



Rural Development Based on Green District Siak Policy

Rury Febrina, Auradian Marta, Raja Muhammad Amin, Sofyan Hadi, Margina Ferlan
and Meris Essio Mento

Universitas Riau

Pekanbaru, Indonesia

rury.febrina@lecturer.unri.ac.id

Abstract. Environmentally sustainable development is the focus of green policies, which emphasize that ‘green’ is a process, not just a status. This concept is embodied in the Green Siak policy in Siak District, which integrates the principles of sustainability in the use of natural resources as well as improving the community's economy. One of the main instruments in this policy is the Ecology-Based District Budget Transfer (TAKE), which provides financial incentives to villages based on their performance in environmental protection and sustainable economic development. Green village performance indicators include two main aspects: (1) Environmental Protection and Rescue, which includes village regulations, budget allocations, and community innovation and participation in environmental management; and (2) Economic Improvement and Poverty Alleviation, which assesses village economic policies, economic empowerment budgets, and ecological-based innovations. The implementation of this policy has shown positive impacts, such as increased environmental regulations, increased village budget allocations for sustainability, and decreased forest fire cases since 2019. However, challenges remain, including limited data and resources, lack of public awareness, financial constraints, and social and cultural barriers to the adoption of sustainable practices. To overcome this, collaboration between the government, communities, and the private sector is needed to strengthen ecological fiscal policies, improve village capacity in environmental management, and ensure ecological economic sustainability. Thus, green village development can become an inclusive and sustainable development model.

Keywords: Green Policy, Green Village, Sustainability, Ecology-Based District Budget Transfer (TAKE), Green Siak.

1 Introduction

Rural development is a multifaceted concept that encompasses various dimensions, including economic, social, environmental, and political factors, all of which play a crucial role in determining the well-being of rural communities. The key indicators of rural development can be broadly categorized into economic, social, environmental, and health-related factors, each of which has a significant impact on the overall quality of life in rural areas. These indicators are interconnected and often influence one another, making it essential to adopt a holistic approach to understanding and addressing rural development challenges.

Economic indicators are among the most critical factors in rural development, as they directly impact the livelihoods of rural residents. Agricultural productivity, access to markets, and the availability of non-farm employment opportunities are key economic indicators that determine the economic well-being of rural communities [Shao et al., 2024; Woodgate et al., 2013]. For instance, the growth of agro-industrial practices and the empowerment of smallholders can significantly improve income levels and reduce poverty, thereby enhancing economic sustainability [Woodgate et al., 2013]. Additionally, the development of rural entrepreneurship and the establishment of micro, small, and medium enterprises (MSMEs) can diversify income sources and create employment opportunities, further contributing to economic stability [Brinkley & Visser, 2022; Shao et al., 2024]. However, economic development must be balanced with environmental sustainability to avoid resource depletion and ecological degradation, which can undermine long-term economic viability [Adjei et al., 2017; El-Haggag & Samaha, 2019].

Social indicators, such as education, healthcare access, and community participation, are equally important in determining the well-being of rural communities. Education plays a pivotal role in enhancing the skills and knowledge of rural residents, enabling them to engage in more productive activities and improve their socio-economic status [Emerllahu & Bogataj, 2024; Ryan, 2004]. Furthermore, community participation and social cohesion are essential for fostering a sense of belonging and cooperation among rural residents, which can lead to more effective collective action and improved governance [Prajaduta & sutikno, 2023; Yuan et al., 2003].

Environmental indicators are also vital in assessing the sustainability of rural development. The management of natural resources, such as water, land, and forests, is crucial for maintaining ecological balance and supporting agricultural productivity [Adjei et al., 2017; El-Haggag & Samaha, 2019]. The adoption of sustainable agricultural practices, such as agroecology, can help mitigate the negative impacts of intensive farming and promote environmental sustainability [Woodgate et al., 2013]. Additionally, the proper management of waste and the reduction of pollution are essential for maintaining a healthy environment and preventing the degradation of natural resources [El-Haggag & Samaha, 2019; Kumar et al., 2020]. The integration of environmental considerations into rural development strategies can ensure that economic growth is achieved without compromising the ecological health of rural areas.

Health-related indicators are closely linked to both social and environmental factors. The prevalence of health disparities, particularly in rural areas, is often exacerbated by limited access to healthcare services, poor living conditions, and environmental hazards [Jiménez, 2024; LeBlanc, 2022]. The COVID-19 pandemic has further highlighted the vulnerabilities of rural health systems, underscoring the need for improved healthcare infrastructure and the adoption of innovative solutions, such as telehealth, to address these challenges [Jiménez, 2024]. Moreover, the mental health and well-being of rural residents are influenced by socio-economic factors, such as poverty, isolation, and limited access to social services, which can have long-term consequences for individual and community health [LeBlanc, 2022; Vidal et al., 2022].

The impact of these indicators on the overall well-being of rural communities is profound. Economic stability, social cohesion, environmental sustainability, and access to healthcare are all interconnected and contribute to the quality of life in rural areas. For instance, improved economic opportunities can lead to better living conditions, which in turn can enhance health outcomes and social well-being [Brinkley & Visser, 2022; Shao et al., 2024]. Similarly, the adoption of sustainable environmental practices can promote ecological health, which is essential for maintaining agricultural productivity and supporting rural livelihoods [Adjei et al., 2017; El-Haggag & Samaha, 2019]. Conversely, the neglect of these indicators can lead to poverty, inequality, and environmental degradation, which can undermine the well-being of rural communities and hinder their development [Barbier, 2012; Woodgate et al., 2013].

Based on the literature review above, the key indicators of rural development—economic, social, environmental, and health-related—are essential for understanding and addressing the challenges faced by rural communities. These indicators are interconnected and must be addressed through a holistic and integrated approach that balances economic growth, social equity, environmental sustainability, and health improvement. By focusing on these indicators, policymakers and practitioners can develop targeted strategies to enhance the well-being of rural communities and promote sustainable development.

One of the policies that encourage village development based on green policies is the allocation of village funds. Village funds can be a driving force in the application of the green village concept in villages in Indonesia. The management of village funds that have the concept of sustainability can also be used as an achievement for a village government by using the concept of incentives for achieving targets [Fahrizal & Firmansyah, 2024]. Green revolution strategies can be seriously considered in sustainable rural development in Indonesia, especially in rural areas that are counterproductively affected by the demographic bonus [Ratih Wulandari & Nurcholis, 2019].

One of the first regencies in Riau Province to commit to the birth of a green policy at the district level is the Siak Regency. The commitment of the Siak Regency Government is outlined in a policy issued before the existence of a legal umbrella at the provincial level. This commitment is outlined in Siak Regent Regulation No. 22 of 2018 concerning Siak Green Regency. In its development, the Siak Green Regency policy is supported by the birth of Regional Regulation No. 4 of 2022 concerning Siak Green Regency. The implementation of this policy refers to three approaches. *First*, a policy approach by directing all regional policies to support the implementation of Siak Green Regency. *Second*, improving environmental governance by encouraging innovations in sustainable and environmentally friendly management of natural resources. *Third*, an economic approach that facilitates the opening of space for community participation and can obtain economic benefits that are in line with the implementation of Siak Green Regency. In general, the Siak Green Regency policy has several objectives, namely [Subhan et al., 2022];

1. Managing natural resources to the greatest extent for the benefit of the

- community with the principles of sustainability and sustainability.
2. The use of natural resources can increase community welfare and local income
 3. The utilization of regional natural resources is carried out both through conservation, downstream and intensification activities in a sustainable manner.
 4. Protection and recognition of the rights of indigenous peoples, culture and local wisdom.

The Green Regency Siak Strategy is realized based on the Green Regency Siak Zone, the Green Regency Siak Zone is divided into several zones for the use of natural resources for space (conservation zones, industrial zones, food crop zones, plantation zones, residential zones, and customary territory zones) [Hadi, 2022; Tim Sekretariat Siak Hijau, 2022]. In addition, the implementation of the Siak Green Regency policy, one of which gives rise to an *Ecological Fiscal Transfer* (EFT) budget scheme [FITRA, 2022; Hadi, 2022; Nasir, 2022a].

Siak Hijau implementation has successfully reduced vulnerability to forest and peatland fires during the dry season, which previously often threatened the lives and livelihoods of village communities. Through the Ecology-Based Budget Transfer (TAKE) program, villages receive special budget allocations to manage natural resources in an environmentally friendly manner. This approach has improved the economy of village communities through sustainable land use. The challenges faced in implementing the Green Siak policy at the village level which are the basis of the problems in this study include: (1) Community Participation and Awareness: There is still low participation and awareness of village communities regarding the importance of environmental sustainability, which may hinder the implementation of the Siak Hijau program at the village level and participation in improving the green village index (2). Limited Budget and Resources: The implementation of the Green Village program requires adequate budget and resources. Some villages face limitations in this regard, despite support through the TAKE policy. (3). Coordination between Parties: The Siak Hijau policy requires synergy between village governments, communities, the private sector and district governments. Coordination and communication challenges between parties can affect the effectiveness of this policy implementation.

Overall, the Siak Hijau policy has brought positive impacts to village development in Siak District, especially in terms of environmental management and improving the local economy. However, the full success of this policy requires increased community participation, adequate resource support, and effective coordination among all stakeholders. Research is urgently needed to see the relationship between the green siak policy and rural development in the framework of sustainable development.

2 Methodology

In this research, the method used is qualitative method. According to Bogdan and Taylor in Moleong, qualitative methods are research procedures that produce descriptive data in the form of written or spoken words from people and behavior that

can be observed [Moleong, 2007]. The type of research used is exploration and literature study, which is a research model that seeks to describe and explore carefully and deeply about certain social phenomena without intervening and hypothesizing and measuring by utilizing literature in the form of books, articles/journals, mass media coverage, laws and regulations and others.

In this study, two interrelated and complementary data collection techniques were used, namely: In depth interview and Literature. Based Study. The data collected in this study are primary data and secondary data. Informants are people or individuals who can provide information to researchers. To select informants, researchers used purposive sampling techniques by selecting informants namely, Siak Hijau Coordination Team, BAPPEDA Siak, Community and Village Empowerment Office, Regional Finance Agency and related OPDs, Sedagho Siak Team, FITRA Riau, Pusako Sub-District Head, Village Government and BPK Dosan, BUMKam Dosan, businesspeople and communities related to rural development.

3 Results and Discussion

Daniel Goleman in his book, *Ecological Intelligence: The Coming Age of Radical Transparency*, explains that 'Green is a process, not a status - we need to think greening.' Green is a process, not a status, which needs to be interpreted as a verb, not as an adjective, which might help us to focus more on environmentally friendly efforts [Sari, 2022]. Thomas L. Friedman gives a definition of the word 'green' in his book, *Hot, Flat, and Crowded: Why We Need Green Revolution*, that 'green' is no longer a fad, green is no longer a platitude, green is no longer something that is considered good. Green is now a way of growing, a way of building, a way of designing, a way of producing, a way of working, and a way of living better [Nurmardiansyah, 2015; Sari, 2022]. The green principle is understood as a commitment to the environment, forming part of a broader ideology that places human relationships with the natural world at the centre. The green movement is a process, not a status; a verb, not an adjective [Nurmardiansyah, 2015]. The development of good environmental awareness has become an important and urgent global discourse. It is argued that eco-crazy should become the guiding principle informing Indonesian state policymaking (political law) in environmental protection and management. However, the concept of Eco-crazy should be further elaborated in the form of a green constitution, green legislation and green budgeting [Nurmardiansyah, 2015].

An effective green policy encompasses several key components that can be implemented globally to foster sustainable development. These components include setting clear environmental goals, fostering a supportive organizational culture, and ensuring legal frameworks are in place to support these initiatives. The following sections elaborate on these aspects. While these components are vital for effective implementation, challenges such as conflicting policies and varying levels of commitment among countries can hinder progress. Addressing these issues requires a collaborative global effort to harmonize policies and share best practices. Environmental performance indicators are crucial tools for assessing and improving the sustainability of villages. These indicators help in monitoring various aspects of

environmental health, such as soil quality, water usage, energy consumption, waste management, and biodiversity. By analyzing the top relevant research papers, this response provides a comprehensive overview of environmental performance indicators in villages, highlighting key findings, challenges, and future directions.

EFTs are intergovernmental transfer mechanisms that reward local governments and villages for maintaining or improving ecological services. These policies are designed to address environmental challenges, such as deforestation, water scarcity, and land degradation, while promoting sustainable development. For instance, in Indonesia, EFTs have been used to protect forested areas in non-forest zones by integrating environmental criteria into village fund allocation [Nasir, 2022]. Similarly, in China, EFTs have been implemented to improve air quality and promote green economic development [Ma & Sun, 2023] [Liu et al., 2024].

Siak Regency has a Green Regency Siak policy, which is a Regency that encourages the principles of sustainability and sustainability in the use of natural resources (SDA) and improving the community's economy. This policy is contained in Regent Regulation Number 22 of 2018 which was then strengthened by Regional Regulation (Perda) Number 4 of 2022. The Green Siak policy is a guideline for stakeholders in regional development, where the economy and sustainable development go hand in hand. It is necessary to conduct a village visit to see the development and impact of TAKE implementation on environmental improvement and protection and improvement of the welfare of village communities. TAKE is simply interpreted as the provision of incentives in the form of money from the district government to the village government based on performance in environmental management and is given only to village governments that have performance achievements based on performance assessments by the Siak Regency Government. The TAKE scheme comes from the reformulation of the Village Fund Allocation (ADK) and Incentives in the Form of Special Financial Assistance (BKK). The objectives of TAKE include:

1. Providing incentives/awards to the Village government for Village performance achievements
2. Balancing and fairness in the distribution of district transfer funds to villages based on needs/affirmations
3. Strengthening Collaboration and Synergy of Regency and Village Development.
4. Encouraging the Participation of the Government and Village Communities in Supporting the Implementation of Siak Hijau in Accordance with Their Authority
5. Encouraging Village Performance Improvement
6. Encourage the improvement of village initiatives in environmental protection and preservation

TAKE Skeme providing incentives to villages that perform well in environmental protection, economic improvement and poverty reduction. This scheme is implemented by reformulating the village fund allocation scheme and adding village performance indicators. The indicator is used to measure village performance (green village index). There are several dimensions and indicators in the assessment of the green village index in Siak Regency.

1. Rescue & Environmental Protection

- a. Village Rescue and Environmental Protection Regulation Policy
 - b. Budget Allocation for Rescue and Environmental Protection Villages
 - c. Innovations and activities of the Village Government and the community in saving the environment
 - d. Village Institutions for Rescue and Environmental Protection
 - e. Building Village Index (IDM) Environmental Aspects
2. Economic Improvement and Poverty Reduction in line with the principle of environmental sustainability
- a. Village Regulation Policy Economic Improvement and Poverty Reduction
 - b. Village Budget Policy for Economic Empowerment and Poverty Reduction
 - c. Decrease in the Number of Poor Families in Villages
 - d. Innovations and activities of the Village Government and the economic community and Poverty Reduction in line with Environmental Protection
 - e. Developing Village Index (IDM) Economic Aspects

Based on the green village performance database in 2020 submitted by the head of the green Siak secretariat team, there were several improvements in the achievement of the green village policy as seen from each indicator which can be seen in Table 1:

Table 1. Performance Achievements of Green Village indicators in Siak Regency 2020

Green Village Performance Indicators	Performance Achievements in Siak Regency
Rescue & Environmental Protection	1. Environmental Protection Policy (15 Village Regulations, 1 Village Head Regulation, 98 Village Head Decrees/Circulars) 2. The Village Budget allocated for environmental preservation and protection efforts reaches IDR. 5,153,900,000 3. The institutions formed reached 107 Environmental Protection Institutions/Communities 4. There are 20 Village Innovations and 126 Village Environmental Protection Activities
Economic Improvement and Poverty Reduction in line with the principle of environmental sustainability	1. Village Economic Improvement Policy (7 Village Regulations, 34 Village Decrees/Circular Letters of Village Heads) 2. Village Budget for Economic Empowerment IDR. 7,817,304,000 3. There are 19 innovations & 84 community economic development activities at the village scale

Source: Expose of Riau Hijau Secretariat Team Leader at Ecological Fiscal Transfer, 2021

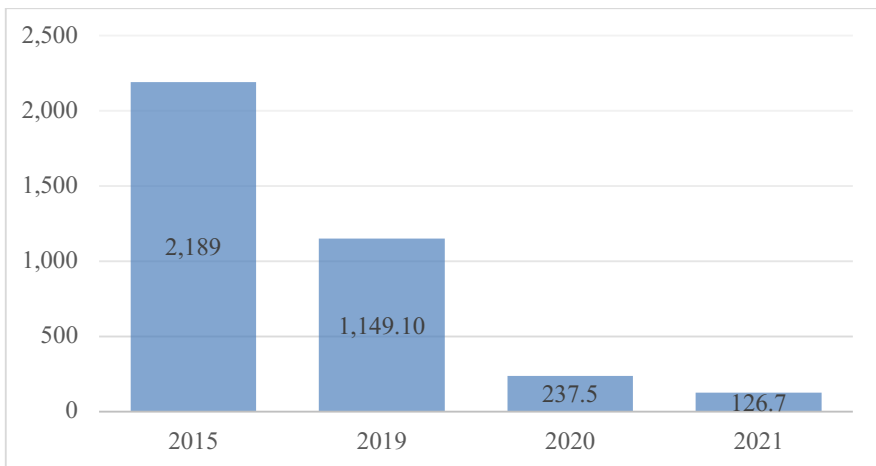
The success of the green village in the green siak framework is seen from the level of community participation in filling and submitting self-assessment forms in accordance with the performance achieved in accordance with predetermined indicators, with the filling stages referring to the self-assessment filling guidelines managed by the Siak District Community and Village Empowerment Service, which are;

- a. The village government fills in data and information and attaches supporting documents (verification tools).

- b. The Village Government fills in and returns the results of the Self-Assessment filling sheet to the Siak District Community and Village Empowerment Service Office
- c. Submission of the self-assessment form document is carried out by sending it via email to the assessment team or submitting it directly to the Siak District DPMK Office.
- d. The assessment team verifies the self-assessment form received from each village government. Forms that are not equipped with supporting documents or verification documents cannot be assessed by the Assessment Team.

The success rate of the green village index is evident in the increased implementation of village government policies aimed at preserving natural resources, fostering economic growth grounded in both local potential and ecological-based business development, and enhancing community engagement in environmental protection through established institutions and field actions. This includes the formation of Fire Care Community groups in nearly all villages in Siak, along with numerous village-level innovations in environmental protection. A notable environmental impact is evident in the decline in forest fire incidents annually in Siak District since the implementation of the Siak Green District policy and the introduction of environmental performance incentives for village governments in 2019-2021, in comparison to the period 2015.

Graphic 1. Trend in the number of forest fires in Siak district 2015, 2019, 2020 and 2021



Source: Expose of Riau Hijau Secretariat Team Leader at Ecological Fiscal Transfer at FGD: Innovation Model for Green Siak Policy Collaboration, 2024

In the context of optimizing data collection and measurement of green village performance indicators, an information system was also prepared which was built in collaboration with the Siak District government and Sedagho Siak. This Green Siak District information system contains information on the Siak District Environmental Information System which is integrated into the Green Siak website. In addition, it is a means of promoting village initiatives, tourism development and the creative economy.

This system also presents information on the collaboration of parties in support of the implementation of Siak Hijau District, activities of development partners (CSOs and Private Sector) for the Implementation of Siak Hijau District. In addition, there is also a map of information on the work areas of development partners in supporting the implementation of Siak Green District as well as information and events of Siak District.

Environmental performance indicators are essential tools for assessing and improving the sustainability of villages. By monitoring key indicators such as soil quality, water usage, energy consumption, waste management, and biodiversity, villages can identify areas for improvement and implement sustainable practices. However, several challenges, including data availability, lack of awareness, financial and institutional constraints, and cultural and social barriers, hinder the effective implementation of these indicators. Addressing these challenges through enhanced data collection, education, financial support, and interdisciplinary research. Despite the importance of environmental performance indicators, several challenges hinder their effective implementation in villages. These challenges include:

1. **Data Availability and Quality;** One of the primary challenges in implementing environmental performance indicators is the availability and quality of data. Many villages lack the resources and infrastructure to collect and analyze environmental data, making it difficult to assess environmental performance accurately [Robling et al., 2023]. In Siak District, there are still villages that have not sent IKLH Village self-assessment data, including 62 villages in 2021, 28 villages in 2022, and 51 villages in 2023. This is due to the transition of manual data management to application-based and the lack of follow-up socialisation carried out by the Village. In addition, villages are limited in properly documenting environment-based activities, which affects the quality of the data presented.
2. **Lack of Awareness and Education;** Many villagers, particularly smallholder farmers, lack awareness and education in terms of environmental performance indicators and their importance. This lack of knowledge can hinder the adoption of sustainable practices and the effective use of indicators [R. Wang et al., 2019; Woodgate et al., 2013]. In Siak District, there are still villages that did not complete the self-assessment and do not have environmental protection practices in the village. This is more due to the lack of support in the form of community-based assistance and empowerment and the lack of capacity of village governments in fulfilling the requirements of the IKLH Village assessment instrument.
3. **Financial and Institutional Constraints;** Financial and institutional constraints are another significant challenge in implementing environmental performance indicators in villages. Many villages lack the financial resources and institutional capacity to invest in sustainable practices and monitor environmental performance effectively [Tang et al., 2024; Woodgate et al., 2013]. In Siak District, problems related to the allocation of village budgets that support environmental performance are still a major obstacle, this is due to the presence of development priorities that are still dominated by physical development, while from the institutional aspect, it has not been seen from the formation of village institutions that are integrated and consistent in carrying out their activity programmes related

to environmental protection efforts. In addition, there are limited partnerships with companies that produce in the village area, especially in collaborating with environmental funding through corporate CSR.

4. **Cultural and Social Barriers;** Cultural and social barriers can also hinder the effective implementation of environmental performance indicators in villages. For example, traditional practices and social norms may resist changes in agricultural practices, making it difficult to adopt sustainable practices [Tang et al., 2024; Y. Wang et al., 2023]. In Siak District, there are still patterns of agricultural and plantation governance behaviour that have not adopted sustainable good practices and utilise environmentally friendly renewable energy. In addition, there is still a lack of local community-based empowerment approaches that have not optimised local strengths in sustainable development efforts.

The impact of green village-based rural development is multifaceted, encompassing environmental, economic, and social dimensions. This approach aims to integrate sustainable practices into rural development, enhancing ecological health, economic resilience, and community well-being. Green village initiatives often involve the adoption of renewable energy, sustainable agriculture, and eco-friendly infrastructure, which collectively contribute to the sustainable development goals. The following sections detail the various impacts of green village-based rural development. Green village initiatives significantly improve the ecological environment by promoting afforestation, wetland construction, and sustainable natural resource management [Ma, 2024; Rahmayanti et al., 2024][Ma, 2024] [Rahmayanti et al., 2024]. The development of green economies in rural areas boosts economic growth by diversifying income sources and enhancing competitiveness [Purnamawati et al., 2023; Tambovceva & Tereshina, 2018]. Community-based ecotourism and educational initiatives in rural areas foster social transformation by enhancing livelihoods and promoting cultural heritage [Khanum, 2024; Kunjuran et al., 2022]. While green village-based rural development offers numerous benefits, challenges remain. The adoption of green practices can be hindered by limited access to technology, financial resources, and policy support. Additionally, the socio-economic benefits of such initiatives may not be evenly distributed, necessitating targeted interventions to ensure inclusivity and equity. Addressing these challenges requires a collaborative effort among policymakers, communities, and stakeholders to create a resilient and sustainable rural ecosystem.

Ecologically based district budget transfer policies, often referred to as Ecological Fiscal Transfers (EFTs), have emerged as a critical tool for promoting environmental conservation and sustainable development at the local level. These policies allocate funds to villages and local governments based on ecological performance, aiming to incentivize the protection of natural resources and the adoption of sustainable practices. To maximize the impact of EFTs, several mechanisms must be in place. These include: (1) **Clear Criteria and Indicators:** Establishing well-defined criteria for fund allocation ensures that villages are rewarded for measurable ecological outcomes [Liu et al., 2024; Nasir, 2022b]. (2) **Participatory Processes:** Involving local stakeholders in policy design and implementation enhances accountability and acceptance [Kabullah, 2022; Nasir, 2022b]. (3) **Financial Incentives:** Providing adequate funding and ensuring

efficient absorption of funds are essential for driving environmental and economic improvements [Anto et al., 2024; Liu et al., 2024]. (4) Policy Coordination: Aligning EFTs with broader development goals ensures that environmental conservation is integrated into local economic planning [Laksana, 2024; Yang, 2023].

4 Conclusion

The concept of ‘green’ is not just a status or trend, but an ongoing process that encompasses ways of living, working, and building with sustainability in mind. To realise an effective green policy, commitment is needed in the form of a green constitution, green regulations, and green budgeting that support environmental protection. One of the green policy implementations in Indonesia is the Siak Hijau programme, which aims to encourage sustainable development in Siak District. This programme is realised through TAKE (Ecology-Based District Budget Transfer), which is an incentive scheme for villages that demonstrate good performance in environmental management and ecology-based economic development. Green village performance indicators are measured based on aspects of environmental protection and economic improvement in line with sustainability principles.

Despite various successes in the implementation of green village policies, such as improved environmental regulations, increased village budget allocations for the environment, and reduced incidences of forest fires, there are still challenges such as lack of community awareness, limited financial and institutional resources, and social and cultural barriers in adopting sustainable practices. To overcome these challenges, a collaborative approach between the government, communities, and the private sector is needed to strengthen ecological fiscal policies, improve village capacity in environmental management, and ensure the economic sustainability of ecologically based villages. Thus, green village development can become a sustainable and inclusive development model.

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