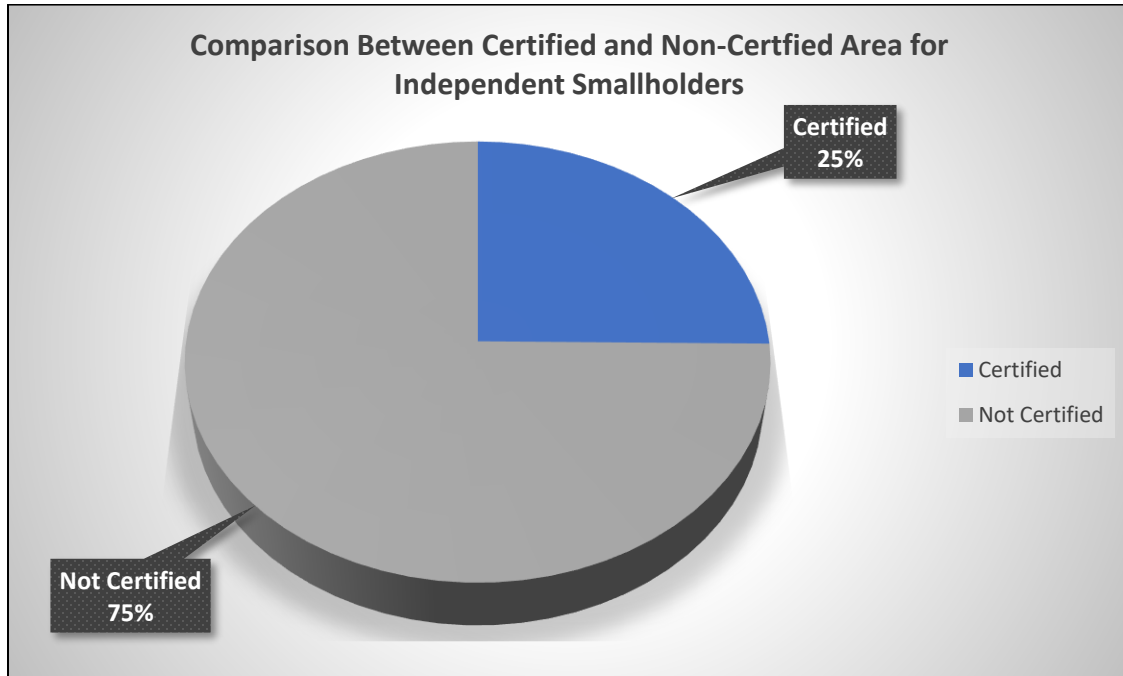


Figure 1: Total Area and Area Certified by MSPO for Smallholders Plantation as for January 2021
(Rizal & Nordin, 2022)

Establishment of sustainable certification schemes such as RSPO and MSPO allows for better administration and monitoring of sustainable palm oil production. It is crucial considering that palm oil is an important commodity and basic ingredients for almost half of the food and cosmetic products found in the global market (Pichler, 2013). With the increased debates on the detrimental effect of palm oil production including deforestation and demolition of wildlife habitat, sustainable certification has become more important (Brandi et al., 2013; Moreno-Peñaranda et al., 2015).

There are three important reasons to get smallholders certified. First, it is due to their significant contribution to palm oil feedstock. There would be a serious threat of disruption in the palm oil supply if the global market only allows for sustainably certified palm oil to be traded. With the exclusion of smallholders' production, palm-oil producing countries will be unable to meet those demands. Second, the smallholders' interest needs to be represented in the sustainable-certified scheme. If there are only small numbers of smallholders in the scheme, little attention will be given to their interest by other stakeholders. This is clearly shown in a study where other stakeholders have a sceptical perception of the smallholders (Cheyns, 2014). Third, is to uphold the validity and legitimacy of the sustainable-certified schemes. The scheme either RSPO or MSPO is based on multi-stakeholder governance where the concept of administrative power is based on deliberation by its stakeholders (Köhne, 2014). The democratic legitimacy of this multi-stakeholder initiative can only be achieved if all the affected stakeholders including smallholders participate during the deliberation.

Limitation of Utilitarian Perspective

The current literatures in sustainable certification emphasises on rational-choice theory to explain the lack of smallholders' participation in the schemes (Brandi et al., 2015; Hidayat et al., 2015; Hidayat, Offermans, & Glasbergen, 2016; Ni et al., 2016). The arguments focus on lack of access to financial assistance during application for sustainable scheme as it deterred the smallholders' intention to be certified. Henceforth, it is argued that lack of participation was contributed by the burden of certification cost. However, it can be argued that factors contributing to smallholders' participation in sustainable certification remain inconclusive and are not completely associated with rational choice. It is argued that there is still a low number of participations despite assistance given to reduce the costs and increase awareness.

The perplexing paradox between views by scholars and facts from the ground can be associated with the limitation of rational-choice theory (RCT). RCT puts a large focus on human behaviour based on maximising the utility (i.e., personal gain or loss based on self-interest). Most of the empirical evidence correlates with the idea of RCT, making RCT look like the universal theory of human action (Hodgson, 2012). However, RCT lacks explanation capability and does not consider important elements such as historical, cultural and institutional perspectives of particular societies in account (Hodgson, 2012). Economists such as Hodgson (2012) argued that RCT falls on *"its excessive quest for generality, it will fail to focus on the historically and geographically specific features of the socio-economic systems that we wish to study and understand"* (Hodgson, 2012, p. 104).

The limitation of RCT calls for a new perspective to explain smallholders' participation in sustainability schemes. Emphasis is essential on the capability of social structure in particular, the impact of the relation between actors (e.g. farmers, dealers, extension officers) in influencing their decision making. Findings on sustainable agriculture practices place importance on quality of interactions, between farmers and other actors in the social structure, to determine agricultural success (Janker, Mann, & Rist, 2019). The interaction amongst peers in the community of smallholders develops and shapes the organisational fabric of the community. The information interchanges among other group members, including on technology and innovation advancements, could increase plantation productivity and output (Mannan, Nordin, Rafik-Galea, & Ahmad Rizal, 2017).

It is of paramount importance to empirically examine the social structure elements capability in predicting success amongst farmers to explain smallholders' participative behaviour in sustainability schemes. Smallholders are also associated with family farmers where they share some of the characteristics of rural local community social structure. As a huge part of social structure is based on interaction and norm, it is essential to recognise the role of identity within the community. A person's behaviour is partially shaped and controlled by the influences of the social system and the person's cognition like expectations and beliefs (Chiu, Hsu, & Wang, 2006). A shared identity is one of the core elements of the social system, similar to an organisation. Social structure is hence mainly represented by social interaction, norm and identity elements that could be explanatory factors in determining human behaviour and intention. Hence, this study investigates the impact of these elements on palm oil smallholders' participative behaviour in Malaysia.

LITERATURE REVIEW

Stakeholder Participation in CSPO – Communitarian and Social Structure

The process of institutionalising sustainability is stalled due to low participation of the smallholders which were argued as due to limited awareness and financial capability factors (Brandi et al., 2015). However, the participation is still low despite the government's interventions to provide financial assistance and massive mobilization of the supportive agent. Hence, this calls for a shift in understanding smallholders in the society structure context. How then, should smallholders be viewed?

The approach in viewing smallholders in promoting sustainability practice can be positioned either through libertarian or communitarian perspective. In a libertarian perspective, smallholders are considered as a business entity (Poutziouris, Smyrnios, & Klein, 2013) and it is operated under the concept of *laissez-faire*. Within this concept, smallholders possess the freedom, as the most important element of an individual (Nozik, 2009), to undergo a business operation without intervention from another entity. Their sole responsibility is to generate profit and they do not need to contribute or rely on the surrounding communities (Friedman, 1970). They are free to compete and have the liberty to choose any direction that they consider best, including to not participate in sustainable certification.

On the other hand, communitarianism emphasises the social construction of the self; that is, the self cannot be understood apart from the social relations in which it is embedded. Individuals make up social practices and institutions in which they pursue their aims in collaboration with one another (Waghid, 2002, p. 183). An individual's freedom is subjected to the virtue of community where it is precondition for social cohesion (unity) (Etzioni, 2014). Social connections such as network and interaction with other individuals are important to increase a person's resources (Piaget, 1978). Too much attention given to the concept of communitarianism however could result in diminished capability in enhancing the capacity of an individual.

In the context of this study, smallholders rely both on themselves and their surrounding community in mobilising their actions. Hence it is imperative to consider both individual element and community virtue in viewing smallholders (Rizal & Nordin, 2022).

Smallholders and Social Structure

Independent smallholders in Malaysia are not bound by a contract with mills or corporations like schemed smallholders. They have autonomy on farm management, land usage, and crop selection. However, smallholders face other kinds of challenges like limited buyers (Nagiah & Azmi, 2012).

Independent smallholders consist of individuals who are usually the breadwinners in their families. More than 60% of independent smallholders in Malaysia rely on palm oil as the main source of income. They usually manage their plantation with the help of family members and employ either permanent workers or on contractual basis. Plantation management includes land preparation, plant cultivation, plant maintenance, harvesting and land restoration. The simple organisation has no or low hierarchical structure. It is a direct relationship between owner – labourer or there might be one or two supervisors between them (Sidique, 2015). The organization is different in comparison with scheme smallholders or corporations where the hierarchical and formal structure is more complex involving many tiers between owner and

employee. Despite the lack of formal structure and relationship, independent smallholders rely heavily on social structure and informal relationships.

Other important elements in smallholders' social structure include their relationship with the actors in their social vicinity. It includes local and religious leaders as well as their relationship with government extension agents – '*Pegawai TUNAS*'. The relationship between these actors contribute to social interaction between smallholders and other actors in their social vicinity and it is simplified in graphical presentation as shown in Figure 2.



Figure 2: Example of Relationship between smallholders and other actors in society

Defining Social Structure

In the general definition, the term “structure” refers to the relation of elements that have some composition of coherence and stability between the elements. The debate between the individual and society perspective in viewing social structure is paramount in conceptualising the social structure itself. Individualists believe that it is the action of the different individuals made up the social convention. Another view is how ‘rational’ individual responses to different types of situations aggregate up to produce social phenomena (Elder-Vass, 2010). The individual perspective focuses on the relational aspect between individuals which will contribute to the development of society. The structurationist otherwise emphasises on the imperative of society (i.e. institutional perspective) in determining individual action.

The first school of thought is the institutional social structure perspective, that includes norms, beliefs and values components in outlining the boundary and moving the society (Bernandi, Gonzales, & Requena, 2006). These components are the mortar and bricks for social structure which also offer clear antecedent values in explaining members' behaviour and action (Bernandi et al., 2006; Burt, 1992). According to institutional theory, the institution is responsible for dictating the actors' behaviour (Zeyen, Beckmann, & Wolters, 2016). The next most important concept of social structure is the relational vision. In this point of view, social structure is made of social relations and the analysis of social structure focuses on the centre of social relations that connects individual, community and society (Bernandi et al., 2006). The antecedent of this perspectives is much more associated to the Marxist tradition where “*social structure as a system of relations between class positions, with the basic relations being the relations of exploitation of*

the dominated classes by the dominant classes" (Ettrich, 2017; Marx, 1887). The relationships are defined by modes of production of a society in a particular historical period (Bernandi et al., 2006).

The two visions paved the pathway in understanding social structure and its impact on individual's actions. As individuals are connected in a network and these networks are then connected to larger networks, social structure is believed to be meaningful and important in this study. The most important features of the smallholders' social structure need to be further dissected for which are discussed as follows:

1. *The cultural aspect of social structure.* Institutional view taught us how an action is influenced by the previous generations especially through the cultural aspect. This cultural value subsequently becomes part of an individual's identity (Englund, Gerdin & Burns, 2020).
2. *The relational aspect of social structure.* The relation is instrumental where the relationship between two individuals contributes to the development of the social structure. Social relation further builds trust and shapes the norms in the society. This subsequently contributes to dictation in economic actions of individuals (Allen, 2023).

The theoretical perspectives underpinning the overall study needs to be further constructed. It has been shown previously on how cultural and relational are two important visions that encompass social structure and argued as suitable to explain the behaviour of society (Gutmann, 2009; Putnam, 2000). The theories explain how an actor's behaviour is affected by the social structure. Hence, paving the path in explaining smallholder's participative behaviour in sustainable certification and the role of social structure within it. The two theories are: Social Capital Theory and Social Identity Theory.

Social Capital Theory

Collective action is the central decision in regards to natural or agriculture resources management around the world (Adger, 2003). For instance, in agriculture and forestry where the resources mostly are found in multiple property rights regimes. There are many users and each of them possesses a different set of behaviours. The collective decision produced by a group or society has been explored by diverse social science disciplines involving study on psychology and anthropology as well as sociology as its central pillars. Mostly, scholars attempted to understand how societies behave in dealing with scarce resources with limited information and uncertain futures (Adger, 2003).

Social capital theory explains how actors or individuals utilise their relationship with other actors in the network to produce both personal good and also collective good (Johnson, 2016). The collective good comprises both philosophical and material elements of social dimension (Adger, 2003).

Social interactions between actors in the social structure leads to the development of social capital (Coleman, 1988; Siisiainen, 2003) where the social interactions further tighten the bond between the members of society (Putnam, 2001). Social interaction hence is an essential component that makes up the first construct in this study to measure relationship strength

between the smallholders as respondents. The relation between smallholders and other agencies within the social structure is the essential element for this construct. Therefore, the first hypothesis of this study is – *“There is a positive impact between social interaction ties and smallholder’s participative behaviour in a sustainable certification scheme”*.

The other component of social capital is social norm, which refers to *“actions that are considered acceptable or unacceptable and can be seen as the basis of building and maintaining personalised trust”* (Lyon, 2000, p. 665). Norms can be seen as part of social structure or a habit that shapes intuitive actions and allows agents to assume risk (Hodgson, 1998, p. 167). The concept of norms is influenced by an individual’s cognitive mechanism, by having trust and without a need to calculate risks but gain benefits each time an action is performed (Lyon, 2000). Shared norm is an important construct in social capital which is highly associated with the level of trust in society (Helbing et al., 2014). A society that has great trust amongst its members tends to share a similar norm that further strengthens the relationship of its members (Putnam, 2001). Hence, the second hypothesis for this study is – *“There is a positive impact between social norms and smallholder’s participative behaviour in a sustainable certification scheme”*.

Social Identity Theory

Social psychology and social identity are important in understanding the impact of social structure in an actor's behaviour (DeLamater & Ward, 2013; Owens, Robinson, & Smith-Lovin, 2010). It is important to understand social interactions as well as identity embedded within a society (Stets & Serpe, 2013). Basically, identity is considered as a *“shared set of meanings that define individuals in particular roles in society”* (Stets & Serpe, 2013) through membership of specific cause or groups in a society, e.g. SPOC (Ellemers & Haslam, 2012).

The important premise is social identity affects collective action of members within the group which lead to smallholders’ participative behaviour. Social identity is a prerequisite for collective action (Haslam, 2012) as group knowledge is the main source of knowledge for an individual/actor through symbolic interactionism (Sedam, 2015). Initially, it began with each actor in the community to form self-categorization which is *“cognitive basis of group behaviour”* (Sedam, 2015). It later develops into *“group prototypicality”* or normativeness where the individual actor begins to act as *“embodiment of relevant in-group prototype rather than a single unique individual”* (Hogg, Terry, & White, 1995, p. 261). The third hypothesis of this study is – *“There is a positive impact between shared identity and smallholder’s participative behaviour in a sustainable certification scheme”*.

The two components i.e., social capital theory and social identity theory are colossal for this study.

METHODOLOGY

A quantitative approach was used in this study to obtain and analyse information from independent smallholders with sustainable certification.

Target Population

The first rule in determining the target population is to determine what is the type of smallholders used for this study. Oil palm smallholders in Malaysia are defined as planters with a

planted area of less than forty (40) hectares. Smallholders commonly refer to landowners of a given right to plant in the respective area (Kailany, 2011; Sidique, 2015).

There are two sustainable schemes that could be owned by the independent smallholders participating in this study, which are MSPO and RSPO. MSPO certification is based on SPOC where smallholders are grouped into different clusters according to their areas. Malaysia Palm Oil Board (MPOB) is responsible for this procedure and assists smallholders to be certified.

Sampling Technique

In order to determine the proper sampling technique, it is essential to identify the potential data analysis intended for this study. In this case, the most suitable analysis to determine the impact of constructs within an early exploratory model is Partial Linear Square – Structural Equation Modelling (PLS-SEM). Determination of sample size for this study is critical as there are cases where studies misused the advantages of PLS-SEM characteristic in analysing small sample size to produce statistical output (Hair, Risher, Sarstedt, & Ringle, 2019). The sample size in this is hence based on power analyses that consider the model structure, the anticipated significance level, and the expected effect sizes. These criteria are essential elements used by Hair and colleagues in developing their power tables known as “minimum R-square method” to determine proper sample size to be used in any PLS-SEM based study (Hair, Hult, Ringle, & Sarstedt, 2016).

This method, which builds on Cohen’s (1992) power tables for least squares regression, relies on a table listing minimum required sample sizes based on three elements (Kock & Hadaya, 2018). The first element of the minimum R-squared method is the maximum number of arrows pointing at a latent variable (i.e. construct) in a model. The second is the significance level used. The third is the minimum R² in the model.

Therefore, the minimum sample size for this study was determined based on minimum R-square as shown in Table 1 below. As this study comprises of 3 arrows pointing at latent variable (i.e. dependent variable) and aims to obtain 1% significance level with 0.10 minimum R² score, the minimum sample size needed is 176 samples (Hair, Hult, Ringle, & Marko Sarstedt, 2014, p. 21). Method of sampling technique for this study is purposive sampling due to two reasons. Firstly, it is essential for the sample to come from the smallholders who own sustainable certification for at least one year prior to the data collection date. This provides a strong assumption that these smallholders understand their justification or *raison d’etre* in participating in sustainable certification. Secondly, the sampling technique allows the limited resources within this study (e.g. monetary and time cost to collect data) to be strategically positioned without compromising the obtained output.

Table 1: Minimum R² method for adequate sampling size

Maximum Number of Arrows Pointing at a Construct	Significance Level											
	1% Minimum R ²				5% Minimum R ²				10% Minimum R ²			
	0.10	0.25	0.50	0.75	0.10	0.25	0.50	0.75	0.10	0.25	0.50	0.75
2	158	75	47	38	110	52	33	26	88	41	26	21
3	176	84	53	42	124	59	38	30	100	48	30	25
4	191	91	58	46	137	65	42	33	111	53	34	37
5	205	98	62	50	147	70	45	36	120	58	37	30

6	217	103	66	53	156	75	48	39	128	62	40	32
7	228	109	69	56	166	80	51	41	136	66	42	35
8	238	114	73	59	174	84	54	44	143	69	45	37
9	247	119	76	62	181	98	57	46	150	73	47	39
10	256	123	79	64	189	91	59	48	156	76	49	41

Note: Extracted from Hair et al. (2016), "A primer on partial least squares structural equation modelling (PLS-SEM)", *Thousand Oaks: SAGE*

The sampling was conducted by consultation with local MPOB officers. In order to avoid unusable questionnaires, the final sample size used in this study is 300 respondents. The number is divided so that half of them are RSPO certified and another half are MSPO certified. Based on the preliminary consultation with MPOB, it was determined that location within the state of Perak, Malaysia, particularly in the district of Batang Padang and Hilir Perak is suitable for this study. Smallholders within the two districts were involved in the early stages of MSPO and RSPO certification.

FINDINGS

A total of 300 questionnaires were collected from 300 independent smallholders. Respondents were approached in their plantation location or during the meeting with 'Pegawai TUNAS' and the forms were collected on the same day.

Demographic Analysis

In this section, analyses on the respondents' demographic characteristics are shown in detail. The demographic analysis includes age, gender and size of plantation.

Age

Respondent's age shown in this section is separated into categorical age groups which are common in study related to agriculture (Mohd Shamsuri et al., 2015; Tey et al., 2013). Findings from the study indicate that only 6% of the respondents are less than 30 years old. Respondents who are aged 30 years old until 40 years old are 12 % of the total respondents. There are 28% of the respondents' ages 41 years old to 50 years old. 45% of them are between 51 to 60 years old. Lastly, there are 9% of respondents who are over 60 years old. Percentage of all respondents are shown in Figure 3 below.

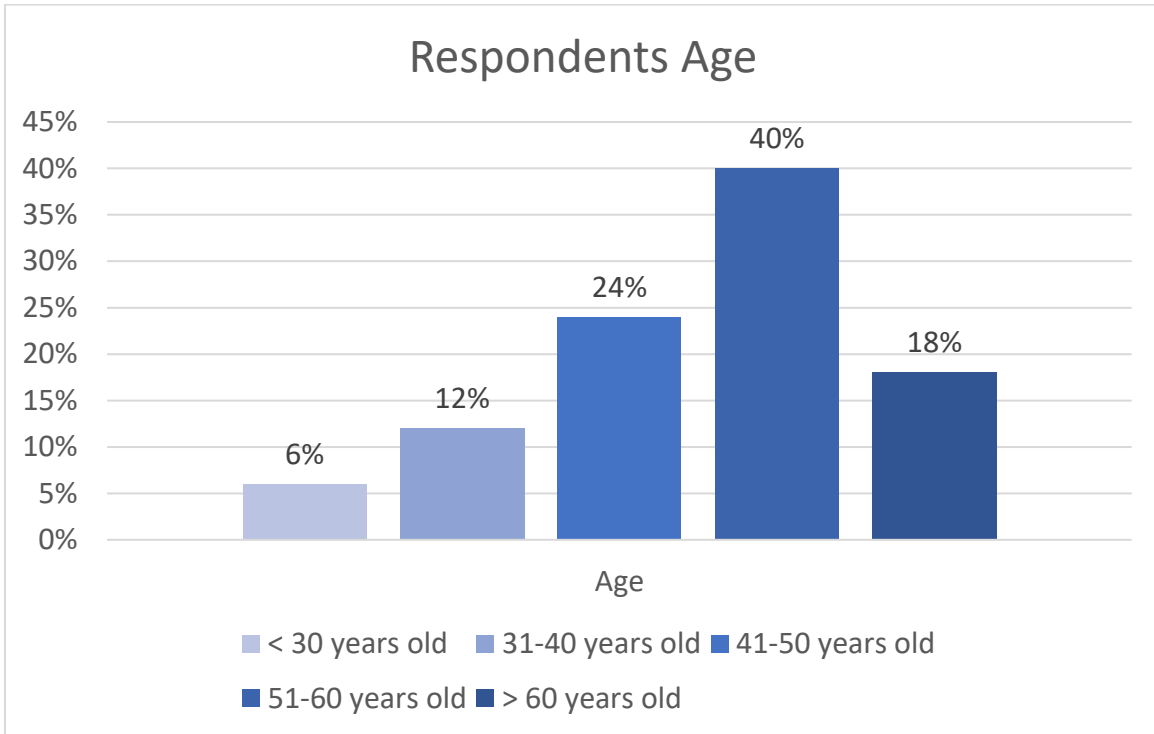


Figure 3: Percentage of the respondents' age

Gender

A majority of respondents are male (91%) and the rest (9%) are female. Table 2 shows the percentage and frequency of respondents' gender in this study.

Table 2: Frequency and Percentage of Respondent's Gender

Gender	Frequency	Percentage (%)
Male	276	92
Female	24	8
<i>Total</i>	<i>300</i>	<i>100</i>

Size of Plantation

Findings from the study show that 34% of the respondents own less than five (5) acres of oil palm plantation. 40% of them own between five (5) to ten (10) acres of oil palm plantation. 20% of the respondents own between 10 to 15 acres. Around 4% own between 15-30 acres and only two (2) percent of the respondents own more than 30 acres (see Figure 4).

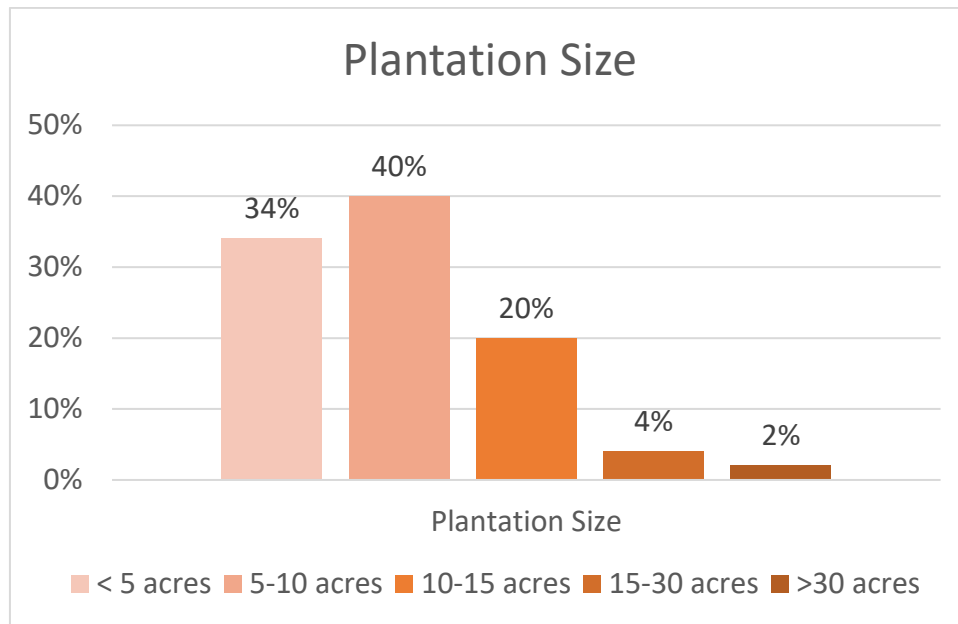


Figure 4: Size of plantation own by the respondents

Inferential Statistic

This study employed PLS-SEM as a method of analysis for the obtained data. It is important for the data to be assessed for the findings to be validated. The study used reflective measurement model assessment as the method. The assessments are divided into two different parts which are assessment of measurement model and assessment of structural model.

It is essential to investigate the significant level and t-statistics for all paths to test the developed hypotheses which measure the impact of the relationship between the constructs. Table 3 shows all the path coefficient t and p values for each of the relationships. In order to obtain the t and p values for each relationship, bootstrapping analysis by using SmartPLS 3.0 was conducted. 5,000 sub-samples were generated and the confidence interval was measured by using "Bias-Corrected and Accelerated (BCa) with the two-tailed test (Hair et al., 2016). Thus, a t-value of more than 1.96 with p values <0.05 indicate a significant relationship between the two constructs (Ramayah, Cheah, Chuah, Ting, & Memon, 2018, p. 145). The findings indicate that only one path coefficient between social norms constructs and participative behaviour construct is not significant. The other relationship is significant. Henceforth, the first and third hypothesis were supported while the second hypothesis is not supported.

Table 3: Path coefficient, p-values and t-values for the study

	Std Beta	T Statistics (O/STDEV)	P Values	Path coefficient significance
Social Interaction Ties -> Participative Behaviour	0.655	13.381	<0.000	significance
Social Norms -> Participative Behaviour	0.016	0.305	0.761	not-significance
Shared Identity -> Participative Behaviour	0.163	3.041	0.002	significance

DISCUSSIONS

The findings from this study could provide an explanation of certain smallholders' behaviour which were not fully explained in the existing literature. For instance, the findings of a study indicate that although almost half of the smallholders admitted that they have never obtained advice and assistance from TUNAS officers, they still obtain decent points in Good Agricultural Practice (GAP) (Awang et al., 2016). This shows that the information is potentially disseminated through word of mouth during the interaction between one smallholder and others.

Findings from this study are also in with the results of a study on a group of indigenous communities, Bidayuh, who were involved as oil palm cultivators through independent smallholders scheme in Sarawak (Lyndon & Razak, 2015). Although in the study, the authors do not specifically show the impact of social interaction, they show that some of their respondents learned new technology from their friends and families (Lyndon & Razak, 2015). Investigating deeper into the rural social structure in Malaysia strengthens findings from the study. The rural community values relationships and seeks to either develop or strengthen them (Fold, 2000; Gullick, 1992).

Information is disseminated through relationships which is later developed into collective action as argued by Rogers, "...relative advantage of a new idea often leads technocrats to assume that existing practices are so inferior that they can be completely dismissed" (Rogers, 2003, p. 255). Rogers criticises change agents that assume a new idea with relative advantage from old ideas will prevail but empirical evidence show otherwise (Rogers, 2003). Humans or actors or agents in social structure value relationships with another human. Hence, it is no surprise if changes or adoption of the new system did not occur even though the system is relatively better than the old system. Although there are benefits and monetary incentives, the participation rate is still relatively low compared to the degree of executed initiatives.

The findings from this study provide an explanation that smallholders value social interaction and have statistically proven the construct positively impacts smallholders' participation in sustainable certification. The capability of shared identity to mobilise social action is also shown in several other studies. For instance, in Indonesia where the trans-immigration that occurred in the 1980s has put immigrants or non-local residents together with local society in the Sumatra region. The immigrants were able to assimilate into local cultures and identity, transforming themselves into the same group and practising the similar culture and values (Steinebach, 2017).

It is hence evident that the model incorporating social identity is able to increase the size of social action especially in the area where integration is needed between conservative and progressive ideas (Dolšak, 2017). Similarly, in a study conducted in Australia, it is found that social identity is amongst the greatest predictors of environmental citizenship and environmental-aware consumer behaviour (Dono, Webb, & Richardson, 2010). On a similar ground, other studies also showed that social identity triggers inter-group process to collective action which explains environmental citizenship (Dono et al., 2010).

The relation between identity and actor action is also shown by other scholars in this discipline. The cognitive function of the actors is associated with group knowledge where it is seen as the main source of knowledge for an individual/actor through symbolic interactionism (Sedam, 2015). Initially, it began with each actor in the community form self-categorization which

is “cognitive basis of group behaviour” (Sedam, 2015). It later develops into “group prototypicality” or normativeness where the individual actor begins to act as “embodiment of relevant in-group prototype rather than a single unique individual” (Hogg et al., 1995, p. 261). Hence, in this study, sustainability and awareness on issues are shown through smallholders’ participative behaviour in obtaining sustainable certification. However, the awareness and concern on sustainability is a form of knowledge which was obtained based on symbolic interactionism with other members of society who shared a similar identity. Thus, this study has proven the mechanism of action made by smallholders were influenced by his or her shared identity.

RECOMMENDATIONS

The study reported in this paper examines the impact of social structure elements on behaviour related to sustainability (i.e. smallholders’ participation in sustainable schemes). Its central thesis is to prove that social structure does affect an actor’s behaviour which provides a new perspective on the current literature. Thus, perception of smallholders in the sustainable scheme shall not be restricted only on RCT. Social structure is proven to turn information which previously considered subtle, nuanced and difficult to verify (e.g. information on sustainable certification) into reliable information through interaction with known and trusted actors in the structure (Granovetter, 2005). However, this study comprises several limitations and shall be paved as future avenues for improvement in the future.

The study did not include the effect of the gap within the social structure in the study, known as structural holes. A deeper analysis of social interaction between actors in the social structure (Burt, 2001) could provide some insights into the structural holes that exist in social networks when there is a lack of direct contact or tie between two or more entities (Lin, Burt, & Cook, 2001). It is important to reiterate that this study and several previous studies have been showing that smallholders live in clusters. It means that a smallholder lives and may interact with other smallholders creating a bunch of clusters. The clusters may be connected by an actor known to form ties which are known as ‘bridging ties’ (Shen, Monge, & Williams, 2014). However, there might be cases where there are clusters that are now connected and isolated from other clusters. Hypothetically, the isolated clusters do not receive the similar impact of social interaction which lead to lack of access towards information. This phenomenon is called structural holes. The inability of this study to investigate the effect of structural holes on smallholder’s participative behaviour provide great opportunities for future studies.

Future studies should also investigate the capability of social structure as mediating impact or moderating impact on RCT based constructs. As the study showed that social interaction and shared identity constructs have a direct impact on smallholder’s participative behaviour, the constructs could be further investigated. By examining their role as mediator or moderator of RCT based constructs such as awareness and perceived economic impact, a deeper understanding of smallholder’s behaviour in the sustainable scheme could be examined.

Future research could also look into the impact of both social structure and participative behaviour towards attitude of the smallholders on sustainability. The establishment of sustainable certifications are aimed to ensure sustainable production of palm oil products, from

planting to production (e.g. cooking oil, solid fat, soap and confectionaries). Considerations of the natural environment should also be taken into account.

CONCLUSION

This study was motivated by limitations found in both academic literature and industrial practices. As the most productive oil seed crop, oil palm is used for both edible oil and biodiesel markets. However, sustainability has become an issue and initiative has been taken including the introduction of sustainable certification through the multi-stakeholder platform. Despite the rigorous approaches introduced to ensure smallholders were getting certified, the number is still minimal. The overall findings indicate that social structure is an important element and impacts smallholders' participative behaviour in sustainable certification. Both social interaction ties and shared identity are statistically proven to impact smallholder's participative behaviour. Social norms are fully mediated by both deliberative communication and responsible leadership on its impact on smallholder's participative behaviour.

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