

Systematic Literature Review on the Social and Economic Impacts of Palm Oil Certification on Smallholders

Rozanna Rosdin¹ , Wai Yan Cheah^{2*} , Ramle Moslim³ 

¹Centre for Research in Development, Social and Environment (SEEDS), Faculty of Social Sciences and Humanities, Universiti Kebangsaan Malaysia (UKM), 43600 UKM Bangi, Selangor Darul Ehsan, Malaysia; Malaysian Palm Oil Board, 6 Persiaran Institusi, Bandar Baru Bangi, 43000 Kajang, Selangor, Malaysia. Email: rozanna@mpob.gov.my

²Centre for Research in Development, Social and Environment (SEEDS), Faculty of Social Sciences and Humanities, Universiti Kebangsaan Malaysia (UKM), 43600 UKM Bangi, Selangor Darul Ehsan, Malaysia. Email: cheahwaiyan@ukm.edu.my

³Malaysian Palm Oil Board, 6 Persiaran Institusi, Bandar Baru Bangi, 43000 Kajang, Selangor, Malaysia. Email: ramle@mpob.gov.my

ABSTRACT

CORRESPONDING

AUTHOR (*):

Wai Yan Cheah
(cheahwaiyan@ukm.edu.my)

KEYWORDS:

Certification
Economic aspect
Social aspect
Oil palm smallholders
Sustainability

CITATION:

Rozanna Rosdin, Wai, Y. C., & Ramle Moslim. (2023). Systematic Literature Review on the Social and Economic Impacts of Palm Oil Certification on Smallholders. *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, 8(3), e002148. <https://doi.org/10.47405/mjssh.v8i3.2148>

Enhancing smallholder compliance to palm oil certification standards helps in achieving the global sustainability agenda. Oil palm smallholders are one of the vital parts of the global certified sustainable palm oil (CSPO) supply chain. However, little is known about on the importance of palm oil certification for the social and economic development of smallholders. This present study aims to systematically review the social and economic benefits received by smallholders in implementing palm oil certification. The review was conducted in accordance with the published standard, namely the PRISMA statement (Preferred Reporting Items for Systematic reviews and Meta-Analyses). The articles of this study were chosen from two major databases, namely Scopus and Web of Science (WoS). The results show that smallholders gained both immediate and long-term social (livelihood, social network and agricultural practices) and economic (financial management, income, price and production) benefits through palm oil certification. If these benefits can be extended to all smallholders, it will help to boost the participation of smallholders in certification. The current progress, impacts and challenges faced by oil palm smallholders in palm oil certification implementation were discussed comprehensively. Future research and suggestions on the contributions of oil palm smallholders in successful certification were summarised. This eventually leading to achieving Sustainable Development Goals (SDGs) for benefits of the whole supply chain of Malaysian palm oil industry.

Contribution/Originality: This study contributes to the existing literature by extending the understanding of social and economic benefits received by smallholders in implementing palm oil certification. Oil palm smallholders can benefit from these empirical findings, which can be used to enhancing smallholder participation in sustainable palm oil certification standards.

1. Introduction

Palm oil is the world-leading vegetable oil. It also contributes significantly to the economic growth of tropical developing nations, both in terms of increasing foreign income and employment opportunities and as well as a contributor to gross national product (GDP). It is an important product both locally and internationally, given its high yields per hectare, low production costs, and uses in the food and non-food industries (Abazue et al., 2019). In 2020, a total of 235.40 million tonnes of oils and fats were produced globally (Malaysian Sustainable Palm Oil, 2021). Palm oil, as the main oil produced, accounted for a 31% share, followed by soybean oil at 25%, rapeseed oil at 11% and sunflower oil at 9% (Malaysian Sustainable Palm Oil, 2021). As for exports, out of 95.03 million tonnes of oils and fats exported in 2020, palm oil occupied 53% of the global export, followed by soybean oil and sunflower oil with 14% each and rapeseed oil at 6% making it a vital source of energy and food supply for the world (Malaysian Sustainable Palm Oil, 2021).

2. Literature Review

In the last decade, palm oil has confronted negative reputation with perceptions of the crop causing deforestation, emissions of greenhouse gases (GHG), biodiversity loss, social exploitation and the oil being damaging to health (Jackson et al., 2019), to the point of being labelled the 'world's most hated crop' (Yan, 2017). Non-government Organizations (NGOs), media and social perceptions towards the palm oil industry seemed to indicate that this crop is generally not sustainable (Aikanathan et al., 2015). These concerns were raised as grounds for banning the use of palm oil. Oil palm is the world's most productive vegetable oil plant, it can be harvested for about 30 years (Yap et al., 2021) and has an output-to-input energy ratio of 9:1 compared to 3:1 for other oilseed crops such as rapeseed or soybean (Basiron, 2007). However, its rapid growth has been connected to the ongoing destruction of habitats for wildlife and biodiversity. Oil palm expansion raises sustainability and conservation concerns. Concerns about the negative impact of massive agricultural developments including palm oil have spurred increasing efforts to promote sustainability in various fields of the agriculture supply chain (Nagiah & Azmi, 2012). In line with the 2030 agenda for sustainable development, adopted by all United Nations Member States since 2015, which provides a shared blueprint for peoples and the planet's peace and prosperity now and in the future. To balance the three components of sustainable development: the economic, social and environmental, the 17 Sustainable Development Goals (SDGs) and 169 targets must be integrated and indivisible (Department of Economic and Social Affairs, n.d.). The definition by Brundtland that has been widely quoted and adopted stated sustainable development is "development which meets the needs of current generations without compromising the ability of future generations to meet their own needs" (Keeble, 1988). However, the definition from the most authoritative organization, The Food and Agriculture Organization of the United Nations (FAO), seems to be more practical with respect to oil palm cultivation. The FAO defines sustainable development as "the management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such sustainable development, in particular in the agriculture, forestry, and fisheries sectors, conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technologically appropriate, economically viable and socially acceptable" (FAO, n.d.).

Smallholders are important stakeholders influencing the growth of the palm oil sector, such as conflict management and environmental conditions. [Rokhim et al. \(2021\)](#) countered that oil palm smallholders conflict management is considered necessary to sustainable business. Smallholders are an important part of the palm oil industry and to ensure they are no exception in the effort to produce sustainable palm oil, various initiatives have been taken by the state government. The Roundtable on Sustainable Palm Oil ([RSPO, 2021a](#)) defines smallholders as a farmer who produce oil palm alongside subsistence crops, where the family provides the majority of labor, the farm is the main source of income, and the planted oil palm area is less than 50 hectares. Oil palm smallholders can be divided into two categories, namely independent smallholders and organized or scheme smallholders. According to [RSPO \(2021a\)](#), independent smallholders are characterized by the freedom to choose what crops to plant, how to use their lands and how to manage their farms. They are self-managed, self-organized, self-financed, and not contractually bound to any mill, estate or agency. Meanwhile, scheme or organized smallholders are structurally bound by contract or credit agreements to a specific mill, estate or government agency. Scheme smallholders are frequently restricted in their crop and planting management techniques and are not free to choose what crops they grow. They are also directly monitored and managed by the scheme's management, to which they are structurally bound ([Hidayat et al., 2015](#)). The Indonesian government used oil palm as a major driver of social and economic development in rural areas through Nucleus Estate and Smallholder schemes (NES). Under these schemes, smallholders can either manage their farm by themselves or entrust it to the company ([Rist et al., 2010](#)). Meanwhile, in Malaysia, smallholders are defined as individual farmers who own or lease less than 40.46 ha of an oil palm farm. Independent smallholders manage their farms by themselves while organized or scheme smallholders are managed by the government agencies. Independent smallholders are grouped into the Sustainable Palm Oil Cluster (SPOC). Under this programme, these smallholders are being assisted by government officers to manage their farms ([Senawi et al., 2019](#)).

Smallholders play a vital role in ensuring the growth of the agricultural sector can achieve sustainable agricultural practice ([Abas et al., 2021](#)). Smallholder manage an estimated 84% of the world's farms, cultivating less than 2 ha of land ([Lowder et al., 2016](#)). Worldwide, there are 3 million oil palm smallholders producing approximately 4 million tonnes of palm oil ([Nagiah & Azmi, 2012](#)). In Indonesia, oil palm smallholders account for about 40.8% of Indonesia's total oil palm area ([Jelsma et al., 2017](#)), while 38.8% of the total oil palm planted in Malaysia is occupied by smallholders ([Yap et al., 2021](#)). Therefore, it is very important to promote independent smallholder participation in the global market for certified sustainable palm oil (CSPO). Third-party independent certification systems constitute a mechanism for demonstrating the implementation of good practices. Certification schemes or systems establish specific rules for compliance with the requirements of sustainability standards. The negative impacts of palm oil production have raised concerns for consumers and buyers and have prompted more and more oil palm growers to promote CSPO in order to prove their production is sustainable ([Brandi et al., 2013](#)). Certification is a procedure involving written assurance that a service, process or product in the supply chain complies with certain standards conducted by a third party ([Majid et al., 2021](#)). Oil palm certification has been used as a tool for monitoring oil palm management practices, traceability for raw material supply and labelling of palm oil products ([Kumaran & Suparyono, 2019](#)). Currently, a few certification standards promote certified and responsible palm oil production, which is Roundtable on Sustainable Palm Oil (RSPO), Indonesia Sustainable Palm Oil (ISPO), Malaysian Sustainable Palm Oil (MSPO), International Sustainability and Carbon Certification (ISCC) and the

Roundtable on Sustainable Biomaterials and Sustainable Agriculture Networks (RSBSAN) (Majid et al., 2021). However, only three are specific for palm oil, the RSPO, MSPO and ISPO. The RSPO was developed by oil palm businesses while MSPO and ISPO were established as national schemes to assist the industry to comply with sustainability requirements (Kuntom et al., 2003). According to Dauvergne (2018), currently, RSPO is the largest voluntary certification for sustainable palm oil, and 17.96 million tonnes, or 19% of global palm oil produced, has been certified with RSPO (RSPO, 2021b).

Although the number of CSPO smallholders is increasing, the real challenge is to prove the effectiveness of the CSPO implementation through a certification system on the ground. The question is whether the CSPO can improve the well-being, businesses and livelihoods of smallholders and at the same time encourage a more sustainable environment. Kamau et al. (2011) reported that Peru's small coffee farmers' total gross and net household income decreases as a result of Fairtrade certification, which is attributed to low yield. Bacon (2005) also stressed that although it has the potential to improve the livelihoods of the small-scale coffee smallholders in Northern Nicaragua, fairtrade and organic certification cannot compensate for the other variables contributing to the decline in their overall standard of living. Despite opinions that certification is ineffective in improving smallholders' livelihoods, others have suggested that the role of certification has the ability to enhance the livelihood of smallholders. In a study of the impact of oil palm development on the economic well-being of rural Indonesian smallholders, Rist et al. (2010) discovered that many smallholders have greatly profited from higher returns. However, to realize these benefits, smallholder cooperatives and district authorities play important roles in assisting smallholders in certification. According to Hidayat et al. (2015), smallholders value certification benefits more if they lead to economic benefits rather than non-economic advantages such as social and environmental advancements. Senawi et al. (2019) showed that along with the process of MSPO certification, Malaysian independent smallholders have progressed from being dependent on social and economic external factors to a more sustainable community.

Smallholders have great potential to make significant contributions to the palm oil industry. It is very important to encourage smallholders to participate in the global CSPO market. However, the challenge that they have to face to continue to be part of the value chain is quite tough. Smallholders are an economically vulnerable group which have limited capital, a lack of agronomic knowledge which reduces their productivity, and uncertainty regarding price of market entry (Hidayat et al., 2015). Currently, most smallholders have yet to reach their true yield potential owing to a lack of knowledge in managing their farms. Ismail et al. (2003) emphasized that to improve smallholders' yield, they must be given education regarding the proper agronomic practices in oil palm cultivation.

Although many studies focus on the impact of the adoption of sustainability standards schemes (Ruysschaert & Salles, 2014; Saswattecha et al., 2015; Cattau et al., 2016; Carlson, et al. 2018), there are insufficient numbers of scholars who systematically review the impacts of the implementation of sustainability standards among smallholders. Moreover, studies on the impact of sustainability standards that are specific for palm oil were relatively fewer. Studies on the impacts of MSPO accreditation have been done in previous years, however, the numbers were lesser than those for RSPO and ISPO certification studies. Increasing concerns on the adverse effects of palm oil cultivation have led to several studies assessing the environmental implications of palm oil certification including greenhouse gas (GHG) reduction, deforestation, improved conservation and many more

(Laurance et al., 2010; Saswattecha et al., 2015; Carlson et al., 2018; Schmidt & De Rosa, 2020). Many studies have been conducted to investigate on the responses and understanding of the environmental impact, but only few measures have been taken with regard to social impacts, partly due to a lack of data (Ayompe et al., 2021). Therefore, this study aims to systematically review the social and economic impacts of palm oil certification on smallholders. To achieve the aim two objectives have been underlined, i) to analyse the type of palm oil certification for smallholders and ii) to study the pattern of social and economic impacts received by smallholders from certification. This study is foreseen to bring significance information to the stakeholders, including government, agencies of the palm oil industry, NGO's and including smallholders for decision making in their field.

3. Research Methodology

The systematic review (SLR) approach was used in this study, which was based on Kitchenham's (2004) initial guidelines. A systematic literature review is a process of identifying, assessing, and interpreting all available research on a specific research question, area of study, or phenomenon of interest. All the reviews can be carried out using eight common steps: (1) formulating the research problem; (2) developing and validating the review protocol; (3) searching the literature; (4) screening for inclusion; (5) assessing quality; (6) extracting data; (7) analysing and synthesizing data; and (8) reporting the findings (Xiao & Watson, 2019).

3.1. PRISMA statement (Preferred Reporting Items for Systematic reviews and Meta-Analyses)

This review was conducted using the principles of the PRISMA statement. The PRISMA Statement's goal is to assist authors in improving the reporting of systematic reviews and meta-analyses. PRISMA could also be used to report systematic reviews of other types of research, particularly evaluations of interventions (Shamseer et al., 2015).

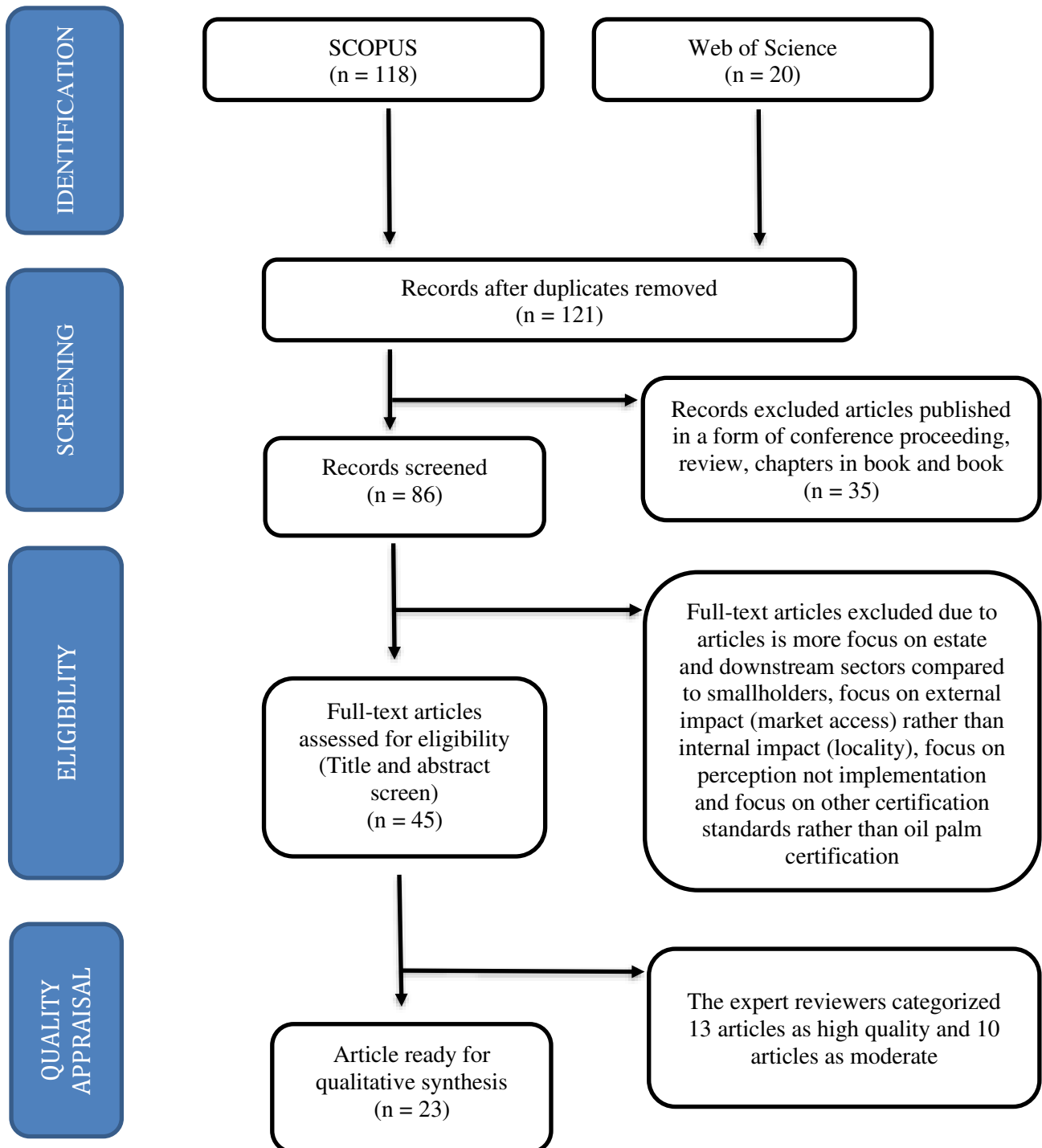
3.2. Formulation of the research question

The research question for this study was formulated using PICO. PICO is a tool that assists researchers to develop suitable research questions for the review. According to Stern et al. (2014), PICO can also be used for qualitative reviews (those seeking to analyse social phenomena and human experience). The three core elements in PICO are Population, Interest and Context. The authors have included three major elements in the review based on these concepts, namely oil palm smallholders (Population), palm oil certification (Interest) and social and economic impact (Context) which subsequently serves as a guide for the authors in developing the key research question of what are the social and economic impacts of the implementation of palm oil certification on oil palm smallholders?

3.3. Systematic searching strategies

Identification, screening, and eligibility were the three main processes involved in the systematic search strategies (refer to Figure 1).

Figure 1: The Flow diagram



3.3.1. Identification

The literature search was conducted in two databases, namely Web of Science and Scopus. These are the two most comprehensive databases for literature searches that are both equally efficient and objective (Aghaei Chadegani et al., 2013). These two databases were used to rank journals based on total citations received and productivity to indicate the journals influence, impact or prestige. According to Bergman (2012), the Scopus database had more citations, but the coverage pattern was similar to Web of Science. The keywords were developed based on the PICO using a thesaurus to find similar words (Table 1). The searching process in these two databases resulted in a total of 138 articles and these were

then screened further by removing duplicates. A total of 17 articles were found to be duplicated, making the remaining total of 121 articles.

Table 1: The search string

Database	Search string
Scopus	(TITLE-ABS-KEY (oil AND palm OR palm AND oil)) AND ((certification OR standard)) AND (sustainability)) AND (oil AND palm AND smallholders OR oil AND palm AND farmers)) AND (social AND impact OR economy AND impact OR social AND influence OR economy AND influence OR livelihood OR profit)
Web of Science	TOPIC: (oil palm OR palm oil) Refined by: TOPIC: (certification OR standards OR certificate OR credential OR document) AND TOPIC: (sustainability) AND TOPIC: (oil palm smallholders OR oil palm farmers) AND TOPIC: (social impact OR economy impact OR social influence OR economy influence OR livelihood OR profit)

3.3.2. Screening

The timeline selected was based on papers published between 2010 and 2021. To ensure the review's quality, articles in the form of proceedings, reviews, chapters in books and books were excluded. 35 articles were excluded from this process since they did not meet the inclusion criteria. The remaining 86 articles were used in the eligibility process.

3.3.3. Eligibility

The selected articles were analysed independently based on titles and abstracts with emphasis on oil palm sustainability standards and oil palm smallholders. This process excluded 41 articles due to articles that focused more on estate and downstream sectors compared to smallholders, on external impacts (market access) rather than internal impacts (locality), focused on perception, not implementation and focused on other certification standards than oil palm certification. The number of articles was reduced to 45 after the titles and abstracts were screened.

3.3.4. Quality Appraisal

Quality appraisal is a tool for assessing the methodological quality of experimental research and provides a way identifying the most rigorous research that can be used to make evidence-based decisions (Wendt & Miller, 2012). According to Petticrew and Roberts (2008), experts should divide the articles into three categories based on their quality: high, moderate, and low. Only articles in the high and moderate categories will be reviewed. After all the remaining articles were reviewed by two experts, 13 articles were ranked as high and 10 articles were ranked as moderate.

4. Result

4.1. Temporal and spatial distribution

Based on the number of articles per year in Figure 2, the highest publication year for articles related to the social and economic impacts of palm oil certification on oil palm smallholders was in 2020 with 9 articles (39.1%), followed by 2019 with 7 articles

(30.4%), then 2015 (8.7%), 2018 (8.7%) and 2021 (8.7%) with 2 articles each. The lowest was in 2016 with 1 article (4.3%). [Figure 3](#) and [Figure 4](#) show the total number of articles according to their respective country and continent of origin. Most of the studies were conducted in Asia with 15 articles (65.2%), followed by Africa with 5 articles (22%), and South America with 3 articles (13%). Based on country, Indonesia had the highest number of research studies with 13 articles (56.5%), followed by Ghana with 4 articles (17.4%), and 2 studies were conducted in each of Brazil (8.7%), Malaysia (8.7%) and Thailand (8.7%) while Colombia (4.3%) and Guinea (4.3%) had only 1 article each.

Figure 2: Number of articles by year

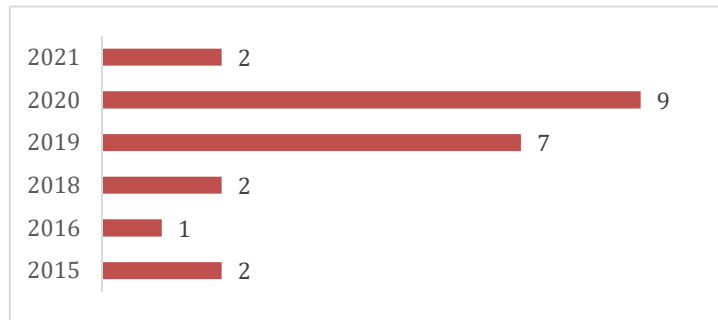


Figure 3: Percentage of articles by continent studied

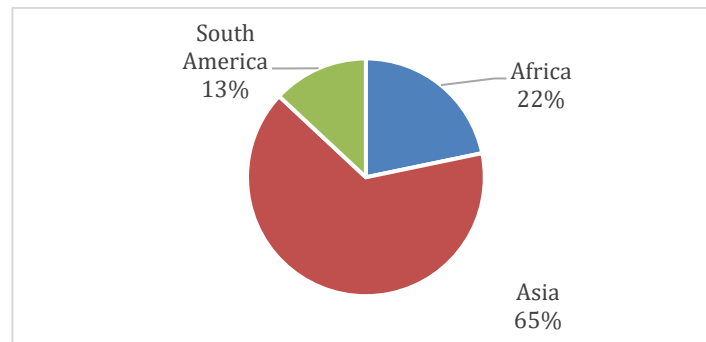
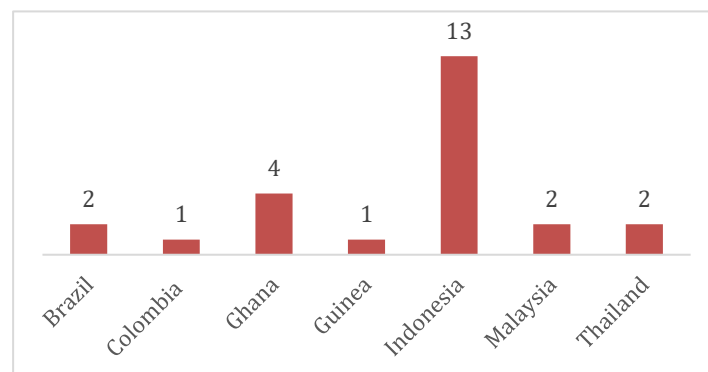


Figure 4: Number of articles by country studied.



4.2. Contextual issues

The RSPO certification scheme was the most researched topic with 14 studies (58%) ([Figure 5](#)). ISPO studies had 3 articles (13%), followed by in Good Agricultural Practices (GAP) with 2 articles (8%) and only one paper touched about MSPO certification (4%). The rest of the articles were related to government efforts or initiatives conducted in the

respective countries. Figure 6 shows that there were three types of oil palm smallholders found in these articles, namely independent, scheme and non-specific smallholders. Independent smallholders have the highest number of research studies with 13 articles (41%), followed by scheme smallholders with 10 articles (31%), while 9 articles (28%) do not specifically mention the category of smallholders. Figure 7 shows the total number of articles based on the method used. Most studies chose survey-based (39.1%) and multiple methods (39.1%) to investigate the social and economic impacts of oil palm certification on oil palm smallholders with 9 articles each. Meanwhile, document analysis was the research method for 4 articles (17.4%) and only 1 (4.3%) article used an interview-based method.

Figure 5: Percentages of articles by type of oil palm certification

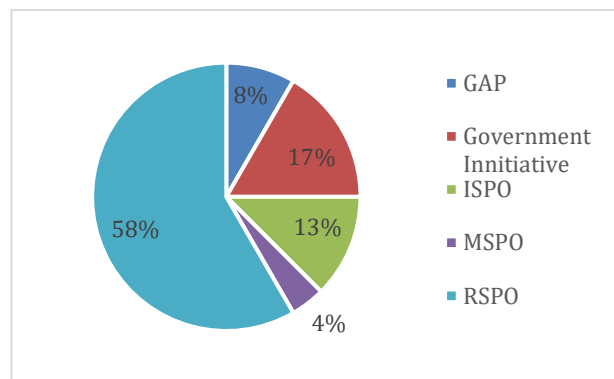


Figure 6: Percentages of articles by type of oil palm smallholders

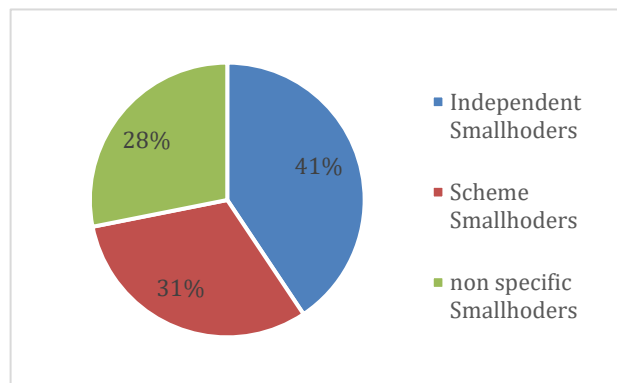
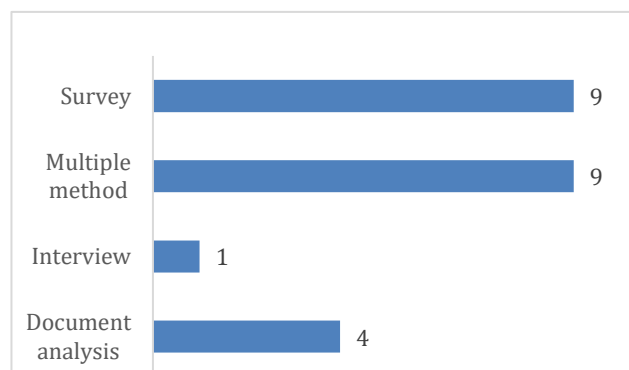


Figure 7: Numbers of articles by method used.



4.3. Substance and content analysis

After a thematic analysis of the content and substance of the 23 articles, this study divided them into two groups according to the main impacts researched, either a) social and b) economic. Through the social impact, 3 themes have been measured which are livelihood, social network, and agricultural practice, while, through the economic impact, 4 themes have been measured, including the financial management, income, price and production. The theme and sub-themes are listed in [Table 2](#).

Table 2: The themes and sub-themes overview of social and economic impacts of palm oil certification on smallholders

Studies	Country	Type of Palm Oil Certification					Type of Smallholder			Social Impact			Economic Impact			
		RS	IS	MS	GA	GI	ISH	SSH	NS	LV	SN	AP	FM	IC	PR	PD
1 Hidayat et al. (2015)	Indonesia	/					/	/		/	/	/	/	/	/	/
2 Baudoin et al. (2015)	Indonesia					/	/	/		/			/	/		
3 Brandi (2016)	Indonesia	/					/	/				/			/	/
4 Glasbergen (2018)	Indonesia	/	/				/	/			/	/	/	/		
5 Nesadurai (2018)	Indonesia & Malaysia	/					/	/		/	/	/	/	/		
6 Schoneveld et al. (2019)	Indonesia		/		/		/						/	/		/
7 Jelsma et al. (2019)	Indonesia				/		/					/				
8 Senawi et al. (2019)	Malaysia			/			/			/	/	/	/		/	/
9 Martens et al. (2019)	Indonesia	/					/			/			/			
10 Santika et al. (2019)	Indonesia	/					/	/		/	/		/			
11 Balde et al. (2019)	Guinea					/			/	/		/	/	/		
12 Hutabarat et al. (2019)	Indonesia	/						/		/	/	/	/	/		
13 Furumo et al. (2020)	Colombia	/							/		/	/	/		/	/
14 Ernah et al. (2020)	Indonesia		/				/	/			/	/	/			/
15 Degli and Oosterveer (2020)	Indonesia & Thailand	/					/	/		/	/	/	/	/	/	/
16 Lee et al. (2020)	Indonesia	/							/	/						
17 Rodthong et al. (2020)	Thailand	/							/	/	/	/	/	/		
18 Khatun et al. (2020)	Ghana	/							/	/		/	/			/
19 Brako et al. (2020)	Ghana	/							/	/		/	/	/		/
20 Vamuloh et al. (2020)	Ghana					/			/	/		/	/		/	
21 Futemma et al. (2020)	Brazil					/			/	/	/		/			
22 Dompreeh et al. (2021)	Ghana	/					/	/		/				/		/
23 Brandão et al. (2021)	Brazil					/			/							

RS = RSPO

IS = ISPO

MS = MSPO

GA = GAP

GI = Government Initiative

ISH = Independent Smallholder

SSH= Scheme or Organized Smallholder

NS = Non-specific Smallholder

LV = Livelihood

SN = Social Network

AP = Agricultural Practices

FM = Financial Management

IC = Income

PR = Price

PD = Production

4.3.1. Social impact – Thematic analysis

Livelihood. According to the authors [Santika et al. \(2019\)](#), [Vamuloh et al. \(2020\)](#), [Lee et al. \(2020\)](#) and [Khatun et al. \(2020\)](#), [Dompreeh et al. \(2021\)](#) livelihood covers aspects of

living conditions (water resources, electricity, adequate sanitation), access to infrastructure (schools, hospitals, clinics), and a variety of credit schemes are improved in oil palm smallholder villages with well-organized management systems compared to a society without a system. [Santika et al. \(2019\)](#) emphasized that the basic well-being of Indonesian smallholders, with factors such as energy for cooking and adequate sanitation, improved after 6 to 8 years while physical well-being aspects such as access to school and healthcare facilities improved in the early stages. Smallholders are trained by the certification group manager (government agencies, companies or NGOs) which contributes a positive impact on the smallholders' human capital (skills and knowledge) ([Hidayat et al., 2015](#); [Nesadurai, 2018](#); [Senawi et al., 2019](#); [Furumo et al., 2020](#)). According to [Senawi et al. \(2019\)](#), independent smallholders who join MSPPO have been provided with personal protective equipment (PPE) and chemical storage racks by the Malaysian government once they are certified. Training will be given by the SPOC Group Manager on the management and handling of pesticides to educate the smallholders on the dangers of improper use to their health. With the comprehensive training provided, smallholders are introduced to safe conditions and employment contributing to better health conditions.

Social network. Through certification, smallholders have a better platform to communicate with other stakeholders such as estates, millers, dealers, suppliers or any other companies ([Senawi et al., 2019](#)). In Malaysia, this platform has served as a consultation process with stakeholders if there are any complaint or grievance issue raised. This have formed a constructive circle of social relationships between smallholders and stakeholders ([Senawi et al., 2019](#)). According to [Futemma et al. \(2020\)](#), smallholders in Brazil built strongly bonded social capital based on community-based initiatives. Smallholders were trained to better manage their businesses, create business relationships with companies and input suppliers and better engage with the members. This made a positive contribution to the social capital of smallholders, increasing opportunities for their networking and relationships ([Hidayat et al., 2015](#)).

Agricultural practice. The social aspects were further strengthened by training smallholders on GAP. The training highlighted proper fertilizer application, good harvesting techniques, integrated pest management practices, limited use of pesticides and spraying, record-keeping, proper maintenance of their farm soil moisture and other points ([Hidayat et al., 2015](#); [Senawi et al., 2019](#); [Brako et al., 2020](#)). Ghanaian oil palm smallholders have reported significant declines in fertilizer and agrochemical use rates since participating in the certification scheme ([Brako et al., 2020](#)). [Ernah et al. \(2020\)](#) stressed that on average over three years, Indonesian certified smallholders spent approximately IDR 50,000 per hectare less on pesticides than non-certified smallholders. Meanwhile, [Hidayat et al. \(2015\)](#) mentioned that Indonesian smallholders collect and send used chemical containers to the cooperative company where it will be safely destroyed. Smallholders received a lot of information about the safe use of chemical pesticides and the disposal of chemical waste. Smallholders were given training on various concerns including GAP, environment, health and safety, and awareness of certification. In Malaysia, some of the training involves government agencies such as the Department of Safety and Health (DOSH), the Department of Environment (DOE), and the Department of Wildlife Protection (PERHILITAN). Smallholders in Indonesia and Malaysia gain access to physical capital elements such as PPE, including skin and eye-protective equipment (goggles, gloves, safety shoes, safety helmets and coveralls), respiratory protective equipment (respirators), chemical storage systems, sanitation rooms, owl nests and waste ponds ([Hidayat et al., 2015](#); [Senawi et al., 2019](#)).

4.3.2. *Economy impact – Thematic analysis*

Financial management. Scheme smallholders believe that by participating in the certification scheme enable them to gain opportunities to access credit, as it can increase their income and ability to repay loans. Ghanaian certified oil palm smallholders have the highest frequency of extension visits and access to credit (Brako et al., 2020). When a high monthly repayment is chosen, Indonesian smallholders can generally return their credit fast, in less than three years (Baudoin et al., 2015). A total of 59 % of Indonesian scheme smallholders have a better access to credit as a result of their participation in the certification scheme (Hidayat et al., 2015). According to Santika et al. (2019), after 6 to 8 years, the financial well-being of Indonesian smallholders improved primarily due to increased access to credit schemes. Smallholders are taught on the way to keep their farm management records, particularly regarding monthly yields, costs of production such as buying fertilizer, pesticide usage, labour costs for harvesting, fresh fruit bunch (FFB) transportation and many more topics (Baudoin et al., 2015; Glasbergen, 2018; Nesadurai, 2018; Schoneveld et al., 2019; Furumo et al., 2020). Implementing this record-keeping system would help the smallholders to manage their finances effectively.

Income. Certification is also thought to have the potential to increased financial capital for smallholders and thus positively contribute to their income. In this context, involvement in certification is highly valued by smallholders as it poses positive impact on the quality and volume of their products, and in turn opening up opportunities for higher income generation (Hidayat et al., 2015; Nesadurai, 2018; Balde et al., 2019; Furumo et al., 2020; Dompreeh et al., 2021). Smallholders' understanding of GAP usually ensures high yields and incomes (Baudoin et al., 2015; Jelsma et al., 2019; Schoneveld et al., 2019). Hidayat et al., (2015) emphasizing that increased knowledge on harmful chemicals may leads to lesser usage of pesticides and herbicides by smallholders and eventually resulting in lesser costs of spraying from approximately IDR 900,000 – 1000,000 /ha/year to IDR 400,000 /ha/year. In Indonesia, the author discovered considerable profit disparities, with certified smallholders earning more than uncertified smallholders. However, the differences were quite small and it is highly depended on the conditions prior to participating in certification (Glasbergen, 2018). According to Nesadurai (2018), household incomes of certified smallholders have improved by almost 25% compared to non-certified smallholders. Certified Ghanaian oil palm smallholders have the lowest poverty levels, compared to uncertified oil palm and other food crop smallholders (Brako et al., 2020).

Price. Most certified independent and schemes smallholders believe that by participating in certification, they will be receiving a higher price for their FFB. According to Degli and Oosterveer (2020), Indonesian and Malaysian smallholders who have access to information on agricultural practices has found improve in FFB quality, output and pricing. A premium price is an additional cost resulting from higher production quality as an indirect result of certification due to GAP training (Glasbergen, 2018). This higher FFB price is not so much due to the fact that their FFBs are certified, but more due to the fact that certified FFB products are often higher quality than uncertified FFB products. According to Hidayat et al. (2015), Indonesian independent smallholders will usually choose to sell FFBs to companies that offer higher prices as they have more flexibility and are freedom to sell, although choices will also depend on the mill distance from plantation.

Production. The technical assistance has been provided by extension officers during farm visits has helped to overcome Colombia's smallholder management challenges for

optimised productivity via certification (Furumo et al., 2020). According to Senawi et al. (2019), total of 1,307 Malaysian smallholders have produced more than 30 t ha⁻¹ yr⁻¹ FFB as of December 2017. This has proven that with the adoption of GAP, smallholders' yields can be comparable to even an estate's yields. In Indonesia, higher production quality is driven by organizational and technological advancements, which can help smallholders, both indirectly and monetarily (Hidayat et al., 2015). According to Ernah et al. (2020), in 2010, yields for certified and non-certified Indonesian smallholders were almost equal, however in 2013, certified smallholders enjoyed an increase of more than 15% of their yields. Nesadurai (2018) stated that certified smallholders were seeing yields increase of around 37 to 39%. Generally, most smallholders are paid based on the weight of the FFBs they produce. As a result, a higher yield, amount, and total weight of FFB harvest is directly translated into a higher income. There are two major potential advantages from implementing GAP that are being recognized by smallholders, are that it will provide better yields and improved quality of FFBs (Baudoin et al., 2015; Schoneveld et al., 2019; Degli & Oosterveer, 2020). However, the selling structure will determine whether the improved quality results in a smallholders would result in financial gain (Brandi, 2016).

5. Discussion

5.1. The social and economic impacts of palm oil certification on smallholders: current insights and progress

The data shows that the number of articles analysed changed year to year. It was found that in 2019 and 2020 the number of articles published increased. This has indicated an increase in interest among researchers on aspects of sustainability towards oil palm smallholders. The impact of anti-palm oil campaigns has raised awareness of the importance of sustainable palm oil (Kannan et al., 2021). Concerns over negative sentiments towards oil palm development have prompted increased efforts in promoting sustainability in the oil palm supply chain (Begum et al., 2019). Most of these studies were conducted in Asia because Southeast Asia has been the world's leading producer of palm oil since 2007 (Cheng et al., 2017).

According to the FAO (n.d.), a total of 70% of the harvested oil palm areas worldwide is grown by Indonesia, Malaysia, and Thailand, making these countries the top three palm oil-producing countries at global scale. Meanwhile, Africa accommodates 21% of global oil palms. The seven producing countries of Oceania and Latin America represent only 6% of the total global area of oil palm, a very modest amount compared to Southeast Asia and Africa (Cheng et al., 2017). Indonesia has the highest number of research studies as Indonesia is the world's largest palm oil-producing country, representing 54% of global palm oil production (Jelsma et al., 2019). Meanwhile, for certification, the RSPO certification scheme has the highest number of studies as it is the oldest and leading certification scheme for palm oil compared to the other oil palm certifications. The RSPO certification scheme was developed in 2004 as a watershed moment for the palm oil industry in combating negative allegations and as one of the measures to prove their commitment towards sustainable development (Majid et al., 2021). Other producing countries have taken the effort to set their own sustainability requirements as demand for CSPO rises.

The Indonesian government established the ISPO certification scheme in 2011 while MSPO was developed by the Malaysian government in 2015 and became mandatory to all Malaysian producers on the 1st January 2020. Apart from palm oil certification, there are

programmes implemented in several countries that are government initiatives to improve the social and economic conditions of their smallholders. In 2010, the Brazilian government launched the Sustainable Palm Oil Production Program (SPOPP) that seeks to create favourable conditions for the expansion of industrial capacity and oil palm plantations in the Brazilian Amazon. SPOPP seeks to provide incentives for smallholders to become more integrated, as they have long been isolated and sometimes at odds with agribusiness interests ([Brandão et al., 2021](#)). In Ghana ([Vamuloh et al., 2020](#)) and Brazil ([Futemma et al., 2020](#)) they are offering contract farming to smallholders. Smallholders can improve their farm management structures through entrepreneurship, innovation, and renegotiation of oil palm contract farming.

Although the implementation of certification is different between schemes and independent smallholders, the benefits of participation in palm oil certification are similar. Direct impacts can be seen, especially in the livelihoods of smallholders. These direct impacts are closely related to new management structures implemented as smallholders are given appropriate training to increase their awareness and knowledge. Participation in certification by smallholders has benefited smallholder management, particularly in terms of building relationships between smallholders and their stakeholders. Smallholders are encouraged to participate in certification activities to build good relationships with their stakeholders. This harmonious and positive interaction will definitely give benefits to their farm operations.

In addition, via certification, smallholders are also given exposure through training related to the High Conservation Value (HCV) as well as training on Environmental Impact Assessments (EIA) and the concept of protected animals ([Hidayat et al., 2015](#)). Organized or scheme smallholders believe that they receive more benefits than independent smallholders as they get improved in technical services and access to credit. They also felt they have better access to information and skill development and were much supported in organizing social activities. Meanwhile, independent smallholders believe that membership in a smallholder's organisation, rather than participation in the certification, influences credit access. More than half of independent smallholders, about 56%, rely on cooperatives, smallholder associations or groups for their access credits compared to 26% of organized or scheme smallholders ([Hidayat et al., 2015](#)). In addition, having better record-keeping and management systems indicates an increase in the organizations' transparency. As a result, it will provide better assurance to banks or financial institutions and they will have more faith and become more inclined to provide loans ([Hidayat et al., 2015](#)).

Certification encourages smallholders to manage their farms properly and through proper GAP practices that will reduce the cost of production, increase the productivity of the farm and indirectly increase the smallholder's incomes ([Senawi et al., 2019](#)). Smallholders are foreseen to increase their yields and therefore incomes by following GAP, which are a part of the certification requirements. With successful implementation of GAP, the smallholders will have a better management towards their plantation operations.

5.2. The social and economic impacts of palm oil certification on smallholders: limitations and challenges

Smallholder certification is making progress but it is particularly challenging to implement, as it requires necessities of financial, manpower, management, and agronomic capabilities, that are usually lacking in smallholders. According to [Brandi et al.](#)

(2015), smallholders will incur additional costs in order to improve agronomic practises and to meet other certification requirements. Smallholders may require more costly inputs, such as high-quality seedlings, the purchase of good fertilizers or pesticides, additional equipment such as PPE, chemical storage, or machinery for field operations that need to be purchased or rented. Smallholders are less interested in non-economic benefits of certification, such as social and environmental improvements, unless this certification leads to economic gains (Baudoin et al., 2015). Currently, in Indonesia, only 3.8% of oil palm smallholder plantations are certified by the RSPO certification scheme. A total of 10.5% of the certified crude palm oil (CPO) produced is from smallholders and from this only 0.5% of them are independent smallholders. Scheme smallholders have a higher percentage as certificates are compulsory to participate in the certification as the palm oil mills associated with it are certified and manage all the prerequisites (Glasbergen, 2018).

Meanwhile, in Malaysia, scheme smallholders have achieved 100% MSPO certification, while for independent smallholders MSPO certification is only at 47.24% (Malaysian Palm Oil Certification Council, 2021). Scheme smallholders, better known as organized smallholders, have less difficulty obtaining certification as they are managed by government agencies. They have a systematic management system similar to estates. Although the achievement of certification for independent smallholders in Malaysia is still low, it shows significant progress. This is due to the Malaysian government providing an incentive to independent smallholders – the audit fee, PPE, chemical storage and training costs are fully borne by the government (Malaysian Sustainable Palm Oil, 2021). In Brazil, the SPOPP, initiated by the government, failed to increase the sectorial competitiveness and scale of development of smallholder schemes. Some of these failures can be linked to circumstances beyond of SPOPP's control, such as political and economic factors, as well as corporate policies and actions. The SPOPP's inability to anticipate the challenges and respond to changing contexts is due to a lack of multi-stakeholder involvement and systematic management (Brandão et al., 2021). There are still limitations in the delivery of information about the schemes smallholders as well as access to the programmes organized for smallholders. Most smallholders live in rural areas and are constrained in their access to information. As a result, programmes implemented by the government aimed at improving the livelihoods of smallholders, such as providing oil palm seeds and subsidized fertilizer, have not been successfully implemented (Hidayat et al., 2015). Although the authors Hidayat et al. (2015) mention there is an impact on FFB prices, this higher price is not so much because their FFBs are certified.

Giving a premium price is the potential economic profit expected of certified smallholders. To date, no substantial premium price for certified palm oil has been recognized by the international markets. GreenPalm, a certificate trading platform that supports sustainable palm oil production, is the sole system that provides a premium price for palm oil growers. However, according to Brandi (2016), the premium given by GreenPalm is generally very small. There is a need to accommodate better the economic interests (FFB price) of smallholders as this will increase the participation of smallholders in certification. Furthermore, some of the authors have touched on other elements in social and economic aspects such as technology adoption (Abas et al., 2021), the happiness level of the oil palm smallholders (Yusoff et al., 2021), employment of workers (Abas et al., 2021) and job opportunities (Tambi et al., 2021). Further studies on these particular aspects will provide a better grasp of the importance of palm oil certification.

6. Recommendations

Based on this study, several recommendations for future studies can be considered. First, more studies on the adoption of palm oil certification by smallholders need to be done, especially for independent smallholders. Demand for sustainable palm oil production, including from smallholders, will become more important. According to [Nesadurai \(2018\)](#), in 2016, 8.8% of global certified palm oil was produced by smallholders, an increase of 3% from 2013. Overall, the number of certified smallholders worldwide increased in 2016 from 109,415 to 139,123, while certified areas farmed by smallholders increased from 257,649 hectares to 333,345 hectares. Therefore, oil palm smallholders will play a greater role in accelerating the palm oil industry towards achieving SDGs by 2030. Second, studies focusing on the certification of oil palm smallholders are still lacking, especially the MSPO certification scheme as it was only implemented in 2015. More research on MSPO certification should be conducted as there are only three sustainable oil palm certifications worldwide, namely the RSPO, ISPO and MSPO. In furthermore, this would strengthen Malaysia's commitment as one of the leading oil palm-producing countries towards sustainability. Third, based on this study, the implementation of certification has the potential to produce social and economic benefits for smallholders, however large-scale positive impacts on the environment such as reducing greenhouse gas emissions and deforestation, are difficult to attain. [Brandi \(2016\)](#) mentions that only small impacts on the environment such as reduction of agrochemical use are seen as realistic. More in-depth studies on the environmental impact will provide a comprehensive study that covers three important elements of sustainable development namely social, economic and environmental.

7. Conclusion

Based on the systematic review of social and economic impacts of palm oil certification for smallholders three types of certifications focus on palm oil, which are the RSPO, ISPO and MSPO. As the oldest and leading certification, extensive research has been conducted on the RSPO compared to ISPO and MSPO. However, the mandatory implementation of ISPO and MSPO continues to expand and reinforce the needs of the industry to fulfil the demands of sustainable palm oil. Palm oil certification can address sustainability issues and challenges related to the multi-stakeholders involved in this industry. This study also suggested that there are 7 areas of social and economic impacts, namely livelihood, social network, agricultural practice, financial management, income, price and production, for smallholders based on the analysed articles. Changes in organizational structure through certification gives smallholders access to training and better communication with their stakeholders. Smallholders' barriers in improving their farm management practices can be overcome with extension support and technical training. It is shown that many smallholders have benefited substantially from their participation in certification.

Although access to the market and obtaining premium prices has not yet been fully achieved through certification, the indirect impact through the management system of smallholders can improve their social and economic situations. With the increasing awareness of producing sustainable palm oil, the number of smallholders participating in this certification scheme continues to increase. Smallholders in the oil palm industry play a vital role in achieving sustainable palm oil production. Therefore, it is important to look from all aspects including the challenges and obstacles smallholders faced in achieving this target.

Acknowledgement

The author would like to express deep gratitude to Dr Cheah Wai Yan for her kind support and guidance in completing this research.

Funding

This work was supported by the MPOB-UKM Endowment Chair, Universiti Kebangsaan Malaysia (EP-2020-024).

Conflict of Interest

The authors state that there is no potential for conflict of interest in relation to financial interests or personal relationships that may influence the work reported in this article.

References

- Abas, A., Er, A. C., Tambi, N., & Yusoff, N. H. (2022). A systematic review on sustainable agricultural practices among oil palm farmers. *Outlook on Agriculture*, 51(2), 155-163. <https://doi.org/10.1177/00307270211021875>
- Abazue, C. M., Choy, E. A., & Lydon, N. (2019). Oil palm smallholders and certification: exploring the knowledge level of independent oil palm smallholders to certification. *Journal of Bioscience and Agriculture Research*, 19(1), 1589-1596. <https://doi.org/10.18801/jbar.190119.193>
- Aghaei Chadegani, A., Salehi, H., Md Yunus, M. M., Farhadi, H., Fooladi, M., Farhadi, M., & Ale Ebrahim, N. (2013). A comparison between two main academic literature collections: Web of science and scopus databases. *Asian Social Science*, 9(5), 18-26. <https://doi.org/10.5539/ass.v9n5p18>
- Aikanathan, S., Basiron, Y., Sundram, K., Chenayah, S., & Sasekumar, A. (2015). Sustainable management of oil palm plantation industry and the perception implications. *Journal of Oil Palm, Environment and Health (JOPEH)*, 6.
- Ayompe, L. M., Schaafsma, M., & Egoh, B. N. (2021). Towards sustainable palm oil production: The positive and negative impacts on ecosystem services and human wellbeing. *Journal of Cleaner Production*, 278, 123914. <https://doi.org/10.1016/j.jclepro.2020.123914>
- Bacon, C. (2005). Confronting the coffee crisis: Can Fair Trade, organic, and specialty coffees reduce small-scale farmer vulnerability in Northern Nicaragua? *World Development*, 33(3), 497-511. <https://doi.org/10.1016/j.worlddev.2004.10.002>
- Balde, B. S., Diawara, M., Rossignoli, C. M., & Gasparatos, A. (2019). Smallholder-based oil palm and rubber production in the forest region of guinea: An exploratory analysis of household food security outcomes. *Agriculture (Switzerland)*, 9(2), 1-19. <https://doi.org/10.3390/agriculture9020041>
- Basiron, Y. (2007). Palm oil production through sustainable plantations. *European Journal of Lipid Science and Technology*, 109(4), 289-295. <https://doi.org/10.1002/ejlt.200600223>
- Baudoin, A., Bosc, P. M., Moulin, M., Wohlfahrt, J., Marichal, R., Caliman, J. P., & Bessou, C. (2015). Linking the transformation of production structures to a multidimensional sustainability assessment grid of smallholders oil palm plantations. *International Journal of Sustainable Development and World Ecology*, 22(6), 520-532. <https://doi.org/10.1080/13504509.2015.1090497>

- Begum, H., Choy, E. A., Alam, A. F., Siwar, C., & Ishak, S. (2019). Sustainability practices framework of the palm oil milling sub-sector: a literature survey. *International Journal of Environment and Sustainable Development*, 18(4), 387-408. <https://doi.org/10.1504/IJESD.2019.103473>
- Bergman, E. M. L. (2012). Finding citations to social work literature: The relative benefits of using Web of Science, Scopus, or Google Scholar. *The journal of academic librarianship*, 38(6), 370-379.
- Brako, D. E., Richard, A., & Alexandros, G. (2020). Do voluntary certification standards improve yields and wellbeing? Evidence from oil palm and cocoa smallholders in Ghana. *International Journal of Agricultural Sustainability*, 19(1), 16-39. <https://doi.org/10.1080/14735903.2020.1807893>
- Brandão, F., Schoneveld, G., Pacheco, P., Vieira, I., Piraux, M., & Mota, D. (2021). The challenge of reconciling conservation and development in the tropics: Lessons from Brazil's oil palm governance model. *World Development*, 139, 105268. <https://doi.org/10.1016/j.worlddev.2020.105268>
- Brandi, C. A. (2016). Sustainability Standards and Sustainable Development – Synergies and Trade-Offs of Transnational Governance. *Sustainable Development*, 25(1), 25-34. <https://doi.org/10.1002/sd.1639>
- Brandi, C., Cabani, T., Hosang, C., Schirmbeck, S., Westermann, L., & Wiese, H. (2013). *Sustainability certification in the Indonesian palm oil sector: benefits and challenges for smallholders*. Deutsches Institut für Entwicklungspolitik (DIE), Bonn.
- Brandi, C., Cabani, T., Hosang, C., Schirmbeck, S., Westermann, L., & Wiese, H. (2015). Sustainability Standards for Palm Oil: Challenges for Smallholder Certification Under the RSPO. *Journal of Environment and Development*, 24(3), 292-314. <https://doi.org/10.1177/1070496515593775>
- Carlson, K. M., Heilmayr, R., Gibbs, H. K., Noojipady, P., Burns, D. N., Morton, D. C., Walker, N. F., Paoli, G. D., & Kremen, C. (2018). Effect of oil palm sustainability certification on deforestation and fire in Indonesia. *Proceedings of the National Academy of Sciences of the United States of America*, 115(1), 121-126. <https://doi.org/10.1073/pnas.1704728114>
- Cattau, M. E., Marlier, M. E., & DeFries, R. (2016). Effectiveness of Roundtable on Sustainable Palm Oil (RSPO) for reducing fires on oil palm concessions in Indonesia from 2012 to 2015. *Environmental Research Letters*, 11(10), 105007. <http://doi.org/10.1088/1748-9326/11/10/105007>
- Cheng, Y., Yu, L., Zhao, Y., Xu, Y., Hackman, K., Cracknell, A. P., & Gong, P. (2017). Towards a global oil palm sample database: Design and implications. *International Journal of Remote Sensing*, 38(14), 4022-4032. <https://doi.org/10.1080/01431161.2017.1312622>
- Dauvergne, P. (2018). The global politics of the business of “sustainable” palm oil. *Global Environmental Politics*, 18(2), 34-52.
- Degli Innocenti, E., & Oosterveer, P. (2020). Opportunities and bottlenecks for upstream learning within RSPO certified palm oil value chains: A comparative analysis between Indonesia and Thailand. *Journal of Rural Studies*, 78(May), 426-437. <https://doi.org/10.1016/j.jrurstud.2020.07.004>
- Department of Economic and Social Affairs. (n.d.). Transforming our world: the 2030 Agenda for Sustainable Development. *United Nations*. <https://sdgs.un.org/2030agenda>
- Dompereh, E. B., Asare, R., & Gasparatos, A. (2021). Sustainable but hungry? Food security outcomes of certification for cocoa and oil palm smallholders in Ghana. *Environmental Research Letters*, 16(5). <https://doi.org/10.1088/1748-9326/abdf88>

- Ernah, Parvathi, P., & Waibel, H. (2020). Will teaching sustainability standards to oil palm smallholders in Indonesia pay off? *International Journal of Agricultural Sustainability*, 18(2), 196–211. <https://doi.org/10.1080/14735903.2020.1744899>
- FAO (n.d.). What is meant by the term “sustainability”? FAO. <http://www.fao.org/3/ai388e/AI388E05.htm>
- Furumo, P. R., Rueda, X., Rodríguez, J. S., & Parés Ramos, I. K. (2020). Field evidence for positive certification outcomes on oil palm smallholder management practices in Colombia. *Journal of Cleaner Production*, 245(xxxx). <https://doi.org/10.1016/j.jclepro.2019.118891>
- Futemma, C., De Castro, F., & Brondizio, E. S. (2020). Farmers and Social Innovations in Rural Development: Collaborative Arrangements in Eastern Brazilian Amazon. *Land Use Policy*, 99(June), 104999. <https://doi.org/10.1016/j.landusepol.2020.104999>
- Glasbergen, P. (2018). Smallholders do not Eat Certificates. *Ecological Economics*, 147(February), 243–252. <https://doi.org/10.1016/j.ecolecon.2018.01.023>
- Hidayat, N. K., Glasbergen, P., & Offermans, A. (2015). Sustainability certification and palm oil smallholders' livelihood: A Comparison between Scheme Smallholders and Independent Smallholders in Indonesia. *International Food and Agribusiness Management Review*, 18(3), 25–48. <https://doi.org/10.22004/ag.econ.208400>
- Hutabarat, S., Slingerland, M., & Dries, L. (2019). Explaining the “Certification Gap” for Different Types of Oil Palm Smallholders in Riau Province, Indonesia. *Journal of Environment and Development*, 28(3), 253–281. <https://doi.org/10.1177/1070496519854505>
- Ismail, A., Mohd, S. A., & Mohd, M. N. (2003). The production cost of oil palm fresh fruit bunches: The Case of Independent Smallholders in Johor. *Oil Palm Industry Economic J*, 3(1), 1–7.
- Jackson, T. A., Crawford, J. W., Traeholt, C., & Sanders, T. A. B. (2019). Learning to love the world's most hated crop. *Journal of Oil Palm Research*, 31(September), 331–347.
- Jelsma, I., Schoneveld, G. C., Zoomers, A., & van Westen, A. C. M. (2017). Unpacking Indonesia's independent oil palm smallholders: An actor-disaggregated approach to identifying environmental and social performance challenges. *Land Use Policy*, 69(August), 281–297. <https://doi.org/10.1016/j.landusepol.2017.08.012>
- Jelsma, I., Woittiez, L. S., Ollivier, J., & Dharmawan, A. H. (2019). Do wealthy farmers implement better agricultural practices? An assessment of implementation of Good Agricultural Practices among different types of independent oil palm smallholders in Riau, Indonesia. *Agricultural Systems*, 170(June 2018), 63–76. <https://doi.org/10.1016/j.agry.2018.11.004>
- Kamau, M., Mose, L. O., Fort, R., & Ruben, R. (2011). The impact of certification on smallholder coffee farmers in Kenya: The case of UTZ program. *Paper presented at the Joint 3rd African Association of Agricultural Economists (AAAE) and 48th Agricultural Economists Association of South Africa (AEASA) Conference, Cape Town, South Africa, September 19-23, 2010*. <https://doi.org/10.22004/ag.econ.96651>
- Kannan, P., Mansor, N. H., Rahman, N. K., Peng, T., & Mazlan, S. M. (2021). A Review on Malaysian Sustainable Palm Oil Certification Process Among Independent Oil Palm Smallholders. *Journal of Oil Palm Research*, 33(1), 171–180. <https://doi.org/10.21894/jopr.2020.0056>
- Keeble, B. R. (1988). The Brundtland Report: “Our Common Future.” *Medicine and War*, 4(1), 17–25. <https://doi.org/10.1080/07488008808408783>
- Khatun, K., Maguire-Rajpaul, V. A., Asante, E. A., & McDermott, C. L. (2020). From Agroforestry to Agroindustry: Smallholder Access to Benefits From Oil Palm in Ghana and the Implications for Sustainability Certification. *Frontiers in Sustainable Food Systems*, 4(March), 1–13. <https://doi.org/10.3389/fsufs.2020.00029>

- Kitchenham, B. (2004). *Procedure for undertaking systematic reviews*. Computer Science Department, Keele University (TRISE-0401) and National ICT Australia Ltd (0400011T. 1), Joint Technical Report, 33.
- Kumaran, S., & Suparyono, M. H. (2019). Malaysian sustainable palm oil certification standards. *Planter*, 95(1117), 239-249.
- Kuntom, A., Kushairi, A., & Choo, Y. M. (2003). Malaysian sustainable palm oil. *Oil Palm Bull*, 71, 15-27.
- Laurance, W. F., Koh, L. P., Butler, R., Sodhi, N. S., Bradshaw, C. J. A., Neidel, J. D., Consunji, H., & Vega, J. M. (2010). Improving the performance of the roundtable on sustainable palm oil for nature conservation. *Conservation Biology*, 24(2), 377-381. <https://doi.org/10.1111/j.1523-1739.2010.01448.x>
- Lee, J. S. H., Miteva, D. A., Carlson, K. M., Heilmayr, R., & Saif, O. (2020). Does oil palm certification create trade-offs between environment and development in Indonesia? *Environmental Research Letters*, 15(12). <https://doi.org/10.1088/1748-9326/abc279>
- Lowder, S. K., Skoet, J., & Raney, T. (2016). The Number, Size, and Distribution of Farms, Smallholder Farms, and Family Farms Worldwide. *World Development*, 87, 16-29. <https://doi.org/10.1016/j.worlddev.2015.10.041>
- Majid, N. A., Ramli, Z., Sum, S. M., & Awang, A. H. (2021). Sustainable palm oil certification scheme frameworks and impacts: A systematic literature review. *Sustainability (Switzerland)*, 13(6). <https://doi.org/10.3390/su13063263>
- Malaysian Palm Oil Board (MPOB). Malaysian Oil Palm Industry Performance 2020 and Prospects for 2021. *Review & Outlook (R&O) Seminar 2021, 11 January 2021*.
- Malaysian Palm Oil Certification Council (MPOCC). MSPO Trace. Available online: <https://mspotracer.org.my/> (accessed on 30th June 2021)
- Malaysian Sustainable Palm Oil (MSPO). Malaysian Palm Oil Board. Available online: <https://mspo.mpob.gov.my/> (accessed on 30th June 2021)
- Martens, K., Kunz, Y., Rosyani, I., & Faust, H. (2019). Environmental Governance Meets Reality: A Micro-Scale Perspective on Sustainability Certification Schemes for Oil Palm Smallholders in Jambi, Sumatra. *Society and Natural Resources*, 33(5), 634-650. <https://doi.org/10.1080/08941920.2019.1674436>
- Nagiah, C., & Azmi, R. (2012). A Review of Smallholder Oil Palm Production: Challenges and Opportunities for Enhancing Sustainability-A Malaysian Perspective. *Journal of Oil Palm, Environment and Health (JOPEH)*, 3, 114-120. <https://doi.org/10.5366/jope.2012.12>
- Nesadurai, H. E. S. (2018). Transnational Private Governance as a Developmental Driver in Southeast Asia: The Case of Sustainable Palm Oil Standards in Indonesia and Malaysia. *Journal of Development Studies*, 55(9), 1892-1908. <https://doi.org/10.1080/00220388.2018.1536262>
- Petticrew, M., & Roberts, H. (2008). *Systematic reviews in the social sciences: A practical guide*. John Wiley & Sons.
- Rist, L., Feintrenie, L., & Levang, P. (2010). The livelihood impacts of oil palm: Smallholders in Indonesia. *Biodiversity and Conservation*, 19(4), 1009-1024. <https://doi.org/10.1007/s10531-010-9815-z>
- Rodthong, W., Kuwornu, J. K. M., Datta, A., Anal, A. K., & Tsusaka, T. W. (2020). Factors Influencing the Intensity of Adoption of the Roundtable on Sustainable Palm Oil Practices by Smallholder Farmers in Thailand. *Environmental Management*, 66(3), 377-394. <https://doi.org/10.1007/s00267-020-01323-3>
- Rokhim, R., Januari, A. D., & Shara, S. (2021). Conflict management of smallholders palm oil plantation: Sustainable business perspective. *IOP Conference Series: Earth and*

- Environmental Science*, 716(1). <https://doi.org/10.1088/1755-1315/716/1/012126>
- Roundtable on Sustainable Palm Oil (RSPO). (2021a). Get involved as a smallholder - Roundtable on Sustainable Palm Oil (RSPO). <https://rspo.org/smallholders#definition>
- Roundtable on Sustainable Palm Oil (RSPO). (2021b). Our impact - Roundtable on Sustainable Palm Oil (RSPO). <https://rspo.org/impact>
- Ruysschaert, D., & Salles, D. (2014). Towards global voluntary standards: Questioning the effectiveness in attaining conservation goals. *Ecological Economics*, 107, 438–446. <https://doi.org/10.1016/j.ecolecon.2014.09.016>
- Santika, T., Wilson, K. A., Budiharta, S., Law, E. A., Poh, T. M., Ancrenaz, M., Struebig, M. J., & Meijaard, E. (2019). Does oil palm agriculture help alleviate poverty? A multidimensional counterfactual assessment of oil palm development in Indonesia. *World Development*, 120, 105–117. <https://doi.org/10.1016/j.worlddev.2019.04.012>
- Saswattecha, K., Kroeze, C., Jawjit, W., & Hein, L. (2015). Assessing the environmental impact of palm oil produced in Thailand. *Journal of Cleaner Production*, 100, 150–169. <https://doi.org/10.1016/j.jclepro.2015.03.037>
- Schmidt, J., & De Rosa, M. (2020). Certified palm oil reduces greenhouse gas emissions compared to non-certified. *Journal of Cleaner Production*, 277. <https://doi.org/10.1016/j.jclepro.2020.124045>
- Schoneveld, G. C., van der Haar, S., Ekowati, D., Andrianto, A., Komarudin, H., Okarda, B., Jelsma, I., & Pacheco, P. (2019). Certification, good agricultural practice and smallholder heterogeneity: Differentiated pathways for resolving compliance gaps in the Indonesian oil palm sector. *Global Environmental Change*, 57(July). <https://doi.org/10.1016/j.gloenvcha.2019.101933>
- Senawi, R., Rahman, N. K., Mansor, N., & Kuntom, A. (2019). Transformation of oil palm independent smallholders through Malaysian sustainable palm oil. *Journal of Oil Palm Research*, 31(3), 496–507. <https://doi.org/10.21894/jopr.2019.0038>
- Shamseer, L., Moher, D., Clarke, M., Gherzi, D., Liberati, A., Petticrew, M., Shekelle, P., Stewart, L. A., Altman, D. G., Booth, A., Chan, A. W., Chang, S., Clifford, T., Dickersin, K., Egger, M., Gøtzsche, P. C., Grimshaw, J. M., Groves, T., Helfand, M., ... Whitlock, E. (2015). Preferred reporting items for systematic review and meta-analysis protocols (prisma-p) 2015: Elaboration and explanation. *BMJ (Online)*, 349(December 2014), 1–25. <https://doi.org/10.1136/bmj.g7647>
- Stern, C., Jordan, Z., & McArthur, A. (2014). Developing the review question and inclusion criteria. *American Journal of Nursing*, 114(4), 53–56. <https://doi.org/10.1097/01.NAJ.0000445689.67800.86>
- Tambi, N., Choy, E. A., Yusoff, N. H., Abas, A., & Halim, U. L. (2021). Well-Being Challenges of Palm Oil Smallholders Community. *Journal of Social Sciences and Humanities*, 18(2), 262–278.
- Vamuloh, V. V., Kozak, R. A., & Panwar, R. (2020). Voices unheard: Barriers to and opportunities for small farmers' participation in oil palm contract farming. *Journal of Cleaner Production*, 275, 121955. <https://doi.org/10.1016/j.jclepro.2020.121955>
- Wendt, O., & Miller, B. (2012). Quality appraisal of single-subject experimental designs: An overview and comparison of different appraisal tools. *Education and Treatment of Children*, 235–268.
- Xiao, Y., & Watson, M. (2019). Guidance on Conducting a Systematic Literature Review. *Journal of Planning Education and Research*, 39(1), 93–112. <https://doi.org/10.1177/0739456X17723971>

- Yan, W. (2017). A makeover for the world's most hated crop. *Nature News*, 543(7645), 306.
- Yap, P., Rosdin, R., Abdul-Rahman, A. A. A., Omar, A. T., Mohamed, M. N., & Rahami, M. S. (2021). Malaysian Sustainable Palm Oil (MSPO) Certification Progress for Independent Smallholders in Malaysia. *IOP Conference Series: Earth and Environmental Science*, 736(1). <https://doi.org/10.1088/1755-1315/736/1/012071>
- Yusoff, N. H., Choy, E. A., Tambi, N., & Abas, A. (2021). A Scoping Review of Wellbeing and Quality of Life Among Oil Palm Smallholders. *e-BANGI*, 18(2), 1-11.