



National agricultural land: A strategy for empowering agricultural land and local Micro, Small, and Medium Enterprises to accelerate national economic and political stability

Deni Nur Zackia Putri¹, Eril Paizi², Salsabilah Dwi Annisa^{2,*}

¹ Department of Law, Faculty of Law and Social Sciences, Ganesha University of Education, Singaraja, Bali 81116, Indonesia;

² Department of Chemistry Education, Faculty of Mathematics and Natural Sciences, Ganesha University of Education, Singaraja, Bali 81116, Indonesia.

*Correspondence: deninurzackiaputri@gmail.com

Received Date: March 2, 2026

Revised Date: June 11, 2026

Accepted Date: July 24, 2026

ABSTRACT

Background: National economic and political stability is strongly influenced by the level of economic self-reliance, particularly in the agricultural sector and micro, small, and medium enterprises (MSMEs) as the backbone of the people's economy. Low human resource quality, dependence on food imports, and large-scale agricultural policies that are insufficiently sustainable have weakened small farmers and increased socio-economic vulnerability, thereby necessitating more inclusive local economic empowerment strategies. **Methods:** This study employs a conceptual review and policy analysis approach through literature review, national policy documents, and secondary data from the agricultural and MSME sectors, using a political economy of development perspective. **Findings:** Based on comparative analysis of previous agricultural empowerment programs, policy documents, and stakeholder consultations, the Nagriland Program is projected to potentially increase land productivity by up to 40%, farmers' income by up to 50%, reduce food imports by up to 30%, and increase MSME turnover by up to 70% within five years. The program also promotes the expansion of sustainable agricultural practices to 80% of cultivated land through technology adoption, environmental stewardship, and integrated land management strategies. These findings reinforce political economy theory, which positions economic self-reliance as a prerequisite for political stability. **Conclusion:** The Nagriland Program represents an effective policy model for empowering agriculture and MSMEs by bridging the gap between macro-level policies and grassroots realities through an integrated approach based on technology, equitable partnerships, and environmental sustainability. **Novelty/Originality of this article:** The novelty of this article lies in the formulation of a spatially, digitally, and institutionally integrated empowerment model for smallholder agricultural land and MSMEs without land expansion, offering an inclusive, environmentally friendly, and community-oriented alternative for national food policy.

KEYWORDS: economic self-reliance; farmer empowerment; food security; Nagriland; MSMEs.

1. Introduction

Etymologically, the term economics originates from the Greek words *oikos* and *nomos*, meaning household management. Over time, however, the concept has expanded to encompass the regulation and utilization of resources on a broader scale to meet human

Cite This Article:

Putri, D. N. Z., Paizi, E., & Annisa, S. D. (2026). National Agricultural Land: A strategy for empowering agricultural land and local Micro, Small, and Medium Enterprises to accelerate national economic and political stability. *Journal of National Paradigm-Based Resilience Strategy*, 3(2), 166-184. <https://doi.org/10.61511/napbres.v3i2.2026.3605>

Copyright: © 2026 by the authors. This article is distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).



needs and achieve sustainable levels of welfare (Masri et al., 2025). Paul A. Samuelson defines economics as a process in which individuals and societies make choices among available alternatives to utilize limited resources in order to produce, distribute, and consume goods and services for both present and future needs. This understanding emphasizes that economics is not merely concerned with wealth accumulation but also with the effective and equitable management of resources to sustain society in the long term.

On the other hand, Aristotle and Talcott Parsons argue that politics is a collective human activity aimed at achieving progress and the common good through actions and decisions that govern public life (Hidayaturrahman, 2021). Politics is closely related to power structures and decision-making processes that have widespread societal implications. The interaction between these two disciplines gives rise to the concept of political economy, an approach that views economic and political dimensions as inseparable and mutually influential. This idea was first systematically introduced by Antoine de Montchrestien, a French thinker in the sixteenth century. Over time, perspectives on the interconnection between these fields have continued to evolve, notably through Lindblom and Dahl in 1953, who described economic and political dynamics as two sides of the same coin. In the 1970s, the term political economy regained prominence and became a foundational framework for analyzing public policies affecting national stability (Yunus & Ardiansyah, 2024). This close relationship demonstrates that forward-looking and well-designed political policies can serve as a key driver of economic self-reliance, while economic dependence can constrain political autonomy, national sovereignty, and the government's capacity to protect national interests.

In Indonesia, economic self-reliance is one of the primary pillars in achieving national sovereignty and prosperity. In reality, however, Indonesia continues to face serious challenges related to low levels of economic self-reliance. Empirical data and research indicate that this condition is rooted in multiple interrelated factors. A study by Hidayat & Tandilangi (2024) provides an in-depth analysis of community economic self-reliance, while Rezi & Ali (2024) highlight supporting and inhibiting factors of village economic independence from the perspective of natural resource management. In addition to internal factors such as human resource quality and entrepreneurial skills, global dynamics including commodity price fluctuations and import dependence further exacerbate these challenges. As a result, economic development policies tend to be reactive rather than strategically oriented toward long-term objectives. These studies suggest that substantial efforts are still required to achieve an ideal level of economic self-reliance. This condition is also reflected in various reports issued by Statistics Indonesia (BPS), which periodically present macroeconomic data indicating a high level of dependence on certain sectors.

Low economic independence does not only affect financial aspects but also has complex consequences for national political stability. Ruchiyani et al. (2022) reveal that economic vulnerability can become a major trigger of political instability, as communities experiencing economic pressure tend to lose trust in the government. Such conditions may generate social tensions, horizontal conflicts, and recurring political unrest. At this point, a vicious cycle emerges in which a weakened economy exacerbates political conditions, while political instability in turn hampers economic growth, making it increasingly difficult for Indonesia to escape structural dependency that constrains national progress. Recognizing the importance of economic independence, particularly in the field of food security, the government has launched various strategic programs, one of which is the strengthening of the agricultural sector through the food estate program (Quirinno et al., 2024; Chaireni et al., 2020). This program aims to create large-scale food production centers expected to boost national food availability. However, the implementation of food estates has revealed numerous problems. Rasman et al. (2023) note that the program has failed to optimize smallholder farmland and, in some regions, has instead caused harm to local communities and damaged ecosystems.

The food estate case in Kalimantan represents the most striking example. The program is considered contradictory to government objectives because land clearing activities have caused ecological damage in areas that function as one of the world's lungs. The loss of

biodiversity, the decline of forest species, and the weakening of ecological functions have led communities dependent on agriculture, forest products, and hunting to experience food insecurity (Audia et al., 2024). Similar impacts have occurred in Merauke, South Papua, where food estate projects have resulted in massive deforestation, violations of customary land rights, minimal community participation in planning, and the loss of Social Wisdom Forests (*Hutan Sosial Kearifan/HSK*), which are crucial to local identity and economic livelihoods (Veronika et al., 2025). These conditions not only threaten the environment but also increase the risk of social crises, economic dependency, and horizontal conflict. Large-scale land clearing that leads to the corporatization of agriculture further weakens the position of small farmers within the food production chain. When large corporations take control of most cultivated land, local farmers lose the space to develop independent and sustainable farming practices. This situation poses long-term risks to national food security, as food production structures become less people-centered and increasingly driven by investor interests. In the event of production failures, distribution disruptions, or market uncertainty, the impacts would be far more severe and difficult to recover from (Ramadhan et al., 2024).

Country of Origin	2017	2018	2019	2020	2021	2022	2023	2024
Netweight : Ton								
India	32,209.7	337,999.0	7,973.3	10,594.4	215,386.5	178,533.6	69,715.7	246,587.9
Thailand	108,944.8	795,600.1	53,278.0	88,593.1	69,360.0	80,182.5	1,381,921.2	1,364,232.8
Vietnam	16,599.9	767,180.9	33,133.1	88,716.4	65,692.9	81,828.0	1,147,705.3	1,248,245.0
Pakistan	87,500.0	310,990.0	182,564.9	110,516.5	52,479.0	84,407.0	309,309.7	803,844.7
Myanmar	57,475.0	41,820.0	166,700.6	57,841.4	3,790.0	3,830.0	141,204.0	831,379.0
Japan	72.1	0.2	90.0	0.3	230.3	56.1	61.5	100.7
China	2,419.0	227.7	24.3	23.8	42.6	6.0	7.0	19.3
Others	54.3	6.5	744.6	0.3	760.1	364.1	12,933.3	25,011.2
Total	305,274.8	2,253,824.4	444,508.8	356,286.2	407,741.4	429,207.3	3,062,857.6	4,519,420.6
Value: 000 US\$								
India	13,397.1	139,158.5	3,018.5	4,849.3	86,276.3	77,739.7	35,505.0	124,541.5
Thailand	60,286.9	386,533.7	38,561.5	76,301.6	41,322.6	44,092.0	804,815.8	862,780.8
Vietnam	6,761.3	360,745.6	16,609.5	51,107.5	32,474.5	42,464.3	668,871.3	752,859.6
Pakistan	34,793.1	134,416.0	67,819.9	41,519.8	20,322.1	35,843.5	182,322.5	472,410.5
Myanmar	19,546.1	15,161.4	56,287.2	21,147.8	1,609.4	1,478.2	88,822.9	480,766.2
Japan	235.0	1.7	243.2	1.2	578.9	150.3	155.4	256.5
China	8,118.7	1,094.1	482.5	479.3	850.5	120.0	142.5	385.7
Others	503.4	17.3	1,231.7	2.4	367.5	154.1	8,388.5	16,254.5
Total	143,641.6	1,037,128.3	184,254.0	195,408.9	183,801.8	202,042.2	1,789,023.9	2,710,255.3

Fig. 1. Rice import data by main country of origin (2017–2024)
(BPS, 2025)

Amid these challenges, the government has also developed the Sustainable Food Yard Program (*Pekarangan Pangan Lestari/P2L*) as a strategy to strengthen national food security through household-level empowerment. This program encourages communities to cultivate various local food sources such as vegetables, fruits, family medicinal plants, and short-cycle crops in home gardens, with the aim of reducing daily household expenditures, increasing food diversification, and improving nutritional intake. This approach is considered more bottom-up in nature, as it optimizes the productive use of small spaces, reduces dependence on large-scale agricultural land, and is more environmentally friendly due to the use of simple and sustainable cultivation techniques. In addition, *P2L* serves as a platform for nutrition education and food self-reliance at the community level, thereby encouraging changes in consumption behavior and strengthening household resilience to food price fluctuations. Nevertheless, the implementation of this program still faces limitations, particularly because *P2L* is accessible only to selected beneficiary households determined through government selection mechanisms. Consequently, not all communities have equal opportunities to independently initiate household-scale farming activities with support in the form of facilities, seeds, and technical assistance. This condition has the potential to create access disparities across regions and social groups, while also indicating

that national food policies continue to face challenges in reaching all segments of society in an equitable and inclusive manner as part of efforts to improve community welfare (Senjawati & Azizah, 2024).

These conditions reveal a gap between ambitious macro-level policies and realities at the grassroots level, where small farmers often have not become the primary subjects in program planning and implementation. Widowati (2023) emphasizes that the utilization of food resources largely managed by communities themselves is a key factor in enhancing food security. This gap suggests that although solutions have been proposed, effective implementation that genuinely focuses on empowering farmers and their own land has yet to be realized, particularly when technical support and field-level assistance remain limited. Therefore, it is essential to explore new, more integrated strategies centered on empowering smallholder agricultural land as a key pathway to strengthening economic independence and national food security in a sustainable manner. Based on the issues outlined above, the author proposes an implementative innovation entitled "National Agricultural Land: A strategy for empowering agricultural land and local Micro, Small, and Medium Enterprises to accelerate national economic and political stability." Therefore, this study seeks to answer the following research question: "How can an integrated agricultural land and MSME empowerment model based on digital technology, sustainability principles, and multi-stakeholder collaboration contribute to strengthening Indonesia's economic self-reliance and political stability?". Accordingly, this study aims to formulate the Nagriland Program as an integrated policy framework to optimize existing agricultural land, strengthen local MSMEs, and support sustainable national resilience.

1.1 Political economy and national resilience

Political economy emphasizes the interdependence between economic systems and political structures in shaping national development outcomes. According to Bulfone (2023), contemporary political economy increasingly highlights the role of state intervention, industrial policy, and institutional coordination in fostering economic resilience and national competitiveness. Economic policies are therefore not merely instruments of growth but also mechanisms for strengthening national stability and sovereignty. This perspective is reinforced by Baker et al. (2023), who argue that political economy frameworks are essential for understanding how structural factors, governance arrangements, and power relations influence the effectiveness of development policies. In particular, economic dependence and unequal access to productive resources may weaken a country's capacity to achieve sustainable development objectives. The concept of resilience has also become increasingly important within political economy discourse. Humprecht et al. (2023) define resilience as the ability of institutions and societies to withstand, adapt to, and recover from various disruptions. Similarly, Vilar-Lluch et al. (2025) emphasize that resilience should not only be understood as a response to crises but also as a long-term capacity-building process supported by effective governance and resource management. Consequently, strengthening economic self-reliance through productive sectors such as agriculture and MSMEs can contribute significantly to enhancing national resilience and political stability.

1.2 Food security and agricultural empowerment

Food security remains one of the fundamental pillars of sustainable national development. Manikas et al. (2023) identify food availability, accessibility, utilization, and stability as the primary dimensions used to assess food security performance. These dimensions demonstrate that food security extends beyond food production and encompasses broader issues related to distribution systems, affordability, and sustainability. Recent studies have highlighted the growing importance of environmentally sustainable agricultural practices in ensuring long-term food security. Wani et al. (2024) argue that sustainable resource management and environmentally responsible production

systems are essential for balancing agricultural productivity with ecological preservation. Agricultural development strategies that neglect environmental sustainability may generate short-term gains while creating long-term vulnerabilities. Technological innovation has also emerged as a crucial driver of agricultural transformation. Zhou et al. (2024) demonstrate that platform-based collaboration and integrated logistics systems can improve market efficiency and strengthen connections between producers and consumers. Likewise, Wen et al. (2025) find that digital technologies contribute significantly to agricultural productivity by enhancing resource efficiency, improving decision-making processes, and facilitating market access. These findings suggest that agricultural empowerment should involve not only land utilization but also technological integration, institutional strengthening, and sustainable resource management.

1.3 MSMEs and rural economic development

Micro, Small, and Medium Enterprises (MSMEs) play a strategic role in promoting rural economic growth, employment generation, and value-added production. Their contribution becomes particularly important in agricultural regions where local processing activities can increase the economic value of agricultural commodities and reduce dependence on raw commodity sales. Financial inclusion is one of the main factors influencing MSME performance. Fomum and Opperman (2023) demonstrate that improved access to financial services positively affects MSME productivity, business sustainability, and competitiveness. Similarly, Susanti et al. (2023) find that innovation capability, entrepreneurial skills, and market access significantly influence MSME performance and competitive advantage. Digitalization further enhances MSME development by expanding market opportunities beyond local boundaries. Qin et al. (2023) show that rural e-commerce contributes substantially to regional economic growth by facilitating market access, increasing business efficiency, and stimulating local entrepreneurship. In addition, Cai et al. (2024) report that FinTech adoption supports rural economic development by improving financial accessibility and reducing transaction barriers. These findings indicate that MSME empowerment strategies should combine capacity building, financial inclusion, technological adoption, and market integration to maximize economic benefits at the local level.

1.4 Existing programs: Food estate and P2L

Indonesia has implemented several programs aimed at strengthening food security and agricultural development, including the Food Estate Program and the Sustainable Food Yard Program (*Pekarangan Pangan Lestari/P2L*). The Food Estate Program was introduced as a large-scale agricultural development strategy intended to increase national food production. Fahmid et al. (2022) argue that the program has significant potential to enhance agricultural output through the utilization of underdeveloped land resources. However, several studies have identified challenges related to implementation, environmental sustainability, and community participation. Tobing (2024) highlights various legal and policy issues surrounding Food Estate implementation, including concerns regarding land governance, ecological impacts, and the limited involvement of local communities in decision-making processes. In contrast, the *P2L* program adopts a community-based approach by encouraging households to utilize home gardens for food production. Rangga et al. (2022) report that *P2L* contributes positively to household food availability, nutritional diversity, and community participation. Similar findings are presented by Mariyani et al. (2024), who emphasize the program's effectiveness in strengthening household-level food security through community empowerment initiatives. Nevertheless, the scale of *P2L* remains relatively limited because it focuses primarily on household consumption and selected beneficiary groups rather than broader agricultural productivity and economic integration. These observations suggest that while both Food Estate and *P2L*

contribute to food security objectives, each program faces limitations regarding sustainability, inclusiveness, technological integration, and value-chain development.

1.5 Research gap and novelty of Nagriland

Previous studies have extensively discussed food security, agricultural development, MSME empowerment, digital agriculture, and rural economic resilience. However, existing approaches tend to address these dimensions separately rather than within an integrated framework. The Food Estate Program primarily focuses on large-scale agricultural production, while *P2L* emphasizes household-level food security. Similarly, studies on agricultural digitalization mainly concentrate on productivity enhancement, whereas MSME research focuses on business competitiveness and financial inclusion. Limited attention has been given to developing a comprehensive model that simultaneously integrates agricultural land optimization, digital technology adoption, MSME strengthening, environmental sustainability, and multi-stakeholder governance. To address this gap, this study proposes the Nagriland (National Agricultural Land) Program as an integrated policy framework that combines GIS-based land mapping, Internet of Things (IoT)-assisted agricultural management, sustainable farming practices, MSME downstream processing, digital marketing systems, and collaborative governance mechanisms. Unlike Food Estate, Nagriland does not require agricultural land expansion, and unlike *P2L*, it extends beyond household-level food production by incorporating market-oriented agricultural development and MSME empowerment. Therefore, the novelty of Nagriland lies in its spatially, digitally, institutionally, and economically integrated approach that seeks to simultaneously strengthen food security, rural economic resilience, environmental sustainability, and national political stability through the optimization of existing agricultural resources.

Table 1. Comparative analysis of food estate, *P2L*, and Nagriland Programs

No.	Aspect	Food Estate	<i>P2L</i>	Nagriland
1	Main Objective	Increase national food production	Household food security	Integrated food security and economic resilience.
2	Scale	Large-scale agricultural land	Household gardens	Existing agricultural land and rural regions.
3	Technology Integration	Limited	Minimal	GIS, IoT, Digital Platform
4	MSME Integration	Not primary focus	Not primary focus	Core component
5	Environmental Sustainability	Frequently debated	Moderate	Sustainability agriculture framework
6	Governance Model	Government-centered	Community-centered	Multi-stakeholder collaborative governance
7	Market Orientation	Production-oriented	Consumption-oriented	Production and market-oriented
8	National Resilience Contribution	Indirect	Indirect	Explicitly integrated

2. Methods

This study employs an empirical qualitative approach with a descriptive participatory design, enriched by secondary quantitative data analysis. This approach was selected because the research not only formulates the concept of the Nagriland Program but also explores empirical realities through direct interaction with policy actors and key agricultural stakeholders. Ontologically, the study conceptualizes agricultural development and food security as social processes shaped by the interplay between state policies, regional institutions, and community-based agricultural practices. Epistemologically, knowledge is constructed through a synthesis of theoretical review, statistical data, and

field-based experiences. The study was conducted in Bali Province in May 2025, with research sites including the Provincial Forestry and Environmental Agency of Bali, the Provincial Agency for Agriculture and Food Security of Bali, and local farmers in Buleleng Regency, selected purposively due to their relevance to issues of environmental sustainability, food security, and the empowerment of smallholder agricultural land.

Table 2. Data sources the Nagriland program

No.	Sources	Data
1	Interviews	Stakeholder perceptions
2	Socialization Session	Feedback on Nagriland.
3	Observation	Existing farming practices
4	Secondary Data	BPS, Ministry Reports

Data were collected through semi-structured interviews, the socialization of the Nagriland Program as a participatory method to obtain stakeholder feedback, limited observation, and literature review and document analysis of policy documents and statistical data from Statistics Indonesia (BPS). Data analysis followed the stages of data condensation, data display, and conclusion drawing and verification, supported by source and methodological triangulation to ensure the validity of the findings. The results are presented in the form of descriptive-analytical narratives, tables of actors and roles, graphs of success indicators, and the Nagriland Program analytical framework, illustrating the interconnections between the empowerment of agricultural land, the strengthening of local MSMEs, and sustainable national economic and political stability. Purposive sampling was employed because the selected institutions possess direct authority and experience related to agricultural land management, environmental sustainability, and food security policy implementation. Interview transcripts and stakeholder feedback were analyzed using thematic analysis. Emerging themes were categorized into four major dimensions: land optimization, technology adoption, institutional collaboration, and MSME strengthening.

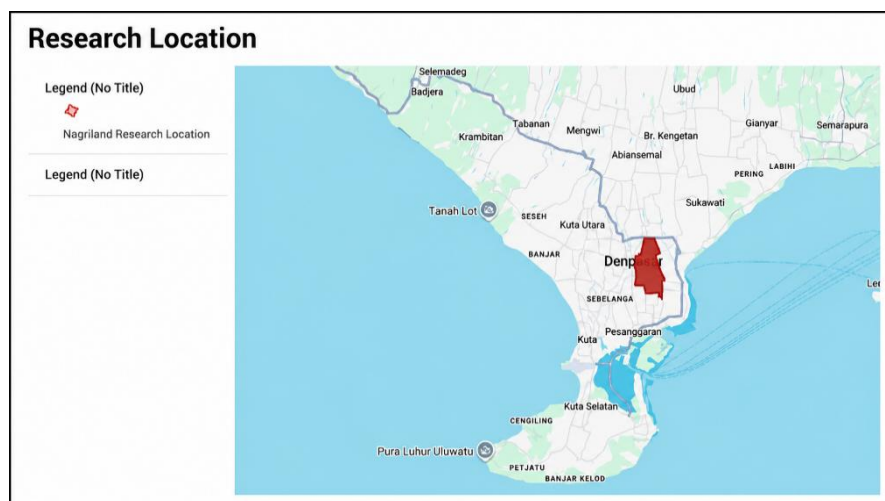


Fig. 2. Research location

3. Results and Discussion

The Nagriland Program (National Agricultural Land) is a national initiative designed by the author as a comprehensive approach to empowering smallholder agricultural land through the application of modern agricultural technologies, the strengthening of farmer institutions, equitable partnerships, and the implementation of environmental sustainability principles without opening new land or degrading forest areas with critical ecological functions. The program emphasizes the optimization of existing agricultural land by utilizing technologies such as smart farming, the Internet of Things (IoT) for soil fertility monitoring, sensor-based water-efficient irrigation systems, precision fertilization tailored

to crop needs, and the digitalization of agricultural management to ensure efficient, measurable, and accountable production processes.

In addition, the program focuses on building an integrated supply chain ecosystem that connects farmers, MSMEs, cooperatives, financial institutions, and both domestic and international markets, thereby ensuring transparent, stable, and farmer-beneficial production and distribution governance. Nagriland is further reinforced by a local MSME development strategy that not only processes agricultural outputs into value-added products but also enhances product quality standards through *halal* certification, Indonesian National Standards (SNI), and BPOM compliance, strengthens digital marketing capabilities through e-commerce training, and expands access to export markets through partnerships with government agencies, industry actors, and international networks. By enhancing MSME capacity in production, innovation, branding, marketing, and global connectivity, the program aims to promote community-based economic growth, strengthen rural economic resilience, expand local employment opportunities, and accelerate the realization of a stable and sustainable national economy.

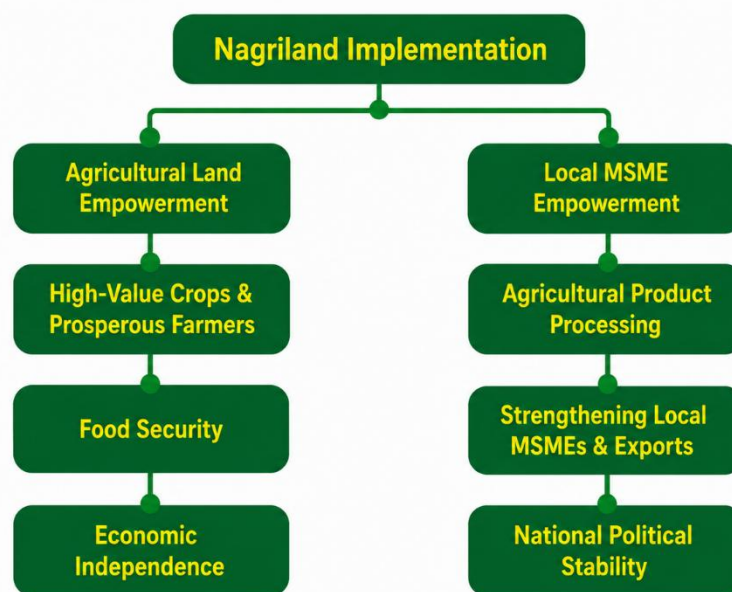


Fig. 3 Conceptual framework of the Nagriland Program

The strategy for empowering agricultural land within the design of the Nagriland Program focuses on four integrated core pillars. First, land inventory and zoning are conducted through data collection on land area, soil characteristics, water availability, and the identification of leading commodities using Geographic Information System (GIS)-based mapping to determine well-targeted priority zones. This approach serves as the foundation for planning program interventions in accordance with the specific potential and needs of each region. In addition, the mapping results are utilized to minimize policy overlap and improve the efficiency of agricultural development resource allocation. The spatial data also support evidence-based decision-making in the medium and long term. Through integrated mapping, potential land-use conflicts can be mitigated from the planning stage onward. This activity involves the Ministry of Agriculture, Statistics Indonesia (BPS), local governments, and the Geospatial Information Agency (BIG) to ensure data accuracy and field validation. Second, the integration of agricultural technology is realized through the application of the Internet of Things (IoT) for real-time land condition monitoring, the use of microbe-based organic fertilizers, and the development of the "Nagriland App" as an integrated platform providing price information, agricultural e-commerce services, harvest distribution systems, and digital education for farmers, in collaboration with the National Research and Innovation Agency (BRIN), the Directorate General of Food Crops, and the national Nagriland IT team. Third, the strengthening of equitable partnership models among

farmers, village-owned enterprises (*Badan Usaha Milik Desa/BUMDes*), cooperatives, and MSMEs is developed through transparent pricing schemes, guaranteed crop absorption, and business assistance facilitated by the Ministry of Cooperatives and MSMEs, regional agricultural offices, and banks distributing People's Business Credit (KUR). Fourth, environmental sustainability is promoted through agroforestry practices, soil and water conservation, and critical land rehabilitation to maintain ecological functions and long-term productivity under the coordination of the Ministry of Environment and Forestry (KLHK), with support from non-governmental organizations.

In strengthening MSMEs, the Nagriland Program positions this sector as the central processing hub for smallholder agricultural outputs to generate value-added products, expand domestic and international markets, and create sustainable employment opportunities for rural communities. The first strategy is human resource development and certification, encompassing entrepreneurship training, capacity building in modern food processing, digital marketing through e-commerce and social media, and facilitated acceleration of licensing and certification such as *halal* certification, BPOM approval, and Indonesian National Standards (*Standar Nasional Indonesia/SNI*), supported by the Ministry of Cooperatives and MSMEs, Vocational Training Centers (*Balai Latihan Kerja/BLK*), Institute for the Assessment of Food, Drugs, and Cosmetics of the Indonesian Ulema Council (*LPPOM MUI/Lembaga Pengkajian Pangan, Obat-obatan, dan Kosmetika Majelis Ulama Indonesia*), Indonesian Food and Drug Authority (*Badan Pengawas Obat dan Makanan/BPOM*), and the National Standardization Agency (*Badan Standardisasi Nasional/BSN*) to ensure MSMEs meet competitive quality standards. The second strategy involves expanding access to capital and tax incentives through low-interest KUR financing, financial literacy assistance, support from the Directorate General of Taxes in simplifying tax administration, and local government policies providing tax and levy relief for newly established agriculture-based MSMEs. The third strategy is the development of industrial clusters for leading commodities such as coffee, rice, and horticulture by encouraging cross-sector collaboration involving the Industry and Trade Offices, farmer associations, *BUMDes*, research institutions, and universities to create efficient, innovative, and market-oriented value chains. The fourth strategy focuses on strengthening promotion and accelerating exports through facilitation of food product exhibitions, cross-border business matching, export assistance based on international standards, and the expansion of global trade partner networks conducted by the Ministry of Trade, the Ministry of Foreign Affairs, and Indonesian trade representatives abroad. Through the integration and synergy of these strategies, the Nagriland Program is expected to strengthen local economic self-reliance, enhance the competitiveness of agricultural MSMEs, and support national food security and stability in a comprehensive and sustainable manner.

In implementing the Nagriland Program, integrated coordination among multiple stakeholders and comprehensive, systematic, and sustainable measures are required to ensure the effectiveness of agricultural land empowerment and the strengthening of local MSMEs as key pillars of national economic development. Program implementation demands strong cross-sector collaboration, harmonized inter-agency policy integration, and robust support in terms of technology, financing, and regulatory frameworks that are responsive to social, economic, and environmental dynamics in order to create an inclusive, efficient, competitive, and resilient modern agricultural ecosystem. These efforts include aligning development planning between central and local governments, optimizing the use of digital agricultural data and integrated information systems, and employing evidence-based research as the foundation for well-targeted policymaking; enhancing human resource capacity through education, technical training, and continuous assistance; and strengthening monitoring, evaluation, and accountability mechanisms to ensure consistency and effectiveness of program implementation across regions. In this implementation context, central and local governments act as regulators, facilitators, and catalysts through the provision of sustainability-oriented policies, incentives, infrastructure, and funding; financial institutions support the program by offering inclusive, equitable, and farmer- and MSME-friendly financing schemes; business actors and MSMEs

function as the driving force of supply chains, downstream processing, product innovation, and economic value creation; while communities and farmers serve as the primary actors in land management, technology adoption, productivity enhancement, environmental conservation, and the strengthening of food security, economic independence, and sustainable national stability.

To achieve the objectives of the program, it is necessary to establish clear target indicators of program success. The projected indicators presented in this study do not represent empirically tested outcomes. Rather, they were developed through comparative benchmarking of agricultural empowerment initiatives, MSME development programs, national policy targets, and stakeholder consultations conducted during the study. Therefore, the indicators should be interpreted as policy-oriented projections intended to guide future implementation and evaluation.

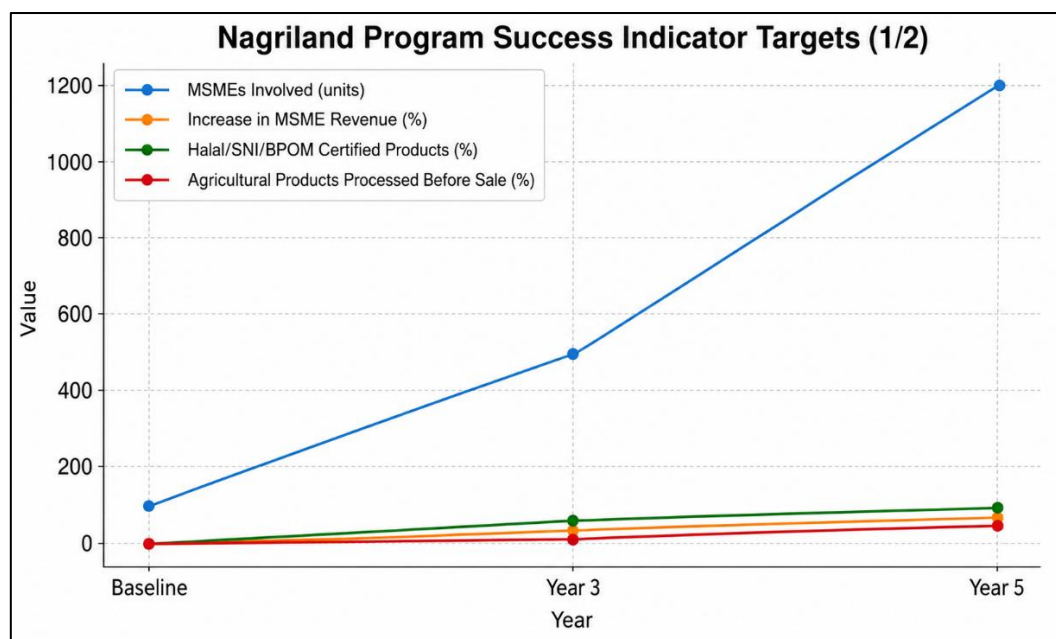


Fig. 4 Graph of target success indicators of the Nagriland Program in agricultural land empowerment

3.1 Target indicators of success for the Nagriland Program in agricultural land empowerment

Land productivity is expected to increase significantly from a baseline of 100% to 125% by Year 3, and further to 140% by Year 5. This increase reflects consistent and positive improvements in land capacity to produce optimal yields per hectare. The improvement is driven by the adoption of more efficient modern planting methods, optimized crop rotation patterns to maintain soil fertility, balanced fertilization based on land-specific needs, and the utilization of agricultural technologies such as soil sensors, precision irrigation systems, and the development of adaptive superior crop varieties. Beyond increasing production volume, higher productivity also contributes to improved crop quality and greater cost efficiency in production. Overall, this achievement serves as a key indicator of the program's success in reducing land-use inefficiencies, enhancing production stability, strengthening the resilience of the agricultural sector in the medium and long term, and sustainably improving farmer welfare at the national level.

Farmer income is projected to increase steadily from a baseline of 100% to 130% by Year 3, and further to 150% by Year 5. This growth reflects a significant and sustainable improvement in farmer welfare, aligned with increased production volume and quality, price stability at the farm level, and broader, more efficient market access. Continuous business assistance, strengthened farmer institutions, and reduced production costs through input efficiency and technological adoption further contribute to higher profit margins. The downstream impacts include increased household purchasing power, greater

reinvestment capacity in agricultural enterprises, and improved socio-economic conditions for farming families. Overall, this positive trend demonstrates that the program not only enhances production but also promotes equitable economic benefits and long-term improvements in farmers' quality of life.

Food imports are projected to decline steadily from a baseline of 100% to 85% by Year 3, and further to 70% by Year 5. This downward trend signals a strengthened national capacity to meet domestic food demand through reliable and sustainable local production systems. As land productivity improves and domestic supply becomes more competitive in terms of price and quality, dependence on imported food commodities is gradually reduced in a controlled and measurable manner. The availability of domestically produced import-substitution commodities plays a strategic role in reducing vulnerability to external shocks, including global price volatility, supply chain disruptions, and geopolitical uncertainties. Strengthened national distribution systems, improved logistics, and enhanced food reserve management further ensure that increased domestic production translates into effective availability across regions. Overall, this indicator highlights the program's contribution to reinforcing national food security, stabilizing strategic food stocks, improving the balance of trade, and minimizing economic risks associated with excessive reliance on international food markets.

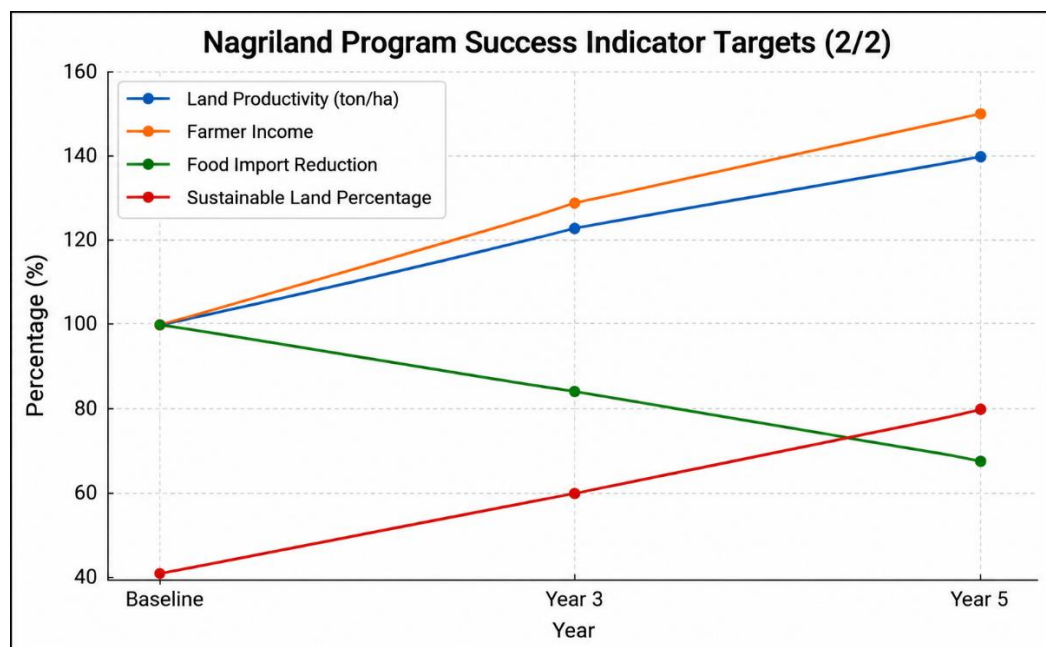


Fig. 5 Graph of target success indicators of the Nagriland Program in local MSME empowerment

The proportion of agricultural land managed under sustainable practices is projected to increase from 40% at baseline to 60% by Year 3, and further to 80% by Year 5. This substantial increase reflects a transformative shift in farming practices toward environmentally responsible and resource-efficient land management. Farmers are increasingly adopting agroforestry systems that integrate food crops with protective tree species, conservative soil management techniques that reduce erosion, and balanced input use that minimizes chemical dependency while maintaining productivity. These advancements are reinforced through continuous technical assistance, farmer capacity-building programs, and the application of data-driven agricultural technologies. The use of organic fertilizers, water conservation methods, and soil fertility management based on real-time data helps maintain long-term land productivity while preserving ecological balance. In the long term, expanded adoption of sustainable land management practices reduces land degradation, mitigates climate-related risks, and ensures that agricultural land continues to perform both its economic and ecological functions. This indicator underscores the program's commitment to sustainability as a foundational principle, ensuring that

productivity gains do not come at the expense of environmental integrity or future generations.

3.2 Target indicators of success for the Nagriland program in local MSME empowerment

3.2.1 MSMEs involved in Nagriland

By Year 3, 500 MSMEs are targeted to be actively involved in agricultural processing and marketing value chains, including processed food, herbal products, crafts, and other innovative value-added products based on local commodities. This number is expected to increase to 1,200 MSMEs by Year 5 as part of a strategy to expand business partnerships, scale up production, and strengthen an inclusive local economic ecosystem. Increased MSME participation reflects enhanced business capacity and product competitiveness, while also positioning MSMEs as key drivers of rural economic development. Stronger linkages with farmers increase sustainable raw material demand, create new employment opportunities, and improve upstream–downstream market integration, thereby supporting sustainable regional economic growth and equitable welfare distribution.

3.2.2 Increase in MSME turnover

The turnover of participating MSMEs is projected to increase by 35% by Year 3, in line with higher production volumes, improved product quality, and expanded access to local and regional markets. By Year 5, turnover growth is expected to reach 70%, indicating stronger and more sustainable competitiveness, particularly in product innovation, production efficiency, and digital marketing utilization. This growth reflects the success of integrated business development, operational efficiency improvements, and the ability of MSMEs to capitalize on technology-based opportunities, partnership networks, and increasingly robust distribution systems. Overall, these outcomes strengthen MSME business foundations oriented not only toward short-term growth but also long-term resilience.

3.2.3 Halal/SNI/BPOM-certified products

By Year 3, 60% of MSME products are targeted to obtain *halal* certification, *SNI*, or *BPOM* approval as compliance with quality and food safety standards. This proportion is expected to increase to 90% by Year 5, indicating widespread compliance with national safety, quality, and regulatory standards. Higher certification rates are essential for entry into modern retail markets, organized distribution channels, and export markets, while also strengthening consumer trust in local products. Certification enhances MSME product reputation and competitiveness and expands opportunities for collaboration with major retailers, digital marketplaces, and international distribution partners.

3.2.4 Agricultural products processed prior to sale

By Year 3, 50% of agricultural products are targeted to undergo processing before sale, such as drying, packaging, fermentation, or simple food processing, as part of a value-added strategy. This figure is expected to increase to 75% by Year 5, reflecting a stronger value-added orientation within the agricultural supply chain. Product processing increases profitability for farmers and MSMEs, expands market opportunities, extends shelf life, reduces dependence on intermediaries, and enables more competitive product diversification across local, regional, and national markets. Standardized and modern processing practices also improve product quality, distribution efficiency, and bargaining power within the supply chain.

3.3 The SMART approach in Nagriland program

In the development of the Nagriland program, the implementation stages are structured using the SMART approach (Specific, Measurable, Achievable, Realistic, and Time-bound) to ensure that every innovation is carried out systematically, is measurable, and can be implemented in accordance with regional capacities and on-the-ground conditions. This approach serves as a strategic framework to guide planning, implementation, monitoring, and evaluation processes more effectively. By applying the SMART principles, each target is not only clearly defined and focused, but also measurable in terms of progress, realistically achievable based on available resources, and bound by a concrete timeline, thereby facilitating effective control and assessment of program outcomes. The detailed application of the SMART approach in this program is outlined as follows.

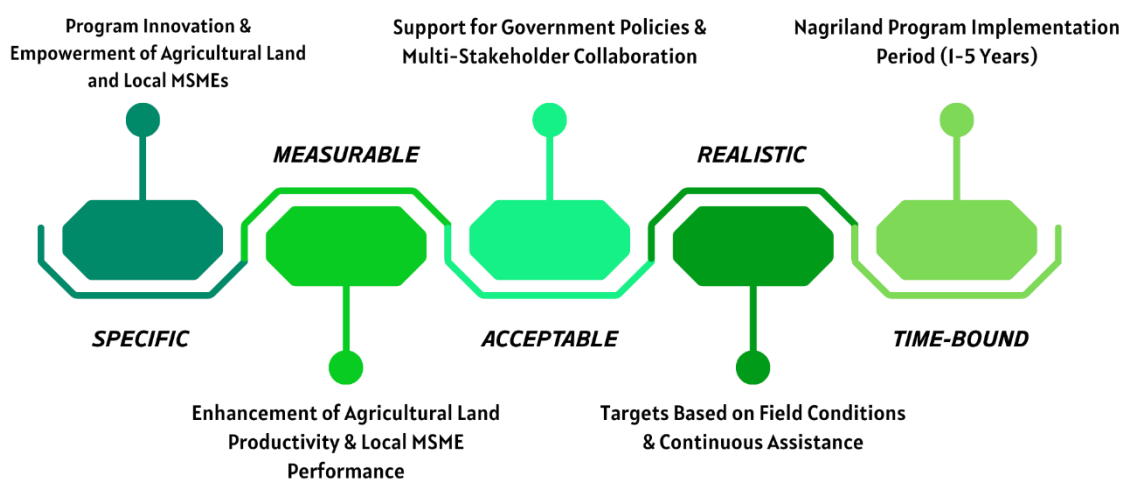


Fig. 6 SMART-based implementation strategy of the Nagriland Program

The Nagriland Program is specifically designed to improve smallholder land productivity, expand sustainable agricultural practices, reduce dependence on food imports, and strengthen the local MSME ecosystem involved in agricultural processing and marketing. Core activities include modern agricultural technology training (precision irrigation, soil sensors, superior crop varieties), environmentally friendly practices (agroforestry and organic fertilizers), MSME product certification facilitation (halal, SNI, BPOM), and value-added supply chain development through post-harvest processing and market partnerships. These activities collectively aim to achieve national food self-reliance, improved farmer and MSME welfare, inclusive regional economic ecosystems, and stronger, more sustainable economic development. Program success is measured through objective and verifiable quantitative indicators, enabling transparent, systematic, and evidence-based evaluation throughout the implementation process. These indicators include improvements in land productivity, increases in farmer income, reductions in food imports, expansion of sustainable land management practices, growth in MSME participation, increases in MSME turnover, wider certification coverage, and a higher proportion of agricultural products being processed into value-added goods before entering the market. Together, these measurable outcomes provide a comprehensive basis for monitoring program performance and assessing its contribution to strengthening agricultural sustainability and economic resilience.

The program is acceptable as it aligns with national policies on food security, local economic empowerment, and sustainable development, and supports the Sustainable Development Goals (SDGs), particularly SDG 2 (Zero Hunger), SDG 8 (Decent Work and Economic Growth), and SDG 16 (Peace, Justice, and Strong Institutions). Multi-stakeholder collaboration enhances legitimacy, implementation capacity, innovation, and equitable benefit distribution. Targets are set realistically based on field conditions, farmer production capacity, infrastructure availability, MSME processing capability, and policy support. Implementation combines on-site training, online learning, provision of facilities

and technology, and certification assistance, ensuring feasibility while maximizing resource utilization and adaptability. The Nagriland Program is implemented over five years, with clear phases ranging from land mapping and capacity building to large-scale implementation, consolidation, evaluation, and ecosystem integration. This phased approach ensures realistic target achievement, minimizes implementation risks, strengthens monitoring and evaluation systems, and supports long-term sustainability and replication. Overall, this staged and SMART-based approach ensures equitable benefit distribution, strengthens local economic growth, and contributes positively to national food security and sustainable agricultural development.

4. Conclusions

Economics as the management of resources and politics as a collective endeavor are closely intertwined within the concept of political economy, where public policy plays a crucial role in fostering economic self-reliance, creating employment, and ensuring a more equitable distribution of wealth. However, Indonesia continues to face serious challenges stemming from low human resource quality, dependence on food and strategic commodity imports, and ineffective policies such as the food estate program, which has instead caused ecosystem degradation, weakened farmers' sovereignty, and increased vulnerability to global market dependence. The clear gap between macro-level policies and on-the-ground realities underscores the need for a new strategy centered on empowering farmers, local MSMEs, and strengthening a sustainable agricultural ecosystem.

In this context, Nagriland (National Agricultural Land) emerges as an innovative solution to empower community-based agricultural land and local MSMEs through a set of integrated approaches, including GIS-based land mapping to maximize potential, the use of IoT technology for production monitoring, the application of organic fertilizers and environmentally friendly practices, digital applications for supply chain management, transparent partnership models, and the development of sustainable agroforestry. MSMEs are supported through production and business management skills training, *halal*/SNI/BPOM certification to ensure quality, access to financing and tax incentives to strengthen financial capacity, the development of commodity-based industrial clusters to increase value added, and export promotion to expand markets and enhance the competitiveness of local products. With measurable indicators such as increased land productivity and crop yields, higher incomes for farmers and MSMEs, and reduced dependence on food imports, the Nagriland program is expected to realize national food security, enhance economic self-reliance, strengthen political capacity through socio-economic stability, and accelerate comprehensive and sustainable national development. Nevertheless, this study is limited by its localized empirical scope and conceptual nature. Future studies should conduct pilot implementations, cost-benefit analyses, and quantitative impact assessments across different regions to validate the effectiveness and scalability of the Nagriland framework.

Acknowledgement

The author would like to express sincere gratitude to the research team who contributed to and supported the implementation of this study and the preparation of this manuscript, namely Deni Nur Zackia Putri (Department of Law, Faculty of Law and Social Sciences, Ganesha University of Education, Singaraja, Bali, Indonesia), Eril Paizi (Department of Chemistry Education, Faculty of Mathematics and Natural Sciences, Ganesha University of Education, Singaraja, Bali, Indonesia), and Salsabilah Dwi Annisa (Department of Chemistry Education, Faculty of Mathematics and Natural Sciences, Ganesha University of Education, Singaraja, Bali, Indonesia). Their contributions included conceptual discussions, technical and academic support, and substantive feedback that enriched the quality of the research and the writing of this article.

Author Contribution

Conceptualization: Deni Nur Zackia Putri; Methodology: Deni Nur Zackia Putri; Investigation and Data Collection: Deni Nur Zackia Putri, Eril Paizi, and Salsabilah Dwi Annisa; Data Analysis and Interpretation: Deni Nur Zackia Putri; Writing to Original Draft Preparation: Deni Nur Zackia Putri; Writing to Review and Editing: Eril Paizi and Salsabilah Dwi Annisa; Visualization and Data Presentation: Deni Nur Zackia Putri; Supervision and Academic Validation: Eril Paizi and Salsabilah Dwi Annisa. All authors have read and approved the final version of the manuscript submitted for publication.

Funding

This research received no external funding.

Ethical Review Board Statement

This study was conducted in accordance with ethical principles for social and humanities research, upholding voluntariness, confidentiality, and the protection of participants' rights. The study did not involve medical interventions or high-risk experiments and therefore did not require approval from an institutional ethics committee. All data collection processes were carried out through interviews and program socialization activities involving staff of the Bali Provincial Forestry and Environmental Service, the Bali Provincial Department of Agriculture and Food Security, and local farmers, while ensuring compliance with applicable research ethics standards.

Informed Consent Statement

Informed consent was obtained from all participants involved in this study, including staff of the Bali Provincial Forestry and Environmental Service, the Bali Provincial Department of Agriculture and Food Security, and local farmers. All participants were provided with clear explanations regarding the research objectives, data collection methods, and the use of data for academic purposes, and they voluntarily agreed to participate in the study.

Data Availability Statement

Supporting data derived from publicly accessible sources are available in an online database and can be accessed at https://drive.google.com/file/d/1TqxP6DpUftIKkqMPAU0zyfw6tfL0o0By/view?usp=drive_link

Conflicts of Interest

The authors declare no conflict of interest. No party had any role in the design of the study; the collection, analysis, or interpretation of data; the writing of the manuscript; or the decision to publish the results.

Declaration of Generative AI Use

During the preparation of this work, Grammarly was used for grammar refinement of the original manuscript, while DeepL was used solely to assist translation into English. Turnitin to conduct similarity checks to ensure the originality of the scholarly work. After using these tools, the author reviewed and edited the entire manuscript as needed and takes full responsibility for the content and substance of this publication.

Open Access

©2026. The author(s). This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The images or other third-party material in this article are included in the article's Creative Commons license, unless indicated otherwise in a credit line to the material. If

material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this license, visit: <http://creativecommons.org/licenses/by/4.0/>

References

- Audia, N. A., Ramahdani, P. S., & Febrianti, W. (2024). Analisis dampak program food estate bagi hutan di Kalimantan, Indonesia. *Jurnal Pendidikan Sosial dan Humaniora*, 3(4), 5202–5212. <https://publisherqu.com/index.php/pediaqu/article/view/1456>
- Baker, P., Smith, J. P., Garde, A., Grummer-Strawn, L. M., Wood, B., Sen, G., ... & McCoy, D. (2023). The political economy of infant and young child feeding: Confronting corporate power, overcoming structural barriers, and accelerating progress. *The Lancet*, 401(10375), 503–524. [https://doi.org/10.1016/S0140-6736\(23\)00033-5](https://doi.org/10.1016/S0140-6736(23)00033-5)
- BPS. (2025). *Imports of Rice by Major Countries of Origin, 2017-2024*. <https://www.bps.go.id/en/statistics-table/1/MTA0MyMx/impor-beras-menurut-negara-asal-utama-2017-2023.html>
- Bulfone, F. (2023). Industrial policy and comparative political economy: A literature review and research agenda. *Competition & Change*, 27(1), 22–43. <https://doi.org/10.1177/10245294221075104>
- Cai, Y., Huang, Z., & Zhang, X. (2024). FinTech adoption and rural economic development: Evidence from China. *Pacific-Basin Finance Journal*, 83, 102264. <https://doi.org/10.1016/j.pacfin.2023.102264>
- Chaireni, R., Agustanto, D., Amriza Wahyu, R., & Nainggolan, P. (2020). Ketahanan Pangan Berkelanjutan. *Jurnal Kependudukan Dan Pembangunan Lingkungan*, 2(1), 70–79. <http://jkpl.ppi.unp.ac.id/index.php/JKPL/article/view/13>
- Fahmid, I. M., Wahyudi, Agustian, A., Aldillah, R., & Gunawan, E. (2022). The potential swamp land development to support food estates programmes in Central Kalimantan, Indonesia. *Environment and Urbanization ASIA*, 13(1), 44–55. <https://doi.org/10.1177/09754253211068521>
- Fomum, T. A., & Opperman, P. (2023). Financial inclusion and performance of MSMEs in Eswatini. *International Journal of Social Economics*, 50(11), 1551–1567. <https://doi.org/10.1108/IJSE-10-2022-0682>
- Hidayat, E. W., & Tandilangi, A. H. (2024). Analisis Kemandirian Ekonomi Warga Dalam Program Pemberdayaan Masyarakat Kelurahan (PPMK) Di Sempur Barat. *Jurnal Studi Interdisipliner Perspektif*, 24(1), 19–26. <https://ejournal-jayabaya.id/Perspektif/article/view/230>
- Hidayaturrahman, M. (2021). *Pengantar ekonomi politik pembangunan*. Unitomo Press. <https://books.google.com/books?id=29RDEAAAQBAI>
- Humprecht, E., Esser, F., Van Aelst, P., Staender, A., & Morosoli, S. (2023). The sharing of disinformation in cross-national comparison: Analyzing patterns of resilience. *Information, Communication & Society*, 26(7), 1342–1362. <https://doi.org/10.1080/1369118X.2021.2008872>
- Manikas, I., Ali, B. M., & Sundarakani, B. (2023). A systematic literature review of indicators measuring food security. *Agriculture & Food Security*, 12(1), 10. <https://doi.org/10.1186/s40066-023-00415-7>
- Mariyani, S., Melani, A., Mustikasari, F., Fikri, M. R. A., & Sam'un, M. (2024). Community empowerment through the utilization of P2L (Pekarangan Pangan Lestari) to support food security in Sindangkarya Village, Kutawaluya District, Karawang. *Transformasi: Jurnal Pengabdian Masyarakat*, 20(2), 380–388. <https://doi.org/10.20414/transformasi.v20i2.10453>
- Masri, M., Judijanto, L., Harefa, Y., & Zalogo, E. F. (2025). *Pengantar ilmu ekonomi*. PT Sonpedia Publishing Indonesia. <https://books.google.com/books?id=U113EQAAQBAI>
- Qin, Q., Guo, H., Shi, X., & Chen, K. (2023). Rural e-commerce and county economic development in China. *China & World Economy*, 31(5), 26–60. <https://doi.org/10.1111/cwe.12483>

- Rangga, K. K., Syarief, Y. A., Listiana, I., & Hasanuddin, T. (2022). Optimalisasi pemanfaatan pekarangan dengan menerapkan konsep Pekarangan Pangan Lestari (P2L) di Kota Bandar Lampung. *Jurnal Pengabdian dan Pemberdayaan Masyarakat Inovatif*, 1(1), 29–37. <https://ejournal.lppm-unila.ac.id/index.php/jppmi/article/view/2307>
- Ramadhan, T., Brutu, S., Romantika, D., Gultom, L. H., Sembiring, T., Andini, P., & Sitepu, E. M. R. (2024). Juridical review of food estate project land clearing against environmental damage judging from Government Regulation No. 23 of 2021 concerning forestry implementation. *QISTINA: Jurnal Multidisiplin Indonesia*, 3(1), 689–695. <https://doi.org/10.59126/qistina.v3i1.512>
- Rasman, A., Theresia, E. S., & Aginda, M. F. (2023). Analisis implementasi program food estate sebagai solusi ketahanan pangan Indonesia. *Holistic: Journal of Tropical Agriculture Sciences*, 1(1), 33–65. <https://doi.org/10.61511/hjtas.v1i1.2023.183>
- Rezi, L. S. F., & Ali, I. (2024). Analisis faktor-faktor pendukung dan penghambat kemandirian ekonomi desa: Perspektif pengelolaan sumber daya alam. *Seminar Nasional LPPM UMMAT*, 3, 579–590. <https://journal.ummat.ac.id/index.php/semnaslppm/article/view/23813>
- Ruchiyani, O. Y., Suriadi, B., Nainita, N., Cahaya, N., Al-Ridho, N., Negeri, U. I., & Utara, S. (2022). Faktor-faktor penyebab kerentanan ekonomi indonesia. In *JCI Jurnal Cakrawala Ilmiah* (Vol. 1, Issue 6). <http://bajangjournal.com/index.php/JCI>
- Senjawati, N. D., & Azizah, A. F. (2024). Analisis ketahanan pangan rumah tangga pada program Pekarangan Pangan Lestari. *Jurnal Sosial Ekonomi Pertanian*, 20(1), 93–102. <https://doi.org/10.20956/jsep.v20i1.30975>
- Susanti, E., Mulyanti, R. Y., & Wati, L. N. (2023). MSMEs performance and competitive advantage: Evidence from women's MSMEs in Indonesia. *Cogent Business & Management*, 10(2), 2239423. <https://doi.org/10.1080/23311975.2023.2239423>
- Tobing, V. T. (2024). Problematic analysis of the legal policy of the food estate program (Government era 2020–2024). *Journal of Law, Politic and Humanities*, 5(2), 983–991. <https://doi.org/10.38035/jlph.v5i2.1152>
- Veronika, Y., Balawangga, P. S. M., Wonda, N. N., Nope, L. I., & Subandi, Y. (2025). Pandangan Hak Asasi Manusia Terhadap Kerusakan Lingkungan Akibat Deforestasi Masif Dalam Proyek Food Estate di Merauke, Papua Selatan Tahun 2024. *Jurnal Ilmiah Multidisipin*, 3(7), 487–496. <https://doi.org/10.60126/jim.v3i7.1121>
- Vilar-Lluch, S., Clutterbuck, D., Kranert, M., Smith, D., Nield, S., & Alwan, N. A. (2025). Being “resilient” and achieving “resilience”: From governmental discourses to the national research agenda in the contexts of food insecurity and cost of living. *PLOS ONE*, 20(1), e0316182. <https://doi.org/10.1371/journal.pone.0316182>
- Quirinno, R. S., Murtiana, S., & Asmoro, N. (2024). Peran sektor pertanian dalam meningkatkan ketahanan pangan dan ekonomi nasional. *NUSANTARA: Jurnal Ilmu Pengetahuan Sosial*, 11(7), 2811–2822. <https://doi.org/10.31604/jips.v11i7.2024.2811-2822>
- Wani, N. R., Rather, R. A., Farooq, A., Padder, S. A., Baba, T. R., Sharma, S., ... & Ara, S. (2024). New insights in food security and environmental sustainability through waste food management. *Environmental Science and Pollution Research*, 31(12), 17835–17857. <https://doi.org/10.1007/s11356-024-32215-1>
- Wen, R., Li, Y., & Zhang, J. (2025). The empowerment of agricultural new quality productive forces by digital economy: Theoretical mechanisms and empirical verification. *Chinese Journal of Eco-Agriculture*, 33(9), 1895–1908. <https://doi.org/10.12357/cjea.20240738>
- Widowati, S. (2023). Prospek Pemanfaatan Pangan Lokal dalam Rangka Meningkatkan Ketahanan Pangan. *Diversifikasi Pangan Lokal Untuk Ketahanan Pangan: Perspektif Ekonomi, Sosial, Dan Budaya*, 2023, 1–13. <https://doi.org/10.55981/brin.918>
- Yunus, A. M. A., & Ardiansyah, M. (2024). *Ekonomi politik*. Penerbit K-Media. <https://books.google.com/books?id=Vv0QEAAQBAJ>

Zhou, L., Hou, G., & Rao, W. (2024). Collaborative logistics for agricultural products of farmer–consumer integration purchase under platform empowerment. *Expert Systems with Applications*, 255, 124521. <https://doi.org/10.1016/j.eswa.2024.124521>

Biographies of Authors

Deni Nur Zackia Putri, is an undergraduate student in the Department of Law, Faculty of Law and Social Sciences, Ganesha University of Education, Singaraja, Bali, Indonesia. Her academic interests include environmental law, civil law, agrarian law, as well as legal studies on sustainable development. She is actively involved in academic activities and scholarly writing focusing on public policy analysis and social justice issues.

- Email: deninurzackiaputri@gmail.com
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: <https://go.undiksha.ac.id/DenizacProfile>

Eril Paizi, is an undergraduate student in the Department of Chemistry Education, Faculty of Mathematics and Natural Sciences, Ganesha University of Education, Singaraja, Bali, Indonesia. His academic interests encompass chemistry education, the development of science learning, and the integration of chemical concepts with environmental and sustainability issues. He is actively engaged in research activities and scholarly writing in the field of science education.

- Email: erilpaizi013@gmail.com
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: N/A

Salsabilah Dwi Annisa, is an undergraduate student in the Department of Chemistry Education, Faculty of Mathematics and Natural Sciences, Ganesha University of Education, Singaraja, Bali, Indonesia. Her academic interests focus on chemical research activities, laboratory practicum, and the application of experimental methods in science education. She is actively involved in academic activities related to the development of laboratory skills and research in chemistry education.

- Email: salsabilahdwiannisa1122@gmail.com
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: N/A