

# Certification of sustainable palm oil plantations in the co-optation of global vegetable competition: Dialogue and dialectics

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**Abstract.** Palm oil plantation certification is the right step for sustainable plantations globally, for this reason it is necessary to describe the implementation of sustainable palm oil plantation certification in various political, economic, social and environmental study keywords and look at the forms of cooperation and interaction that exist between palm oil plantation certification in various literacies that can be describe empirically from time to time. The bibliometric analysis technique is limited to 221 research articles published during 2002 - 2023 with the keywords Certification, Palm Oil in the economic, social, political, and environmental areas indexed by Scopus. This research focuses on abstraction analysis and content analysis of the study. The research flow was evaluated using VOSviewer 1.6.19 software. The results show a study trend that leads to certification of palm oil plantations initiated by the government and private sector as well as international institutions and the existence of certification practices for various elements of palm oil utilization and management (Producers and Consumers).

## 1 Introduction

Palm oil is one of the strategic commodities of vegetable oil, this is because the productivity of palm oil is higher than other vegetable oils, showing a comparison of the realized productivity of vegetable oil crops, tons/ha/year with total palm oil (3.36), Sun (0.78), Rapeseed (0.74) Soybeans (0.47), based on land area, according to USDA [1], the largest total area for vegetable oils is soybeans (127 million ha), rapeseed (35.5 million ha), sunflowers (27.6 million ha) and oil palm (24 million ha). There are many derivative products that can be utilized and produced as processed food for use by people in their daily lives, for example the use of cooking oil which is used by almost most of the world's population using this material, and the existence of renewable energy alternatives such as biofuel for vehicles. According to data, the majority of palm oil production is produced by Indonesia, reaching 45.5 million metric tons and Malaysia reaching 18.8 million metric tons, so these countries on the Asian continent have an interest in sales on the global market.

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However, the European Union's policy regarding anti-deforestation through the European Union Deforestation-Free Regulation (EUDR) requires exporters to verify products that do not come from deforestation. Supervision of the implementation of palm oil cultivation, utilization and processing in the world has attempted to fulfill the principles of sustainability through fulfilling social aspects, ensuring land is not in forest areas, employment aspects, non-discrimination, and no deforestation, through various forms of RSPO, MSPO, ISPO certification, ISCC, SAN, HCS and RSB [2].

The certification of palm oil plantations involves various efforts to ensure that palm oil is a product that considers environmental aspects. These issues can directly and indirectly affect the global development of the palm oil industry and are related to its business expansion. Firstly, in the international market for vegetable oils, there is fierce competition. The prices of Crude Palm Oil (CPO) and Kernel Palm Oil (KPO) are relatively low compared to other vegetable oils [3]. Apart from that, palm oil production is more significant than other vegetable oils. This makes it a suitable raw material for the production of biodiesel and other products such as food, cosmetics and various daily necessities. Second, environmental problems (environmental damage, global warming, deforestation) and social problems (sustainability, agricultural conflicts, human rights violations, social inequality). The third principle is improving the management of oil palm plantations in a sustainable manner based on the principles of sustainable development, green palm and clean production. There are different principles underlying the issuance of different types of certificates. Fourth, protectionism is implemented in several palm oil-importing countries as a national economic policy. In the future, not only palm oil producers but also palm oil consumers will receive certification to support sustainability.

## 2 Method

The method used in this research is descriptive bibliometric analysis through article publication data with the search keyword "oil palm plantation certification", this keyword is adjusted to the object of study, namely certification of oil palm plantation practices, this is considering using the keyword "coconut certification palm oil" then the object of study is too broad. The publication range for 2002 - 2023 is the result of searching for published articles in the Scopus/Scopus indexed data base on data collection on August 15 2023 on the Scopus website, totaling 221 articles. The restrictions on the search area for articles are limited to the economic, social, political and environmental fields, this is in line with the focus of the study, namely those related to sustainable studies that lead to the fields mentioned previously. After the data is obtained based on search keywords accompanied by boundaries of the field of study and year range, it is then saved in the form of a CSV file or Comma Separated Values File. The next step is to carry out data cleaning, cleaning is carried out for keywords that are the same/have the same meaning. . The goal is to avoid duplicate keywords appearing during the analysis process.

Vosviewer 1.6.19 software is software used to visualize bibliometric maps or data sets containing bibliographic fields such as title, author, author, journal, etc., with the aim of visualizing three category patterns, model network visualization, overlay visualization, and density visualization. Network visualization is to see whether there is a connection or substantial relationship between research terms, Overlay visualization aims to see previous indicators based on the year of publication, and Density visualization describes the density or concentration of research groups. The resulting map can be used as a reference for appropriate content analysis based on researcher names, publication years and research trends, as well as to identify trends in research topics that occur in scientific articles and journals and to identify collaboration models and research fields. Please help look. Explore the psychological structure of a particular area, in current literature.. The weaknesses in this

study are limited to certain publication databases which are not integrated with publication databases from other sources.

### 3 Results and discussion

Mapping and clustering in bibliometric analysis charts and rankings with Vosviewer software are a plus. Often, they complement each other. This map can be used to get a detailed picture of the article's network structure. Classification is also used to provide an overview and understanding of classification.

#### 3.1 Network visualization

The network view shows the coexistence of certain words with your other search keywords, showing the network and relationships between them "Oil Palm Plantation Certification" for the period 2002 - 2023. Of the 221 articles indexed by Scopus, 3 clusters can be grouped which can be identified through the color of the nodes. For each keyword, the visualization results illustrate that the studies in one cluster and the other study keywords often overlap and tend to be related.

Cluster 1, symbolized in red, includes terms related to studies with the dominant keywords "Government, Governance, Initiative, Actor, Value Chain", for example these keywords discuss studies that lead to how markets interact on a local and international scale [4], corporate sustainability standards may only cover some environmental, social and governance pillars that should be included in sustainable investments [5], certification standards can be improved by including provisions to improve restoration habitat on plantations and smallholder land, the need to increase inclusion and value in sustainable supply chains [6], study of the challenges of certified farmers related to implementing ISPO certification but their marketing activities are still controlled by intermediaries [7], study related to the public policy agenda which focuses more on environmental aspects, aspects of the global poor, as well as public participation and dialogue [8], studies of economic feasibility and competitiveness in developing countries vary but contribute significantly to energy supply [9].

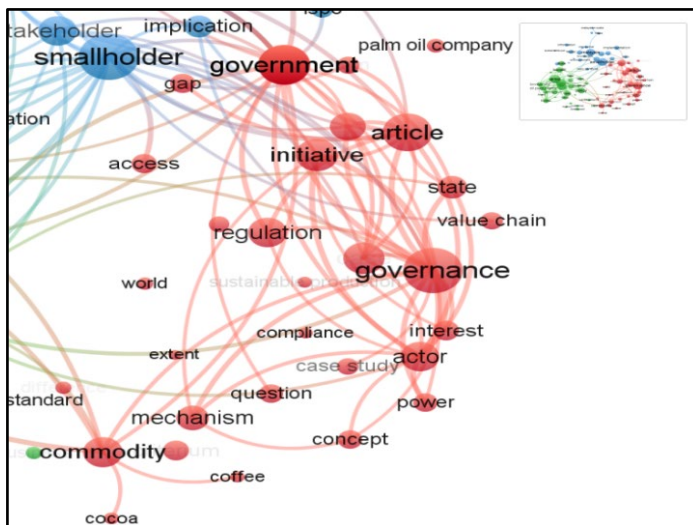
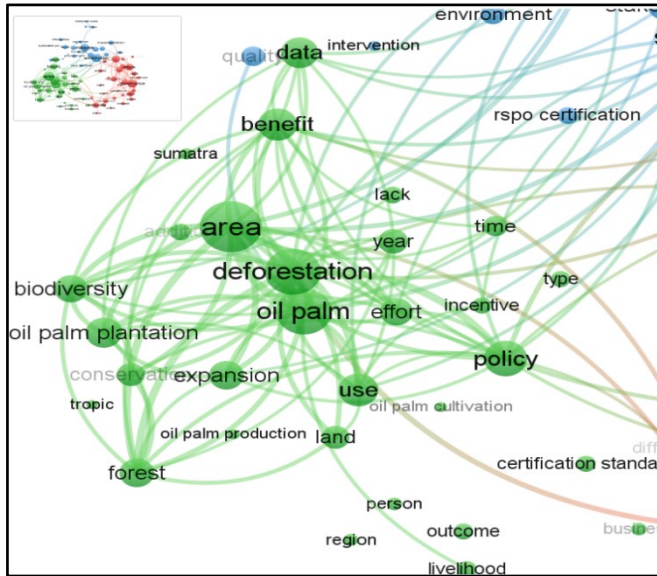


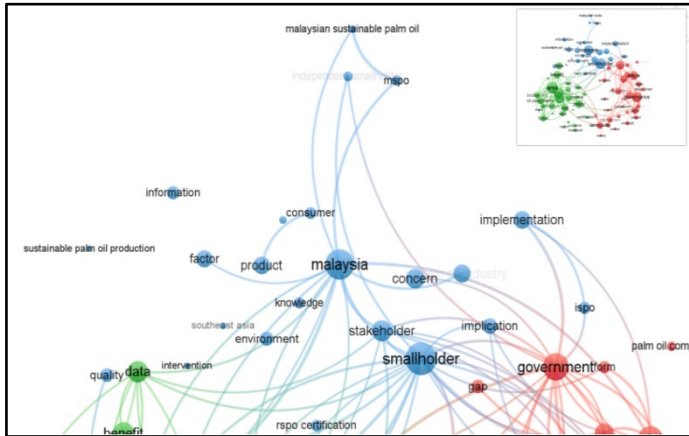
Fig. 1. Network visualization of cluster 1.

Cluster 2, symbolized in green, consists of studies that tend to lead to almost the same conditions as the previous cluster, there are also several dominant keywords, namely Deforestation, Palm Oil, Policy, Area, Benefit, Use. These keywords, for example, discuss studies that lead as follows: most of the supply base and concessions of farmers in Sumatra and Kalimantan were located in large mammal habitats in the 1990s and in areas with tropical biodiversity [10], small farmers weak land ownership rights, poor quality seeds and low yielding palm oil, as well as a lack of skills, expertise and access to funding [11], the global agricultural value chain on sustainability governance initiated by the public and the private sector [12], palm oil commodities achieve the targets of sustainable development and poverty alleviation goals [13].



**Fig. 2.** Network visualization of cluster 2.

Cluster 3, symbolized in blue, consists of several dominant keywords, namely Smallholder, Stakeholder, Implication and the dominant study location in Malaysia. The network in this cluster can provide an overview regarding the trend of studying sustainable palm oil plantation certification in the aspects of farmers, partners and the impact on the State locus. Malaysia. although many RSPO certified farmers make real changes to obtain certification, these changes do not always address core sectoral performance issues [14], perceptions of Economic Benefits, Social Interaction, Human Rights [15] Shared Identity, and Communication have an influence significant impact on the participation of small farmers in sustainable certification of palm oil [16], Supply chain research involves palm oil actors, non-governmental organizations, financial institutions, consultants and certification institutes, and various actors in the palm oil chain (plantation companies, traders and processors, producers and traders of palm oil goods). Palm Oil Conservation Network [17].



**Fig 3.** Network visualization of cluster 3.

### 3.2 Overlay visualization

After determining the mapping and classification, the next step is to map and classify the characteristics of the research in the "Oil Palm Plantation Certificate" study according to indications and previous years or publish the research. The information obtained from the image overlay results below can be used as a reference for identifying and viewing the "state of the art". In this view, the node color is a keyword that indicates the year of publication.

Cluster 1, with purple nodes, study intensity in 2017 was dominated by studies of the keywords forest, use, regulation, interest. For example, the state and the important role of certification in dealing with private and transnational certification [18] studies which describe the question of the usefulness of palm oil plantation certification for environmental, social and traceability benefits, Cluster 2, with dark green nodes, study intensity in 2018 was dominated by studies of the keywords palm oil, area, governance, initiative. For example, studies describe the majority of smallholder farmers in palm oil producing countries as not involved in palm oil certification schemes [19], future forest conservation policies must include measures that target both producers (supply side) and consumers (demand side) to overcome deforestation [20], the reliability of ISPO certification for the global market [21].

Cluster 3, with light green nodes, study intensity in 2019 was dominated by studies of the keywords expansion, government, concern, commodity, policy. For example, studies of efforts to establish sustainable palm oil plantation certification regulations are free from trade protectionism and are more political than scientific [22], concentration of certification on land ownership rights [23].

Cluster 4, with yellow nodes, study intensity in 2020 - 2023 is dominated by studies of the keywords smallholder, gap, implementation, ISPO, MSPO. For example, a study of the influential role of communication in facilitating the implementation of sustainable practices among small farmers (2023), MSPO certification can increase the economic profitability of independent farmers.

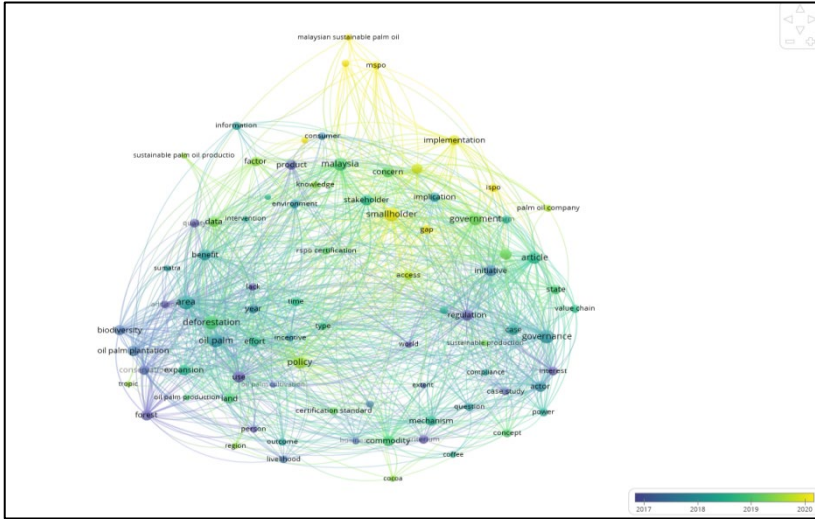


Fig. 4. Overlay visualization.

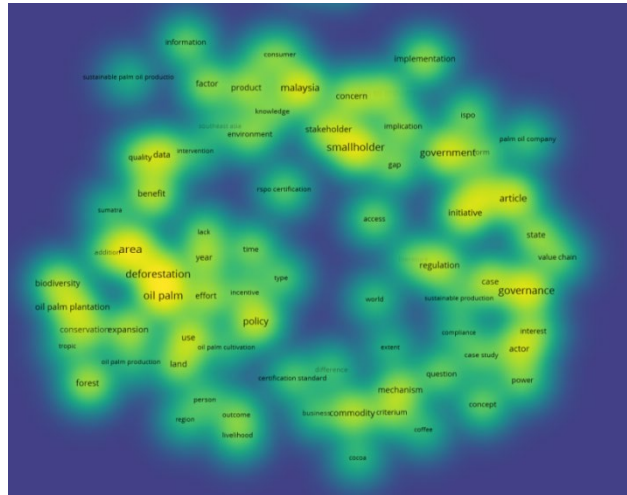
### 3.3 Density visualization

Next, analyze the article using density analysis. Looking at the image below, you can see that one node has more dense networks or regions than the other nodes. The meaning is seen from the number of keywords colored yellow, which means that the site is a broad research topic, including the keywords Smallholder, Governance, Deforestation, etc.

For example, firstly, smallholder which refers to people's plantations located illegally in forest areas creates challenges for small farmers to gain access to funding, harvests, and obtain sustainable certification, certification standards experience difficulties in resolving challenges. faced by small farmers, low income, low crop yields, and land ownership insecurity [24], then how Good Agricultural Practice (GAP) studies can affect productivity and welfare [25], access to certification for farmers, they are very dependent on external facilitators [26].

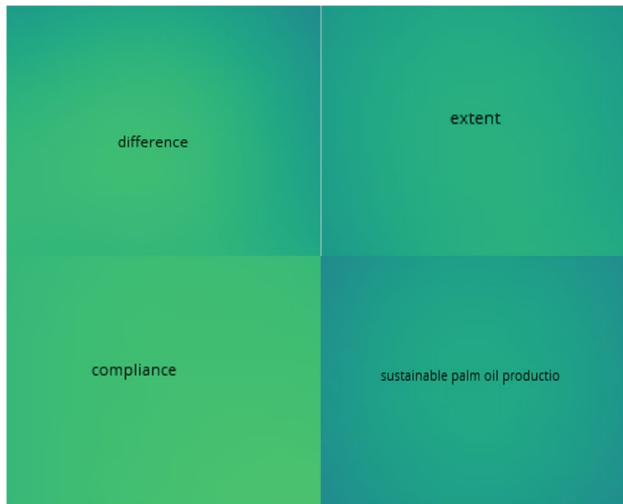
Second, governance studies, for example, studies of government governance on three governance models, namely third party certification schemes, domestic regulations, special association arrangements [27], from the perspective of sustainable plantation actors, for example, the involvement of industry and state actors [28], actors The private sector is an important partner in the sustainable governance of commodity supply chains such as palm oil [29].

Third, a study of deforestation, for example alleviating deforestation in the palm oil sector from various stakeholders involved [30], the positive impact of RSPO certification in reducing deforestation in plantation forest areas [31], RSPO certification is immature statistically significant reduction in deforestation [32].



**Fig. 5.** Density visualization “high density”.

However, the following overview shows that research using current keywords is less informative than in research.



**Fig. 6.** Visualization of density "low density".

Based on the results of the “low density” perspective, it is clear that research on sustainable palm oil plantation certification will continue to progress, resulting in comparisons between certifications and levels of implementation, review and impact research. , the scope of certification and compliance-based research. We aim to produce organic and sustainable palm oil.

## 4 Conclusion

This study can illustrate that future palm oil plantation certification studies will have a broader scope, not only at the level of palm oil plantation management but also at the production level and at the consumer level as users of the certification results, there are

various findings related to various different points of view regarding palm oil studies. sustainability from various perspectives, the implementation of existing plantation certification (ex, ISPO, RSPO, MSPO etc.) allows for global competition for vegetable oils in meeting various aspects of sustainability criteria.

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