



## Feasibility Analysis Of Implementation In Palm Oil Processing Factories Using The House Of Method Risk

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### ABSTRACT

This study assesses the effectiveness of the House of Risk (HOR) method in mitigating supply chain risks within palm oil processing plants. By integrating Failure Mode and Effects Analysis (FMEA) with House of Quality (HOQ), the method identifies and prioritizes risk factors while proposing actionable measures for risk mitigation. Findings demonstrate that adopting the HOR method contributes to decreased liquid waste generation and enhanced production efficiency. Additionally, a bibliometric analysis of scholarly publications reveals a notable growth in research focused on risk management in the palm oil sector between 2014 and 2024. This highlights a growing recognition of the importance of systematic risk assessment and management strategies in enhancing sustainability and operational resilience within palm oil processing. The study underscores the HOR method's utility as a comprehensive approach to addressing complex supply chain challenges, thereby promoting sustainable practices and operational excellence in the industry.

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## INTRODUCTION

Factory coconut palm is one of industry results agriculture is the most important in Indonesia and is company moving industry in the field processing material Raw coconut fresh fruit bunches (FFB). palm with objective produces Crude Palm Oil (CPO) and coconut kernels palm oil (IKS) as product main (Product half finished / material standard industry downstream). The food , cosmetics , soap and paint industries are industries that use it material base coconut palm oil . Even lately This There is effort use oil coconut palm as material standard making material alternative fuel (Saifullah , 2021).

Processing coconut palm is a productive process oil coconut palm oil . The main results can be obtained is oil coconut palms , palm kernels , husks , shells and empty bunches . Factory coconut palm oil palm (PKS) continuesun on the process units that utilize it combination treatment mechanical , physical and chemical ( Modestha , 2016).

Coconut palm is very important plant for development national . Coconut plantation palm can absorb field power more work big and as source foreign exchange (Fauzi & Susila Putra, 2019). Plant produces in coconuts palm is existing plants can taken the result routinely . Generally , aged 3 to with 25 years or until rejuvenated return . In order to grow and produce maximum done maintenance plant in a way periodically , as for target maintenance plant is For spur growth leaves and fruit can balanced , maintain fruit to reach maximum maturity and maintenance health plant coconut palm oil . Key role in activity maintenance plant coconut Palm oil is one of them is on activities fertilization For can fulfil need plant nutrients , for fulfil these nutrients so given fertilizer Good chemistry nor organic . Fertilizer chemistry will bring up significant impact to plant However only taking place temporary , therefore often accompanied with addition fertilizer organic . Use fertilizer organic in addition nutrients in activities fertilization especially in phase plant produce will be very useful Because focused on growth generative and vegetative plants (Azhari Rizal, 2022).

Coconut Palm oil is also a product strategic defense as source oil vegetable, with production 4.09 tons per hectare per year. High productivity make coconut palm competitive as alternative oil that can be used by industry food , cosmetics , products health , biofuel and biodiesel. Potency coconut palm encouraging Indonesia to expand its plantation area coconut palm oil . Since 1980, industry coconut palm oil grows in Indonesia around 10% per year . Coconut palm is producer oil the most efficient and abundant vegetable growing in the area tropical (Stephanie et al., 2018).

Coconut palm as one of the commodity that has role important as producer the country's largest foreign exchange earner need given attention For support sustainability the production . Therefore That need done study For know factors influencing determinants production coconut palm the . Study This aim For know influencing factors production coconut smallholder palm oil in the Regency Mukomuko Bengkulu Province so expected can formed A system plantation coconut people's palm oil with level high production and utilization factors efficient production ( Alfayanti & Efendi , 2013).

House of Risk is method renewable in analyze risk . The application use FMEA (Failure Mode and Error Analysis) principles for measure risk in a way combined quantitative with the House of Quality (HOQ) model for prioritize agent necessary risk prioritized moreover formerly For Then choose most effective action For reduce risk potential generated by the agent risk ( Ardiansyah & Nugroho, 2022).

underlying HOR model management risk in focus prevention , that is reduce possibility happen agent risk . So the very first stage is with identify incident risks and agents risk . Usually One agent can cause more from One incident risk . Adapt from FMEA method , assessment applied risks is the Risk Priority Number (RPN) which consists of of 3 factors , namely probability occurrence , level severity from emerging impacts , and detection .

HOR method only set probability For agent risk and level severity incident risk . Because of possibility One agent risk cause more from One incident risk , then need quantity potency risk aggregate from agent risk . Adapting the House of Quality (HOQ) model for determine agent risk must given priority as action peg ahan . A rating is given For every agent risk based on big mark ARPj For every j agent risk . Therefore that , if there is Lots agent risk , company can choose moreover formerly potential agent big give rise to incident risk (Magdalena, 2019).

Model with two deployments This called the House of Risk (HOR) which is modification from the HOQ model. HOR[1] is used For determine level priority agent necessary risk given as action prevention

, HOR [2] is priority in taking considered action effective ( Pujawan & Geraldin, 2009).

## RESEARCH METHODS

Study This use systematic literature review and analysis bibliometrics . Bibliometrics is A branch knowledge learning knowledge about application of two methods that is mathematics and statistics . This method used For count change in a way quantitative and qualitative in a group documents and other media (Purwantoro, 2021) . Analysis bibliometrics is technique quantitative For analyze the derived bibliographic data from article nor journal . Analysis This often used For inspect quote reference article scientific in journal , describe field scientific journal , and classify paper academic based on field study . Research data used in study This is article or journal scientific with range 2014-2024 sourced from the Google Scholar database. Search article scientific done directly on the googlecholar.com website with 5 keyword combinations . Map of publication model development scientific management chain supply industry creative webbing analyzed palm leaves using VOSViewer software .

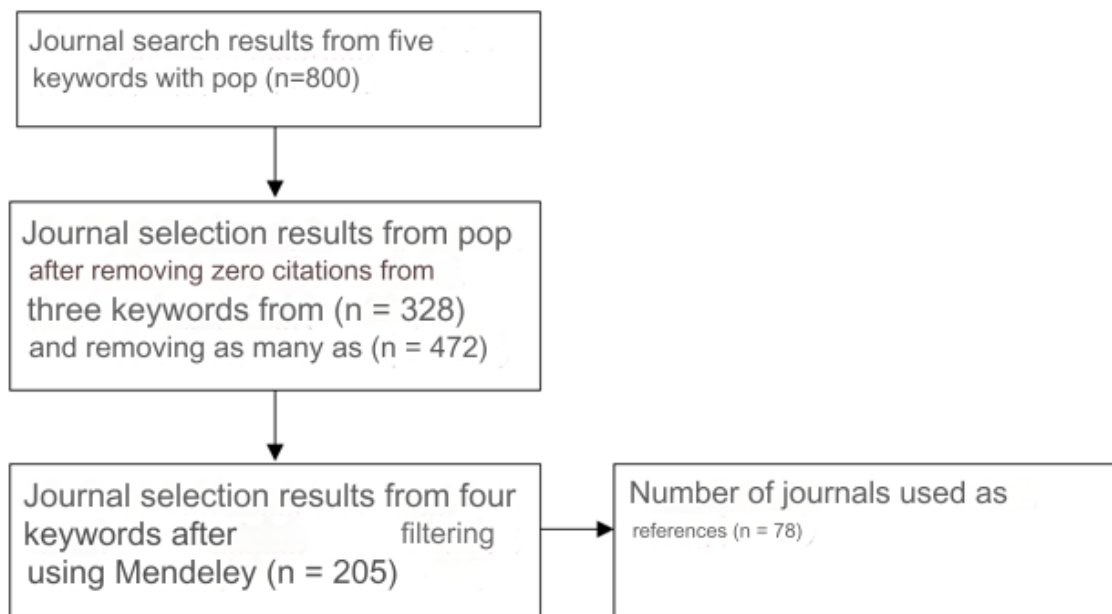


Figure 1. Screening Process Literature

## RESULTS AND DISCUSSION

Development publication with topic studies feasibility and risks Implementation of house of risk in factories coconut palm on the range 2014-2024 experienced significant increase in 2018 to 2021 , however experience decline in 2022 to 2024. Table 1 shows amount publication with keywords as following :

1. Management risk, factory processing coconut palm oil, analysis economy, industry coconut palm oil.
2. Risk model , house of risk, plantation coconut palm oil , priority risk , factory coconut palm oil .
3. Implementation of mitigation strategies risk , coconut palm oil , house of risk.
4. Feasibility study , analysis risk , factory processing coconut palm oil , house of risk method .

Publication highest in 2018 to 2021 on four keywords with 35 articles or 45% of the total data.

Table 1. Distribution Year Article Publication

Year publication	Number of Articles	Percentage
2014-2017	10	13%
2018-2021	35	45%
2022-2024	33	42%
<b>Total</b>	<b>78</b>	<b>100%</b>

Development studies factory suitability coconut palm with house of risk method , in figure 2 which shows that in 2014-2024 it will increase publication scientific highest occurred from 2018 to 2020. This prove that study about implementation of house of risk in factories coconut palm not enough interesting For researched because in 2021 to 2024 it will experience decline .

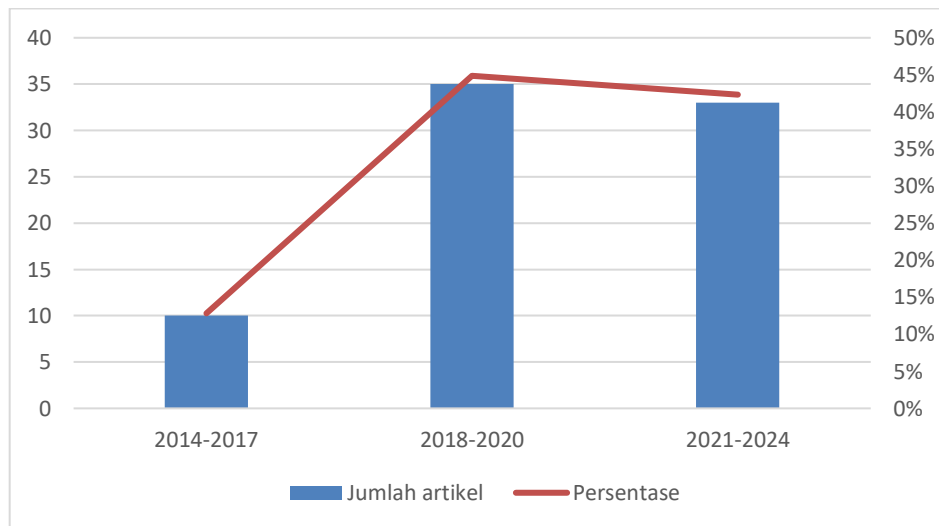


Figure 2. Development Publications .

Figure 3 shows that based on keywords ( co-words), maps development field Feasibility Study topic Application in Factory Processing Coconut Palm Using the House of Risk Method indexed by Google Scholar for 2014-2024 to form into 4 clusters , viz cluster 1 is colored red consists from topic coconut palm oil , manufacturing , income , cluster 2 colored green easy consists from topic house of risk, risk , hor , cluster 3 colored blue consists from topic chemical quality, palm of oil, study, cluster of 3 colors yellow consists from topic factory coconut palm oil .

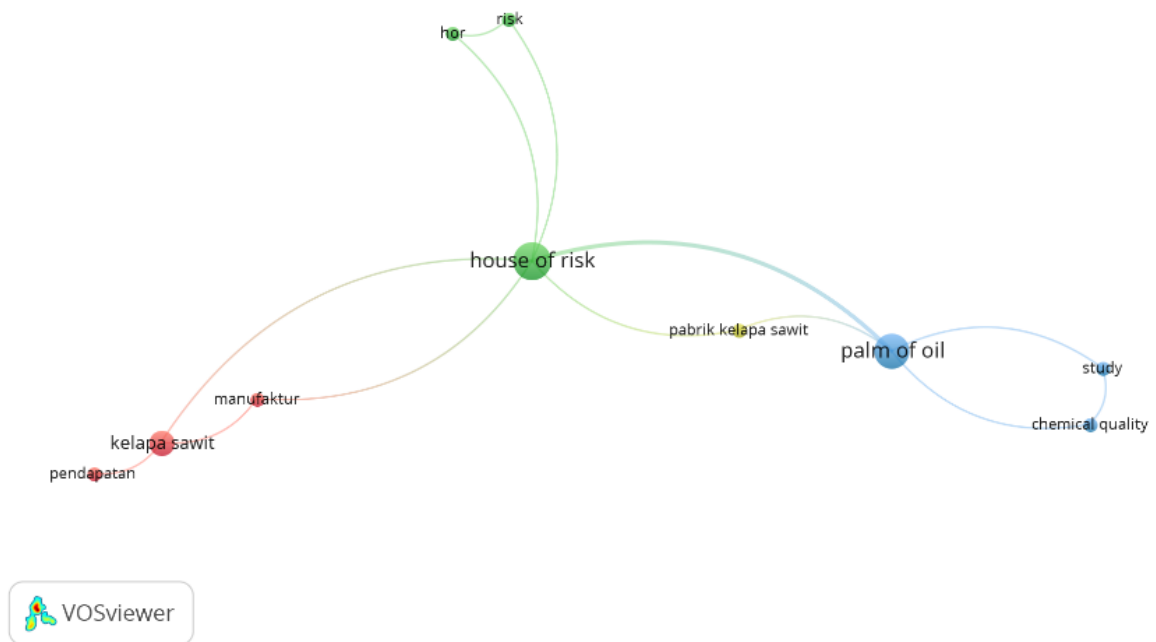


Figure 3. Network Visualization

Based on 156 keywords, found 4 clusters were formed from various kinds of keywords in Google Scholar journal. Development map publication with 4 keyword combinations in topic implementation of house of risk in factories coconut palm own a number of cluster material discussion , such as seen in the table following :

Clusters	Amount
1 (Red)	3
2 (Light Green)	3
3 (Blue)	3
4 (Yellow)	1

After explore network very cluster interesting For Keep going find distribution and evolution of keywords in network from time to time use visualization *overlays* and danceability *VOSviewer* , same network can displays total occurrences and period time study from every keyword with yellow represents the most recent and blue old which represents the oldest. Can observed that problem study moment This is topic latest with time average publication range between 2014 and 2024.

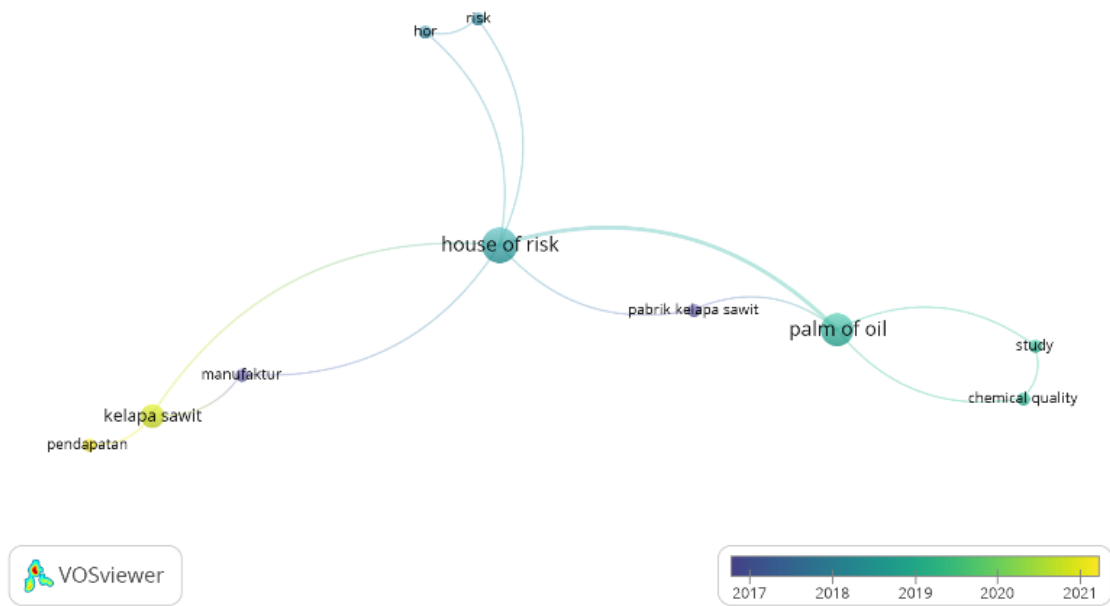


Figure 4. Network Visualization

Figure 5 also shows low density on the topic manufacture compared to with topic other like topic main namely house of risk and palm of oil. Therefore that , p This give rise to demands more study focused on challenges in manage chain supply to the factory coconut palm oil in the technological era .

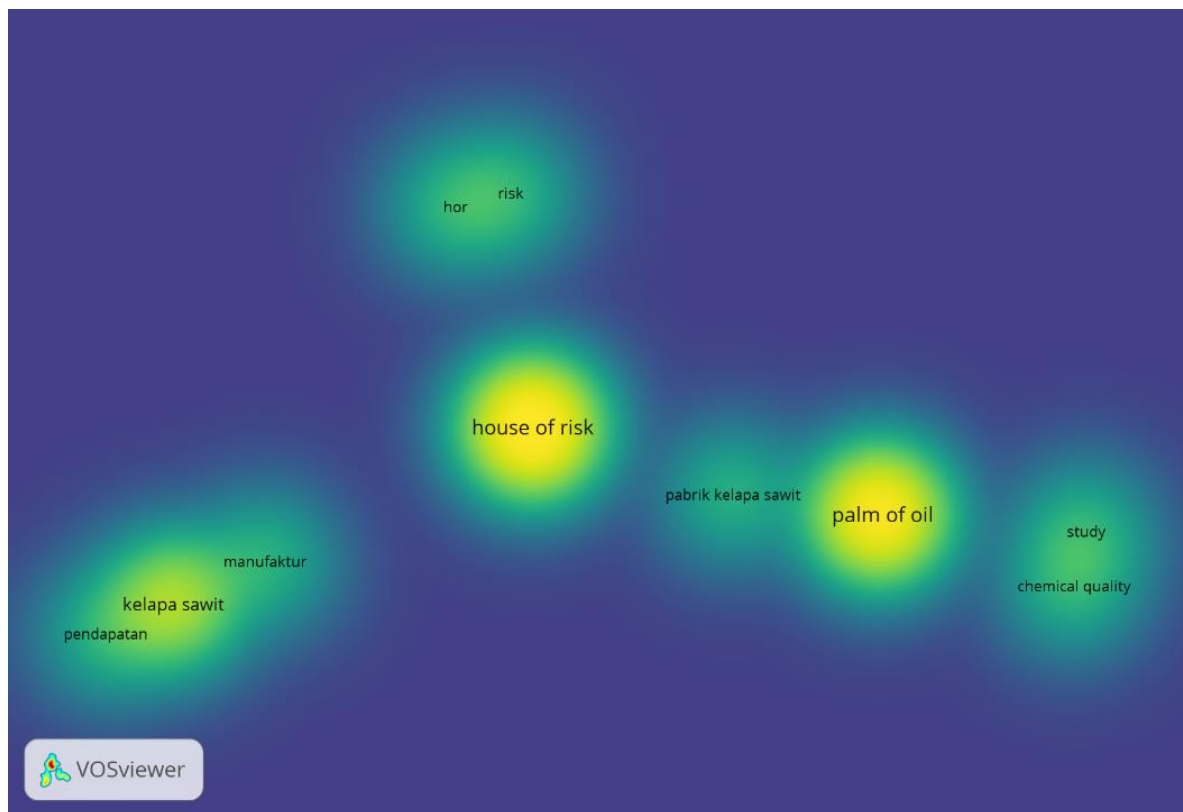


Figure 5. Density Visualization

## CONCLUSION

Analysis systematic Literature review and bibliometrics were conducted showing that the most research done start 2018 to 2021 , namely regarding house of risk, palm of oil. Whereas in study about factory coconut palm oil , chemical quality studies, and manufacturing Still spelled out A little . That matter can spur for other researchers for increase study regarding the manufacturing industry and chemical quality studies based on processing coconut palm inside factory with house of risk method .

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