Jurnal Pendidikan Ekonomi Indonesia

Journal homepage: https://ejournal.upi.edu/index.php/JPEI

Jurnal Pendidikan Ekonomi Indonesia (JPEI)
e-ISSN 2721-1401 p-ISSN 2987-4904
Vol. 8(1), May (2025) 55-73
Doi: https://doi.org/10.17509/jpei.v7i1

Comparative Study of Advanced Agrarian Countries in Enhancing Indonesia's Economic Welfare: A Literature Review Study

Mahesa Jaya Gunawan[1*], Muchammad Shubchi Fadhilah Ramadhan[2], Mohammad Reza Putra Nugroho[2]

[1]Faculty of Economics and Business, Universitas Padjajaran, Sumedang 45363, Indonesia
[2]Faculty of Economics and Business Education, Universitas Pendidikan Indonesia, Bandung 40154, Indonesia
*Correspondence: E-mail: mahesa24001@mail.unpad.ac.id

ABSTRACT

This study aims to analyze the comparative agrarian policies between Indonesia and advanced agrarian countries, as well as to evaluate the effectiveness of their implementation in improving the economic welfare of the population. Utilizing the Systematic Literature Review (SLR) method with the PRISMA approach, a total of 10 relevant scholarly articles were thoroughly analysed. The study findings reveal that although Indonesia has implemented various policies with substance similar to those of other countries—such as agricultural subsidies, agrarian reform, and price protection—their effectiveness remains low. This is attributed to weak institutional frameworks, lack of technological integration, limited research adoption, and policy inconsistency. In contrast, countries such as China, India, Germany, and Brazil have achieved success through adaptive incentive systems, strong institutional integration, and sustained investment in agrarian research. This research recommends a strategic reform of Indonesia's agrarian policies by emulating globally successful models, in order to strengthen the agricultural sector's contribution to inclusive and sustainable national economic development.

OPEN ACCESS

Article History:
Submitted 21 December 2024
First Revised 14 January 2025
Accepted 15 February 2025
First Available online 20 March 2025
Publication Date 29 May 2025

Keyword:
Agrarian Policiy,
Agrarian Reformation,
Agriculture,
Economic Welfare,
Global Economy

CONTACT: mahesa24001@mail.unpad.ac.id

INTRODUCTION

The agricultural sector plays a strategic role in the global economy, particularly for countries with a strong agrarian foundation (Ghosh, R. 2024). Effective agricultural policies are key to enhancing productivity, ensuring food security, and promoting the sustainability of the sector. As time progresses, academic research on agricultural policy continues to evolve, reflecting shifts in paradigms, approaches, and priorities in managing the agrarian sector. Advanced agrarian countries hold a strategic position in the global economy, supported by efficient and highly competitive agricultural systems (Shestakovska et al., 2023). For instance, the Netherlands, despite its limited land area, has become one of the world's largest agricultural exporters, with export values exceeding 100 billion euros in 2022.

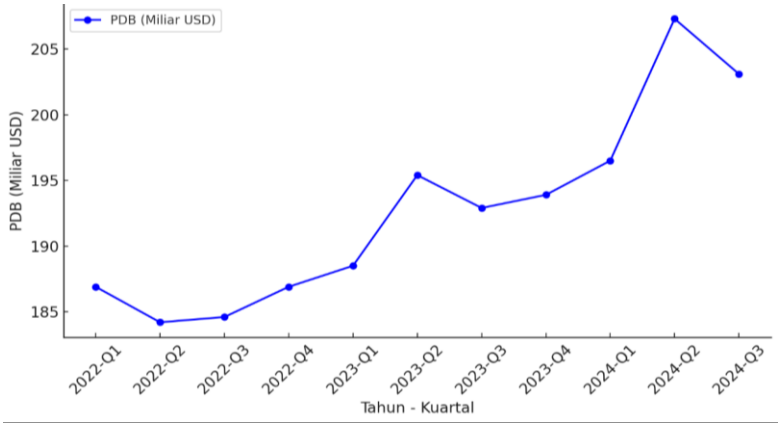

Figure 1. *Agricultural Sector GDP of the United States (2022–2024, in Billion USD)*
Sources: World Bank (2022-2024)

Figure 1 shows the fluctuations in the United States' agricultural sector GDP between 2022 and 2024. In 2022, the sector started at $186.9 billion in Q1, declined slightly to $184.6 billion in Q3, and then returned to $186.9 billion. In 2023, the agricultural GDP showed an upward trend, reaching $188.5 billion in Q1, increasing to $195.4 billion in Q2, and $192.9 billion in Q3. A notable rise occurred in Q4, reaching $193.8 billion. This positive momentum continued into 2024, with $196.5 billion in Q1, peaking at $207.8 billion in Q2, before a slight decrease to $203.1 billion in Q3. Overall, the data demonstrate sustained growth in the U.S. agricultural sector despite some fluctuations. This success reflects the effectiveness of well-designed policies, advanced technology adoption, and innovation-driven strategies in optimizing agriculture as a key driver of national economic growth.

Countries such as the United States, the Netherlands, and Australia have successfully optimized their agricultural policies to enhance productivity, resource efficiency, and environmental sustainability (Christine et al., 2024). In contrast, Indonesia—as a developing agrarian country—continues to face several challenges in managing its agricultural sector, including low productivity, dependence on imports, and policies that are insufficiently adaptive to global dynamics. Although agriculture remains a backbone of the Indonesian economy, its contribution to the national Gross Domestic Product (GDP) has shown a consistent decline in recent years.

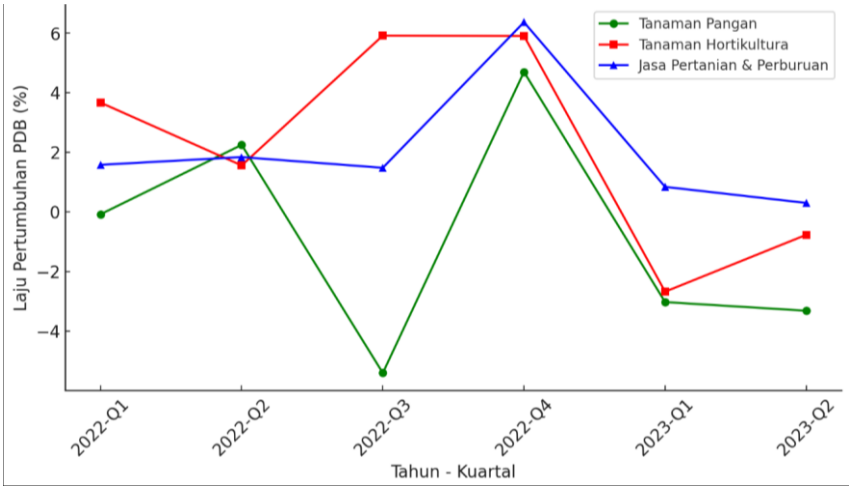

Figure 2. *Quarterly GDP Growth Rate by Industry, 2022–2023 (Percent)*
Sources: Badan Pusat Statistik (2022-2024)

According to Figure 2, growth data for the agricultural sub-sectors during the 2022–2023 period indicates notable fluctuations, particularly in the food crops and horticulture sectors. For instance, the food crops sub-sector experienced a contraction of -5.41% in the third quarter of 2022, before returning to a positive growth rate of 4.7% in the fourth quarter. However, negative trends reemerged in the first two quarters of 2023, with contractions of -3.03% and -3.32%, respectively. A similar pattern is observed in the horticulture sector, which declined sharply from 5.92% in Q3 2022 to -2.68% in Q1 2023. Meanwhile, the agricultural services and hunting sub-sector remained relatively stable with positive growth, although it weakened from 6.37% in Q4 2022 to 0.3% in Q2 2023.

These fluctuations highlight the instability of Indonesia's agricultural sector, which can be attributed to various factors, such as dependence on weather conditions, poorly adaptive policies, and low levels of innovation and efficiency in production systems. Research by Rizzo et al, (2020) emphasizes that agricultural policy in Indonesia remains reactive and lacks a strong data-driven foundation. Additionally, Adam et al., (2021) found that the adoption of technology in Indonesian agriculture lags significantly behind that of advanced agrarian countries. These limitations further undermine the competitiveness of the national agricultural sector amid increasing global pressure and the demand for higher efficiency.

This study identifies gaps in the formulation and implementation of agricultural policies between Indonesia and advanced agrarian nations, as well as their impact on economic growth. As such, it aims to address a gap in the literature by offering evidence-based and adaptive policy strategies. Previous studies have examined agricultural policies in advanced agrarian countries and their economic impacts. For example, Anderson & Martin (2006) demonstrated that subsidy policies and technological incentives play a critical role in boosting the competitiveness of the agricultural sector in developed countries. Conversely, research by Susilowati (2020) found that Indonesian agricultural policy remains reactive and insufficiently data-based.

Other studies have also pointed to low levels of innovation within the Indonesian agricultural sector. For instance, Adam et al., (2020) noted that the adoption of technological innovations remains very limited compared to advanced agrarian countries due to infrastructure constraints, insufficient government incentives, and low technological literacy among farmers. Togneri et al., (2019) highlighted that Indonesia's irrigation systems are still far behind countries like the Netherlands, which has implemented data-driven automated irrigation systems. Herdiansyah et al., (2023) also pointed out that Indonesia's agricultural policies continue to rely on traditional methods with minimal adoption of precision agriculture. Furthermore, Mariyono, J. (2022) revealed that limited access to credit and financing restricts Indonesian farmers' ability to adopt modern technologies. Meanwhile, Lakitan, B. (2019) noted that research and development in Indonesia's agricultural sector is still minimal compared to countries like the United States, which allocates significant funding to agricultural innovation.

Although numerous studies have examined agricultural policy in developed and developing contexts separately, few have comprehensively compared the policy dynamics of both within a unified economic framework. Most existing literature focuses on domestic policy analysis without linking it to the experiences of more advanced agricultural nations. This study offers a comparative approach that differentiates policy, technological integration, and economic outcomes, with the goal of providing more effective policy recommendations for Indonesia. By comparing the approaches of advanced agrarian nations, the study highlights how technology-driven policies, fiscal incentives, and integrated research and development efforts can improve productivity and resilience in the agricultural sector. It is expected that the findings will offer strategic insights for Indonesia in designing more adaptive, evidence-based agricultural policies to enhance the competitiveness of the national agricultural sector.

This research aims to analyze the differences in the formulation and implementation of agricultural policies in advanced agrarian countries and Indonesia, identify the key factors contributing to the success of agricultural policies in developed countries, and formulate policy recommendations that could be applied in Indonesia to enhance the competitiveness of its agricultural sector and support economic growth. Academically, the study contributes to the literature on comparative agricultural policy. Practically, the findings are expected to provide input for policymakers in crafting more innovative and evidence-based regulations to strengthen Indonesia's agricultural sector.

LITERATURE REVIEW

1. Advantage of Agrarian Optimization Theory (AOA)

The Advantage of Agrarian Optimization (AOA) theory posits that agrarian countries can achieve economic superiority when the agricultural sector is optimized through strategic policies, resource efficiency, and technological innovation (Schultz, 1964). While AOA partly depends on the land area available, its effectiveness hinges more on how a country manages and utilizes its agricultural resources. In this study,

AOA theory is employed to assess the extent to which Indonesia's agricultural policies can be aligned with the strategies of advanced agrarian nations to enhance the country's economic welfare.

2. Competitive Advantage Theory

The Theory of Comparative Advantage was first developed by David Ricardo (1817) in his seminal work *On the Principles of Political Economy and Taxation*. This theory asserts that a country can gain economic benefits by specializing in and exporting goods that it can produce at a relatively lower opportunity cost, while importing goods that are more costly to produce domestically. In the context of agriculture, this theory suggests that Indonesia holds a comparative advantage in the production of tropical crops such as rice, palm oil, and coffee. However, despite this potential, the productivity of Indonesian agriculture remains low compared to that of advanced agrarian nations. This is attributed to limited technological adoption, restricted access to capital for farmers, and trade policies that have yet to fully support the export of high-value agricultural products. This study applies the Theory of Comparative Advantage to identify strategies that Indonesia can implement to enhance the competitiveness of its agricultural sector through innovative policies and optimal utilization of agrarian resources.

3. Theory of Technological Innovation in Agriculture

The Theory of Technological Innovation in agriculture was developed by Theodore W. Schultz (1964) in his book *Transforming Traditional Agriculture*. This theory emphasizes that innovation and technology are key drivers in enhancing productivity and competitiveness in the agricultural sector. Schultz argues that agricultural modernization through technological advancement can reduce reliance on traditional factors such as manual labour and extensive land use, while simultaneously improving production efficiency. This study employs the theory of technological innovation in agriculture to identify actionable steps that Indonesia can take to increase the adoption of agricultural technology, thereby strengthening food security and supporting the growth of an agrarian-based economy.

METHODS

This study employs the Systematic Literature Review (SLR) method, using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) approach, to systematically examine the relevant literature on agricultural policies in advanced agrarian countries and their impact on economic welfare. This method was chosen for its effectiveness in filtering and analyzing previous studies in a structured manner, thereby producing transparent, accurate, and replicable findings for future research (Tugwell & Tovey, 2021). Following PRISMA guidelines, this study adheres to the stages of identification, screening, eligibility selection, and data analysis and synthesis to ensure the quality and relevance of the reviewed literature.

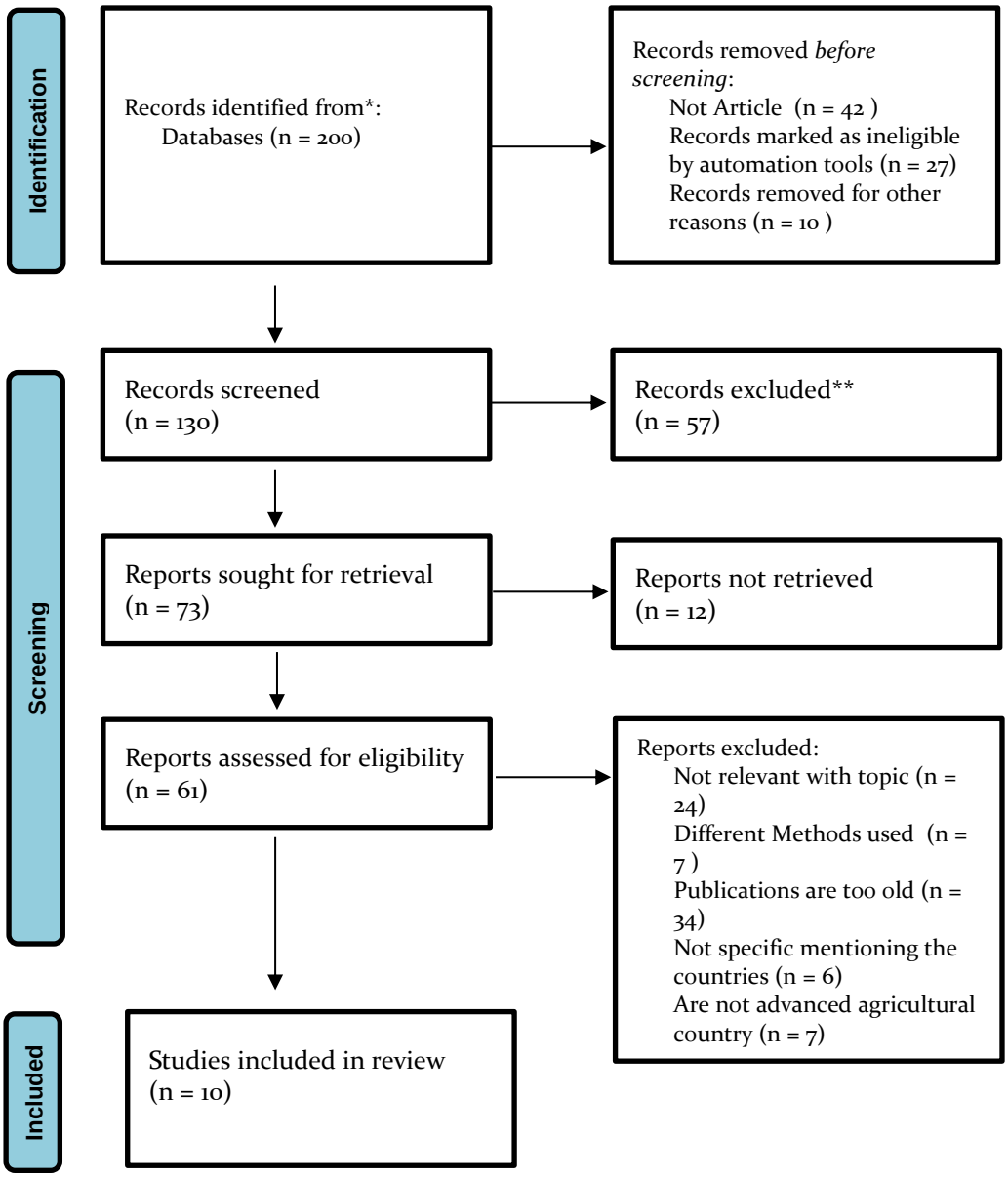

Figure 3. *PRISMA Identification Process*

Figure 3 illustrates the identification stage of the PRISMA process, which involves a systematic search across several reputable academic databases, including Scopus, Web of Science, ScienceDirect, and SpringerLink. The search strategy employed a combination of keywords such as "agricultural policy" and "global economic" to ensure the relevance of the results. This initial screening yielded 200 articles, which were then imported into reference management software (Mendeley) to streamline the selection and organization of the literature.

Following the initial search, a preliminary screening was conducted to ensure that only relevant articles meeting the inclusion criteria were analyzed further. This screening involved several important steps. First, 42 publications were excluded because they were not peer-reviewed scientific articles but rather books, seminar proceedings, theses, dissertations, and other non-journal formats. This exclusion was necessary to maintain data relevance and quality. Second, 27 additional articles were

removed because they did not meet eligibility criteria; these included articles published in non-reputable journals, opinion pieces or editorials, or those lacking sufficient empirical data to support research findings. Third, 10 articles were excluded for other reasons, such as the unavailability of full text, language barriers preventing analysis, or publication in journals not indexed in trusted academic databases.

After this initial screening, 130 articles remained and progressed to the screening phase for further selection. At this stage, the articles were reviewed based on their titles and abstracts to verify their relevance to the research topic. As a result, 57 articles were eliminated due to a lack of direct relevance or insufficient information for analysis. Consequently, 73 articles met the criteria and advanced to the next stage. Subsequently, full-text retrieval was attempted for these 73 articles; however, 12 articles could not be accessed due to paywall restrictions, unavailability in digital format, or removal of journals from academic databases. This reduced the number of articles available for further analysis to 61.

In the eligibility stage, a thorough review of the full texts of the remaining 61 articles was conducted to confirm their suitability for inclusion in the study. Several criteria had to be fulfilled at this stage to ensure the quality and relevance of the literature analyzed.

Table 1. *Eligibility Criteria*

Criteria	Inclusion	Exclusion
Year of Publication	2000–2025	Before 2000
Data Coverage	Clearly mentions the country	Does not clearly mention the country
Document Type	Scientific Article	Not a Scientific Article
Access	Accessible without payment	Requires payment to access
Country Type	Advanced Agrarian	Not Advanced Agrarian
Database	Scopus	Non-Scopus

This evaluation involved analyzing the research methodologies, data scope, and content relevance to the study objectives. The purpose of this process was to ensure that only articles with significant contributions to the research were retained. The evaluation results showed that 24 articles were excluded due to insufficient relevance to the research topic. Additionally, 7 articles were eliminated because they employed methodological approaches that differed from those required in this study, making them unsuitable for further analysis. Furthermore, 34 publications considered outdated were excluded due to concerns about their currency and relevance in the context of the current research. Moreover, 13 articles were removed because they did not focus on advanced agrarian countries and only mentioned continental coverage without specifying the countries studied, thus providing insufficient specific information needed for the analysis. Through these various selection stages, only articles that truly met the eligibility standards were included in the study.

Consequently, the number of articles that passed to the final analysis stage was 10. These selected articles were then further analyzed to identify patterns of agricultural policies implemented in advanced agrarian countries and their impact on economic welfare. The findings from the various studies were compared and synthesized into tables and visualizations to provide clearer insights into the key factors behind successful policies that could be applied in the context of Indonesia. With the PRISMA method, this study is expected to deliver systematic, transparent, and replicable results for future research.

RESULT

Based on a systematic review of the 10 scientific articles analyzed in this study, it was found that agrarian policies have a significant impact on economic development and community welfare, especially in agrarian countries with high dependence on the agricultural sector. These studies present various policy approaches, agricultural development strategies, and performance indicators of the agrarian sector that can serve as benchmarks for evaluation in Indonesia. Generally, the five main focuses in this review—namely agricultural indicators, foreign agrarian policies, policy comparisons, evaluation of Indonesian policies, and policy reform recommendations—form the main framework for understanding the dynamics and effectiveness of agrarian policies in different contexts.

The studies show that agricultural indicators such as contribution to employment, land productivity, food security, and environmental sustainability are important variables in measuring the success of agrarian policies. Furthermore, various agrarian countries such as China, India, Brazil, and ASEAN member states have developed context-based policies ranging from performance-based subsidies, land use reforms, to long-term investments in agrarian research. Their success is reflected not only in production growth but also in improvements in farmers' welfare and socio-economic stability in rural areas.

DISCUSSION

1. Countries Agricultural Indicator

The agricultural sector is a key sector that can be a competitive advantage for many countries. Historically, agriculture has made significant contributions to countries around the world.

Table 2. *Agriculture Indicators*

Countries	**Lands (%)**	**Population**	**Agrictultural GDP**	**Agricultural Workers (%)**
China	55.4	22.8	22.8	22.8
India	60.0	44	44	44
Germany	60.0	1	1	1
Countries	**Lands (%)**	**Population**	**Agrictultural GDP**	**Agricultural Workers (%)**
Brazil	26.7	8.2	8.2	8.2
Philippines	42.5	22.8	22.8	22.8
Vietnam	39.3	33.0	33.0	33.0

Indonesia	29.8	29.3	29.3	29.3
Thailand	46.0	30.1	30.1	30.1

Data in Table 2 indicates that the agricultural sector plays a central role in providing employment across the six agrarian countries studied. With nearly a quarter of their populations working in this sector, agriculture serves not only as the foundation of rural economies but also as a pillar of national social and economic stability. The high dependency of communities on agriculture implies that any policy shifts—such as subsidies, land reforms, price protections, or technological investments—will have a direct impact on the livelihoods of millions. Therefore, agriculture should be viewed not merely as a food production activity but as a strategic instrument for job creation, poverty reduction, and equitable development.

The significant role of agriculture in absorbing labor also highlights its potential as a solution to unemployment and regional disparities (Natadireja et al., 2024). In many developing countries, agriculture remains the most accessible sector for individuals with limited education and skills (Rufaidah et al., 2023). This means that if governments implement appropriate policies—such as modernizing farming equipment, increasing access to financing, and enhancing farmers' capacities—productivity can improve without sacrificing employment levels. This makes agriculture a crucial arena for achieving inclusive economic growth.

However, high labor involvement in agriculture can also signal structural stagnation if not accompanied by increases in productivity and farmer income. In many countries, including Indonesia, smallholder farmers remain trapped in traditional labor systems, low wages, and limited access to technology and markets (Rufaidah et al., 2023). If left unaddressed, this condition could deepen economic inequalities between urban and rural areas. Hence, special attention must be directed not only towards expanding agricultural employment but also toward improving the quality and welfare of agricultural jobs.

Furthermore, the success of the agricultural sector in absorbing labor heavily depends on the extent of fiscal resources invested by governments in sustainable agrarian development (Mueller & Mueller, 2016). Countries like China and India have demonstrated that agrarian reforms, agricultural infrastructure support, and price protection mechanisms can generate millions of new jobs and significantly increase farmers' incomes (Zhang & Drury, 2024; Jiang, 2016). Meanwhile, countries such as Brazil emphasize the importance of research and innovation in creating modern agriculture that remains labor-intensive yet economically efficient (Martinelli et al., 2016). Indonesia should adopt similar strategies to fully leverage the agricultural sector as a driver of equitable and inclusive development. Thus, the substantial contribution of agriculture to employment is not merely a descriptive statistic but an important indicator that should spur the formulation of more progressive and transformative agrarian policies. In the current global context—where food security, climate change, and socio-economic crises are interconnected—prioritizing the agricultural sector in development is no longer a choice but a strategic necessity.

2. Agrarian Policies

Agriculture is one of the key sectors in the global economy, playing a crucial role in food supply, raw materials for industry, and employment creation. Since prehistoric times, humans have relied on agriculture as a primary source of livelihood (Rehman et al., 2016). Along with technological advancements and population growth, agriculture has undergone various transformations in production methods, land use, and governing policies.

In the modern context, agriculture functions not only as a provider of food resources but also plays a vital role in maintaining environmental balance, economic sustainability, and national as well as global food security (Laiprakobsub, 2017; Keating & Carberry, 2010). However, the sector faces numerous challenges such as climate change, land degradation, and limited water resources (Rufaidah et al., 2024). To address these challenges, governments worldwide implement agricultural policies aimed at increasing productivity, protecting farmers' welfare, and ensuring price stability of food commodities.

Table 3. *Agrarian Policies of Countries*

Country	Main Agrarian Policies	Why Effective?
China	1. Enhancement of Innovation and Agricultural Technology 2. Reform of Subsidy and Incentive Policies 3. Investment in Agricultural Infrastructure 4. Strengthening Environmental Sustainability Regulations	1. Increased farmers' income 2. Agricultural market stability 3. Small farmers face challenges in adapting to technology
India	1. Green Revolution 2. Digital Input Subsidies 3. Mechanization	1. Robust distribution system 2. Targeted subsidies through digitization
Germany	Common Agricultural Policy (CAP): 1. Sustainable Agricultural Reform 2. Support for Farmers through Subsidies and Incentives 3. Digitalization and Modernization of Agriculture	1. Increased agricultural productivity through advanced technologies 2. Reduced dependence on food imports
Brazil	1. EMBRAPA – Autonomous and Applied Agricultural Research Institution	1. Sustainable research investment, strong stakeholder collaboration
Vietnam	1. Technology assistance and fertilizer subsidies to improve crop yields 2. Investment in irrigation systems and agricultural mechanization 3. Incentives for rice exporters	1. Increased rice production and export 2. Improved farmer welfare through higher crop yields
Philippines	1. Agrarian reform program for land redistribution 2. Investment in irrigation systems to improve agricultural efficiency 3. Price support for small farmers	1. Increased rice production, but high dependency on imports remains 2. More stable food prices
Thailand	1. Rice price subsidies to support farmers' welfare 2. Government purchase of harvests at	1. Domestic rice price stability 2. Increased government spending due to subsidies

fixed prices
3. Improved access to agricultural credit

3. Policies Comparation

To understand the differences in agricultural policies implemented across various countries, it is important to identify the key policies enacted to support the agricultural sector. These policies may encompass various aspects, such as agricultural subsidies, price support programs, and initiatives to promote the development of agricultural technology. Each country adapts these policies according to local conditions, including agroecosystem characteristics, domestic market needs, and economic development priorities. Therefore, comparing these policies provides insight into how different countries address agricultural issues and helps identify which policies are most effective in achieving sustainable long-term goals.

Table 4. *Comparison of Agrarian Policies by Country*

Country	Agricultural Subsidies			
	Agricultural Subsidies	**Agricultural Credit**	**Price Protection**	**Agricultural Technology Development**
India	Yes	Yes	Yes	Yes
China	Yes	Yes	Yes	
Germany	Yes	Yes	Not explicit	Yes
Brazil	Yes	Yes	Yes	Yes
Philippines	Yes	Yes	Yes	Yes
Vietnam	Yes	Yes	Not explicit	Yes
Indonesia	Yes	Yes	Yes	Yes
Thailand	Yes	Yes	Yes	Yes

Agricultural subsidies are one of the most common forms of government intervention to support the sustainability of the agrarian sector (Martinelli et al., 2016). Through subsidies, the state provides assistance in the form of reduced production input costs such as fertilizers, seeds, or farming equipment, as well as direct aid and low-interest financing (Mueller & Mueller, 2016). The primary objectives of this policy are to increase productivity, reduce production costs, and maintain farmers' income stability. In many countries, subsidies also play a crucial role in ensuring national food security by enabling farmers to produce at affordable costs and remain competitive in the market (Rolls, D., 2004). Comprehensive subsidy models have proven effective in maintaining food production sustainability while encouraging efficiency within the national agricultural system.

Alongside subsidies, agricultural credit serves as an important instrument for promoting growth in the agrarian sector, especially in developing countries (Laiprakobsub, 2017). Agricultural credit refers to financing provided to farmers or agribusiness actors to fund farming needs, ranging from procurement of production inputs to land development or acquisition of agricultural technology (Rehman et al., 2016). Access to credit is key for smallholder farmers who often lack sufficient initial capital. With credit support, farmers can increase production capacity, manage land more optimally, and adapt to market dynamics and climate changes. The role of

financial institutions, both state-owned and private, is critical in ensuring the availability of fair, affordable, and sustainable financing.

In addition to financial aid, price protection is also a strategic policy to guarantee farmers' welfare (Laiprakobsub, 2017). Fluctuations in agricultural commodity prices often harm farmers, especially when harvests are abundant but prices plunge. To address this, governments in various countries implement base price policies, market interventions, and even agricultural insurance schemes (Jiang, H., 2009). In Thailand, the Thai National Crop Insurance Top-Up Schemes (TNCIS) operates through collaboration between the government and private insurance companies affiliated with the Thailand General Insurance Association (TGIA) (Laiprakobsub, 2017). Meanwhile, in the Philippines, the Philippine Crop Insurance Corporation (PCIC) provides premium subsidies for smallholder farmers to protect them against natural disasters and price volatility (Keating & Carberry, 2010). In Indonesia, the Paddy Farming Insurance Program (AUTP) is designed to protect farmers from crop failure due to flooding, drought, or pest attacks. However, future challenges include expanding coverage, improving farmers' literacy, and strengthening monitoring systems to ensure that the program delivers tangible benefits on the ground (Rufaidah et al., 2023; Natadireja et al., 2024).

Equally important, the development of agricultural technology is a fundamental pillar in transforming the agrarian sector toward a more productive and sustainable system (Mueller & Mueller, 2016). Agricultural technology encompasses a range of innovations, from superior crop varieties, mechanization, precision farming systems, to digital applications facilitating weather monitoring, irrigation, and market access. These innovations not only boost yields but also enhance resource use efficiency, reduce vulnerability to climate change, and expand farmers' access to markets and information. Equitable dissemination of technology is essential to ensure that the transformative impacts are widely felt by farmers across regions (Keating & Carberry, 2010). However, in Indonesia, technology adoption still faces challenges related to infrastructure, extension services, and initial investment costs. Therefore, the government's role is crucial in strengthening research systems, technology dissemination, and partnerships with the private sector to broaden the reach of innovations to grassroots levels (Rufaidah et al., 2023).

4. Policy Evaluation in Indonesia

Over the past two decades, Indonesia has implemented various agrarian policies encompassing agrarian reform, agricultural input subsidies, price protection for harvests, and food estate programs. In terms of substance, these policies are not much different from those implemented by other agrarian countries such as China, India, Brazil, Germany, as well as several Southeast Asian countries like Thailand and Vietnam. However, Indonesia's achievements in productivity, farmer welfare, and food security still lag behind these countries. This indicates that having similar policy designs does not necessarily produce the same performance, and the effectiveness heavily depends on the quality of implementation, supporting systems, and the capacity of the executing institutions.

Table 5. *Agrarian Performance Table*

Country	Main Agrarian Policies	Why Effective?	Condition in Indonesia
China	HRS (Long-Term Land Use Rights), CAWUR (Water Reform)	Legal certainty, strong input subsidies, market control, land allocation, resource access	Agrarian reform not accompanied by funding guarantees and access
India	Green Revolution, Subsidies, Digital Input, Mechanization	Robust distribution system, targeted subsidies through digitalization	Digital input subsidies not yet widely applied, many underdeveloped areas
Germany	Reform of CAP (Common Agricultural Policy), Environmentally-Based Subsidies	Strong bureaucracy, agri-environment integration, targeted incentive systems	Subsidies still input-based without sustainability indicators
Brazil	EMBRAPA – Autonomous and Applied Agrarian Research Agency	Sustainable research investment, strong inter-stakeholder collaboration	Research agency not yet integrated with farmers' needs, high bureaucratic budget allocation
Thailand, Philippines	Price protection, government purchasing, market stabilization	Strong logistics and warehousing, able to absorb harvest, stable basic food prices	GPP (Government Purchase Price) not consistently applied, weak food storage infrastructure, unclear policies

Based on the findings presented in Table 5, one example of agricultural policy is the Common Agricultural Policy (CAP) implemented in Germany. Through this policy, agricultural subsidies are no longer based on the volume of production but rather on the extent of farmers' contributions to ecosystem sustainability, such as soil conservation, organic practices, and efficient water management (Rehman et al., 2016). This policy succeeds because Germany has a strong bureaucratic structure, accountable supervision systems, and integration between agricultural and environmental policies. Conversely, in Indonesia, agricultural subsidies still focus on inputs such as fertilizers and seeds without environmental indicators, making the programs more consumptive and lacking long-term impact on agricultural sustainability (Rehman et al., 2016).

Another example comes from China, which since the 1980s has implemented the Household Responsibility System (HRS) (Jiang, 2009). This system grants farmers long-term land-use rights individually, although land ownership remains with the state. The success of this policy is supported by legal certainty, strong village institutions, and a results-based incentive system. In addition, China adopted the Comprehensive Agricultural Water Use Reform Policy (CAWURP), a national irrigation reform emphasizing efficiency, water conservation, and progressive tariffs (Rolls, 2004). This policy works well because it is integrated into national planning systems and accompanied by strict control over resource allocation (Jiang, 2009). In Indonesia, agrarian reform has been implemented but has not been followed by sustainable management systems, guaranteed market access, or long-term financing for land recipients.

Meanwhile, India has succeeded in increasing productivity and food security through the Green Revolution, which involved the adoption of high-yield varieties, mechanization, and extensive input subsidy systems (Dhawan, 2017). India continues to maintain fertilizer and irrigation subsidies in many areas but is modernizing schemes through digitization and subsidy disbursement based on farmer identity. This program is successful because India has developed a strong distribution system and ensures connectivity between production, markets, and pricing policies (Dhawan, 2017). In Indonesia, input subsidies have long been a core policy but are often mistargeted, prone to diversion, and not yet based on solid digital data. For instance, subsidized fertilizer distribution still suffers from inefficient intermediaries and weak supervision at the village level (Natadireja et al., 2024).

Brazil's success in building its agricultural sector is largely attributed to EMBRAPA (Brazilian Agricultural Research Corporation), an autonomous public research institution focused on tropical agricultural innovation (Mueller & Mueller, 2016). EMBRAPA has produced superior varieties, precision agriculture technologies, and encouraged commodity diversification based on research. This success is supported by consistent government investment in research and strong partnerships among scientists, farmers, and industry players. In Indonesia, research institutions such as BRIN and Balitbangtan have not been able to play a strategic role similar to EMBRAPA (Mueller & Mueller, 2016). Low research funding allocation, internal bureaucratic obstacles, and weak linkage between research and farmer needs are serious barriers to developing local innovation (Martinelli et al., 2016).

In Southeast Asia, Thailand, Vietnam, and the Philippines have effectively implemented price protection policies for farmers. Their governments set clear and stable floor prices and actively purchase crops when prices fall, stabilizing the market (Rehman et al., 2016). They also have relatively good food storage and logistics systems capable of holding stock for extended periods (Keating & Carberry, 2010). In Indonesia, the Government Purchase Price (HPP) has long been implemented by Bulog, but its execution is often inconsistent. Bulog faces challenges in warehouse capacity, budget constraints, and slow internal bureaucracy. Moreover, food import policies are often issued during harvest seasons, damaging market prices and harming local farmers (Natadireja et al., 2024).

The fundamental difference between Indonesia and these countries lies in institutional strength and policy coordination. In countries like China and India, agrarian policies are implemented consistently and integrated from the central government to the village level (Zhang & Durry, 2024; Jiang, 2009). In Indonesia, overlapping authorities frequently occur among ministries such as the Ministry of Agriculture, ATR/BPN, and local governments. This results in inefficient policy implementation on the ground (Rufaidah et al., 2023). For example, land redistribution by ATR is not always accompanied by empowerment programs from the Ministry of Agriculture or access to financing through KUR. To truly improve farmers' welfare, an integrated cross-sectoral approach is needed. Besides institutions, access to data and technology is also a key differentiator. Countries like India and Brazil have built farmer and land data systems based on digital platforms supporting evidence-based policy. Indonesia has started digitalization through Kartu

Tani and e-RDKK, but these are not yet widespread or directly linked to subsidy, logistics, and market systems (Mueller & Mueller, 2016; Martinelli et al., 2016; Dhawan, 2017). Consequently, policy planning often misses targets and is unresponsive to real field conditions. To improve this, Indonesia must accelerate the integration of agrarian and agricultural data into a unified national digital platform.

Equally important is the strong political will and policy continuity in these countries. Agricultural policies do not shift with regime changes but are continuously refined and focused (Martinelli et al., 2016). EMBRAPA in Brazil has consistently operated for decades, as have China's HRS and India's digital subsidy systems. In Indonesia, many policies change depending on short-term political priorities, causing programs to exist only administratively without long-term impact on farmers. A cross-government commitment is needed to ensure the sustainability and continuity of agrarian policies nationwide.

Thus, although Indonesia has adopted various agrarian policies similar in substance to those of other countries, the results have not been proportional due to weak implementation, lack of inter-agency coordination, limited data and technology access, and insufficient investment in innovation and research. To strengthen policy effectiveness, Indonesia needs to build solid institutional systems, enhance local capacities, integrate technology and data in planning, and prioritize sustainability and social justice in every agrarian policy implemented. Good policies alone are not enough — appropriate and consistent execution is the key to success.

5. Policy Recommendation in Indonesian Agriculture

A policy application that has yet to be adequately implemented in Indonesia is the establishment of an autonomous and practical national agrarian research institution similar to Brazil's EMBRAPA. Although Indonesia has the National Research and Innovation Agency (BRIN), the role of agrarian research remains fragmented and is not directly integrated with the actual needs of farmers in the field (Mueller & Mueller, 2016). Indonesia requires a dedicated institution that handles tropical agricultural innovation with a cross-sectoral approach, ranging from developing superior local varieties to smart agriculture systems based on data. This institution must be granted budgetary and managerial autonomy and form close partnerships with farmers, universities, and local governments so that research outputs can be directly adopted by agricultural actors (Martinelli et al., 2016).

Another policy worthy of consideration is the development of an environmentally sustainable agriculture incentive system, such as the subsidy reform under the CAP in Germany (Rehman et al., 2016). Currently, Indonesia still focuses on input subsidies, particularly fertilizers, without considering long-term environmental impacts (Rufaidah et al., 2023). However, the subsidy system can be transformed into a reward scheme for farmers who implement environmentally friendly practices, such as crop rotation, use of organic fertilizers, or soil and water conservation. In such a model, subsidies are not merely production tools but become instruments to transform agriculture toward sustainability, aligned with Indonesia's commitment to green development and climate crisis mitigation.

Meanwhile, long-term land-use rights guaranteeing legal certainty for small farmers, like China's Household Responsibility System (HRS), have not been fully realized in Indonesia (Zhang & Drury, 2024). Many farmers still cultivate land without certificates or under short-term informal contracts, making them reluctant to invest or unable to access formal credit. The Indonesian government needs to accelerate agrarian reform that not only redistributes land but also guarantees long-term legal management status. With this approach, farmers will be more empowered, productive, and willing to make decisions beneficial for the sustainability of their land.

Indonesia has indeed implemented agricultural subsidies similar to India's model. However, the digitalization of subsidy distribution is still suboptimal. In India, the Aadhaar system integrates farmer data with bank accounts, land records, and digital identities, enabling subsidies to be distributed directly and accurately (Dhawan, 2017). Indonesia has started with e-RDKK and Kartu Tani, but implementation remains limited and not all farmers are registered. The government needs to strengthen national farmer data integration and accelerate digital transformation in the agricultural sector to prevent subsidy leakage and ensure that aid reaches farmers in need.

Another highly important recommendation is strengthening price buffer systems and crop purchase mechanisms at the local level, as implemented in Thailand and Vietnam (Laiprakobsub, 2017). In Indonesia, the Government Purchase Price (HPP) system has not been fully effective due to the limited presence of BULOG in the field and weak regional logistics networks (Rufaidah et al., 2023). Therefore, the government could establish warehouse and crop buyer networks managed by village-owned enterprises (BUMDes), cooperatives, or regional-owned enterprises (BUMD) that can absorb farmers' products at minimum prices during harvest seasons. This policy would protect farmers from market price fluctuations, increase their bargaining power, and strengthen national food reserves at the village level.

Beyond this, policies like water management based on efficiency and conservation, as implemented through China's CAWURP, are also highly relevant for Indonesia, especially in regions facing water conflicts or dependency on technical irrigation (Rolls, 2004). Indonesia can develop progressive water tariff systems and improve irrigation infrastructure using water-saving technologies such as drip and sprinkler irrigation (Jiang, 2009). Additionally, involving farmer groups in water management through local institutions (P3A) needs to be strengthened to ensure more equitable and participatory water distribution. Water efficiency is crucial not only to maintain productivity but also to anticipate the impacts of climate change that disrupt planting seasons.

CONCLUSION

This study shows that the agricultural sector remains the backbone of the economy in many agrarian countries, including Indonesia. An analysis of 10 scientific articles reveals that advanced agrarian countries such as China, India, Germany, Brazil, and Southeast Asian nations have agrarian policies that are substantively

similar to those in Indonesia, but their execution is far more effective. The success of these countries is influenced by strong institutions, policy continuity across regimes, integration of technology and research, as well as consistent outcome- and environment-based incentives.

Conversely, although Indonesia has implemented policies such as agrarian reform, agricultural subsidies, price protection, and agricultural modernization, the effectiveness of implementation remains weak. This is due to poor inter-agency coordination, low institutional quality, limited data and digitalization, and suboptimal investment in agricultural research and innovation. As a result, Indonesia has yet to significantly improve productivity, farmer welfare, or the competitiveness of its agrarian sector.

This study recommends several strategic reforms in agrarian policy, including the establishment of an autonomous national agrarian research institution similar to EMBRAPA, strengthening subsidy systems based on environmental sustainability as in Germany's CAP, granting long-term land management rights as in China's HRS, digitalizing subsidies as in India, and reforming harvest price protection as done in Thailand and Vietnam. These reforms are expected to address structural stagnation and enhance the agricultural sector's contribution to Indonesia's sustainable economic growth.

REFERENCES

Adam, L., Jin, J., Khan, A., Hussain, J., & Sophia, T. T. (2021). A Study of the Adoption of Technology in Agriculture: Evidence from the Indonesian Paddy Rice Farmer. *Cutting-edge Research in Agricultural Sciences*, *12*, 105-124.

Anderson, K., Martin, W., & Van der Mensbrugghe, D. (2006). Distortions to world trade: impacts on agricultural markets and farm incomes. Applied Economic Perspectives and Policy, 28(2), 168-194.

Badan Pusat Statistik. (2022–2024). *Statistik Indonesia*. https://www.bps.go.id

Christine, A. F., Nainggolan, Y., Wiryono, S., Hakam, L. I., & Hakam, D. F. (2024). Environmental, Social, and Governance (ESG) Impact on Corporate Financial Strategy of Energy and Utilities Companies. *Available at SSRN 4728055*.

Dhawan, V. (2017, January). Water and agriculture in India. In Background paper for the South Asia expert panel during the Global Forum for Food and Agriculture (Vol. 28, pp. 80-85). Business Association.

Ghosh, R. (2024). Data-driven governance and performances of accountability: Critical reflections from US agri-environmental policy. *Science as Culture*, *33*(1), 70-96.

Herdiansyah, H., Antriyandarti, E., Rosyada, A., Arista, N. I. D., Soesilo, T. E. B., & Ernawati, N. (2023). Evaluation of conventional and mechanization methods towards precision agriculture in Indonesia. *Sustainability*, *15*(12), 9592.

Jiang, H. (2009). Review of chinese agricultural policy. Transnational Corporations Review, 1(4), 4

Keating, B. A., & Carberry, P. S. (2010). Sustainable production, food security and supply chain implications.

Laiprakobsup, T. (2017). Inequality in rice farmers' access to a government assistance program in rural Thailand. Asian Politics & Policy, 9(3), 442-461.

Mariyono, J. (2019). Microcredit and technology adoption: Sustained pathways to improve farmers' prosperity in Indonesia. *Agricultural Finance Review*, *79*(1), 85-106.

Martinelli, L. A., Naylor, R., Vitousek, P. M., & Moutinho, P. (2010). Agriculture in Brazil: impacts, costs, and opportunities for a sustainable future. Current Opinion in Environmental Sustainability, 2(5-6), 431-438.

Mueller, B., & Mueller, C. (2016). The political economy of the Brazilian model of agricultural development: Institutions versus sectoral policy. The quarterly review of economics and finance, 62, 12-20.

Natadireja, R. R., Ningrum, S., & Pancasilawan, R. (2024). Dynamics Of Indonesian Agricultural Policy From 1945-2022. Eduvest-Journal of Universal Studies, 4(7), 5642-5664.

Rehman, A., Jingdong, L., Khatoon, R., Hussain, I., & Iqbal, M. S. (2016). Modern agricultural technology adoption its importance, role and usage for the improvement of agriculture. Life Science Journal, 14(2), 70-74.

Ricardo, D. (1895). The first six chapters of the principles of political economy and taxation of David Ricardo, 1817. Macmillan and Company.

Rizzo, G., Agus, F., Batubara, S. F., Andrade, J. F., Edreira, J. I. R., Purwantomo, D. K., ... & Grassini, P. (2023). A farmer data-driven approach for prioritization of agricultural research and development: A case study for intensive crop systems in the humid tropics. *Field Crops Research*, *297*, 108942.

Rolls, D. (2004). The emergence of the'Jiang Zemin Era': legitimacy and the development of the political theory of'Neo-Conservatism'--1989-1995 (Doctoral dissertation, University of Southern Queensland).

Rufaidah, F., Karyani, T., Wulandari, E., & Setiawan, I. (2023). A review of the implementation of financial technology (Fintech) in the Indonesian Agricultural Sector: Issues, access, and challenges. International Journal of Financial Studies, 11(3), 108.

Schultz, D. (1964). Ophthalmic Tolerances—Suggested AOA Policy. Clinical and Experimental Optometry, 47(7), 186-189.

Shestakovska, T., Durglishvili, N., & Kushnir, S. (2018, October). Competitiveness of the agrarian business in the context of maintenance of leadership positions on the market. In *2nd International Conference on Social, Economic and Academic Leadership (ICSEAL 2018)* (pp. 177-184). Atlantis Press.

Tugwell, P., & Tovey, D. (2021). PRISMA 2020. Journal of Clinical Epidemiology, 134, A5-A6.

World Bank. (2022–2024). *World development indicators*. https://data.worldbank.org

Zhang, J., & Drury, M. (2024). Sustainable agriculture in the EU and China: A comparative critical policy analysis approach. Environmental Science & Policy, 157, 103789.