How to Cite:
Putri, N. M. A. A., Sudarma, I. M., & Wijayanti, P. U. (2026). Agricultural macroeconomics on the Regional Gross Domestic Product (RGDP) growth of Bali Province. *Tennessee Research International of Social Sciences*, *8*(1), 99–108. Retrieved from https://triss.org/index.php/journal/article/view/134

Agricultural macroeconomics on the Regional Gross Domestic Product (RGDP) growth of Bali Province

Ni Made Ayu Anjani Putri
Graduate Program in Agribusiness, Faculty of Agriculture, Udayana University, Denpasar, Indonesia
Corresponding Email: madeayuanjani10@gmail.com

I Made Sudarma
Graduate Program in Agribusiness, Faculty of Agriculture, Udayana University, Denpasar, Indonesia

Putu Udayani Wijayanti
Graduate Program in Agribusiness, Faculty of Agriculture, Udayana University, Denpasar, Indonesia

***Abstract*---**This study aims to examine the impact of macroeconomic policies on the growth of the agricultural sector's Regional Gross Domestic Product (RGDP) in Bali Province. The research adopts a quantitative approach using multiple linear regression analysis based on time-series data. The variables analyzed include income, household consumption, agricultural sector investment, government expenditure, net exports, and agricultural labor. Data were processed using EViews software, incorporating classical assumption tests, t-tests, F-tests, and coefficient of determination analysis. The findings indicate that, simultaneously, all variables significantly influence the growth of the agricultural sector's RGDP. Partially, agricultural investment, government expenditure, and agricultural labor demonstrate significant effects, whereas household consumption and net exports are found to be statistically insignificant. Structural constraints, particularly limited land availability and production capacity, limit the effectiveness of macroeconomic policies in fully stimulating agricultural output growth. The study concludes that the effectiveness of macroeconomic policies in promoting agricultural sector growth remains constrained by structural challenges within the sector. Therefore, policy directions should prioritize productivity

ISSN 2766-7464 (Online)
Publisher: Smoky Mountain Publishing
Manuscript submitted: 27 Dec 2025, Manuscript revised: 18 Jan 2026, Accepted for publication: 09 Feb 2026

enhancement, agricultural land protection, and labor capacity strengthening to achieve more sustainable agricultural growth.

***Keywords*---**Macroeconomic Policy, Regional Gross Domestic Product, Agricultural Sector, Bali Province.

Introduction

Economic development fundamentally aims to improve living standards, expand employment opportunities, promote equitable income distribution, and encourage structural transformation from primary to secondary and tertiary sectors. Although economic development and economic growth are closely interrelated, regional growth trajectories vary depending on each region's capacity to manage and optimize its resources efficiently and sustainably.

As an agrarian country, Indonesia has historically relied on agriculture as a major source of livelihood. The agricultural sector plays a strategic role not only in supporting national economic development but also in strengthening regional economies. Economic growth, commonly measured through the growth of Regional Gross Domestic Product (RGDP) at both current and constant prices, serves as an important indicator of regional welfare and productivity. A higher RGDP generally reflects stronger economic performance and improved societal prosperity (Rahman et al., 2019). Furthermore, the contribution of the agricultural sector to RGDP formation remains significant in regional economic structures (Mappigau, 2021).

Bali Province, while internationally recognized as a tourism destination, also possesses substantial agricultural potential. Beyond ensuring food security, agriculture constitutes an essential component of the region's economic structure. However, RGDP data at constant prices indicate that the contribution of agriculture to Bali's economy from 2010 to 2024 has shown a declining trend. This pattern reflects an ongoing structural transformation in which economic activities gradually shift from the primary sector toward the service sector.

The decline became more pronounced in 2019, preceding the COVID-19 pandemic, when economic activities began to weaken. As the tourism sector slowed down, indirect impacts were observed in agriculture through reduced demand, disrupted distribution channels, and weakened purchasing power (BPS Bali Province, 2020). Interestingly, during 2020–2021, the agricultural sector demonstrated resilience and experienced a relative increase in contribution, acting as a buffer amid the contraction of tourism and service sectors. Government policies focused on strengthening food security further supported this temporary recovery. However, in 2022 the contribution declined again as tourism rebounded and once more dominated Bali's economic structure (BPS Bali Province, 2023).

Regional economic growth is closely linked to macroeconomic policy instruments implemented by the government. From the expenditure approach perspective, growth is determined by household consumption, government spending,

investment, and net exports (Inayah, 2023). In the context of agriculture, these macroeconomic components—together with labor dynamics—directly shape production capacity, market demand, and sectoral sustainability. Therefore, understanding how macroeconomic policy variables influence the growth of the agricultural sector's RGDP is crucial, particularly in a structurally transforming region such as Bali, where agriculture must adapt within an increasingly service-oriented economy.

Methods

This study is designed as a quantitative research with a descriptive approach aimed at analyzing the impact of macroeconomic policies on the contribution of the agricultural sector to the Regional Gross Domestic Product (RGDP) of Bali Province. The study integrates qualitative descriptive analysis and quantitative modeling to provide a comprehensive evaluation of policy effectiveness. The qualitative component examines fiscal, monetary, trade, and real sector policies implemented by the Bali Provincial Government in relation to agricultural development, while the quantitative component applies the Solow-Swan economic growth framework to measure the influence of macroeconomic variables on agricultural sector performance. The theoretical foundation of this research draws upon the Solow-Swan growth model, regional development theory, and macroeconomic policy theory, which collectively explain the interaction between capital accumulation, labor, structural transformation, and policy instruments in shaping sectoral output.

This research adopts a library-based study utilizing secondary time-series data obtained from official institutions, including the Central Bureau of Statistics (BPS), the Regional Development Planning Agency (Bappeda), the Provincial Agricultural Office, and other relevant government agencies. The observation period spans from 2008 to 2023, with analysis limited to Bali Province. The agricultural sector examined in this study encompasses the subsectors of food crops, horticulture, plantations, and livestock, as strategic components of regional economic development. The analysis employs RGDP at constant prices to ensure comparability over time by eliminating inflationary distortions.

The analytical framework focuses on four main aspects: identifying macroeconomic policies affecting the agricultural sector during 2008–2023; analyzing their impact on the sector's contribution to RGDP; measuring the influence of macroeconomic variables—namely investment, household consumption, government expenditure, net exports, and agricultural labor—on agricultural output growth; and identifying structural constraints affecting policy implementation. Quantitative analysis is conducted using multiple linear regression based on the Ordinary Least Squares (OLS) method, complemented by classical assumption tests, t-tests, F-tests, and the coefficient of determination. The qualitative findings are used to interpret econometric results and to explain structural challenges such as land conversion, climate variability, and declining youth participation in agriculture, thereby enabling a comprehensive assessment of macroeconomic policy effectiveness in strengthening Bali's agricultural sector.

Result and Discussion

Macroeconomic Policies in the Agricultural Sector of Bali Province (2008–2023)

During the period 2008–2023, the Provincial Government of Bali consistently positioned the agricultural sector as a strategic pillar within the regional economic structure through a series of macroeconomic policy interventions embedded in the Regional Medium-Term Development Plans (RPJMD) and annual development frameworks. These policies were primarily directed toward strengthening food security, enhancing productivity of leading commodities, protecting agricultural land, expanding market access, and integrating agriculture within Bali's tourism-dominated economy. At the same time, policy orientation was designed to respond to structural challenges, including land conversion, climate variability, and market demand fluctuations resulting from Bali's increasing reliance on the service sector.

In the 2008–2013 RPJMD period, policy emphasis was placed on production incentives, institutional strengthening, and agricultural–tourism integration. The government implemented fertilizer subsidies and facilitated access to credit schemes, including the promotion of the Kredit Usaha Rakyat (KUR), to reduce production costs and encourage farm-level investment (Dewi, 2024; Saragih et al., 2017). The Integrated Farming System Program (Simantri), introduced in 2009, became a flagship initiative aimed at promoting environmentally sustainable and efficiency-oriented agricultural practices (Anugrah et al., 2014). Institutional reinforcement of farmer groups, cooperatives, and the traditional subak irrigation system was also prioritized to enhance bargaining power and improve access to technology and markets (Haryanto et al., 2016). Furthermore, agricultural–tourism synergy was promoted through the development of agrotourism areas, strengthening local value chains and supporting the preservation of traditional agricultural landscapes (Sutawan, 2008; Arida, 2017).

During the 2013–2018 period, policy direction shifted toward strengthening agricultural competitiveness and regional self-reliance. Greater attention was given to the development of leading commodities, organic agriculture, research collaboration, and local product marketing. Institutional and market reforms were reinforced through regulatory instruments, including Governor Regulation No. 99 of 2018, which prioritized the utilization and marketing of local agricultural products (Bappeda Bali Province, 2019). In the subsequent 2018–2023 period, agricultural policy became more structured and modernization-oriented. Programs focused on increasing production and productivity, improving agricultural infrastructure and extension services, strengthening plant and livestock protection systems, and promoting the adoption of appropriate technology and smart farming innovations (BPTP Bali, 2022). Institutional accountability and agribusiness value-added strategies were also emphasized, particularly for leading commodities such as coffee, cocoa, and horticultural products. Overall, macroeconomic policies in Bali's agricultural sector evolved from stabilization and incentive-based measures toward a more integrated, innovation-driven, and sustainability-oriented development approach. Nevertheless, the effectiveness of these policies continues to be constrained by

structural limitations, including land scarcity, tourism-driven land conversion, and declining youth participation in agriculture.

The Impact of Macroeconomic Policies in the Agricultural Sector on the Growth of Bali's RGDP

The second research question examines the impact of macroeconomic policies in the agricultural sector on the growth of Bali Province's Regional Gross Domestic Product (RGDP). The analysis employs three key indicators: agricultural RGDP (constant prices), the Farmers' Terms of Trade (NTP), and agricultural employment. These indicators collectively represent sectoral economic performance, farmers' welfare, and labor absorption capacity, thereby providing a comprehensive perspective on the role of agriculture in regional economic development. During the 2008–2024 period, the provincial government implemented various macroeconomic policies aimed at increasing productivity, strengthening agribusiness structures, and enhancing value added within the agricultural sector.

The trend of agricultural RGDP at constant prices shows a long-term increase despite short-term fluctuations. Agricultural RGDP rose from IDR 16,092.72 billion in 2010 to IDR 21,579.83 billion in 2024 (BPS Bali Province, 2025), indicating that macroeconomic interventions contributed positively to sectoral capacity expansion. The growth observed during 2010–2012 reflects the impact of input subsidies, production incentives, and institutional strengthening. Although a temporary decline occurred in 2013 due to external factors such as climate variability and commodity price fluctuations, agricultural RGDP recovered and increased steadily during 2014–2019, coinciding with policies emphasizing productivity enhancement, agribusiness development, and integrated farming systems. During the COVID-19 pandemic (2020–2022), agricultural RGDP experienced mild contractions and stagnation; however, the sector functioned as an economic buffer when tourism sharply declined. Recovery in 2023–2024 suggests that modernization policies, technological adoption, and institutional reinforcement have gradually strengthened the sector's resilience. Overall, macroeconomic policies have supported long-term growth in agricultural value added, although short-term volatility remains influenced by structural and external constraints.

The Farmers' Terms of Trade (NTP) further illustrate the relationship between policy effectiveness and farmers' welfare. NTP remained above 100 during the early implementation phase (2010–2012), reflecting improved purchasing power due to input subsidies and price stabilization efforts. However, the decline in NTP during 2013–2015 and the sharp drop during the pandemic (2020–2021) indicate that existing policies were insufficient to fully offset rising production costs and market disruptions. The subsequent recovery in 2022–2024 demonstrates improved price stabilization, enhanced market access, and stronger institutional integration with tourism-related demand. Meanwhile, agricultural employment shows a long-term declining trend, consistent with Bali's structural transformation toward the service sector. Although labor absorption decreased over time, agricultural RGDP did not decline proportionally, suggesting that macroeconomic policies increasingly emphasize productivity gains and value

added rather than labor expansion. Temporary increases in agricultural employment during 2020–2021 confirm the sector's stabilizing role during economic crises. In sum, macroeconomic policies in Bali's agricultural sector have contributed positively to RGDP growth and economic stability, primarily through productivity enhancement and structural resilience, although their effectiveness remains moderated by land conversion pressures, climate variability, and shifting labor preferences.

Factors Influencing the Effectiveness of Macroeconomic Policies in the Agricultural Sector on the Growth of Bali Province's Agricultural GRDP

The t-test results were employed to identify the partial effect of each macroeconomic policy variable on the growth of the agricultural sector's Gross Regional Domestic Product (GRDP) in Bali Province. The findings indicate that agricultural sector investment (X1) has a positive and statistically significant effect on the growth of agricultural GRDP. This result suggests that regional government policies aimed at increasing investment in agriculture—through the development of production infrastructure, provision of agricultural machinery and equipment, and the promotion of commodity-based agribusiness—have proven effective in enhancing value added and sectoral output. Investment incentive policies and integrated agricultural development programs, such as the Simantri program implemented during the 2008–2013 and 2018–2023 Regional Medium-Term Development Plan (RPJMD) periods, have served as key instruments in strengthening the role of investment as a driver of agricultural sector growth in Bali.

Regional government expenditure in the agricultural sector (X2) shows a statistically significant but negative relationship with agricultural GRDP growth. This finding indicates that increases in government spending do not automatically translate into improved agricultural sector performance. Several studies in Indonesia suggest that agricultural public expenditure is still predominantly allocated to routine and administrative spending, which has limited impact on enhancing production capacity and value added in the sector (Inayah, 2023). Furthermore, the effectiveness of public spending is highly dependent on program targeting accuracy, planning quality, and policy implementation capacity at the regional level. Consequently, budget increases that are not accompanied by improvements in expenditure quality may result in fiscal inefficiencies and fail to directly stimulate agricultural output (Puspitasari, 2018). This condition reflects the challenges of regional macroeconomic policy implementation, where the magnitude of agricultural expenditure has not yet fully optimized agricultural GRDP growth. Therefore, regional government spending in agriculture should be more strongly directed toward productive expenditures that enhance production capacity and farmers' competitiveness.

The household consumption variable (X3) does not have a statistically significant effect on agricultural GRDP growth. This finding suggests that increases in community consumption in Bali do not directly stimulate agricultural sector growth, primarily because consumption patterns remain dominated by non-agricultural products or imported agricultural goods. This condition indicates that consumption-enhancing policies have not been fully integrated with policies

aimed at protecting and marketing local agricultural products. Accordingly, this result reinforces the importance of regional government initiatives to promote local product consumption through supply chain strengthening, farmers' markets, and synergies between the agricultural and tourism sectors.

Similarly, net agricultural exports (X4) do not demonstrate a statistically significant effect on agricultural GRDP growth. This result implies that the contribution of Bali's agricultural exports remains relatively limited and has not yet become a primary engine of sectoral growth. Dependence on local and domestic markets, as well as constraints related to business scale and product standardization, limit the role of net exports. Thus, although the regional government has promoted the development of leading commodities and product quality improvement, these findings suggest that such policies require further strengthening to enable agricultural exports to contribute more substantially to sectoral growth.

The agricultural labor variable (X5) is found to have a positive and statistically significant effect on agricultural GRDP growth. This result indicates that labor availability and participation remain crucial factors in Bali's agricultural production processes. Regional government policies focusing on capacity building for farmers—through training, extension services, and institutional strengthening—contribute to maintaining agricultural labor productivity. These findings also highlight the need to balance labor productivity improvements with modernization and technological adoption to ensure more sustainable agricultural sector growth.

Overall, the t-test results demonstrate that not all regional macroeconomic policy instruments exert equal effects on agricultural GRDP growth. Investment and labor are identified as key factors supporting the effectiveness of macroeconomic policies in the agricultural sector, whereas government expenditure, household consumption, and net exports still face various limitations in optimally driving growth. These findings underscore the importance of aligning macroeconomic policy formulation with effective on-the-ground program implementation to ensure that policies adopted by the Government of Bali Province genuinely enhance agricultural sector performance in a sustainable manner.

Based on the t-test results, it can be concluded that, partially, variables X1, X2, and X5 significantly influence the dependent variable (Y), as each has a probability value lower than the 5 percent significance level. In contrast, variables X3 and X4 do not significantly affect the dependent variable, as their probability values exceed 0.05. Therefore, not all independent variables in the model individually exert a statistically significant effect on the dependent variable.

Challenges in the Implementation of Macroeconomic Policies in the Agricultural Sector Affecting Bali's Economic Growth

The implementation of macroeconomic policies in Bali's agricultural sector faces several structural and environmental challenges that potentially hinder the achievement of agricultural GRDP growth. Three primary challenges are

identified: land conversion, climate change, and declining youth interest in agriculture.

First, agricultural land conversion remains a major structural constraint. Data from the National Land Agency (BPN) indicate that paddy field areas declined significantly from 70,995 hectares in 2019 to 64,474 hectares in 2024, reflecting an average annual reduction of more than 1,000 hectares. Earlier data (2011–2015) also show a consistent decline in paddy land accompanied by an increase in non-agricultural land, indicating ongoing conversion driven by tourism development, settlements, and infrastructure expansion. Although rice productivity increased from 53.31 quintals/ha in 2018 to 62.07 quintals/ha in 2023, this improvement has not fully offset the shrinking land base. As a result, rice production remains fluctuating and has not grown proportionally, limiting the agricultural sector's contribution to Bali's GRDP growth.

Second, climate change presents a significant external challenge. Rainfall data (1991–2023) show spatial variations, with increasing rainfall trends in lowland and coastal areas (79% of observation points) and declining trends in highland regions (21%). Uncertainty in rainfall patterns and the rising frequency of extreme weather events—such as floods and droughts—have disrupted planting seasons, production cycles, and crop yields. Horticultural and plantation crops, which are more climate-sensitive, are particularly affected. Excessive rainfall increases pest and disease risks, while prolonged dry periods reduce productivity. These conditions lead to annual production fluctuations and weaken the stability of agricultural output, thereby reducing the effectiveness of macroeconomic policies aimed at stabilizing and increasing agricultural GRDP.

Third, declining youth interest in agriculture constitutes a critical structural issue. Agriculture is widely perceived as a low-income, high-risk sector with limited career prospects compared to tourism and services. As a result, labor preferences have shifted away from agriculture. Data show that out of 361,673 farmers in Bali, only 23,162 are aged 19–39, while the majority are over 39 years old. The minimal proportion of young farmers indicates weak regeneration within the sector. This demographic imbalance hampers innovation adoption, technological modernization, and long-term productivity, posing risks to the sustainability of agricultural development and its contribution to regional economic growth.

Conclusion

Macroeconomic policies in Bali Province's agricultural sector during the 2008–2024 period have undergone significant development, both in orientation and policy approach. In the earlier phase, policies primarily focused on increasing production and protecting farmers through incentives, subsidies, and institutional strengthening. Over time, the policy framework evolved toward a more integrated approach, linking agriculture with the tourism sector, strengthening leading commodities, promoting appropriate technology utilization, and advancing environmentally sustainable agricultural development. Although conceptually comprehensive, policy implementation continues to face structural

challenges, including land conversion, infrastructure limitations, and disparities in regional capacity.

Macroeconomic policies in the agricultural sector have influenced the dynamics of agricultural GRDP, Farmers' Terms of Trade (NTP), and employment absorption in Bali Province. Agricultural GRDP has fluctuated throughout the observation period, reflecting both policy responsiveness and external pressures such as climate change and land conversion. The NTP showed improvement during certain periods as a result of incentive and farmer protection policies, although it has not yet achieved stable growth. Meanwhile, agricultural employment has gradually declined in line with Bali's economic transformation, which is increasingly dominated by tourism and service sectors.

Partial test results indicate that investment and labor significantly affect agricultural GRDP, highlighting that capital accumulation and labor availability remain key drivers of agricultural growth. Government expenditure also shows a significant effect but with a negative direction, suggesting that public spending during the study period has not been fully effective in improving sectoral performance. In contrast, household consumption and net exports do not have a significant impact on agricultural GRDP, indicating that these variables have not yet become determining factors in Bali's agricultural growth.

The findings further reveal that the implementation of macroeconomic policies in Bali's agricultural sector continues to encounter major challenges, particularly ongoing agricultural land conversion and the impacts of climate change on production stability. The reduction of productive land and the increasing risk of crop failure directly weaken policy effectiveness in promoting agricultural GRDP growth. Therefore, policy success is not solely determined by the scale of government intervention but also by the ability to address structural constraints affecting the sustainability of the agricultural sector.

Managerial Implications

The findings of this study imply that improving the effectiveness of macroeconomic policies in Bali's agricultural sector requires a strategic reorientation toward productive and performance-based public expenditure. Regional governments should shift budget allocations from predominantly routine and administrative spending toward investments that directly enhance production capacity, such as irrigation infrastructure, agricultural mechanization, downstream processing, and technology adoption. Strengthening monitoring and evaluation systems based on measurable performance indicators is essential to ensure that budget increases translate into tangible improvements in agricultural output and value added.

Given that investment and labor significantly influence agricultural GRDP, managerial strategies should prioritize strengthening investment incentives and fostering public–private partnerships in integrated agribusiness development. Agricultural development must also be aligned with Bali's tourism-based economy by promoting agro-tourism value chains and high-value commodity diversification. Simultaneously, workforce regeneration strategies are crucial,

including youth-oriented agripreneurship programs, digital farming initiatives, access to agricultural financing, and rebranding agriculture as an innovative and technology-driven sector to attract younger generations.

Addressing structural constraints is equally important. Strict enforcement of sustainable agricultural land protection regulations and the integration of spatial planning with agricultural economic policies are necessary to mitigate land conversion. Furthermore, climate adaptation strategies—such as adaptive cropping calendars, early warning systems, crop insurance schemes, and climate-resilient seed development—should be incorporated into long-term agricultural planning to reduce production volatility. Ultimately, policy effectiveness depends on synchronizing macroeconomic policy design with practical, field-level implementation through cross-sectoral coordination and regionally adaptive development approaches to ensure sustainable agricultural growth in Bali Province.

References

Anugrah, I. S., et al. (2014). *Sistem Pertanian Terintegrasi – Simantri: Konsep, Pelaksanaan, dan Perannya dalam Pembangunan Pertanian*. Pusat Sosial Ekonomi dan Kebijakan Pertanian.

Arida, I. N. S. (2017). *Pariwisata berbasis pertanian dan kearifan lokal di Bali.*

Badan Pusat Statistik Provinsi Bali. (2020). *Produk Domestik Regional Bruto Provinsi Bali*. Denpasar: BPS Provinsi Bali.

Badan Pusat Statistik Provinsi Bali. (2023). *Produk Domestik Regional Bruto Provinsi Bali*. Denpasar: BPS Provinsi Bali.

Badan Pusat Statistik Provinsi Bali. (2025). *Produk Domestik Regional Bruto Provinsi Bali Menurut Lapangan Usaha Tahun 2010–2024*. Denpasar: BPS Provinsi Bali.

BPTP Bali. (2022). *Implementasi smart farming berbasis IoT pada usahatani hortikultura di Bali*. Prosiding Seminar Nasional Teknologi Pertanian.

Dewi, N. L. Y. (2024). Implementasi kebijakan kawasan jalur hijau dalam mendukung keberlanjutan subak di Jatiluwih. *Governance: Jurnal Ilmiah Kajian Politik Lokal dan Pembangunan*, 11(2).

Haryanto, Y., & Supadi. (2016). Peran kelompok tani dalam peningkatan kesejahteraan petani. *Jurnal Penyuluhan*.

Inayah, I. (2023). Pengaruh pengeluaran pemerintah di sektor pertanian terhadap pertumbuhan ekonomi di Indonesia. *Jurnal Penelitian Ekonomi Manajemen dan Bisnis (JEKOMBIS)*, 149–169.

Saragih, B., & Siregar, H. (2017). Peran Kredit Usaha Rakyat terhadap pengembangan usaha agribisnis. *Jurnal Agribisnis Indonesia*.

Sutawan, N. (2008). *Konversi lahan pertanian dan keberlanjutan subak di Bali*. Universitas Udayana.