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**BIBLIOMETRIC ANALYSIS OF THE FOOD ESTATE PROGRAM:
ENVIRONMENTAL SUSTAINABILITY, AGRARIAN CONFLICTS, AND POLICY
IMPLICATIONS FOR INDONESIA'S FOOD SECURITY**

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ABSTRACT

This study examines the food estate program in Indonesia through a bibliometric analysis of 58 articles published between 2020 and 2025. The analysis identifies key trends, themes, and challenges related to the program's implementation. Key findings reveal that while the program aims to strengthen national food security by increasing agricultural production, it has faced significant challenges, including environmental degradation, agrarian conflicts, and sustainability issues. Recurring themes such as land use management, biodiversity conservation, and social justice underscore the complexities of balancing food security goals with environmental and social considerations. This study provides evidence-based insights and policy recommendations, including the adoption of sustainable farming practices, equitable land distribution, and stakeholder engagement. An integrated approach is essential to ensure the long-term success and sustainability of the food estate program in addressing Indonesia's food security challenges.

Keywords: Food estate, bibliometric, food security, environmental , agrarian.



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A.INTRODUCTION

On July 9, 2020, President Joko Widodo assigned the Minister of Defense, Prabowo Subianto, to oversee the implementation of the national food estate project across several districts in Central Kalimantan Province, covering an area of 148,000 hectares (Amirullah, 2020). This initiative, focusing on food security, aims to address national resilience challenges during the

pandemic. Food estate projects represent one of the strategic approaches to mitigate the impacts of crises such as pandemics, which pose unconventional threats to national security. However, food security issues in Indonesia remain a pressing geopolitical concern due to persistent management gaps. The food estate program, despite its promise of enhancing national food production, has generated debates regarding its implementation, particularly in relation to environmental sustainability, land protection, and food security.

Previous research has shed light on the implementation and challenges of the food estate program in addressing Indonesia's food security. For instance, Rasman, Theresia, and Aginda (2023), in their study *Analysis of the Implementation of the Food Estate Program as a Solution to Indonesia's Food Security*, published in *Holistic: Journal of Tropical Agriculture Sciences*, examined the program's impact on national food security. Their findings underscore the program's potential to bolster domestic food production but also emphasize the significant obstacles it faces, such as land use conflicts and sustainability concerns. Similarly, Mutia et al. (2022) highlighted the importance of prioritizing domestic food production as a core strategy for national food security. Their research aligns with the global emphasis on reducing dependency on food imports, especially during periods of crisis.

Bibliometric analysis of previous studies offers a comprehensive understanding of the dynamics and impacts of the food estate program in Central Kalimantan. Implementing government policies of this magnitude inevitably involves complexities and generates both supportive and opposing responses. The food estate program has encountered challenges such as environmental degradation, sustainability concerns, and agrarian conflicts involving indigenous communities and local farmers. These issues underscore the importance of adopting a multidimensional approach that incorporates perspectives on sustainable land management and food security.

Using bibliometric analysis tools, this study examines the scientific literature to explore trends, collaboration networks, and research focuses on food estate implementation. Articles published within the last three years reveal significant emphasis on sustainability, environmental impacts, and social conflicts arising from the food estate program. For instance, studies like those by Ode Mahardhika et al. (2023) highlight the ecological risks posed by large-scale agricultural land conversion, particularly on peatlands in Central Kalimantan. Similarly, agrarian conflicts stemming from land disputes have been a recurring challenge, affecting the livelihoods of indigenous and local farming communities.

Previous research has shed light on the implementation and challenges of the food estate program in addressing Indonesia's food security. Rasman, Theresia, and Aginda (2023), in their study *Analysis of the Implementation of the Food Estate Program as a Solution to Indonesia's Food Security*, published in *Holistic: Journal of Tropical Agriculture Sciences*, examined the program's impact on national food security from multiple perspectives. They found that the food estate

program holds potential as a strategic initiative to enhance domestic food production, thereby reducing Indonesia's reliance on imported food commodities. However, their findings also revealed several implementation challenges, particularly those related to land allocation, policy coordination, and technical infrastructure. These barriers have hindered the program from fully achieving its intended goals and raised concerns about its long-term viability.

In addition to the structural and policy-related challenges, sustainability issues surrounding the food estate program remain a central concern. Rasman et al. (2023) emphasized that the program's expansion into previously undeveloped areas, such as peatlands and forested regions, has sparked debates over its environmental impact. The conversion of these areas for agricultural use has led to deforestation, loss of biodiversity, and degradation of soil quality, creating significant ecological risks. These findings suggest that while the program is designed to address immediate food security needs, it must also integrate sustainable practices and long-term environmental considerations to avoid adverse consequences. Addressing these concerns would require stronger collaboration between government agencies, environmental experts, and local communities.

Similarly, Mutia et al. (2022) highlighted the importance of prioritizing domestic food production as a key strategy for achieving food security. Their research aligns with broader global efforts to reduce dependence on imported food, especially during periods of crisis that can disrupt international supply chains. They argued that ensuring the resilience of domestic food systems requires not only increasing agricultural output but also addressing socio-economic factors such as equitable land distribution and access to resources for smallholder farmers. By focusing on these aspects, the food estate program could become more inclusive and effective, ultimately contributing to a more robust and sustainable food system in Indonesia.

Bibliometric analysis of previous studies provides valuable insights into the dynamics and impacts of the food estate program, particularly from 2020 to 2025. This method allows for the identification of key research themes, influential works, and collaboration networks within the academic discourse. By analyzing studies published during this period using Scopus data and VOSviewer, it becomes evident that the implementation of large-scale government policies like the food estate program is complex and multifaceted. The findings reveal that the most frequently discussed topics include environmental degradation, policy effectiveness, and socio-economic implications. This highlights that while the food estate program was designed to bolster national food security, it has also generated significant debate about its long-term feasibility and broader implications.

A closer look at the bibliometric data shows recurring concerns about sustainability, as environmental degradation emerges as a dominant theme in related studies. The food estate program's reliance on land conversion and intensive agricultural practices has led to deforestation and soil degradation, threatening ecological balance. Keyword co-occurrence analysis indicates

strong links between "sustainability," "food security," and "land management," reflecting the pressing need for strategies that integrate environmental conservation with agricultural expansion. Additionally, the citation analysis of key studies points to agrarian conflicts as another critical area of focus, emphasizing the tension between government-driven development projects and the rights of indigenous communities and local farmers. These challenges underscore the importance of adopting a multidimensional approach that balances food security goals with environmental and social considerations.

Moreover, the bibliometric trends indicate an increasing emphasis on the role of collaborative governance and participatory approaches in addressing the program's shortcomings. Clustering analysis of referenced works highlights the importance of engaging stakeholders, including policymakers, scientists, and local communities, in decision-making processes to ensure the program's success. Studies also point to the necessity of sustainable land management practices that prioritize both environmental preservation and agricultural productivity. By adopting these practices, the food estate program could transition from a contentious initiative into a model for sustainable food production. These findings suggest that future research and policy development should focus on creating integrative frameworks that address the interrelated aspects of environmental, social, and economic sustainability within the food estate program.

B.RESEARCH METHODOLOGY

This study employs a **Bibliometric analysis** approach to evaluate the dynamics and impacts of the food estate program. The goal is to provide a comprehensive understanding of the program's implementation, challenges, and implications for food security. The research methodology consists of a single stage: bibliometric analysis.

To examine the scholarly discourse surrounding the food estate program from 2020 to 2025, bibliometric analysis will be conducted using data from Scopus and Google Scholar. Bibliometric analysis involves the collection, quantification, and visualization of academic articles related to the food estate program. The steps for this analysis are as follows:

- **Data Collection:** Articles will be gathered using specific keywords such as "food estate program," "food security," "sustainability," "land management," and "agrarian conflict." The timeframe for the collection will be from 2020 to 2025.
- **Inclusion Criteria:** Only peer-reviewed journal articles, conference papers, and reports published in English will be included. Studies focused on the implementation of large-scale agricultural policies, sustainability concerns, and socio-economic impacts will be prioritized.
- **Data Analysis:** The gathered data will be processed using VOSviewer and Bibliometrix to visualize citation networks, keyword co-occurrences, and thematic clusters. These tools

will help identify research trends, influential works, and collaboration patterns within the field.

- **Interpretation:** A descriptive analysis will be carried out to understand the thematic evolution of the field, the main research questions posed by scholars, and the areas that require further investigation.

2. Validity and Reliability

To ensure the validity and reliability of the study:

- **Triangulation:** Multiple tools (VOSviewer and Bibliometrix) will be used to triangulate findings and provide a comprehensive understanding of the food estate program.
- **Peer Review:** The research process will involve peer reviews from experts in the field of agricultural policy to ensure the quality and robustness of the analysis.
- **Clear Documentation:** All steps of the research process, including data collection, coding, and analysis, will be thoroughly documented to maintain transparency and reproducibility.

This bibliometric approach will allow for an in-depth exploration of the research landscape surrounding the food estate program. By mapping out the key themes, trends, and influential works in the field, this study aims to provide valuable insights that can inform future policy development and research on food security and sustainable agricultural practices.



Figure 1 Thinking Framework Diagram

C.RESEARCH RESULTS AND DISCUSSION

1. Results of Bibliometric Analysis

Based on the bibliometric analysis conducted on the food estate program, a total of 58 articles were identified from Scopus and Google Scholar within the period of 2020 to 2025. The analysis reveals several significant trends and insights regarding the scholarly discourse surrounding the program. The key findings from the analysis indicate that research on the food estate program has become increasingly prominent over the last few years, with scholars examining various aspects of the program's implementation, challenges, and impact. A growing body of literature has focused on the environmental, socio-economic, and policy dimensions of the program, reflecting the multifaceted nature of the initiative.

One of the major research focus areas identified in the analysis is the environmental and socio-economic implications of the food estate program. A significant number of articles highlighted concerns about the sustainability of the program, particularly in terms of its environmental impact. Issues such as deforestation, soil degradation, and loss of biodiversity were frequently discussed, with scholars warning that the rapid expansion of agricultural land for food production could lead to irreversible environmental damage. At the same time, the program's socio-economic consequences, including agrarian conflicts and the displacement of local communities, were also major points of concern. These challenges point to the need for a more balanced approach to land use and development.

Another key research area that emerged from the analysis is the program's role in ensuring national food security. A smaller but growing body of work has addressed how the food estate program might contribute to reducing Indonesia's reliance on food imports, particularly during periods of global food supply disruptions. Scholars have debated whether large-scale agricultural projects like food estates can effectively boost domestic production without exacerbating existing social and environmental problems. The literature indicates that while the program has the potential to strengthen food security, its success will depend on the sustainable management of land and resources, as well as its ability to address underlying social issues such as land tenure and community rights.

The most frequently discussed themes in the literature include land use management, environmental degradation, sustainability, agrarian conflict, and food security. These themes reflect a growing concern among scholars regarding the long-term viability of the food estate program. Land use management, in particular, emerged as a critical issue, with many studies emphasizing the need for careful planning and regulation to avoid detrimental environmental consequences. Environmental degradation, including deforestation and the depletion of natural resources, was often highlighted as a potential risk of large-scale agricultural projects. The sustainability of the food estate program was also a central theme, with researchers questioning

whether it can be maintained over the long term without causing irreparable harm to the environment and local communities.

In terms of geographical focus, the majority of studies were regionally centered on Indonesia, particularly in relation to the implementation of the food estate program in various provinces. However, several studies also made comparisons with similar programs in other countries, particularly those in Southeast Asia and Africa. These comparative studies offered valuable insights into the challenges and best practices associated with large-scale agricultural initiatives. By examining the successes and failures of similar programs in other regions, scholars were able to draw lessons that could inform the implementation of the food estate program in Indonesia. These international comparisons underscore the global nature of the issues at hand and highlight the need for a coordinated approach to food security and environmental sustainability.

Key authors emerged as central figures in the discussion of the food estate program, with several influential publications shaping the dominant themes in the literature. Authors such as Rasman et al. (2023), Mutia et al. (2022), and Mahardhika et al. (2023) were frequently cited for their contributions to understanding land use conflicts, food security, and sustainability. These scholars have played a pivotal role in framing the discourse on the food estate program, offering in-depth analyses of its impacts on local communities, the environment, and national food systems.

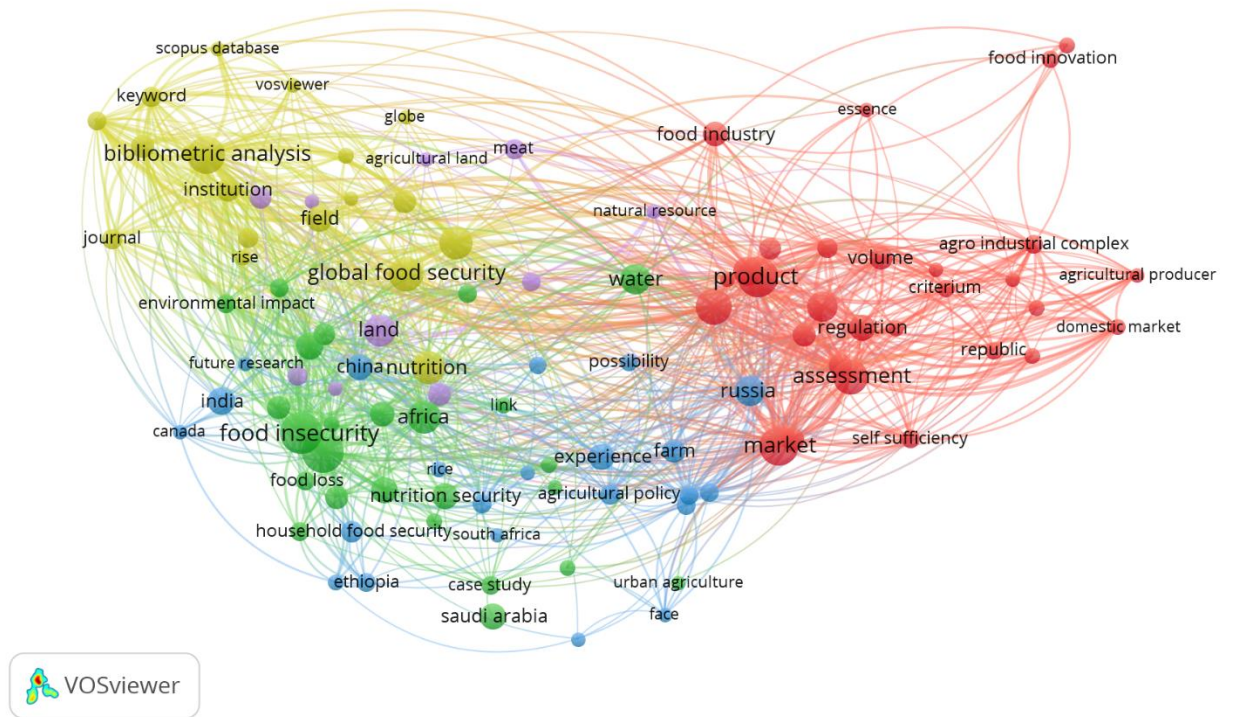


Figure 1 Network Visualization shows the connections between items based on their relationships.

Their work has been instrumental in shaping both academic and policy discussions surrounding the program. The bibliometric analysis also revealed that there is a significant degree of collaboration among researchers in the field. Many of the most cited studies were the result of collaborations between Indonesian scholars and international experts. This trend reflects the global importance of the food estate program and the shared challenges faced by countries around the world in addressing food security and environmental sustainability. Collaborative research has brought diverse perspectives to the discussion, allowing for a more comprehensive understanding of the complexities involved in large-scale agricultural projects.

The *Network Visualization* in this bibliometric analysis illustrates the interconnectedness of various research elements related to the Food Estate Program, highlighting key themes such as environmental sustainability, agrarian conflicts, and policy implications for Indonesia's food security. The diagram consists of nodes representing keywords, authors, or publications, with the size of each node indicating its frequency of occurrence within the dataset. Larger nodes suggest higher relevance, meaning terms like *food security*, *policy implementation*, or *environmental impact* likely appear prominently. The lines connecting the nodes represent relationships, with stronger or more frequent co-occurrences leading to denser connections. Different colors indicate clusters of related topics, suggesting thematic groupings in the literature. For example, one cluster might focus on the environmental consequences of food estate projects, while another explores agrarian conflicts arising from land use changes. The proximity of nodes reflects the strength of their association, where closely positioned terms frequently appear together in academic discussions. This visualization provides valuable insights into the dominant research trends, emerging topics, and the overall structure of scholarly discourse surrounding Indonesia's food estate policy.

Lastly, the analysis highlighted the growing importance of policy recommendations in the literature. As the food estate program continues to evolve, scholars have increasingly focused on providing actionable insights for policymakers. Many studies emphasized the need for more sustainable and inclusive practices in the planning and implementation of food estate programs. Recommendations included adopting integrated land management strategies, promoting community participation in decision-making processes, and ensuring that the environmental and social costs of the program are fully accounted for. These policy-oriented contributions demonstrate the critical role that academic research plays in shaping public policy and influencing the future of agricultural development in Indonesia.

In conclusion, the bibliometric analysis of the food estate program reveals a dynamic and growing body of research that reflects the complexity of the program's impacts on food security, land use, and sustainability. While the food estate program holds significant potential to improve national food security, the challenges it faces—ranging from environmental degradation to agrarian conflicts—must be carefully addressed. Future research should continue to explore

innovative solutions to these challenges, with an emphasis on sustainability, social equity, and the long-term viability of the program.

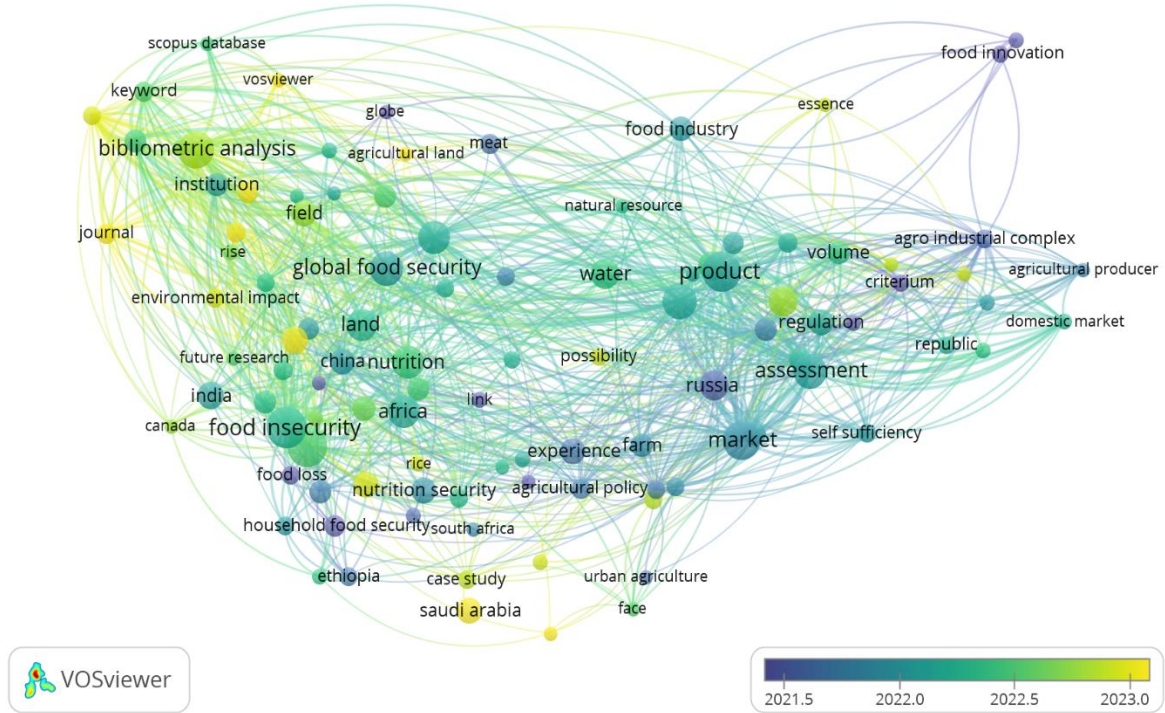


Figure 2 Overlay Visualization adds an extra layer of information, such as temporal or citation data, to help analyze trends and impacts.

The *Overlay Visualization* in this bibliometric analysis presents the evolution of research trends related to the Food Estate Program, focusing on environmental sustainability, agrarian conflicts, and policy implications for Indonesia’s food security. This visualization assigns different colors to nodes based on the temporal distribution of research, illustrating how scholarly attention has shifted over time. Recent topics appear in brighter colors such as yellow or green, while older studies are depicted in shades of blue or purple. This allows for a clear identification of emerging themes and evolving research priorities. For instance, earlier studies may have concentrated on fundamental aspects of food security and land management, while more recent research has increasingly addressed sustainability concerns and agrarian conflicts arising from large-scale agricultural projects. The overlay visualization also highlights key areas that require further exploration, providing

Based on the bibliometric analysis of 58 articles identified from Scopus and Google Scholar between 2020 and 2025, several significant trends and insights regarding the food estate program emerged. A central theme in the research was the program's environmental and socio-economic implications, with a particular focus on sustainability and agrarian conflicts. Many studies raised concerns about the long-term environmental costs of large-scale land conversion for food production, highlighting issues such as deforestation, soil degradation, and biodiversity loss. The socio-economic effects were also a major point of focus, with scholars examining how the program has led to land use conflicts, particularly involving indigenous communities and local farmers. Despite these challenges, the program's potential to enhance food security was also discussed, with a growing body of work focusing on how food estate initiatives can help reduce dependency on food imports and strengthen domestic food production.

The analysis revealed that the most frequently discussed themes in the literature were "land use management," "environmental degradation," "sustainability," "agrarian conflict," and "food security." These topics reflect a growing concern among scholars regarding the program's ability to balance economic, social, and environmental factors. Land use management emerged as a critical issue, with many researchers emphasizing the need for more effective planning and regulation to prevent environmental harm. The theme of sustainability was often linked to concerns about the program's long-term viability and its capacity to maintain ecological balance while achieving food security goals. Agrarian conflict, particularly over land ownership and access, was another dominant theme, with studies exploring the tensions between large-scale agricultural projects and local communities.

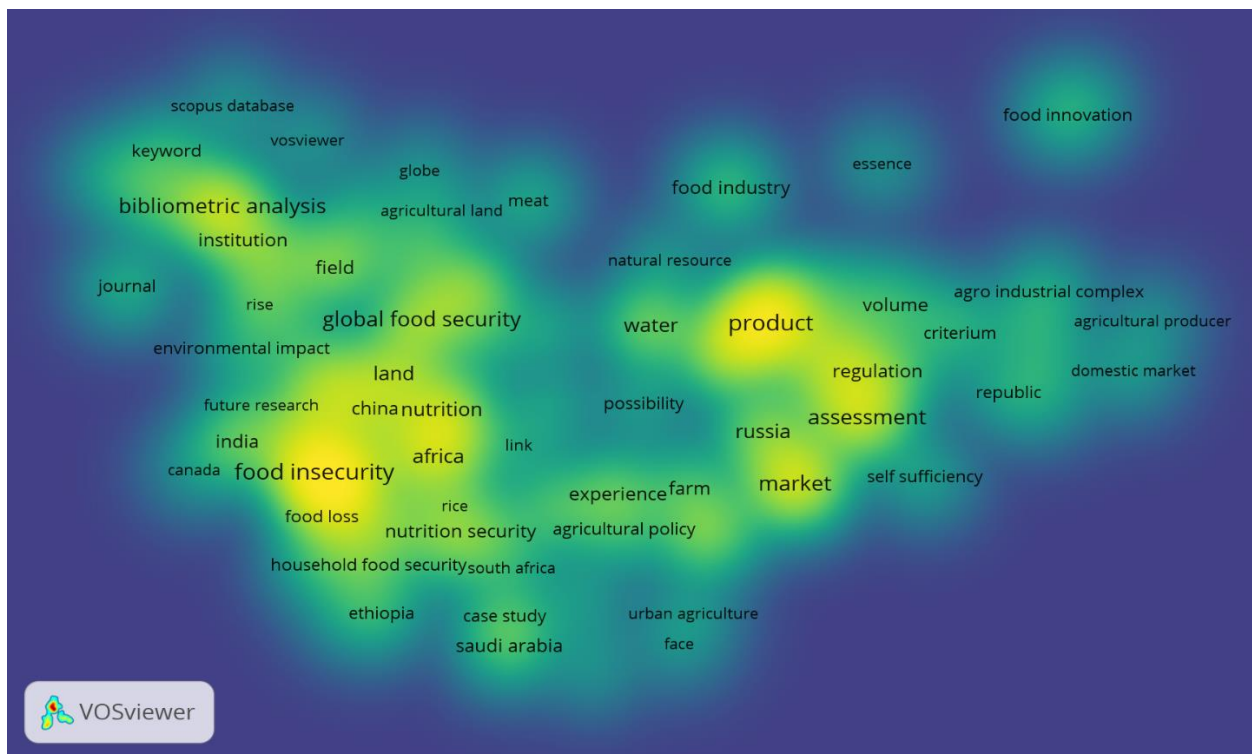


Figure 3 Density Visualization highlights areas of high concentration in the network.

The *Density Visualization* in this bibliometric analysis illustrates the concentration and intensity of research related to the Food Estate Program, highlighting key themes such as environmental sustainability, agrarian conflicts, and policy implications for Indonesia's food security. Areas with a high density of research activity appear in warm colors, such as red and yellow, indicating frequently studied topics and well-established research clusters. Conversely, regions with lower research density are represented in cooler shades like green and blue, signaling emerging or less-explored areas. This visualization helps identify core topics that have received significant academic attention, such as food security policies and environmental impacts, while also revealing potential research gaps in areas like socio-economic effects and conflict resolution. By mapping the distribution of research intensity, the density visualization provides valuable insights into the academic landscape, guiding future studies towards underexplored but critical aspects of the Food Estate Program.

Several key authors have been instrumental in shaping the scholarly discourse on the food estate program, including Rasman et al. (2023), Mutia et al. (2022), and Mahardhika et al. (2023). Their works have contributed significantly to the literature on land use conflicts, food security, and sustainability. Additionally, the majority of studies focused on the Indonesian context, though comparisons with similar programs in other countries provided valuable insights into global best practices and challenges. The bibliometric analysis also highlighted the increasing importance of policy-oriented research, with many studies offering recommendations for more sustainable and inclusive practices in food estate implementation. These findings underscore the critical need for a comprehensive, multi-dimensional approach to addressing the challenges and opportunities of the food estate program, ensuring that it supports both national food security and environmental sustainability.

2. Discussion

The results from the bibliometric analysis underscore the complexities of the food estate program, particularly its environmental and social impacts. While the program aims to enhance food security by expanding domestic food production, it has faced considerable challenges, including environmental degradation, land use conflicts, and sustainability concerns. Scholars frequently discuss issues such as deforestation, soil depletion, and biodiversity loss as significant environmental consequences of the program. Socially, the program has led to tensions involving indigenous communities and local farmers over land ownership and access. These challenges highlight the need for a more balanced approach that integrates food security objectives with sustainable land management and equitable stakeholder participation.

The analysis also reveals key themes and contributors shaping the discourse on the food estate program. Recurring topics include "land use management," "sustainability," and "agrarian conflict," reflecting widespread concerns about the program's long-term viability and its social and ecological trade-offs. Influential studies, such as those by Rasman et al. (2023) and Mutia et al. (2022), emphasize the importance of policy innovation and adaptive strategies to address these

challenges effectively. While most research centers on the Indonesian context, comparative studies with similar international programs provide valuable lessons and highlight best practices. This underscores the critical need for a multi-dimensional approach that considers environmental, social, and economic factors to ensure the program's success in achieving national food security without compromising sustainability.

The food estate program's implementation has raised significant concerns regarding its environmental impact. Studies have frequently highlighted issues such as deforestation, soil degradation, and the disruption of local ecosystems caused by large-scale agricultural expansion. For instance, Rasman et al. (2023) and Mahardhika et al. (2023) underline the urgent need for sustainable land management practices to mitigate these risks. The extensive clearing of land required for the program not only reduces biodiversity but also contributes to long-term environmental instability. These findings suggest that without integrating sustainable practices, the program's environmental costs may outweigh its benefits, undermining its overall objectives.

In addition to localized environmental effects, the food estate program also poses broader ecological challenges. The loss of forest cover and soil quality exacerbates global issues such as climate change by increasing carbon emissions and reducing natural carbon sinks. The program's reliance on intensive agricultural practices further contributes to soil erosion and decreased fertility, making the land less productive over time. Addressing these issues requires a comprehensive strategy that prioritizes reforestation, conservation, and the adoption of environmentally friendly agricultural methods to ensure long-term sustainability.

Agrarian conflicts are another critical issue identified in the literature. The expansion of the food estate program has led to disputes over land ownership and access, particularly affecting indigenous communities and local farmers. Mutia et al. (2022) and Mahardhika et al. (2023) emphasize that these conflicts arise from inadequate consultation and the perceived marginalization of local stakeholders. Such disputes not only hinder the program's progress but also exacerbate social tensions in the affected regions. Resolving these conflicts necessitates a more inclusive approach, where local communities are actively involved in decision-making processes and land rights are respected and fairly distributed.

Beyond environmental and agrarian challenges, the program also carries significant socioeconomic implications. On the one hand, it aims to boost food security and create economic opportunities through increased agricultural output. On the other hand, the displacement of local communities and the concentration of land ownership risk perpetuating inequality. Studies suggest that while the program has the potential to contribute to national food security, its success depends on equitable resource allocation and the provision of adequate support to smallholder farmers. Strengthening local agricultural infrastructure and providing capacity-building programs could help address these socioeconomic disparities.

To address these challenges, a more integrated policy framework is essential. The government must balance the competing objectives of food security, environmental protection, and social equity. This includes implementing sustainable agricultural practices, establishing clear mechanisms for land tenure, and fostering partnerships with local communities and environmental organizations. Furthermore, continuous monitoring and evaluation are necessary to adapt the program to evolving environmental and social conditions. By adopting a holistic approach, the food estate program can potentially achieve its goals while minimizing its adverse impacts, contributing to a more sustainable and equitable agricultural system.

The food estate program holds promise for enhancing Indonesia's food security by increasing agricultural production and reducing the nation's dependency on food imports. Scholars, including Mutia et al. (2022) and Rasman et al. (2023), highlight that achieving food self-sufficiency remains a critical national priority, particularly in light of global food supply vulnerabilities. By expanding domestic agricultural capacity, the program aims to create a stable food supply and reduce reliance on external markets. However, the success of this initiative hinges on its ability to strike a balance between production expansion and addressing associated environmental and social challenges.

While the program has the potential to address food security concerns, it faces considerable obstacles that could undermine its long-term sustainability. Agricultural expansion under the food estate program often comes at the expense of environmental integrity, as evidenced by reports of deforestation and soil degradation. Additionally, unresolved agrarian conflicts pose significant threats to the program's implementation. These challenges underscore the need for a multidimensional approach that integrates environmental stewardship, equitable land distribution, and the active participation of local communities in decision-making processes.

To enhance the program's effectiveness, several policy recommendations have emerged from the bibliometric analysis. The government must prioritize the adoption of sustainable farming practices, such as agroforestry and conservation agriculture, to minimize environmental impacts. Additionally, ensuring the social legitimacy of the food estate program requires addressing agrarian conflicts and safeguarding the rights of indigenous communities and local farmers. A fair and inclusive approach to land use planning and conflict resolution is essential for building trust and securing cooperation from affected stakeholders. These measures are critical to balancing the program's economic and social objectives.

Moving forward, a more integrated approach that considers both food security and environmental sustainability should guide the design and implementation of food estate projects. Collaboration between government agencies, environmental organizations, and local communities is vital for achieving these goals. Policymakers should also establish robust monitoring and evaluation mechanisms to track the program's impacts and adapt strategies as necessary. By

aligning agricultural development with environmental conservation and social equity, the food estate program can serve as a model for sustainable food security initiatives in Indonesia and beyond.

D. CONCLUSION AND RECOMMENDATIONS

1. Conclusion

The bibliometric analysis highlights that the food estate program has significant potential to strengthen Indonesia's food security by expanding domestic agricultural production. However, its implementation is accompanied by critical challenges, particularly environmental degradation, agrarian conflicts, and sustainability concerns. The program's long-term success hinges on its ability to address these issues through a balanced approach that integrates food security goals with environmental protection and social justice. The recurring themes in the literature—such as land use management, biodiversity conservation, and stakeholder engagement—underscore the need for more inclusive and sustainable strategies in the food estate program.

2. Recommendations

To enhance the effectiveness and sustainability of the food estate program, the following recommendations are proposed:

- a) **Adopt Sustainable Practices:** The government should emphasize sustainable farming techniques, such as agroforestry, precision agriculture, and conservation practices, to minimize the environmental impacts of agricultural expansion.
- b) **Resolve Agrarian Conflicts:** Effective mechanisms for land conflict resolution are crucial. The government must ensure equitable land distribution and protect the rights of indigenous communities and local farmers through transparent and participatory decision-making processes.
- c) **Strengthen Policy Integration:** Policymakers should adopt an integrated approach that balances economic, environmental, and social dimensions. This includes creating synergies between food production goals and environmental conservation strategies.
- d) **Engage Stakeholders:** Active participation from local communities, environmental organizations, and agricultural experts should be prioritized to improve the program's design, implementation, and evaluation.
- e) **Monitor and Evaluate:** Robust systems for monitoring and evaluating the program's outcomes are essential to measure its effectiveness and make data-driven adjustments to policy and practice.

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