GREEN ECONOMY INNOVATION: PARTNERSHIP BETWEEN SMES AND FOREST FARMER COMMUNITIES IN UTILIZING NON-TIMBER FOREST PRODUCTS

INOVASI EKONOMI HIJAU: KEMITRAAN ANTARA UMKM DAN KOMUNITAS PETANI HUTAN DALAM PEMANFAATAN HASIL HUTAN BUKAN KAYU

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Abstrak: Studi ini menganalisis dampak kemitraan strategis antara UKM dan komunitas hutan pada kesejahteraan ekonomi dan pelestarian lingkungan. Kemitraan ini mengintegrasikan pelatihan teknis, akses pasar, dan praktik pengelolaan hutan berkelanjutan untuk meningkatkan pemanfaatan hasil hutan bukan kayu, seperti penyadapan resin damar. Dengan pendekatan campuran metode eksplanatori berurutan, penelitian ini menggabungkan analisis kuantitatif dari survei dengan wawasan kualitatif dari wawancara dan observasi. Temuan menunjukkan peningkatan signifikan pada pendapatan rumah tangga, keterampilan teknis, dan akses pasar, yang berkontribusi pada stabilitas ekonomi dan peningkatan kualitas hidup masyarakat. Kemitraan ini juga mendorong kesadaran lingkungan melalui program reboisasi dan praktik penyadapan ramah lingkungan yang mendukung pelestarian ekosistem jangka panjang. Model ini menunjukkan pendekatan holistik dalam menghadapi tantangan sosial dan ekologis, menawarkan kerangka kerja yang dapat direplikasi untuk memberdayakan komunitas sambil memastikan pengelolaan sumber daya yang berkelanjutan. Penelitian mendatang akan mengeksplorasi dampak jangka panjang, integrasi teknologi canggih, dan pembiayaan hijau untuk meningkatkan efektivitas model ini.

Kata kunci: hasil hutan bukan kayu, kemitraan strategis, pengelolaan hutan berkelanjutan

Abstract: *This study analyzes the impact of strategic partnerships between SMEs and forest farming communities on economic welfare and environmental conservation. These partnerships integrate technical training, market access, and sustainable forest management practices to enhance the utilization of non-timber forest products, such as damar resin tapping. Using a sequential explanatory mixed-methods approach, the research combines quantitative analysis from surveys with qualitative insights from interviews and observations. Findings reveal significant improvements in household income, technical skills, and market access, leading to economic stability and enhanced quality of life for community members. The partnerships foster environmental awareness through reforestation programs and eco-friendly tapping practices supporting long-term ecosystem preservation. This model demonstrates a holistic approach to addressing social and ecological challenges, offering a replicable framework to empower communities while ensuring sustainable resource management. Future research will explore long-term impacts, advanced technologies integration, and green financing to improve the model's effectiveness.*

Keywords*: non-timber forest products; strategic partnership; sustainable forest management*

INTRODUCTION

In recent decades, awareness of the importance of sustainable forest management has significantly increased (Giweta, 2020). Sustainable forest management involves conserving trees and using non-timber forest products (NTFPs). NTFPs such as damar resin, forest honey, rattan, and traditional medicinal ingredients offer economical alternatives for communities living near forests without causing ecological damage (Duffy et al., 2021; Gusmailina et al., 2020). With its high biodiversity, Gunung Gede Pangrango National Park stands out as a strategic area for NTFP management. This region presents significant economic opportunities through forest products like damar resin and forest honey, which can become primary sources of livelihood for local communities. However, challenges in

forest management remain, particularly in balancing economic exploitation with environmental conservation. Therefore, strategic partnerships between small and medium-sized enterprises (SMEs) and local communities emerge as potential solutions to optimize economic benefits while ensuring the sustainability of forest ecosystems.

Nevertheless, using NTFPs in Indonesia still faces several challenges, such as the lack of community knowledge and skills and limited support from the business sector (Harbi et al., 2023; Ulya et al., 2022). Uncontrolled exploitation of forest resources often leads to significant environmental damage, prompting the government to introduce regulations to balance utilization and conservation (Muslikhun, 2024). One of the main challenges is the low added value of NTFP products due to limited market access and technology (Pasaribu et al., 2021). In this context, forest communities often remain trapped in a cycle of poverty, as their income from NTFPs is insufficient to meet a decent standard of living (Sunderlin et al., 2003; Wang et al., 2023). Inequitable income distribution and limited technical capacity further hinder the optimization of NTFP utilization. Thus, a new approach is needed to sustainably improve community welfare through more effective and efficient NTFP management.

A proposed solution to this issue is strategic partnerships between SMEs and local communities, exemplified by CV Kartobi Maryam Sejahtera and the Karya Tani Forest Farmer Group (KTH) in Gunung Gede Pangrango National Park. This partnership focuses on managing non-timber forest products, particularly damar resin, by providing technical training, tools, materials, and market access to local communities. The program aims to enhance the added value of NTFP products and expand market access, thereby providing significant economic benefits to local communities. Moreover, the partnership integrates environmental conservation efforts through programs that benefit the forest. This collaborative approach contributes to increased community income and helps preserve forest ecosystems, which are vulnerable to damage from overexploitation (Kalogiannidis et al., 2022; Njurumana et al., 2020). Through this program, local communities gain job opportunities, improved skills, and more stable livelihoods.

Theoretical support for this initiative includes the sustainability approach, emphasizing the balance between economic, social, and environmental aspects. This approach aligns with the concept of sustainable development proposed by IUCN (2004), which underscores the importance of balancing natural resource utilization with ecological integrity (Bennett, 2004). Social capital theory is also relevant in this context, as it strengthens networks and relationships between local communities and the business sector (Carmen et al., 2022; Ceci et al., 2020). The strategic partnership implemented by CV Kartobi Maryam Sejahtera and the Karya Tani Forest Farmer Group reflects these theories, where social capital serves as a foundation for collaborations that yield economic benefits while maintaining environmental sustainability.

This study shares similarities with previous research in several aspects. For instance, Bannor et al. (2021) highlighted the importance of technical training, market information access, and value chain actor networks in empowering forest farming communities. This aligns with the focus of this study on the impact of technical training and support for forest farming communities in managing non-timber forest products. Nambiar (2021) also emphasized the role of partnerships between small farmers and the private sector in supporting green economic growth, land restoration, and poverty alleviation, which parallels this study's focus on strategic partnerships between SMEs and forest farming communities. Furthermore,

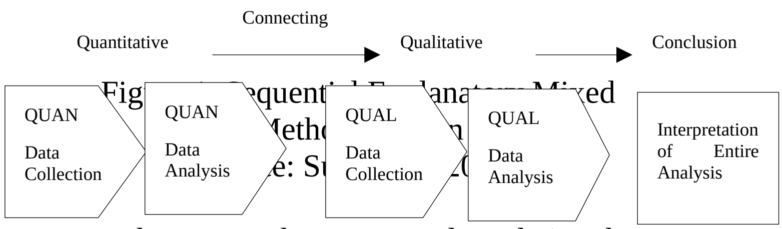
Muttilainen & Vilko (2022) underlined the importance of diversifying NTFP production as a green economic opportunity and the need for effective communication and collaboration in the value chain, which is also central to the partnership model in this study. However, this study significantly differs in its emphasis on the impact of strategic SME partnerships on economic welfare and environmental preservation in Indonesia. This contrasts with Bannor et al. (2021), which focused on farmer entrepreneurship within Ghana's reforestation framework; Nambiar (2021), which emphasized small forests for increased timber supply and climate change mitigation, and Muttilainen & Vilko (2022), which identified drivers and barriers for Finnish forest farmers in the non-timber forest product sector.

This research analyses the impact of strategic partnerships between SMEs and forest farming communities on community economic welfare and environmental conservation. Specifically, the research questions are as follows: (1) How does the technical training and support provided by CV Kartobi Maryam Sejahtera to farming communities improve skills and increase income in sustainable forest management? (2) What strategic partnership model is implemented between SMEs and forest farming communities in managing non-timber forest products? (3) How does this strategic partnership impact community economic welfare and the local environment? This study offers novelty by developing a strategic partnership model between SMEs and forest farming communities for NTFP management that improves community economic welfare and supports environmental conservation in Indonesia. Unlike previous studies focusing on individual entrepreneurship analysis, land restoration through small forest schemes, or barriers to NTFP diversification, this research integrates dimensions of technical training, community empowerment, and strategic collaboration within a unique local context.

The proposed model provides a holistic approach to addressing socio-economic and environmental challenges simultaneously. This study is expected to contribute significantly to developing partnership models that can be replicated in other regions and serve as a reference for sustainable forest management policies.

METHODOLOGY

This study employed a mixed methods approach with a sequential explanatory design, combining quantitative and qualitative approaches to comprehensively understand the economic conditions of the community, the strategic partnership model, and its impact on economic welfare and environmental preservation.



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The research was conducted in the vicinity of Gunung Gede Pangrango National Park, Sukabumi, which was chosen for several reasons: (1) the presence of an active strategic partnership between the SME CV Kartobi Maryam Sejahtera and the KTH Karya Tani forest farmer community in managing non-timber forest products such as damar resin and forest honey; (2) the high economic potential of non-timber forest products with stable market demand; (3) the biodiversity of the conservation area that supported local economic sustainability; and (4) the implementation of technical training programs and sustainability support by CV Kartobi Maryam Sejahtera. The study participants included KTH Karya Tani community members and CV Kartobi

Maryam Sejahtera employees who were directly involved in the strategic partnership.

This research identified the independent variable (X) as the strategic partnership between SMEs and forest farmer communities in managing non-timber forest products and the dependent variables (Y) as economic welfare and environmental preservation. Quantitative data were collected using Likert-scale questionnaires to measure the influence of the strategic partnership on economic welfare and environmental conservation. Data analysis was conducted using SPSS version 23 through descriptive and inferential analyses, including multiple linear regression, to test the relationships between variables. The research population consisted of 150 members of the KTH Karya Tani community and 12 employees of CV Kartobi Maryam Sejahtera, with a sample of 62 respondents determined using purposive sampling and the Slovin formula:

$$n = \frac{N}{1 + N\ x\ e^2}$$

$$n = \frac{162}{1 + 162\ (0.1^2)}$$

$$n = \frac{162}{2.62}$$

$$\approx 61.83$$

Where:

- n = Sample size
- N = Population size
- e = Margin of error (10%)

The sampling technique used in this study was purposive sampling based on specific characteristics or criteria. The respondent criteria were: (1) members of KTH Karya Tani who had been involved in the strategic partnership with CV Kartobi Maryam Sejahtera for at least one year, and (2) employees of CV Kartobi Maryam Sejahtera who were directly involved in managing non-timber forest products.

Quantitative data collection involved primary data from Likert-scale questionnaires distributed to members of the KTH Karya Tani community and CV Kartobi Maryam Sejahtera employees to measure the influence of the strategic partnership on economic welfare and environmental preservation. The Likert scale sought responses across aspects of (SS) Strongly Agree, (S) Agree, (TS) Disagree, and (STS) Strongly Disagree. Secondary data were obtained through documentation, including books, journals, reports, and relevant literature, ensuring the data collected provided a structured and measurable overview of the variables studied.

Qualitative data collection involved field surveys, in-depth interviews, and observations to gather relevant and comprehensive data. Field surveys used questionnaires to collect primary data related to the community's economic conditions before the strategic partnership, covering income, sources of livelihood, and welfare levels (Sugiyono, 2019). In-depth interviews employed a semi-structured approach involving selected informants to explore the impact of the strategic partnership between CV Kartobi Maryam Sejahtera and KTH Karya Tani on economic welfare and environmental preservation. Interviews were conducted using a pre-designed guide to strengthen data and minimize respondent bias (Soehartono, 2015). Observations were made to understand the practices of damar resin tapping, product processing, and environmentally friendly forest management by KTH Karya Tani, providing direct insights into the local context (Nasution, 2012).

Data analysis was conducted using both quantitative and qualitative methods. The quantitative analysis employed SPSS version 23 for processing data through validity, reliability, and classical assumption tests (normality, heteroscedasticity, multicollinearity) to

ensure the feasibility of the regression model. Multiple linear regression was used to measure the influence of the independent variable on the dependent variables, with T-tests for partial testing. Meanwhile, the qualitative analysis involved data reduction, presentation in narrative, table, or chart formats, and drawing conclusions based on identified patterns and themes, following the methods of Miles and Huberman. The validity of qualitative data was examined through technique triangulation (interviews, observations, documentation) and time triangulation (repeated data collection). Combining these methods provided comprehensive analysis results to describe the strategic partnership's relationship to economic welfare and environmental preservation.

RESULTS AND DISCUSSION

Quantitative Results: Economic Welfare Changes

One of the main focuses of this study is the impact of strategic partnerships on the economic welfare of communities living near the forest. Based on the survey results, there was a significant increase in the average income of respondents after engaging in strategic partnerships. Before the partnership, the average income of KTH Karya Tani members was approximately IDR 654,000 per month. After several years of the partnership, the average income increased to IDR 1,800,000 per month in 2024.

This income increase is attributed to several factors. First, the partnership provided access to technology and training that helped improve the production of damar resin, the primary non-timber forest product managed by KTH Karya Tani. CV Kartobi Maryam Sejahtera also expanded market access for damar resin products, which positively impacted price stability and market demand. With this partnership, farmers were no longer dependent solely on local markets but could sell their products to broader markets at more competitive prices.

For instance, the previously limited and fluctuating quality of damar resin tapping has significantly improved. Farmers can now produce approximately 10–20 kg of damar resin daily, harvested every 30 days. By 2024, the total monthly production reached 300 kg, with a stable selling price of approximately IDR 2,180 per kilogram, compared to the lower prices before the partnership began. This data indicates that farmers' incomes have increased significantly along with productivity and market access improvements.

The improvement in economic welfare is also reflected in other indicators, such as access to education and healthcare facilities. Some respondents reported that the additional income from non-timber forest products helped them finance their children's education and access better healthcare services. The partnership also impacted overall quality of life, with some respondents reporting improvements in their housing conditions and dietary patterns.

Description of Quantitative Data

Data collected from 62 respondents through questionnaires revealed considerable variation in income, skills, and work experience. Most respondents had been involved in the strategic partnership for more than two years, allowing researchers to analyze significant changes in their income and welfare. Income data showed that before the partnership, most respondents had incomes below the local poverty line, with an average monthly income of only around IDR 654,000. However, after participating in the strategic partnership for several years, their average monthly income increased to IDR 1,800,000. These results indicate a significant improvement in the community's economic welfare. In addition to income, other indicators used in the

quantitative analysis include improvements in skills and access to markets. Based on the survey, more than 70% of respondents reported that their skills in managing non-timber forest products (NTFP), particularly in tapping damar resin, significantly improved after attending training organized by CV Kartobi Maryam Sejahtera. This contributed to increased productivity and the quality of products they produced.

Table 4.1 Respondents' Monthly Income Before and After the Strategic Partnership

Respondent	Monthly Income 2017 (Rp)	Monthly Income 2024 (Rp)
R1	650,000	1,750,000
R2	660,000	1,800,000
R3	640,000	1,780,000
R4	655,000	1,790,000
R5	650,000	1,800,000
R6	645,000	1,770,000
R7	655,000	1,785,000
R8	650,000	1,800,000
R9	660,000	1,820,000
R10	650,000	1,800,000
R11	655,000	1,790,000
R12	650,000	1,780,000
R13	645,000	1,770,000
R14	660,000	1,810,000
R15	650,000	1,800,000
R16	655,000	1,795,000
R17	650,000	1,785,000
R18	645,000	1,770,000
R19	660,000	1,820,000
R20	650,000	1,800,000
...	...	...
R62	660,000	1,820,000
Average	654,000	1,800,000

Table 4.2 Strategic Partnership Score (X) and Economic Welfare (Y)

Respondent	Strategic Partnership Score (X)	Monthly Income (Y - IDR)
R1	0	650,000
R2	0	660,000
R3	0	640,000
R4	0	655,000
R5	0	650,000
R6	0	645,000
R7	0	655,000
R8	0	650,000
R9	0	660,000
R10	0	650,000
R11	0	655,000
R12	0	650,000
R13	0	645,000
R14	0	660,000
R15	0	650,000
R16	0	655,000
R17	0	650,000
R18	0	645,000
R19	0	660,000
R20	0	650,000
R21	1	1,750,000
R22	1	1,800,000
R23	1	1,780,000
R24	1	1,790,000
R25	1	1,800,000
R26	1	1,770,000
R27	1	1,785,000
R28	1	1,800,000
R29	1	1,820,000
R30	1	1,800,000
R31	1	1,790,000
R32	1	1,780,000
R33	1	1,770,000
R34	1	1,810,000

Respondent	Strategic Partnership Score (X)	Monthly Income (Y - IDR)
R35	1	1,800,000
R36	1	1,795,000
R37	1	1,785,000
R38	1	1,770,000
R39	1	1,820,000
R40	1	1,800,000
...	...	...
R62	1	1,820,000

Description: Strategic Partnership Score (X): 0 = Before the partnership (2017), 1 = After the partnership (2024). Monthly Income (Y) is measured in Indonesian Rupiah (Rp).

Simple Linear Regression Analysis

Based on the data above, a simple linear regression analysis was conducted to examine the effect of strategic partnerships on the community's economic well-being.

Regression Equation:

$$Y = a + bX$$

Where:

Y = Economic well-being (Monthly Income in IDR)

X = Strategic partnership (0 or 1)

Regression Results:

Intercept (α) = 654,000

Regression coefficient (b) = 1,146,000

Thus, the regression equation becomes:

Y = 654,000+1,146,000 X

This indicates that after the establishment of a strategic partnership (X = 1), monthly income increases by IDR 1,146,000.

Significance Test:

The p-value = 0.000 (p < 0.05), indicating that the effect of strategic partnerships on economic well-being is statistically significant.

Analysis of T-Test and F-Test

The T-test tests the partial significant effect of each independent variable on the dependent variable. Based on the T-Test results, strategic partnerships significantly affect the community's economic welfare, as evidenced by a T-calculated value more significant than the T-table value and a p-value < 0.05. Meanwhile, the F-Test is used to test the simultaneous significant effect of the independent variables on the dependent variable. Based on the F-Test results, the regression model used in this study is substantial overall, with an F-calculated value more significant than the F-table value. This indicates that the independent variable (strategic partnership) collectively influences the dependent variables (economic welfare and environmental preservation).

Qualitative Analysis

Qualitative data obtained from in-depth interviews and field observations were analyzed using thematic analysis techniques, where key themes emerging from the interviews were identified and further examined. This qualitative analysis aims to deepen the understanding of how strategic partnerships influence economic welfare, community skills, and environmental preservation.

Skill Enhancement

One of the main themes identified from the interviews is the significant

improvement in skills among members of the Karya Tani Forest Farmers Group (KTH Karya Tani). Before the partnership, many farmers had only basic knowledge of damar resin tapping. However, they learned more modern and environmentally friendly tapping techniques after participating in training sessions organized by CV Kartobi Maryam Sejahtera. This has allowed them to increase production without damaging the environment, thereby ensuring the sustainability of damar trees as a primary source of non-timber forest products (NTFPs). In addition to technical skills, the training also covered aspects of small business management and financial literacy. Several respondents reported that this training helped them manage their income more wisely and systematically. As a result, they could allocate portions of their income for savings, business investments, and their children's education.

Wider Market Access

Before the strategic partnership, most farmers in KTH Karya Tani faced difficulties marketing NTFPs, particularly damar resin, to broader markets. Local markets were often unstable, with fluctuating prices and uncertain demand. However, through the strategic partnership, CV Kartobi Maryam Sejahtera has played a key role in helping farmers access broader and more stable markets. Interviews with several farmers revealed that the improved marketing network provided by this partnership helped stabilize product prices and ensure continuous demand. CV Kartobi Maryam Sejahtera also supported efforts to improve product quality, enabling NTFPs from KTH Karya Tani to compete in national and international markets.

Environmental Preservation

From an environmental perspective, the partnership also contributes positively to conservation efforts. Training programs organized by CV Kartobi Maryam Sejahtera emphasized the importance of sustainable forest management, particularly in environmentally friendly damar resin tapping techniques. Interview results showed that farmers are now more aware of the importance of preserving damar trees and forest ecosystems as long-term sources of livelihood. Some farmers also participate in reforestation programs, planting damar trees to ensure the sustainability of these natural resources. Additionally, joint forest patrols conducted by the community with support from CV Kartobi Maryam Sejahtera have helped protect forest areas from illegal logging and encroachment.

Challenges Faced

Despite the success of this partnership in many aspects, in-depth interviews also revealed several challenges still faced by forest farming communities. One major challenge is the limited access to advanced technology to improve production efficiency. Additionally, some farmers face difficulties securing the business capital needed to expand production scale. Infrastructure constraints remain problematic, with inadequate road access to markets and transportation facilities. This affects the distribution of NTFPs to distant markets and slows down the delivery process, ultimately impacting farmers' income.

Discussion

The technical training provided by CV Kartobi Maryam Sejahtera aligns with the capacity-building approach to community empowerment. According to Surya et al. (2021), empowerment through technical training can enhance the capabilities of individuals and communities to optimize resource utilization. The training outcomes, which enable farmers to improve their skills without damaging resin trees, also support the principle of sustainability (Baipai et al., 2023; Kandel et al., 2022). The increase in farmers' income from IDR 654,000 to IDR

1,800,000 per month demonstrates the significant impact of providing access to training, technology, and markets. These findings are consistent with the study by Liu et al. (2022), which highlighted that technical training and market support can substantially improve the income of smallholder farmers.

The strategic partnership between CV Kartobi Maryam Sejahtera and the forest farmer community KTH Karya Tani reflects an inclusive business model approach that emphasizes collaboration for community economic empowerment. As Porter and Kramer explained in the concept of Creating Shared Value (CSV), partnership strategies involving training, marketing support, and improved access to technology can create shared value for SMEs and farmers (Khubana, 2023). The sale of resin products in national and international markets is also relevant to the findings of Noack & Larsen (2019), who showed that expanding market access can enhance farmers' income and economic stability.

The economic impact of this partnership, such as increased farmer income and improved quality of life, supports the theory of livelihood sustainability (Roscher et al., 2022), which emphasizes the importance of diversifying income sources for economic well-being. Additionally, adopting environmentally friendly tapping techniques and reforestation programs aligns with the principles of ecological modernization (Chisika & Yeom, 2024), where technological innovation and collaboration enhance natural resource management. Support for forest patrols, which help prevent illegal logging, further aligns with Tomas & López (2018) findings in Governing the Commons, which emphasize that community-based resource management can serve as a solution to prevent ecosystem degradation.

This study offers advantages over previous research by specifically integrating an analysis of the impact of strategic partnerships between SMEs and forest farmer communities on utilizing non-timber forest products for economic well-being and environmental conservation, using quantitative and qualitative approaches. Earlier studies tended to focus on aspects such as farmer entrepreneurship (Bannor et al., 2021), the role of smallholder farmers in tropical landscape restoration (Nambiar, 2021), or the drivers and barriers in non-timber production (Muttilainen & Vilko, 2022), without delving deeply into the collaboration between farmers and SMEs and its holistic impact. The findings of this study support previous research regarding the importance of technical training and market access (Bannor et al., 2021; Muttilainen & Vilko, 2022), as well as the critical role of smallholder farmers in the green economy (Nambiar, 2021). However, this study adds a new perspective by highlighting the direct influence of partnerships on income, skill enhancement, and price stability, which were not explored in detail in prior studies. Furthermore, the study's contributions to environmental conservation through reforestation programs and environmentally friendly tapping techniques align with findings by Muttilainen & Vilko (2022) and Nambiar (2021), emphasizing the importance of sustainability in forest resource management. This indicates that the study strengthens previous findings by providing a more integrated and applicable context.

The findings of this study demonstrate that strategic partnerships significantly impact the economic well-being of communities and promote environmental conservation. The increase in income, skills, and market access achieved through strategic partnerships elevates farmers' living standards and encourages them to care more about sustainable resource management. Training programs focused on environmentally friendly techniques and stable market access support synergy between economic and ecological aspects.

Thus, this strategic partnership model can be an example of similar initiatives in other regions to empower communities around forests while maintaining environmental sustainability. This underscores the importance of collaboration between the private sector and local communities to create holistic and sustainable solutions.

CONCLUSION

This study demonstrates that strategic partnerships between SMEs and forest farmer communities significantly enhance economic welfare and contribute to environmental conservation. Specifically, the partnership between CV Kartobi Maryam Sejahtera and KTH Karya Tani successfully integrates technical training, market access, and sustainable forest management practices. Addressing the research objectives, the findings indicate that this partnership has increased household incomes, empowered communities with technical skills, and promoted environmental awareness through reforestation programs and eco-friendly tapping techniques. However, future research is encouraged to delve deeper into the application of such models in various ecological and socio-economic contexts to evaluate their replicability and long-term impacts. Additionally, ongoing studies may explore integrating advanced technologies and green financial mechanisms, such as carbon financing or carbon credits, to optimize the outcomes of sustainable forest product management initiatives.

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46

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