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Balancing Agricultural Development and Conservation: Community Perspectives on Land Use Challenges in Lebong Regency, Indonesia

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A B S T R A C T

This research analyzes community perspectives on agriculture, plantation, and food programs in Lebong Regency, with a particular focus on the Double Cropping Season (MT2) program. This research draws upon three interconnected theoretical frameworks: Political Ecology Framework for analyzing power relations in environmental access, Sustainable Livelihoods Approach for examining rural community adaptations, and Adaptive Co-Management Theory for analyzing collaborative natural resource management. Using a mixed-method approach, the study was conducted in seven sub-districts with 100 respondents selected through cluster random sampling. The findings reveal varying levels of community satisfaction, with satisfaction indices reaching 76 in three main sub-districts and 66 in four companion sub-districts. 78% of the community supports program continuation with noted improvements. Key implementation challenges include inequitable land ownership structures, where the majority are tenant farmers, agricultural land conversion, and land conflicts related to conservation areas that cover 69.89% of Lebong Regency. Analysis through these theoretical frameworks reveals that successful agricultural development in Lebong requires fundamental changes in power distribution, institutional support, and program implementation approaches. The research recommends establishing a multi-stakeholder governance platform, modifying the MT2 program to focus on agricultural intensification, and adopting more flexible management approaches to balance agricultural productivity with conservation needs.

INTRODUCTION

The agriculture and plantation sectors play an important role in the economic and social development of developing countries (Hidayah et al., 2022; Pawlak & Kołodziejczak, 2020; Rahman et al., 2024; Schleifer & Sun, 2020; Sira & Pukala, 2020), including Indonesia (Bashir et al., 2019; Dewi et al., 2022). The role of the agriculture and plantation sector covers many important aspects of developing countries' development, from food security to poverty alleviation and rural development (Christiaensen & Martin, 2018; Lowder et al., 2021). The sector contributes significantly to gross domestic product (GDP) in many developing countries (World Bank, 2022), such as Indonesia, where it accounted for around 13% of total GDP in 2020 (Roseple, 2022). In addition, the sector is the main source of livelihood for a large proportion of the rural population, absorbing large amounts of labor and reducing unemployment (Fuglie et al., 2020; International Labour Organization, 2022).

While extensive research has been conducted on agricultural development in Indonesia, there is a notable gap in understanding the specific challenges faced by regions like Lebong Regency, where unique geographical, socio-cultural, and ecological factors intersect. Previous studies have largely focused on national-level policies or more economically central regions, overlooking the nuanced realities of areas with significant conservation zones (Euler et al., 2017; Santika, 2019). Agriculture and plantations have a role in ensuring national food security, reducing dependence on imports, and protecting the country from global food price shocks (Béné et al., 2019; Lipton & Saghai, 2017). In Indonesia, efforts to increase agricultural productivity have helped the country achieve rice self-sufficiency in some periods, although challenges remain (Ahsani & Ardian, 2020; Dewi, 2018). Furthermore, the sector also plays a role in poverty alleviation through increased agricultural productivity and crop diversification, which can increase the income of small and medium farmers and boost rural economic growth (Christiaensen & Martin, 2018; Dorosh & Thurlow, 2018). Also, agriculture and plantations have strong linkages with other sectors of the economy, driving growth in food processing, logistics, and microfinance services (Barrett et al., 2022; Dercon & Gollin, 2014).

This research contributes to the global discourse on sustainable agricultural development in regions with high biodiversity and conservation value. The challenges faced in Lebong Regency mirror similar issues in other developing countries where agricultural expansion often conflicts with conservation efforts (Rasmussen et al., 2018; Wanger et al., 2020). The study's findings resonate with global challenges in achieving Sustainable Development Goals, particularly SDG 2 (Zero Hunger) and SDG 15 (Life on Land) (Kroll et al., 2019; Pradhan, 2017). Although the role of the agriculture and plantation sector is crucial on a national and global scale, its implementation and impact may vary at the regional level (Erbaugh et al., 2017; Rigg et al., 2018). Each region in Indonesia has its characteristics that influence the development of the agrarian sector, including geographical, socio-cultural, and local economic factors (Ikhsani et al., 2020; Sondakh et al., 2021). Lebong Regency, located in Bengkulu Province, is one of the regions that has the complexity and potential of the agricultural sector in Indonesia (Rencana Strategis Kementerian Pertanian Tahun 2020-2024, 2021). With geographical advantages in the form of varied topography, ranging from lowlands to mountains, as well as a climate conducive to agriculture, this sector is one of the main pillars of regional economic development (BPS Kabupaten Lebong, 2023). An analysis of the economic structure of Lebong Regency reveals that the agricultural sector is still the backbone of the regional

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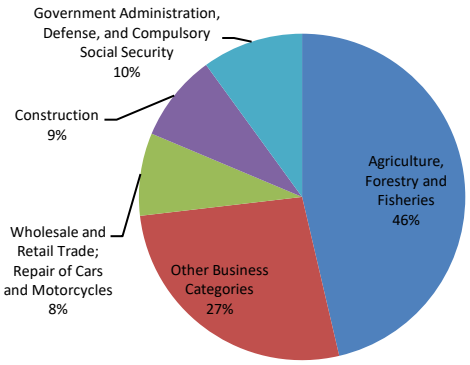
economy, contributing more than 30% to the Gross Regional Domestic Product (GRDP).

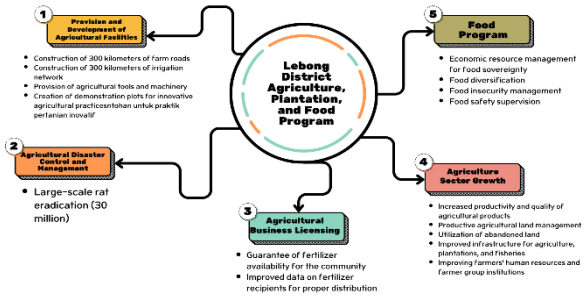
Figure 1. Percentage Distribution of GRDP by Business Field in 2022



Source: Lebong Regency Central Bureau of Statistics 2023

This condition not only reflects the economic significance of the sector but also underscores the need for sustainable agricultural policy development that can respond to challenges on the ground (Suharyanto, 2018). To this end, the Lebong District Government, through the Agriculture and Fisheries Service, has initiated six strategic programs to revitalize the agricultural sector and strengthen regional food security. These programs cover various aspects, including technological, socio-economic, and environmental, in response to the complexity of the challenges. A brief description of the programs can be seen in Figure 2 below:

Figure 2. Agriculture, Plantation, and Food Programs in Lebong District



Source: Lebong District Agriculture and Fisheries Office, 2023

The figure above provides an overview of the agriculture, plantation, and food programs implemented in Lebong Regency, which are expected to reduce regional dependence on one type of commodity and increase farmers' income. These programs are in line with one of the local government's flagship programs based on the vision of the Lebong Regent, to create an independent and advanced region in the agricultural sector. The flagship program is the 2-Time Planting Season (MT2) agricultural program, which focuses on staple food crops, namely rice. In addition to increasing agricultural productivity, the MT2 program also aims to open up new lands that have the potential to be used as agricultural land through the conversion of unproductive forests into agricultural land.

However, the implementation of these programs is faced with a complex reality. The dominance of tenant farmers, most of whom do not own their land, creates dynamics in the agrarian structure of Lebong District. This situation not only affects farmers' access to productive resources but also impacts the effectiveness of government programs and the distribution of development benefits (Mariyono, 2019). Furthermore, problems regarding land conflicts in Lebong District, where part of the area in Lebong District is a protected area. However, many residents open agricultural/plantation land in conservation areas, so vertical conflicts often occur between communities in the buffer zone area, who need agricultural land to support the family economy, and the government as a policy maker who will always try to protect the area on the grounds of forest sustainability.

Lebong Regency faces a critical dilemma in reconciling its agricultural development goals with its conservation responsibilities. With 69.89% of its area designated as conservation zones, the region struggles to implement agricultural expansion programs like MT2 without encroaching on protected areas. This situation is further complicated by inequitable land ownership structures, where most farmers are tenants with limited decision-making power.

Faced with this complexity in administering agricultural programs, local governments have adopted a participatory approach involving various stakeholders, including the central government, provincial government, universities, and non-governmental organizations (Tirta Pos, 2023). Previous studies have highlighted the effectiveness of participatory approaches in increasing the adoption of sustainable agricultural technologies and practices (Douthwaite & Hoffecker, 2017; Kraaijvanger et al., 2016; Sukomardojo et al., 2023). However, applying this concept in the specific context of Lebong District, with its unique socio-economic and ecological characteristics, still requires further exploration.

This research aims to fill this gap, with a focus on analyzing community perspectives on agriculture, plantation, and food programs in Lebong District. This research addresses two fundamental questions: what are the community's perceptions and support for the sustainability of agriculture, plantation and food programs in Lebong District, and what are the main challenges in implementing these programs in an area with significant conservation areas? To answer these questions comprehensively, this study has four specific objectives:.

First, to analyze the perceptions and support of the community regarding agricultural, plantation, and food programs in Lebong District, examining how local stakeholders view and engage with current agricultural initiatives. Second, to identify and examine the challenges faced in the implementation of these programs, with a particular focus on land-use conflicts and conservation policies, investigating the tensions between development needs and environmental protection. Third, to evaluate the effectiveness of the MT2 (Double Cropping Season) program and its implications on local agricultural practices and environmental sustainability, assessing both its economic benefits and ecological impacts. Fourth, to propose recommendations for more inclusive and sustainable agricultural development strategies that consider local ecological and social realities, ensuring that future policies better reflect the needs of all stakeholders.

To address this complex dynamic, this research draws upon three interconnected theoretical frameworks. The Political Ecology Framework (Robbins, 2012) provides a lens for analyzing

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how power relations and political-economic forces shape environmental access and management in conservation-rich areas. This is complemented by the Sustainable Livelihoods Approach (Scoones, 2009), which examines how rural communities adapt their agricultural practices within environmental and institutional constraints. The Adaptive Co-Management Theory Armitage et al., (2009) further enriches this theoretical foundation by providing insights into collaborative natural resource management approaches, particularly relevant for analyzing Lebong's innovative participatory governance strategies.

This research is based on the premise that communities, in this case farmers, have in-depth knowledge of the environment and challenges related to agriculture. Through a mixed-method approach that combines quantitative and qualitative analysis, this study aims to generate a comprehensive understanding of the interaction between government policies, social dynamics, and ecological realities on the ground. By understanding the perceptions, aspirations, and constraints the community faces, this research is expected to contribute to agricultural development that increases productivity and pays attention to aspects of social justice and ecological sustainability in Lebong District.

METHOD

This study employed a mixed-methods approach to examine community perspectives on agriculture, plantation, and food programs in Lebong District, Indonesia (Creswell, 2015; Tashakkori & Teddlie, 2015). The research design integrated quantitative and qualitative data collection and analysis techniques through a systematic framework that ensured comprehensive data gathering and analysis.

The sampling strategy utilized cluster random sampling (Taherdoost, 2018), chosen specifically to account for the geographical distribution of the MT2 (Double Cropping Season) program implementation. The selection process focused on seven sub-districts: three main sub-districts that served as MT2 demonstration plots (Bingin Kuning, Lebong Sakti, and Amen) and four companion sub-districts (Lebong Selatan, Lebong Tengah, Lebong Utara, and Uram). From each sub-district, two villages were strategically selected based on their proximity to the sub-district capital, with one village being the closest and another being the farthest, to ensure representation of varying accessibility conditions.

The sample size determination followed a structured approach within the cluster random sampling framework. With a total population of 58,676 (based on the 2023 General Election Permanent List), the study implemented a proportional distribution of respondents across the selected villages. Ten respondents were systematically selected from each village, resulting in a total sample size of 100 respondents (see table 1), which provided sufficient statistical power for quantitative analysis while maintaining feasibility for data collection.

For qualitative data collection, the study employed a case study approach specifically focused on analyzing the MT2 program implementation. In-depth interviews were conducted with key informants, including local agricultural officials, community leaders, and farmers from both main and companion sub-districts. This approach allowed for detailed exploration of program dynamics, implementation challenges, and community responses across different geographical and administrative contexts.

The research process followed a systematic procedure: initial data collection through questionnaires and interviews, rigorous data quality testing including validity and reliability assessments, careful editing and tabulation of collected data, comprehensive analysis using descriptive statistics for quantitative data and thematic analysis for qualitative insights, and finally, thorough interpretation leading to conclusion drawing. This methodological framework ensured both breadth and depth in understanding community perspectives on agricultural development programs in the region.

Table 1. Research locations

Sub-District	Village / Urban Village	Total of respondents
The three main sub-districts that became the demonstration plots of the MT2 agricultural program		
Bingin Kuning	Bungin Village	10
	Karang Dapo Atas Village	10
Lebong Sakti	Ujung Tanjung III Village	10
	Muning Agung Village	10
Amen	Pyang Mbik Village	10
	Selebar Jaya Village	10
Four accompanying sub-districts that did not become demonstration plots for the MT2 agricultural program		
Lebong Selatan	Turan Lalang Village	10
Lebong Tengah	Pagar Agung	10
Lebong Utara	Talang Ulu	10
Uram	Bentangur	10
Total		**100 Orang**

Source: processed research results, 2024

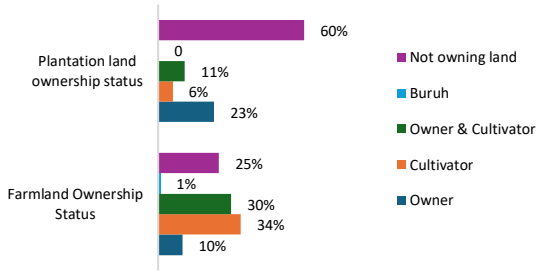
RESULTS AND DISCUSSION

Regional Characteristics of Lebong Regency

Lebong Regency, with an area of approximately 1,665.28 km², is the third largest regency in Bengkulu Province. The region consists of 12 sub-districts and has varied topography, including valleys, hills, and mountains. The dominance of hills with altitudes between 500 and 1,000 meters above sea level (masl) and an average monthly temperature of around 28.91 degrees Celsius make Lebong Regency very suitable for various types of plants (BPS Kabupaten Lebong 2023).

Despite favorable natural conditions, farmers in Lebong District face challenges to agricultural access, as most of them are sharecroppers who do not own their land (Figure 3). The majority of productive land, particularly that allocated for agrarian activities, is owned by an economic elite group, mostly individuals with strategic positions in the local government hierarchy. In this context, this group has full control over the land and applies a profit-sharing system that is considered unfavorable by tenant farmers. The most commonly applied profit-sharing system is an even split of two, in which the sharecroppers have to bear the entire cost of farming.

Figure 3: Agricultural and Plantation Land Ownership Status



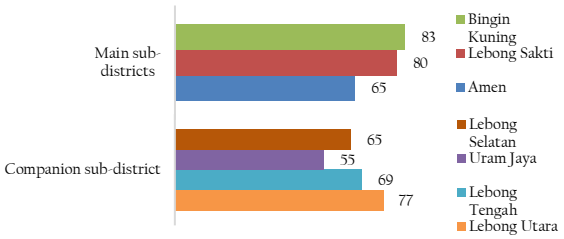
Source: research analysis results, 2024

The limited access of farming communities to agricultural land in Lebong District has an impact on economic uncertainty and hinders the long-term planning and development of agricultural businesses. The implications of this unequal access to land also have a substantial impact on the effectiveness of the implementation of agricultural programs, including the Twice Planting Period (MT2) Program. When landowners have a great deal of power in land-use decision-making, agricultural innovation programs can face resistance if they are perceived to be inconsistent with their interests. This directly affects long-term agricultural business planning and has the potential to hinder the achievement of the objectives of agriculture, plantation, and food programs organized by the Lebong District government.

Community Perspective

Analysis of the data obtained through the questionnaire instrument shows that the majority of people in Kabupaten Lebong are quite satisfied with the implementation of agriculture, plantation, and food programs initiated by the Lebong District Government. As shown in Figure 4, the community satisfaction index in the three main sub-districts of Bingin Kuning, Lebong Sakti, and Amen reached an average of 76. This finding indicates that people residing in these three sub-districts, which are the demonstration areas of the MT2 agricultural program, are generally satisfied with the implementation of agricultural, plantation, and food programs by the Lebong government in 2023.

Figure 4. Level of Community Satisfaction in the Three Main Sub-districts and Four Supporting Sub-districts



Source: research analysis results, 2024

On the other side, the four companion sub-districts - North Lebong, Central Lebong, Uram Jaya, and South Lebong - recorded an average community satisfaction index of 66. This shows that although the communities in these sub-districts feel the positive impact of the agricultural program, their level of satisfaction is not as high as the communities in the main sub-districts where the MT2 demonstration plots are located.

Based on the results of the analysis of the data obtained from the main sub-districts and accompanying sub-districts, it is known that there is a gap between areas that become demonstration plots of the MT2 agricultural program and areas that do not become demonstration plots of the MT2 agricultural program. This difference in satisfaction levels is influenced by several factors. One of the main factors identified was the limited agricultural extension through the MT2 farming program demonstration plots in the four accompanying sub-districts. The lack of access to information and guidance on modern and innovative agricultural practices directly affects the perception and satisfaction of local communities, which is reflected in the survey results that only reached an index of 66.

Furthermore, there are indications that the allocation of resources provided by the Lebong District Government tends to favor the main sub-district. The government often prioritizes the distribution of resources to the main sub-district to make them models of successful agricultural programs that can be replicated by other sub-districts. This approach is based on the hypothesis that success in key sub-districts can generate a positive demonstration effect, which in turn will encourage companion sub-districts to increase participation and adoption of similar agricultural programs.

However, this strategy has the potential to create disparities in the distribution of resources and program outcomes. Main sub-districts tend to receive more substantial allocations of budget, experts, and modern agricultural equipment, while sub-districts experience a lack of similar support. This disproportionate allocation of resources may result in differences in the effectiveness of program implementation and the level of community satisfaction in the two categories of sub-districts. Main sub-districts that receive more intensive support tend to show more optimal results, as seen in higher agricultural productivity and greater increases in farmers' income through the success of MT2. Amen sub-district, for example, which successfully implemented MT2, produced more rice production compared to other areas (Bencoolen Times, 2023). at the same time, the companion sub-districts experienced many crop failures, especially during the implementation of MT2.

Community Perceptions of Agriculture and Plantation Programs

The Lebong District Government has initiated a series of agriculture and plantation programs to support the agricultural sector and improve farmers' welfare. These programs cover a wide range of focuses, including the provision and development of agricultural facilities and infrastructure, agricultural disaster control and management, agricultural business licensing, and overall agricultural sector growth efforts (Table 2).

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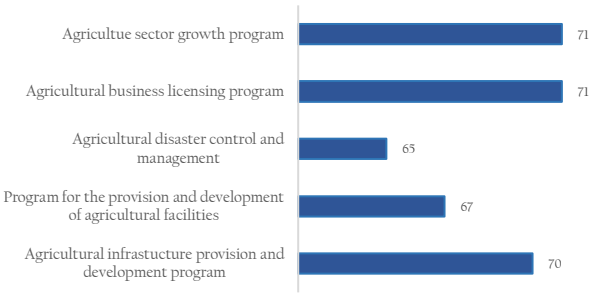
Table 2. Program Focus of Agriculture and Plantation of Lebong District

Program	Description
Provision and Development of Agricultural Facilities	• Farm road construction: 300 km • Irrigation network: 300 km • Provision of agricultural tools and machinery • Creation of demonstration plots for agricultural innovation
Provision and Development of Agricultural Infrastructure	Provision of agricultural equipment and other facilities
Agricultural Disaster Control and Management	Rat eradication: 30 million
Agricultural Business Licensing Program	• Guarantee of fertilizer availability for the community • Improved data on fertilizer recipients for proper distribution
Agriculture sector growth program	• Increased productivity and quality of agricultural products • Productive agricultural land management • Utilization of abandoned land • Improved infrastructure for agriculture, plantations, and fisheries • Improved human resources of farmers and farmer group institutions

Source: Lebong District Agriculture and Fisheries Office, 2023

The table above shows the diverse and ambitious focus of the program, which includes extensive agricultural infrastructure development, such as 300 km of farm roads and irrigation networks, as well as rat eradication with a target of 300 million rats, which is one of the main problems faced by farmers in lebong district, Furthermore, based on the agriculture and plantation programs, an analysis of the level of community satisfaction (Figure 5) indicates a generally positive response to the majority of the implemented programs. However, there are variations in satisfaction levels between programs that require special attention.

Figure 5. Level of Community Satisfaction with Agriculture and Plantation Programs



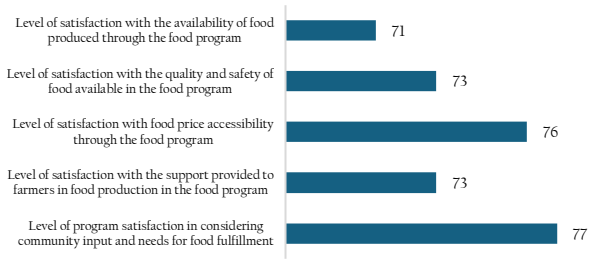
Source: research analysis results, 2024

Based on the research data, the majority of people in Kabupaten Lebong feel quite satisfied with the agriculture and plantation programs organized by the government. The level of community satisfaction is measured with a range of 1 to 100, where the average result shows a satisfaction level of 68.8. When looking at the numbers obtained in each program, the agricultural disaster control and management program obtained a relatively low number. Based on the results of interviews and field observations, this is due to the large number of rat infestations on farmers' farms. Where in 2023, after the rice harvest period was over, some farmers who tried to plant other crops, such as peanuts, chilies, corn, and others, experienced crop failure due to rat pests.

There are many factors contributing to rat infestation problems that originate from farmers' own activities due to their ignorance, including non-uniformity in planting times, which in turn creates continuous feed availability for rat populations, facilitating rapid population growth; improper management of crop residues, such as straw piles (batet) in the field, providing shelter and breeding grounds for rats, increasing the potential for the population explosion in the next planting season; and complex rat population dynamics.

As Jacob et al., (2010) reported, there is often an increase in the population of paddy rats in the second and third planting seasons. Sudarmaji et al. also noted that field mice can give birth up to three times in one growing season, especially during the generative phase of rice plants. The rapid reproduction pattern and adaptation of rats to the agricultural environment create additional challenges in the management of this pest. Efforts to control rat pests that have been carried out so far have not been fully effective, so pest attacks still occur in the field. The effectiveness of the rat eradication program is also influenced by the implementation of strategies at the field level. Although the target of eradicating 30 million rats has been set, without good coordination between farmers, extension workers, and the government, and without the application of more innovative pest control technologies and methods, the expected results are difficult to achieve. This condition is reflected in the number of farmers who experienced crop failure due to rat infestation and the low level of public satisfaction with the program.

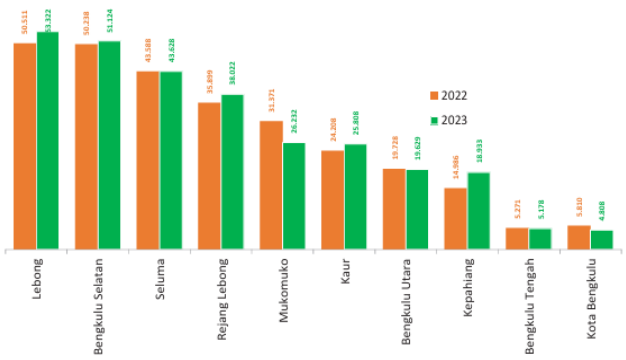
Figure 6. Level of Public Satisfaction with the Food Program



Source: research analysis results, 2024

One of the main factors affecting this level of satisfaction is an increase in food crop production, particularly rice. For most people, rice is very important for fulfilling food consumption because it is a staple food. Therefore, the success of food programs is measured by how well they can increase rice production to meet the needs of the community. In 2023, there was an increase in rice production in Lebong Regency, which is the region with the highest rice production in Bengkulu Province (Figure 7). This suggests that the programs implemented were successful in increasing agricultural productivity in these areas. This increase not only ensures sufficient rice availability for the local community but also contributes to food price stability and the economic welfare of the community.

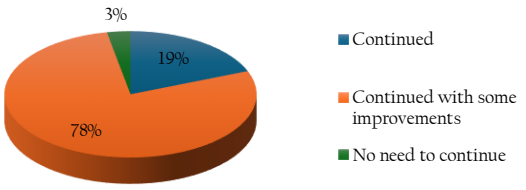
Figure 7. Rice Production in Bengkulu Province by Regency/City (TON-GKG), 2022 and 2023



Source: BPS Bengkulu Province, 2023

Based on a comprehensive analysis of the level of community satisfaction related to agriculture, plantation and food programs in Kabupaten Lebong, it is known that the implementation of these programs has shown significant effectiveness in meeting the needs of the community in the agricultural sector. This indication is reflected in the majority of respondents expressing an adequate level of satisfaction with the implementation of these programs. Furthermore, this level of satisfaction is manifested through community support for the sustainability of the programs in agriculture, plantations, and food (Figure 8).

Figure 8. Lebong Community Support for the Sustainability of the Lebong Regional Government's Agriculture, Plantation, and Food Program 2023.



Source: research analysis results, 2024

The majority of people in Lebong District, 78%, support the continuation of the agriculture, plantation, and food programs with a note to make some improvements in their implementation, followed by 19% of people who support the continuation of the agriculture, plantation, and food programs without improvements, and 3% of people who think that these programs do not need to be continued in the future. However, it should be noted that the "moderate" level of satisfaction suggests that there is room for further improvement and optimization. This can serve as a basis for the local government to conduct an in-depth evaluation and refinement of the program to increase its effectiveness and positive impact on the welfare of the agricultural community in Lebong District.

Critical Review of Lebong District's Agriculture, Plantation and Food Program

In the implementation of agricultural programs, the Lebong District Government has one flagship program that is in line with the vision of the Lebong Regent, to create an independent and advanced region in the agricultural sector. The program is the *Musim Tanam 2 Kali* (MT2) agricultural program, which focuses on staple food crops, namely rice. In addition to increasing agricultural productivity by conducting a rice planting period twice a year, the MT2 program also aims to open up new lands that have the potential to be used as agricultural land by clearing unproductive forests and converting them into agricultural land.

The establishment of this program was carried out considering that Lebong District is an area that holds a rice planting period only once per year. Socio-cultural challenges have made the tradition of planting rice once a year in Lebong District not only based on technical factors but also influenced by the community's belief in myths and farmers' reluctance to take the risk of crop failure due to pest attacks. In addition, land ownership is also an obstacle, considering that most farmers in Lebong District are tenant farmers who do not have full authority in making planting decisions. For this reason, the government, through the MT2 program, seeks to increase agricultural productivity by encouraging farmers to plant rice twice a year. This program started in 2021 and continues until now. The effort is supported through various agriculture, plantation, and food programs developed by the Agriculture and Fisheries Office, such as the rat pest eradication program to support the success of farmers planting rice in the second season.

Although the community has given a positive response, where the majority of the community is quite satisfied with the implementation of agriculture, plantation and food programs. However, the implementation of the MT2 Program initiated by the Lebong District Government as a flagship program in the agrarian sector has raised various critical responses from various elements of the community. These criticisms mainly focus on the readiness of the local government apparatus to implement this program, which includes various aspects ranging from resource capacity to funding and implementation mechanisms. This phenomenon occurs because local governments seem to be trying to optimize various strategies to realize the program, which is strongly suspected to be an effort to fulfill the political promises of regional heads during the electoral campaign period. These strategies include the allocation of 20% of village funds to support the MT2 program, which is legitimized through the Regulation of the Minister of Finance of the Republic of Indonesia Number 201/PMK.07/2022 on the use of village funds, which mandates villages to budget 20% of village funds for food and animal security programs, as well as relying on provincial government support in the form of hand tractor assistance, provision of seeds for an area of 1300 hectares, construction of the Farmer Business Network (JUT), and procurement of 1300 units of fertilizer. Meanwhile, the local government allocates assistance in the form of pesticides, such as feeding or fumigation, to support the success of this program.

In the context of budgeting, the implementation of the MT2 program in selected villages adopts a production accounting pattern with a cross-sharing system between the district and village budgets through the APBDes. However, the reality in the field shows that all MT2 operational needs are instead fully borne by village funds. This mismatch between the initial plan and implementation indicates a gap in coordination between the

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district and village governments, as well as a potential overburden on the village budget that could have a negative impact on other priority programs at the village level. This problem is closely correlated with the structure of agricultural land ownership, where the majority of productive land, especially those allocated for agrarian activities, is owned by economic elite groups who are mostly individuals with strategic positions in the local government hierarchy. Consequently, when the MT2 program is implemented, the landowners (landlords) delegate its implementation to the village government, and the village government then recruits sharecroppers to carry out the rice cultivation process. This situation raises new issues related to farmer remuneration, considering that the prevailing regulations do not allow the use of village funds for wage payments. Normatively, village fund allocations should be earmarked for programs that have been formulated and agreed upon through the Village Deliberation mechanism and stipulated in formal planning documents such as the Village Medium-Term Development Plan (RPJMDes) and the Village Government Work Plan (RKPDes).

Further criticism came from the discrepancy between the data on program realization submitted by the government and the results of field investigations conducted by civil society organizations. Based on information from the Head of the Lebong District Agriculture and Fisheries Office, the realization of the MT2 program in 2023 reached 1,333.75 hectares from 42 villages in 9 sub-districts from the target land area at the beginning of the planning, which was 2,100 hectares from 54 villages in 11 sub-districts. However, the results of an investigation conducted by the Lebong Community and Activist Forum (FORMAL) show that the estimated area of rice fields participating in the MT2 program is only around 1,000 Ha, with a much smaller number of villages. This difference in data raises concerns about the potential for budget misuse or fictitious land reporting in the implementation of the program. For this reason, a comprehensive evaluation and greater transparency in the implementation of this program are needed, including in terms of budget management and reporting of results. Further investigations by the authorities into alleged irregularities in the implementation of this program need to be conducted to ensure accountability and prevent potential state losses.

In addition, the MT2 Program, which aims to open 1000 hectares of new land in Lebong District through the conversion of unproductive forests into agricultural land, presents several serious problems, especially in the context of ongoing land conflicts given the status of protected areas in Lebong District. These problems include: first, the plan to open 1000 hectares of new land seems to ignore the reality of land conflicts that have been ongoing since the 1980s. With 69.98% of Lebong District's area being a conservation area, including Kerinci Sebelat National Park, Protected Forest, and Nature Reserve, it is difficult to imagine how 1000 hectares of land can be converted without exacerbating existing conflicts. Such a policy has the potential to create new tensions between the government, indigenous communities, and conservation area managers (Afrizal & Anderson, 2016; Harbi et al., 2021; Pambudi, 2023; Putra, 2019).

Second, the concept of "unproductive forests" that will be converted needs to be reviewed. In an ecological context, even forests that are considered economically unproductive still have important functions in maintaining ecosystem balance. Changing the status of this land could negatively impact the biodiversity and ecosystem services provided by forest areas, including carbon sequestration and water cycle regulation (Antarissubhi et al., 2023; Ruysschaert & Hufty, 2020). Third, the program appears to contradict conservation commitments that have been established through various policies, ranging from the colonial era to modern conservation area designations. Changing the status of protected areas, even if they are deemed "unproductive", could create a dangerous precedent and undermine long-term environmental protection efforts. Fourth, from a legal and administrative perspective, the process of changing protected area status to agricultural land is not an easy one. It requires approval from different levels of government and is likely to face resistance from environmental and civil society groups. Finally, the focus on new land clearing may divert attention from more sustainable solutions, such as agricultural intensification on existing land or the development of more efficient and environmentally friendly agricultural technologies. Where increased productivity through better agricultural technologies and practices can reduce the pressure to clear new land (Antarissubhi et al., 2023).

Considering the complexity of the situation in Lebong District, the MT2 program to clear 1000 Ha of new land seems unrealistic and potentially counterproductive. The World Resources Institute (2024) emphasizes that "Every hectare of forest converted contributes significantly to carbon emissions and the loss of critical ecosystem services". Instead of opening up new conflicts, the government needs to focus efforts on resolving existing land conflicts, improving the productivity of agricultural land already in use, and developing development strategies that are better aligned with conservation principles and the rights of indigenous peoples. Prof. Dr. Hariadi Kartodihardjo, a forest policy expert from IPB University, emphasized that "Forest conversion policies must consider not only economic aspects but also the ecology and socio-culture of local communities. Without a holistic approach, we risk creating new, more complex problems". A more holistic and participatory approach to land use planning is needed to achieve a balance between the needs of economic development and environmental conservation in Lebong District.

Challenges in the Implementation of Agriculture, Plantation, and Food Programs in Lebong District

The implementation of agriculture, plantation, and food programs in Lebong District faces several complex challenges that require in-depth analysis and a holistic approach. These challenges can be categorized into several main aspects:

Table 2. Challenge The Implementation of Agriculture, Plantation, and Food Programs

Aspect/ Challenges	Description	Impact	Case Example / Detail
Land Ownership Structure	Inequality in land ownership, the majority of farmers are tenants, not owners.	Uncertainty in management, limiting farmer autonomy, reducing motivation for long-term investment.	Pyang Mbik Village: The 2-Time Planting Period (MT-2) program is constrained by the ownership status of rice fields not belonging to local residents or landlords outside the region.
Land Use Change	Transformation of agricultural land into settlements or other infrastructure.	The reduction in the area of productive agricultural land hampers the implementation of agricultural programs.	LP2B in various sub-districts, cases in Sungai Gerong, Selebar Jaya, and Central Lebong sub-districts.

Aspect/ Challenges	Description	Impact	Case Example / Detail
Land Conflict and Conservation Policy	Tensions between the need for land for agriculture and environmental conservation policies.	Social conflicts between communities and the government, barriers to environmental conservation and agriculture.	Disputes with TNKS, Protected Forests, and Nature Reserves. Conflicts in buffer zone areas.

Source: research analysis results, 2024

1. Land Ownership Structure

Inequality in the structure of land ownership is one of the constraints in the development of the agricultural and plantation sectors. The majority of farmers act as tenants, not landowners, which results in uncertainty in management and limits farmers' autonomy in agronomic decision-making. This phenomenon is evident in the case of Pyang Mbik village, where the implementation of the Masa Tanam 2 Kali (MT-2) program is constrained by the ownership status of rice fields that do not belong to local residents. Most landlords are located outside the Lebong Regency area, so with the MT2 program, they leave the matter of planting back to the village. This uncertainty of land tenure has a significant impact on farmers' motivation to make long-term investments in improving soil quality and agricultural infrastructure.

2. Land Use Change

Agricultural land conversion is one of the challenges faced by the Lebong Regency in its efforts to implement programs in the agriculture, plantation, and food sectors. The National Land Agency (BPN) of Lebong District, revealed that the results of the assessment of Sustainable Food Agricultural Land (LP2B) in the region showed a transformation of land functions. Referring to the Lebong District Regional Regulation (Perda) Number 3 of 2021 on Controlling the Conversion of Sustainable Food Agricultural Land, which was enacted on September 2, 2021, it was determined that the LP2B area in Lebong District reached 9,010.21 hectares. The spatial distribution of this land covers various sub-districts, with the largest concentration in the Bingin Kuning sub-district (1,399.91 hectares) and the smallest area in the Rimbo Pengadang sub-district (276.37 hectares). Observations indicate that there are LP2B that have been stipulated in the regulation that have undergone a functional transformation, especially into residential areas and agricultural supporting infrastructure, such as farming roads. Cases of land conversion were identified in several locations, including Sungai Gerong, Selebar Jaya, Central Lebong Sub-district, and several other sub-districts (Roseple, 2022).

3. Land Conflict and Conservation Policy

Lebong District faces a complex dilemma between the needs of economic development and environmental conservation efforts. With 69.89% of its area or around 134,834.55 hectares being conservation areas, there is a tension between conservation policies and the need for land for agriculture. These conflicts are rooted in historical policies that began in the colonial era and were reinforced post-independence through the establishment of the Kerinci Sebelat National Park (TNKS) and other conservation areas. The characteristics of land conflicts vary across sub-districts, involving disputes with TNKS, Protection Forests, and Nature Reserves. The roots of these conflicts can be traced to the transformation of land status from customary or clan land to state conservation areas in the 1980s. This situation created a clash of interests between indigenous communities who have long inhabited and managed the land and the government's conservation policies. In addition, many residents open agricultural/plantation land in conservation areas, so vertical conflicts often occur between communities in the buffer zone area, which need agricultural land to support the family economy, and the government as a policy maker who will always try to protect the area on the grounds of forest sustainability.

Theoretical Analysis of Agricultural Development in Lebong Regency

Agricultural development in Lebong Regency presents a compelling case for examining how power relations, livelihood strategies, and resource management approaches intersect in a conservation-rich area. Through Robbins' Political Ecology framework, we can understand how power dynamics fundamentally shape access to agricultural resources and environmental decision-making in the region. The concentration of land ownership among political elites, particularly those holding strategic positions in local government, creates what Robbins terms "politically enforced scarcity." This manifests clearly in Lebong's tenant farming system, where farmers must bear all cultivation costs while sharing profits equally with landowners, demonstrating how political power structures directly influence agricultural practices and outcomes.

The distribution of program benefits between main and supporting sub-districts (satisfaction indices of 76 versus 66) further illustrates these power dynamics. The preferential allocation of resources to main sub-districts, while justified as creating demonstration effects, reflects what Robbins identifies as the political nature of resource distribution. This political dimension becomes particularly evident in the MT2 program's implementation, where the discrepancy between reported coverage (1,333.75 hectares) and actual implementation (approximately 1,000 hectares) reveals how political interests can influence program reporting and implementation.

Examining these dynamics through Scoones' Sustainable Livelihoods Framework reveals how institutional arrangements affect farmers' ability to develop sustainable practices. The framework helps explain how limitations across different forms of capital constrain farmers' livelihood options. Natural capital access is restricted by conservation policies covering 69.89% of the region's area, while financial capital is constrained by unfavorable profit-sharing arrangements. Human capital development suffers from uneven distribution of agricultural extension services, and social capital is weakened by limited participation in decision-making processes. These constraints create what Scoones identifies as a challenging institutional environment that limits farmers' ability to develop sustainable livelihoods.

The MT2 program's attempt to convert "unproductive forests" into agricultural land exemplifies what Scoones describes as the tension between livelihood strategies and institutional constraints. The program's approach to expanding agricultural land conflicts with established conservation policies, creating a situation where farmers' livelihood needs clash with institutional requirements for environmental protection. This tension is particularly acute in buffer zones, where communities struggle to balance immediate economic needs with long-term conservation mandates.

Armitage's Adaptive Co-Management Theory provides insights into the collaborative and learning aspects of agricultural

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management in Lebong. The theory reveals significant gaps in current management approaches, particularly in stakeholder collaboration and adaptive learning processes. The challenges in pest management, especially the persistent rat infestation problems, demonstrate limited success in what Armitage terms "learning by doing." Despite having scientific knowledge about rat population dynamics in multiple planting seasons, the program has struggled to develop effective adaptive responses.

The strong community support for program continuation (78% favoring improvements) suggests the potential for what Armitage describes as collaborative management. However, the current implementation approach lacks key elements of adaptive co-management: flexible response mechanisms, effective stakeholder collaboration, and systematic learning processes. This is particularly evident in the gap between district and village-level program implementation, where coordination failures have led to implementation challenges and resource allocation problems.

The interaction between these theoretical frameworks reveals deeper insights about agricultural development in conservation-rich areas. While Political Ecology helps understand how power relations shape resource access and program implementation, the Sustainable Livelihoods Approach reveals how these power dynamics affect farmers' ability to develop viable agricultural practices. Adaptive Co-Management Theory then shows how current governance approaches fail to address these challenges effectively through collaborative learning and adaptation.

The MT2 program's challenges particularly illustrate these theoretical intersections. Political power structures influence program design and resource allocation (Political Ecology), while institutional arrangements constrain farmers' ability to participate effectively (Sustainable Livelihoods). The limited success in addressing implementation challenges reveals gaps in adaptive management approaches (Adaptive Co-Management). This theoretical analysis suggests that successful agricultural development in Lebong requires addressing power imbalances, strengthening institutional support for sustainable livelihoods, and developing more effective collaborative management approaches.

CONCLUSION

The implementation of agricultural programs in Lebong Regency reveals complex dynamics between power relations, institutional arrangements, and environmental management. Through Political Ecology analysis, we observe how power structures, particularly in land ownership and resource distribution, significantly influence program outcomes. This is evident in the satisfaction disparity between main and supporting sub-districts (76 versus 66) and the challenges faced by tenant farmers under current profit-sharing arrangements.

The Sustainable Livelihoods perspective reveals how limited access to various forms of capital constrains agricultural development, particularly in a region where 69.89% of the area is designated for conservation. Meanwhile, gaps in Adaptive Co-Management approaches are reflected in implementation challenges, despite strong community support for program continuation. These theoretical insights suggest that successful agricultural development in conservation-rich areas requires fundamental changes in power distribution, institutional support, and program implementation approaches.

Based on our analysis of agricultural development in Lebong Regency, we recommend establishing an integrated approach to program implementation that addresses three critical areas. First, develop a multi-stakeholder governance platform that includes tenant farmers, landowners, and conservation authorities to facilitate more equitable decision-making and resource distribution between main and supporting sub-districts. Second, modify the MT2 program to focus on agricultural intensification of existing farmland rather than forest conversion, while implementing improved profit-sharing arrangements between landowners and tenant farmers. Third, adopt more flexible and adaptive management approaches that can effectively respond to implementation challenges while balancing agricultural productivity with conservation requirements. These recommendations aim to create a more sustainable and equitable agricultural development model that addresses current power imbalances while maintaining environmental integrity.

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