

RURAL ECONOMY IN THE FRAMEWORK OF SUSTAINABLE GREEN DEVELOPMENT POLICY IN BANJARNEGARA REGENCY

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Abstract

This study aims to analyze the integration of green development principles into the rural economic structure of Banjarnegara Regency. As a region with a strong agricultural sector base and renewable energy potential, Banjarnegara holds a strategic position in implementing low-carbon economic strategies. Using quantitative descriptive methods based on secondary data from the Central Statistics Agency (BPS) for the 2021-2025 period, this study evaluates the relationship between green growth policies and economic equity in rural areas. The analysis shows that sustainable agricultural commodity diversification and optimization of local potential can promote inclusive growth. These findings recommend the need for a regional policy framework that strengthens the adaptive capacity of rural economies to global sustainability standards to ensure long-term prosperity.

Keywords: Rural Economy, Green Development, Banjarnegara, Low Carbon Economy, Inclusive Growth

INTRODUCTION

Banjarnegara Regency is a region in Central Java with rural characteristics dominated by the agricultural and plantation sectors, which are the mainstay of the majority of the population. Structurally, this primary sector not only absorbs the main workforce but also serves as a driving force for regional economic stability that supports food security at the regional level. The dominance of rural characteristics in Banjarnegara Regency places the agricultural and plantation sectors as the main pillars of its community's livelihoods. However, the high dependence on this sector requires a more modern rural economic transformation strategy to increase the added value of superior regional products and the welfare of farmers in the region. With a landscape that supports land productivity, Banjarnegara Regency emerges as one of the strategic agricultural and plantation centers in Central Java. This region has great potential for natural resource-based economic development, where agrarian activities are the socio-economic lifeblood for the majority of its population. Banjarnegara Regency relies on the agricultural and plantation sectors as the foundation of the people's economy. In the context of sustainable development, optimizing these sectors is key to alleviating poverty and accelerating equitable infrastructure development and economic access in remote villages.

Amidst the current of global economic transformation, the transition to sustainable green development is no longer merely an option but a necessity for rural areas to remain economically competitive while maintaining the integrity of their ecosystems. This urgency raises a fundamental challenge: formulating a growth model capable of accelerating local economic added value without increasing the carbon footprint, so that rural prosperity is not priced at the cost of environmental degradation. The era of global economic transformation demands that rural areas adopt the principles of sustainable green development as a survival strategy in an increasingly selective market. A crucial issue emerging in this transition is the dilemma between productivity and

sustainability: how rural areas can optimize the potential of their natural resources to improve community welfare without neglecting their commitment to reducing global carbon emissions. The transition to a green economy is now a new standard in global development, forcing rural areas to reorient their development strategies. The primary focus is on synchronizing economic growth and ecosystem preservation. Therefore, an innovative approach is needed that can increase the added value of the rural economy in an inclusive manner while maintaining sustainability to ensure the survival of future generations. In response to the shifting global economic paradigm, sustainable green development is a vital instrument for rural areas to maintain their competitive relevance. The current technical and policy challenge is finding a balance between per capita income growth in rural areas and the increasing environmental burden. This requires a leap in added value in primary sectors through integrated, environmentally friendly practices.

The novelty of this study highlights the analysis of the economic agility of Banjarnegara Regency as a rural entity that is navigating the transition towards a green economy (Gubernur Jawa Tengah, 2025). Using regional macro data instruments, this study specifically evaluates the alignment between regional economic structures and sustainable development principles. Its primary contribution is the formulation of policy directions capable of mitigating the trade-off between natural resource exploitation and the need to preserve the environment for long-term economic resilience.

LITERATURE REVIEW

The Urgency of Transitioning to a Green Economy

Green economic development in rural areas focuses on efficient use of natural resources and pollution reduction through appropriate technology. Conventional economic growth models have been shown to improve living standards, but at the cost of high natural resource exploitation and increased greenhouse gas emissions (Baba et al., 2021). The energy transition is increasingly seen as a promising opportunity for economic development in rural areas. Rural areas are not only important as physical locations for renewable energy facilities, but also have significant potential to create significant synergies for sustainable rural development (Tolnov & Rudolph, 2020). There is an urgent need to shift to more environmentally friendly methods to ensure long-term economic and ecological sustainability. Therefore, a green economy is seen as an economic model that not only pursues GDP growth, but also focuses on reducing environmental risks and ecological scarcity (Wulandari & Apriada, 2025).

Definition and Paradigm of Sustainable Development

Sustainable development is a development process whose principle is to maximize existing resources to meet present needs without compromising the ability of future generations to meet their own needs (Foreword et al., 1987). Green economy integrates environmental (ecological risk reduction), social (well-being and equity), and economic (sustainable growth) aspects, in contrast to the usual quantitative growth concept, green economy emphasizes the limits of the planet's regenerative capacity (finite environmental limits)(Baba et al., 2021). This paradigm is not simply about environmental sustainability, but rather an integration of three main pillars that must work hand in hand: economic, social, and environmental. A green economy in agriculture is not only about conservation, but also about optimizing resource use to increase productivity without damaging the environment (Indriyanti, 2025). Through empowerment and adoption of sustainable practices, rural areas can build resilience to climate change while increasing the competitiveness of local economies in the wider market (Geza et al., 2022).

Relevance for Rural Areas

Green economy initiatives are particularly relevant for rural areas because their primary focus often focuses on the agricultural sector and the use of natural resources, which are the primary livelihoods of rural communities. Green economic development in rural areas is not only about the environment, but also about creating decent and sustainable jobs (green jobs) to prevent uncontrolled urbanization (Geza et al., 2022). Green transformation in rural areas can increase agricultural yields and create resilience to environmental shocks, which directly helps address poverty issues (Baba et al., 2021). The concept of inclusive growth in the rural economy emphasizes that development benefits must reach communities at the village level through market access and strengthening digital value chains. Disparities in access to digital financial services between urban and rural areas persist, posing a challenge for rural areas to adopt new, technology-based development policies (Tay et al., 2022). Green economic literacy also shows that regions with a high dependence on natural resources need to make a transition to more environmentally friendly practices to ensure long-term financial resilience. Green development must be inclusive, meaning that the economic benefits of environmental policies must be accessible to all levels of society, including communities in rural areas themselves (Desalegn & Tangl, 2022).

Green development focuses not only on ecosystem preservation but also on well-being and social equity. Green policies in rural areas often involve optimizing the agricultural sector through sustainable practices that reduce long-term input costs and increase farmers' resilience to climate change. A low-carbon economy encourages resource efficiency and technological innovation. In the rural context, this relates to the use of renewable energy and energy-efficient agricultural mechanization to create added value without increasing the ecological footprint.

RESEARCH METHODS

This research uses a quantitative approach with a descriptive-analytical design that relies entirely on secondary data observation. All data was collected systematically through documentation techniques to ensure the validity of the information to be processed in the regional analysis model.

Data Sources

The data used in this study is time-series data sourced from official publications of the Central Statistics Agency (BPS) of Banjarnegara Regency, including Gross Regional Domestic Product (GRDP) for 2021-2025 to examine the structure and growth of economic value added, the Human Development Index (HDI) and Sectoral Statistics to measure the quality of socio-economic development achievements, and Regional Planning Documents, including the Regional Medium-Term Development Plan (RPJMD), to align macroeconomic data findings with the strategic policy direction of the local government.

Research Variables

To capture the dynamics of the rural economy and the green transition, the research variables focused on the primary sector, namely the growth rate of GRDP in the agricultural sector and other leading sectors as the backbone of the rural economy. Social welfare, namely the depth of rural poverty, is used to evaluate development inclusiveness. Digital adaptive capacity, namely indicators of energy use and regional digital technology penetration, is used as a proxy for local economic agility in adopting low-carbon innovations.

Analysis Techniques

Collected data was analyzed using three regional analysis instruments to produce comprehensive conclusions, including:

(1) Trend Analysis

Trend analysis is a statistical analysis method used to observe the movement of data over time. The goal is to identify patterns, whether a variable tends to increase, decrease, or remain stable over the long term. This technique is used to map the fluctuations and development direction of basic sectors in rural Banjarnegara over a specific period. With 3 main functions of trend analysis, namely Prediction (forecasting) is estimating future values (for example, GRDP growth), performance evaluation is to see whether a policy or strategy has a consistent impact from year to year, and anomaly identification is to find points where data deviates from the usual pattern, which may be caused by external shocks (such as an economic crisis or pandemic). There are several technical approaches to calculating trends, one of which is the linear line method (least square method) as the most commonly used method for data that has a constant upward or downward trend. The basic formula is :

$$Y = a + bX$$

where Y is the predicted variable, a is a constant, b is the slope (trend), and X is time

(2) Shift-Share Analysis

Shift-Share Analysis is an analytical technique used to determine the causes of growth or decline in an economic sector in a region (a smaller administrative area) compared to a larger region (a reference or national area). This technique is an instrument applied to evaluate changes in the regional economic structure in depth, while also measuring the relative competitiveness of Banjarnegara Regency compared to its reference region (Central Java Province). Using the equation:

$$\Delta E_{ij} = NE_{ij} + IM_{ij} + CE_{ij}$$

this analysis separates the effects of national growth, sectoral shifts, and local competitive advantage:

ΔE_{ij} : Total change in GRDP value of sector i in region j

NE_{ij} : Growth due to national factors.

IM_{ij} : Growth due to national industrial specialization.

CE_{ij} : Growth due to local (competitive) advantages.

(3) Macro Descriptive Analysis

It is an analytical method used to photograph, describe, and explain the economic conditions of a region in a broad (aggregate) manner using quantitative data that functions as the final interpretation stage to correlate the implementation of green development policies with economic inclusion parameters, so that data-based policy recommendations can be formulated (evidence-based policy).

RESULTS AND DISCUSSION

Trend Analysis (Welfare Projection)

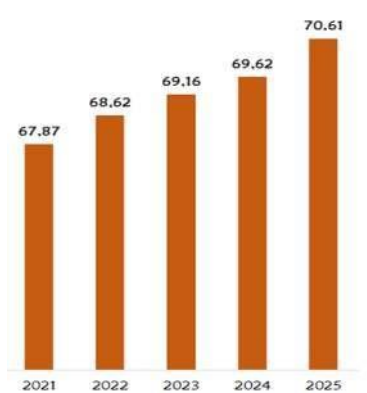


Figure 1. Human Development Index Trends in Banjarnegara Regency 2021-2025

Based on the Official Human Development Index Statistics data for 2021-2025, Banjarnegara Regency shows a consistent positive growth trend. For example, the Human Development Index

growth of 1.42% (from 69.62 to 70.61 in 2024-2025) reflects the region's agility in improving the quality of life, consisting of an expenditure component reaching IDR 10,992,000 indicating an increase in the purchasing power of rural communities, and an education component, namely Expected Years of Schooling (HLS), reaching 12.04 years, this signals the readiness of Banjarnegara Regency's human resources to transition to a knowledge-based or digital economy (Statistik & Banjarnegara, 2025).

Shift-Share Analysis (Economic Performance 2021-2025)

This analysis dissects the growth of Banjarnegara's GRDP to see whether the growth comes from external factors (Province) or internal strengths (Local Competitiveness).

Table 1. Shift-Share Analysis of Leading Sectors

Leading Sectors	National Share (NS)	Proportional Shift (IM)	Competitiveness (RS)	Net Change (E)
Agriculture, Forestry, and Fisheries	2,194.02	-250.53	501.85	2,445.34
Processing Industry	758.6	-122.78	776.66	1,412.48
Communication	117.41	56.74	102.31	276.46

Source: BPS Banjarnegara Regency processed

The results of the Shift-Share analysis show that the agriculture, forestry, and fisheries sector in Banjarnegara Regency has a positive Differential Shift (RS) value of 501.85. This indicates that the agricultural sector in Banjarnegara has stronger local competitiveness compared to the average growth of the same sector in Central Java Province. Although the sector (Proportional Shift) experienced pressure of -250.53 due to macro trends, local economic agility was able to compensate for this weakness, so that this sector still provided a net contribution (Net Change) of 2,445.34 billion rupiah to the regional GRDP. In addition, the information and communication sector showed growth in all components (NS, IM, RS positive), which indicates that this sector has become a new agile growth engine, namely growing quickly, flexibly, and adaptively to environmental changes or market challenges.

Macro Descriptive Analysis (RPJMD Integration)

This section links the statistical findings with the vision in Regional Regulation No. 2 of 2025 concerning the 2025-2029 RPJMD (Banjarnegara, 2025). Sinkronisasi Kebijakan pada daya saing positif di sektor pertanian dan industri pengolahan sejalan The main objective of the RPJMD is to increase the added value of the regional economy. The increase in the HDI status to "high" validates that the medium-term development strategy has been effective in improving the welfare of rural communities. Furthermore, Banjarnegara's rural economic agility has successfully demonstrated that rural areas can achieve inclusive growth. With continuously increasing expenditure components and strong local industrial competitiveness, Banjarnegara is on the right track to implementing a low-carbon economy without sacrificing productivity. Strategic recommendations: Based on the RPJMD, which emphasizes the integration of the national planning system, Banjarnegara needs to optimize the information and communication sector (which has a positive RS) to support Smart Farming (Azzahra et al., 2025). This step will strengthen the competitiveness of agriculture (basic sector) while maintaining environmental integrity in accordance with the principles of green development.

Based on secondary data, Banjarnegara Regency demonstrates rapid adaptation in developing a sustainable agricultural sector, particularly in highland commodities. The success of this green transition depends heavily on the ability of local institutions and financial systems to manage environmental risks and integrate them into daily economic decisions (Desalegn & Tangl, 2022). The research results show that integrating green economy and rural policies can accelerate

the achievement of sustainable development targets in Banjarnegara without sacrificing real economic growth. Strengthening policies that integrate the energy sector with financial incentives is needed to enable the region to make technological leaps (Susanti et al., 2025).

It is assumed that sustainable green development policies have a positive impact on improving the standard of living of rural communities in Banjarnegara. Using the 2025 Human Development Index (HDI) and the Per Capita Expenditure Index as test parameters, empirical findings show that Banjarnegara's HDI jumped to 70.61 (high status) with 1.42% growth (the highest in recent years). Per capita expenditure increased to IDR 10,992,000, supported by sectors supporting green development (electricity and energy, and information and communication), which recorded positive net change. The increase in HDI status from "moderate" to "high," driven by all components (health, education, expenditure), demonstrates that development policy directions aligned with the sustainable RPJMD (Regional Medium-Term Development Plan) have a tangible impact on quality of life. This increase in welfare occurs inclusively in predominantly rural areas. Sustainable development policies have been shown to positively correlate with improvements in the living standards of the Banjarnegara community.

Low-carbon economic transformation strengthens the competitiveness of leading sectors in rural areas of Banjarnegara Regency. Using the Differential Shift (RS) Value test parameter in the Shift-Share Analysis, empirical findings show that the agricultural sector (the main base sector) has a positive local competitiveness (RS) value of 501.85, the manufacturing industry sector recorded the highest RS value of 776.66, and the information and communication sector recorded a positive RS of 102.31. Positive RS values indicate that Banjarnegara has economic agility. Although several sectors are under pressure nationally/provincially, Banjarnegara's internal factors (through efficiency transformation and regional policies) are able to make this leading sector grow faster. The transformation towards digital and more efficient industries (as mandated by the RPJMD) strengthens the "bargaining position" of Banjarnegara's rural economy compared to neighboring regions. Economic transformation has been proven to strengthen the competitiveness of leading sectors in rural areas of Banjarnegara Regency through significant local competitive advantages.

CONCLUSION

Based on the results of data analysis and testing of the green economy and sustainable development hypothesis in Banjarnegara Regency, several conclusions can be drawn that there is an increase in the welfare and quality of human resources where Banjarnegara Regency shows a positive and consistent HDI growth trend, with a significant spike proving that development in Banjarnegara has succeeded in increasing the standard of living of the community inclusively, supported by increased purchasing power (per capita expenditure) and HR readiness through the achievement of adequate Expected Years of Schooling (HLS) for the digital economic transition.

The strength of local competitiveness, as seen in the Shift-Share analysis, confirms that Banjarnegara Regency possesses strong local competitiveness (Differential Shift) in leading sectors, particularly agriculture and the manufacturing industry. Adaptation to local economic growth has proven effective in offsetting external pressures from provincial macro trends, allowing the basic sector to continue to contribute significantly to the region's GRDP. This demonstrates that economic transformation strengthens the bargaining position of rural areas.

There is synchronization of policies and green transformation, where there is strong alignment between macroeconomic achievements and the strategic vision of the Banjarnegara RPJMD 2025-2029. Positive growth in the information and communication sector and the energy sector is a strong signal of the initial success of the low-carbon economic transformation. The integration of green development policies and digitalization (such as smart farming) has proven to be a new growth engine capable of maintaining a balance between real economic productivity and environmental sustainability (conservation).

Banjarnegara Regency has successfully demonstrated that rural areas can achieve competitive economic growth without sacrificing ecosystem integrity. This success depends heavily on the rapid adaptation of local institutions and the support of a green financial system to manage environmental risks and accelerate technological advancements in basic sectors.

The rural economy in Banjarnegara Regency has great potential to become a model for sustainable green development if supported by targeted regional policies. Practical implications for local governments include the need to develop a green economy roadmap that integrates leading rural sectors with the digital ecosystem. This study's limitations, which rely on secondary macro data, are expected to be addressed in future research with specific case studies at the independent village level in Banjarnegara.

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