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Universal Benefits of BRI "*Grow and Green*" for Climate Resilience in Tanjung Perepat, Berau

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Abstract

The Grow and Green program is an ecosystem restoration and environmental conservation activity that involves community entities by articulating land productivity through productive plants. BRI collaborates with the Bakau Benefit Universal Foundation (BakauMU) with the University of Muhammadiyah Berau (UMBerau), involving the Berkah Usaha Sejahtera Farmer Group as beneficiaries in improving the quality of forest resources and providing alternative economic income. The program has been implemented since 2023 on 28 hectares of land in Tanjung Perepat Village, Berau, East Kalimantan. The purpose of the service is to support restoration efforts, ecosystem preservation, and community economic improvement through improving the quality of forest resources to strengthen climate resilience. The method used is Participatory Action Research (PAR), which emphasizes the active participation of farmer group members. The framework uses a sustainability approach, planting pattern design, data collection techniques, and intensive monitoring. The service results provide solutions to optimize land through area governance efforts by maximizing the role and capacity of farmer groups, implementing low-emission forest management practices, and strengthening business governance as an inclusive economic investment. Communities derive universal benefits from durian planting activities from the balance between the environment and community welfare in ecological, economic, social, and cultural terms, as well as creating effective collective management of farmer group members that contributes to global climate resilience.

Keywords Bank Rakyat Indonesia; Climate Resilience; Grow and Green; Tanjung Perepat; Universal Benefits

1. INTRODUCTION

Ecosystem restoration performs several important ecological functions, such as mitigating the impacts of climate change, maintaining environmental sustainability, improving the water cycle, soil quality, and the function of damaged ecosystems, and conserving biodiversity (Pajerih, 2023). Economically, ecosystem restoration helps strengthen economic institutions through expanding business networks and increasing household income from non-timber forest products (Sanjaya, 2020). In addition, improved forest governance will increase community understanding of participatory policies, reduce emissions, and increase forest carbon storage (Kennedy & PKEP-FEB-UKI, 2024).

The Grow & Green "Restoring and Preserving Ecosystems" program is a collaborative initiative between PT Bank Rakyat Indonesia (BRI), Yayasan Bakau Manfaat Universal (BakauMU), Universitas Muhammadiyah Berau (UMBerau), and Berkah Usaha Sejahtera Farmer Group (KT. BUS). BAKAUMU Foundation, in partnership with UMBerau, empowers one of the forest farmer groups in Tanjung Perepat Village, collaboratively providing alternative livelihoods for the Village community in optimizing the productivity of their management area.

The tropical forest ecosystem in Tanjung Perepat Village continues to experience significant pressure (Gerona-Daga et al., 2024). The decline in the condition of forest ecosystems in this area generally occurs due to land conversion into plantation areas, commercial timber extraction as raw materials (buildings, ships, and housing), and other deforestation activities (Bhagarathi et al., 2024). The problem of forest management that does not pay attention to forest protection rules is mainly influenced by the lack of knowledge, the perception, attitude, and behavior of the community and stakeholders who do not support environmental conservation (Butarbutar, 2021). This is indicated by the persistence of illegal logging, limestone exploitation, and land conversion to oil palm plantations. These conditions lead to loss of forest biodiversity, threaten habitats and rare species, reduce the quality of ecosystem services in watersheds, and loss of connectivity between forest ecological zones, important corridors for biodiversity protection (Atmaja & IAIN Pontianak, 2023).

The selection of the program location on KT. BUS is based on the following considerations: 1) The farmer group management area is 170 hectares (SK. Head of Tanjung Perepat Village dated March 31, 2023 No. 525.1/71/Kp-TP/III/2023 and Decree of Biduk-Biduk Sub-District dated April 11, 2023 No. 525.1/95/Sektr-KBB/IV/2023 is within the area of other use areas (APL) which consists of residential areas, community

gardens and other land covering an area of 5,021 Hectares, 2) Tanjung Perepat Village is located in the Coastal and Small Islands Conservation Area - Derawan Islands and Surrounding Waters (KKP3K-KDPS) limited utilization zone (870.65 ha) and Other Zone (227.82 Ha), Sub Zone Tourism and Sustainable Fisheries - Coastal Park (IB) which has a sustainable Mangrove and coral reef ecosystem; **3)** Coincides with the distribution of 80% of mangroves from the total area of the Biduk-Biduk sub-district mangrove area; 4) 674.26 Ha Mangroves in the limited utilization zone of Tanjung Perepat KKP3K are designated as Indonesia's National Peat Hydrology Area (SK.129/MENLHK/SETJEN/PKL.0/2/2017); **5)** Supporting the sustainability of community livelihoods in natural resource development planning and land use in Tanjung Perepat Village, 5) KT. BUS is a strategic community entity in improving sustainable forest management practices.

Therefore, BRI implements the concept of green economy for climate resilience by restoring conservation, utilization, and protection of resources through the Grow and Green program in the KT. BUS management area. This also supports the effectiveness of low-emission community land use to improve the livelihoods of communities around the forest in line with supporting biodiversity conservation achievements. Land management of 28 hectares of preservation area was successfully maintained as productive land in carbon storage or reclassified as productive forest in Berau Regency, with an increase in the area of forest in APL status managed for conservation purposes in East Kalimantan.

Planting 2500 durian trees in Tanjung Perepat is a concrete step in increasing carbon stocks that support climate resilience and long-term investment in forest farming communities. BRI has articulated the productivity of the land to be planted with durian productive plants, interspersed with intercrops in the form of corn and chili. This program is also a strategy to strengthen farmer group institutions in increasing their capacity and welfare through participatory low-emission practices.

This village, located on the south coast, is the route to Berau Regency's leading marine tourism destination. Researchers observed that this region's potential tourist destination area needs to be developed through alternative tourist destinations by utilizing natural resources that have not been managed optimally along the coastal land. According to this estimate, planting 2,500 durian trees on 28 hectares of land is a real and effective way to reduce the impact of climate change. Another domino effect of planting 2,500 durian trees in Tanjung Perepat occurs in the economic, social, and cultural sectors. The development of alternative attractions other than marine tourism that dominates around the Tanjung Perepat area is an opportunity to create a variety

of ecotourism that prioritizes nature conservation in the form of agrosilvopasture, which compares agricultural practices, forest edge plantations, and livestock grazing. Therefore, through community service activities, researchers invite farmer group members and the community of Tanjung Perepat Village to plant and maintain productive plants, which are an important part of implementing a green economy. The management carried out on forest resources has avoided forest conversion and degradation, and is a long-term investment in maintaining the carbon storage of the lowland forest ecosystem that stretches at the foot of the Tanjung Perepat karst.

2. METHODS

Community service was implemented in Batu Sempit, Tanjung Perepat Village, Biduk-Biduk District, Berau Regency, East Kalimantan Province, in the management area of KT. BUS covering an area of 28 hectares. The type of plant planted is durian as many as 2,500 trees. The implementation began on June 20, 2023, and will last 4 years. Within this duration, routine maintenance, data collection on tree height and diameter, and monitoring data are input into the Montree database system every 4 months. In the planting area, corn and chili seeds are also planted as intercrops that can be harvested at any time to meet the daily needs of the farmer group members.

The method used in this service activity is Participatory Action Research (PAR), which emphasizes the active participation of farmer group members to understand the substance of the established partnership based on their perspectives and develop joint solutions. Partnerships are established to identify problems, plan actions, and evaluate the results, emphasizing collaboration, reflection, and collective action. The strategy consists of a sustainability approach, Site delineation and cropping pattern design, and Data collection and monitoring techniques.

The flow of the activity stages is presented in the following figure:

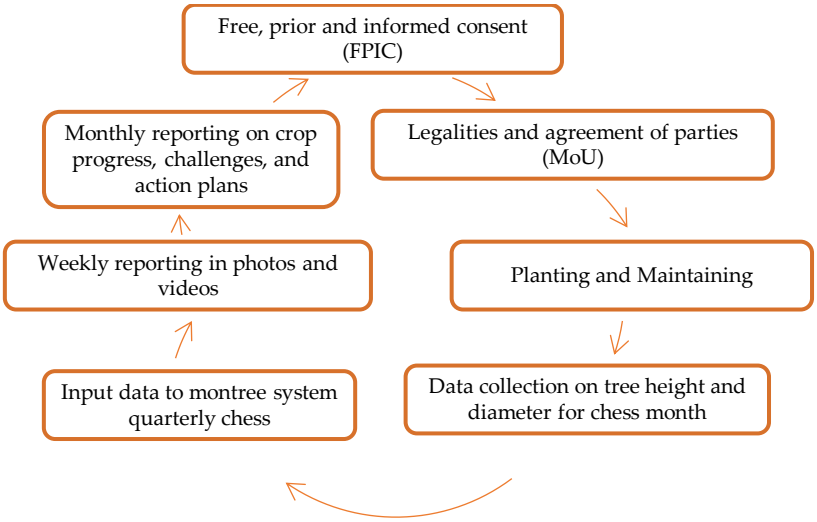

Figure 1. Launching of the Grow and Green Program

The strategy to perpetuate the program's benefits is formulated in sustainable implementation, namely, (1) Formulating a collaborative design agreement in a participatory manner through a populist economic scheme. It is expected that KT. BUS can continue the program stages in the form of protection and development of ecotourism even though it has not received program cooperation; (2) The Berau Regent's approval is the long-term target of the Biduk-Biduk sub-district and Tanjung Perepat village head's decision on the farmer group's management area on APL for conservation and ecotourism purposes; (3) KT. BUS as the manager will obtain significant benefits considering that the legality of management is the legal basis for authority and guarantees sustainability, even though the program cooperation has been completed; (4) The integration of planning in the Village Medium Term Development Plan (RPJMK) document is expected to encourage what BRI has initiated through the Grow and Green program to continue even though the support has been completed; (5) Capacity building brings benefits that will continue to be felt by farmer groups even after the cooperation has ended; (6) The people's economy scheme will provide a percentage of the profits from the income of farmer group members and the village's original income, so that farmers directly participate in the self-sustainability of Tanjung Perepat Village in the future; (7) Variations in APL area governance as an alternative destination to marine tourism in Biduk-Biduk will bring benefits to the sustainability of tourism in Berau Regency.

The planting design, landscape, and carrying capacity of the area were used to determine the planting delineation. This leads to conclusions about the landscape description and the carrying capacity of the area (Ayumadany et al., 2022). Marking of planting areas is done to demarcate which areas are suitable for use based on field

surveys. Durian tree planting uses a spaced planting method with a dimension of 10x10 meters with a planting pattern of 5 cardinal centers, where each planting position will show symmetrical lanes in all directions. This design allows enough space for each tree to get optimal sunlight, reduce root competition, and distribute nutrients and water. This ideal configuration allows durian trees to grow healthily and productively without getting in each other's way, minimizing the risk of disease and improving accessibility to tree care (Ramli et al., 2021). Implementing this pattern considers the contours of the land in the lowlands and hills. It does not damage local endemic plants such as Ulin, Bangkirai, and Meranti, which the part of Kalimantan's typical plants. Protecting local plant species also aims to maintain ecosystem diversity and provide natural habitats for fauna and their associations (Rohyani et al., 2022).

Tree height is measured using a scale pole, and tree diameter using a measuring card. Then, the KoboToolbox or Google Forms application records effectiveness and time efficiency in the field. Recording via this Android-based application also reduces the use of paper and streamlines the team in data collection and photo documentation (Nurhalimah et al., 2024). The resulting data is textual data integrated with spatial data, where the entered data can be linked to the information content matrix and further exported into the Montree system.

This activity focuses on monitoring tree development and the active involvement of farmer group members. This monitoring technique informs the condition of plant growth, potential pest and disease problems, causes of death, and other challenges. The data and information generated will be useful in developing control strategies and farmer group management effectiveness, solution designs, and collective follow-up plans.

3. FINDINGS AND DISCUSSION

Local community empowerment and environmental sustainability are interconnected aspects of sustainable development (Kurniawan et al., 2023). The planting and maintaining productive durian plants, as many as 2,500 trees, provide significant benefits to the Tanjung Perepat community, especially in learning the principles of land governance, institutional governance, and sustainable business governance.

Restoring and Preserving Ecosystems reflects a shared vision and mission in maintaining a balance between the environment and the welfare of society (Nebasifu

et al., 2024). The Grow and Green program is evidence of implementing a long-term green economy of ecological, economic, social, and cultural integration. It creates management effectiveness that contributes significantly to climate resilience globally. The universal benefits obtained include: Benefits of environmental and ecological services, Economic, social, and cultural benefits, Benefits of management effectiveness, and carbon stock contribution and long-term investment.

The management area of KT. Tanjung Perepat BUS covers a natural tropical moist forest, has high biodiversity, including typical flora and endemic fauna. This condition allows the restoration and preservation of ecosystems as the carrying capacity of the living environment for various ecological components. It provides important ecosystem services such as water regulation and carbon storage (Baskent, 2020). As a result, this area not only metamorphoses into productive land but also transforms into a conservation site and educational site that supports the preservation of biodiversity.

Figure 2. Launching of the Grow and Green Program

Figure 3. Durian Plant Maintenance.

Tree plantings are important as natural carbon sinks (Friggens et al., 2020), absorbing and storing atmospheric carbon dioxide in their biomass (Raihan et al., 2021). This process is an important factor in climate regulation. Tree planting is therefore a tangible and effective way to combat climate change (Apeh et al., 2023). Environmental impacts and benefits that will increase climate resilience and gradually reduce emissions will result from careful selection of tree species and planting sites, as well as ongoing maintenance and monitoring (A. & P., 2023).

The existence of communities in and around forests is an integral part of forest resource management (Limbong et al., 2023). Part of conservation education is increasing community engagement to enable the development of initiatives related to mitigation, livelihood development, tree and carbon monitoring, and community conservation area management (Chisika & Yeom, 2024). The Grow and Green program opens opportunities to improve community welfare through optimal community

economic empowerment efforts in synergy with implementing low-emission community practices.

Figure 4. Intercrop planting

The long-term benefit is the opportunity to develop alternative tourism in the southern coastal region of Berau, which is already known as a marine tourism destination. The existence of marine tourism is further encouraged by the development of a variation of ecotourism that prioritizes nature conservation in the form of agrosilvopastura that compares agricultural practices, forest plantations, and livestock grazing (Naparin & Lambung Mangkurat University, 2024). Good forest and environmental management is key in creating natural tourism attractions in this area and will benefit the local community economically (Sudini LP. & Arthanaya IW, 2022). The lifestyle of communities around forests, communities in forest conservation areas, and communities in non-forestry cultivation areas (KBNK) or APL (including plantations) are considered when developing a people's economy to empower rural communities (Nirzalin et al., 2023). The focus of this approach is to address several strategic issues relating to community engagement in resource rights that can be granted to communities in the region, as well as methods and actions that can be taken to pursue community rights by local culture (Zikargae et al., 2022).

The strategy of improving community welfare is focused on how the community can be directly involved in the program and how the program can help the community in natural resource management (Irawan et al., 2022). The Grow and Green program provides communities with the opportunity to be directly involved in forest management and ensures that communities have the right to manage natural resources through the concept of forest management (Ajijah et al., 2022).

Figure 5. The atmosphere during rest after plant maintenance.

The measure of effectiveness is a standard for achieving goals and objectives as an indicator of the extent to which communities and programs carry out their duties optimally (Palah et al., 2022). Things that affect effectiveness are size, level of difficulty, satisfaction, and results in carrying out an activity (Anis et al., 2021). In addition, evaluation is important if there is a misunderstanding of the level of productivity achieved to ensure a continuous process (Data-driven Machine Criticality Assessment – Maintenance Decision Support for Increased Productivity, 2022).

The Grow and Green program has had a significant impact on KT. BUS in streamlining work procedures persuasively and collectively. This is a valuable lesson for the local community in running the program and testing the organization's management capabilities (Rambe et al., 2023). This is evidenced by using organizational resources to achieve targeted goals through planning and decision making, organizing, leading, and controlling (Kozioł-Nadolna & Beyer, 2021). KT. BUS has created local champions and demonstrated performance achievements in commitment to carry out the process of planning, organizing, participating, and consistency of work by optimizing available resources for environmental restoration and preservation in line with program targets.

Based on the development results, 1 year after planting, the durian plants are visually increasingly showing encouraging developments and signs of high livability, characterized by the growth of twigs and leaves, the emergence of new shoots, and the plants are getting taller and increasing in diameter. Slowly, durian plants planted on 28 hectares of land have contributed to storing carbon and restoring productive ecosystems.

Figure 6. Data collection of tree height, diameter, and photos

The Intergovernmental Panel on Climate Change is the United Nations climate panel that states that the Earth's warming in the last century has occurred at a very high rate and is not natural (Knight, 2025). This factor can be attributed to human activities, particularly the massive use of fossil fuels worldwide (Evseeva et al., 2021). This is exacerbated by the massive release of carbon caused by deforestation and degradation on both land and sea (The Disastrous Effects of Deforestation and Forest Degradation in the Climate Vulnerability Era, 2022).

Without any efforts or actions to intervene in the rate of increase in Earth's temperature, there is a high possibility that BMKG's predictions will lead to disasters for humanity in the future (Sekaranom et al., 2021). Therefore, this service form is realized through concrete actions encouraging efforts to mitigate and adapt to climate change (Ajwang & Nambiro, 2022). This practical implementation of building practices includes protecting the environment, reducing carbon emissions, and promoting community well-being and economic growth (Adanma & Ogunbiyi, 2024).

The selection of the Tanjung Perepat area as a target village was motivated by the condition of its forest ecosystem, which continues to experience significant pressure due to land conversion into oil palm plantations, commercial timber extraction as raw material (buildings, boats, and housing), illegal logging, and limestone mining. Thus, community assistance targets the Berkah Usaha Sejahtera Farmer Group (KT BUS) as an association of farmers in Tanjung Perepat because it will degrade the function of the forest as a life support. This activity not only provides economic benefits, but can also provide social and environmental benefits, thus inspiring the neighbors of

Tanjung Perepat Village to care more about the environment and participate in nature conservation efforts (Baloch et al., 2022)

The effectiveness of community land utilization to improve the livelihoods of communities around the forest is in line with the support of biodiversity conservation achievements (López-Carr, 2021). In addition to restoring ecosystems to mitigate climate change, this program can increase community income (LÖFQVIST et al., 2023).

4. CONCLUSION

The mainstreaming of climate change issues has brought a low-carbon development mission that brings equitable welfare and inclusive economic growth, and climate resilience now and in the future. BRI's commitment to business and investment has been able to integrate environmental, social, and governance concepts in a sustainable area management program model in Tanjung Perepat and bring innovations, green economy investments, and broader community behavior change campaigns. The Grow and Green program has provided a cost-effective solution to the challenge of increasing emissions, strengthening its reputation, position, and strategic role in supporting the government's commitment to face the challenges of global climate change through implementing a national-scale pilot program, and the first in Indonesia.

At the level of community institutions, the Grow and Green Program has significantly impacted farmer groups in streamlining work patterns persuasively and collectively. This is evidenced by creating a process of using institutional resources to achieve targeted goals through planning and decision-making, resources to achieve the targeted goals through planning and decision making, organizing, leading, and controlling. This process will give birth to local champions and show the achievement of farmer group performance in the commitment to carry out the planning, organizing, participation, and controlling process. Planning, organizing, participation, and consistency of work, optimizing resources for environmental restoration and preservation, aligned with program targets. Program targets.

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