



EVALUATION OF DRYLAND AND WETLAND RICE POLICIES FOR FOOD SECURITY IN MAHAKAM ULU

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Abstract:

Food security in isolated areas requires agricultural policies that ensure effective production, accurate targeting, adequate support, equitable benefits, and sustainability. This study evaluates the policy for developing dryland and wetland rice to strengthen food security in Mahakam Ulu Regency. A descriptive qualitative approach was employed, with interviews conducted in Matalibaq Village. Primary data were obtained from five informants representing village government, the Village Consultative Body, and customary institutions, while secondary data were drawn from research documents on planted area, harvested area, and rice types for 2022–2026. The analysis applies William N. Dunn's six policy evaluation criteria: effectiveness, efficiency, adequacy, equity, responsiveness, and appropriateness. The findings indicate that the policy is moderately effective for dryland rice development, although harvested area remains affected by rainfall and wetland development is still at an early stage. Efficiency is constrained by high transport costs, damaged roads, limited personnel, and lengthy distribution procedures. Assistance has not fully met farmers' needs, beneficiary distribution requires improvement, and government responsiveness needs more consistent follow-up. Substantively, the policy is appropriate to local conditions, yet beneficiary targeting remains problematic. The study recommends stronger beneficiary verification, irrigation and post-harvest support, improved distribution, and data-based monitoring to sustain food security in Mahakam Ulu.

Keywords: policy evaluation; food security; dryland rice; wetland rice; Mahakam Ulu

INTRODUCTION

Food security is an essential component of development because it concerns people's ability to obtain sufficient, safe, and sustainable food. Food security depends not only on production volumes but also on access, distribution, institutions, and the government's capacity to maintain sustainable food systems. Kuntariningsih et al. (2023) demonstrated that the success of food-security interventions is influenced by communication and the involvement of governmental and local actors. Rusliyadi (2023) emphasized that village-level food self-sufficiency policies must consider community participation and institutional sustainability so that program benefits extend beyond short-term assistance. More recently, Astuti et al. (2026) stressed that strengthening food security requires coordination across sectors and levels of government to ensure that national policies respond to community needs at the local level.

In the context of decentralization, local governments play a strategic role in translating food needs into policies suited to regional characteristics. Support for

production, agricultural inputs, farmer institutions, distribution, and extension services should be designed according to local conditions. Selvia and Widyastuti (2024) showed that food-security policy implementation varies across regions because of differences in regional characteristics, resources, leadership, budgets, and infrastructure. Suwarlan et al. (2025) likewise emphasized that coordination and collaboration between local governments and stakeholders are important for ensuring sustainable food sufficiency. Similarly, Nugroho et al. (2025) identified multisectoral coordination, food provision, interorganizational collaboration, and monitoring and evaluation as important elements of food-policy implementation involving multiple actors.

The need for context-sensitive food policies is particularly significant in East Kalimantan. Cahyono and Tokuda (2024) showed that food-security conditions in East Kalimantan are associated with sociodemographic characteristics and access to resources, while Nurlaily et al. (2026) identified variations in food security across the province's regencies and municipalities. Regarding supply, Agustian et al. (2026) showed that strengthening food supplies in East Kalimantan requires production and supply-chain planning that can respond to changing regional demand. These findings indicate that food policy in East Kalimantan must account for differences in geography, accessibility, and local production capacity.

Mahakam Ulu Regency faces food-security challenges associated with its geographical conditions, limited accessibility, and reliance on local food production. Dryland rice is an important component of community farming systems, while wetland rice development is increasingly being promoted as an alternative means of strengthening food production. Tening et al. (2025) found that dryland rice production in Mahakam Ulu continues to face constraints relating to infrastructure, access to agricultural inputs, and institutional capacity. These conditions suggest that strengthening food security in Mahakam Ulu requires policies that not only encourage production but also address implementation barriers at the local level.

One regional policy instrument is Mahakam Ulu Regent Regulation No. 33 of 2022 concerning Assistance for the Development of Dryland and Wetland Rice Cultivation. This regulation positions the development of both land types as part of efforts to strengthen regional food production. Conceptually, agricultural development must consider local ecological characteristics and resources. Antriyandarti et al. (2023) showed that dryland farming households are vulnerable to water scarcity and resource limitations, while Assajjad et al. (2026) emphasized the importance of strategies for utilizing local resources in accordance with the ecological conditions of East Kalimantan.

Nevertheless, the planted and harvested areas of rice in Mahakam Ulu have fluctuated. Research documents recorded a planted area of 20,560 hectares in 2022, decreasing to 17,875 hectares in 2023, increasing to 23,220 hectares in 2024, and declining again to 20,529 hectares in 2025. The harvested area similarly

changed from 19,442 hectares in 2022 to 15,625 hectares in 2023, increased to 21,958 hectares in 2024, and fell to 18,720 hectares in 2025. Data for 2026 were still being compiled. These changes indicate that the existence of a policy does not automatically produce stable year-on-year growth in planted and harvested areas.

These fluctuations warrant investigation because policy success cannot be assessed solely by the existence of assistance or programs. It must also be evaluated in terms of the achievement of objectives, efficient resource use, the adequacy of support for farmers, equitable distribution of benefits, responsiveness to target-group needs, and alignment with regional characteristics. Risnawati et al. (2025) showed that food-security policies require adaptation to climate change and environmental conditions, while Tening et al. (2025) highlighted infrastructure and input-access constraints affecting rice production in Mahakam Ulu. A more comprehensive evaluation of policy processes and benefits at the local level is therefore needed.

Previous studies provide an important foundation but leave a research gap. Tening et al. (2025) evaluated dryland policy and rice production in Mahakam Ulu, focusing on Regent Regulation No. 12 of 2021 and production data for 2018–2023. Antriandarti et al. (2023) focused on determinants of household food security among dryland farmers, while Cahyono et al. (2025) analyzed the balance between rice production and consumption in East Kalimantan using a system dynamics model. Few studies have specifically evaluated policy implementation following Regent Regulation No. 33 of 2022, which encompasses both dryland and wetland rice, by examining the experiences of local stakeholders. This gap underpins the novelty of the present study.

Accordingly, this study aims to evaluate the policy for developing dryland and wetland rice to support food security in Mahakam Ulu Regency, with interviews conducted in Matalibaq Village. The evaluation employs William N. Dunn's six criteria: effectiveness, efficiency, adequacy, equity, responsiveness, and appropriateness (Dunn, 2017). The study seeks to provide an account of policy implementation quality and identify areas requiring improvement in the development of local food production in Mahakam Ulu.

Literature Review

Policy Evaluation

Policy evaluation is a systematic process of assessing policy achievements, benefits, and weaknesses to inform improvements in public decision-making. This study adopts William N. Dunn's six criteria: effectiveness, efficiency, adequacy, equity, responsiveness, and appropriateness (Dunn, 2017). This framework is relevant because it considers not only goal achievement but also resource use, benefit distribution, target-group needs, governmental responses, and policy suitability. In Mahakam Ulu, Tening et al. (2025) demonstrated that evaluations of dryland policy and rice production should consider infrastructure constraints, access to inputs, institutions, and production capacity.

Food Security

Food security is a multidimensional condition encompassing food availability, access, utilization, and sustainability. Kuntariningsih et al. (2023) showed that communication between government and local actors is important for implementing food-security programs. Selvia and Widyastuti (2024) found that regional characteristics, resource availability, leadership, budgets, and infrastructure influence policy implementation, while Suwarlan et al., (2025) highlighted the importance of coordination between local governments and stakeholders. Accordingly, this study understands food security as the capacity of regional policy to support production while maintaining access to and the sustainability of local food supplies.

Dryland and Wetland Rice Development

The development of dryland and wetland rice is one strategy for strengthening food availability based on local potential. Antriyandarti et al. (2023) showed that the food security of dryland farming households is influenced by agricultural resources and socioeconomic conditions. Hasanah et al. (2024) also found that household-head education, household size, the ratio of rice expenditure, and income are associated with food security among dryland farming households. Meanwhile, Cahyono et al. (2025) emphasized the importance of balancing rice production and consumption in East Kalimantan's food-security planning. In Mahakam Ulu specifically, Tening et al. (2025) identified persistent infrastructure and input-access problems in dryland rice development. The present study extends this research by evaluating a policy encompassing both dryland and wetland rice using Dunn's six evaluation criteria.

RESEARCH METHOD

This study employed a descriptive qualitative approach with an evaluative case-study design. The qualitative approach was selected to develop an understanding of local implementers' and stakeholders' experiences of policy implementation, while the evaluative design was used to assess the policy against predetermined criteria. The unit of analysis was the dryland and wetland rice development policy in Mahakam Ulu Regency, with interviews conducted in Matalibaq Village.

Informants were purposively selected based on their involvement in and knowledge of the program at the village level. The five informants comprised the Head of the Service Section of the Matalibaq Village Government, the Chairperson and Deputy Chairperson of the Village Consultative Body (BPK), the Village Customary Leader, and a Village Customary Institution Staff Member. Interviews were conducted on 21 and 29 September 2026. For consistency, informants are identified as R1-R5 in the findings.

Primary data were collected through interviews guided by 18 questions, with three questions addressing each evaluation criterion. Secondary data were obtained from research documents reporting planted area, harvested area, and

rice types for 2022–2026, which identified the Mahakam Ulu Regency Food Security and Agriculture Office (DKPP)/related documents as their sources. The 2026 data were still being compiled and were therefore not used to draw quantitative conclusions about changes in planted and harvested areas.

FINDINGS AND DISCUSSION

Development of Dryland and Wetland Rice Programs

The research documents show changes in planted and harvested rice areas during 2022–2025, while the 2026 data were still being compiled. The original instrument labeled the final column “main type of assistance,” although the recorded entries were names of upland rice, including Mayas, Abong, Samarinda, and Pulut. Accordingly, this article labels the column “main rice types/varieties” to reflect the content of the available data.

Table 1. Planted and Harvested Rice Areas in Mahakam Ulu Regency, 2022–2026

Year	Planted Area (ha)	Harvested Area (ha)	Main Rice Types/Varieties
2022	20.560	19.442	Upland rice: Mayas, Abong, Samarinda, Pulut, and others
2023	17.875	15.625	Upland rice: Mayas, Abong, Samarinda, Pulut, and others
2024	23.220	21.958	Upland rice: Mayas, Abong, Samarinda, Pulut, and others
2025	20.529	18.720	Upland rice: Mayas, Abong, Samarinda, Pulut, and others
2026	Data being compiled	Data being compiled	Upland rice: Mayas, Abong, Samarinda, Pulut, and others

Source: Research documents citing the Mahakam Ulu Regency DKPP/related documents; compiled by the researchers, 2026.

Table 1 shows a fluctuating pattern. Planted and harvested areas declined in 2023, reached their highest levels in 2024, and declined again in 2025. This pattern is consistent with informants’ accounts of an increase in 2024 followed by a decline attributed to weather conditions. These data are not used as the sole measure of success but provide context for interpreting interview findings across the six evaluation criteria.

Effectiveness

Effectiveness assesses the extent to which a policy achieves its intended objectives. Interviews indicated that dryland rice development had been implemented and planting targets had largely been met, but harvested areas remained below their potential because of heavy dependence on rainfall. Informants R3, R4, and R5 also stated that wetland development remained at the preliminary land-assessment stage, with an initial plan covering approximately 141 hectares. R1 and R2 corroborated that the program had achieved its objectives only partially and that implementation in 2026 had not yet been completed.

"Planting targets have been met, but the harvested area is still not optimal because it depends heavily on rainfall." (R3, interview, 29 September 2026)

These findings suggest that the policy can be considered moderately effective, although its outcomes remain suboptimal. The increase recorded in 2024 did not establish a consistent trend, as outcomes remained vulnerable to weather conditions, limited land availability, and accessibility constraints. This finding is consistent with Tening et al. (2025) , who identified infrastructure, input access, and production capacity as major food-security challenges in Mahakam Ulu. Cahyono et al. (2025) also showed that balancing rice production and consumption in East Kalimantan requires stronger local production capacity. Furthermore, Risnawati et al. (2025) and Antriandarti et al. (2023) highlighted climate adaptation and water constraints as important factors in sustaining food production.

Efficiency

Efficiency concerns the use of budgets, labor, time, facilities, and the smooth distribution of assistance. All five informants reported broadly similar concerns regarding suboptimal resource use. Assistance was considered to be delivered late because of high transportation costs. Damaged roads, limited personnel, and lengthy procedures were also identified as major distribution barriers.

"Delivery was not sufficiently timely because transportation and freight costs were high." (R2, interview, 21 September 2026)

Consequently, the efficiency criterion was not adequately met. In geographically challenging areas, efficiency should be assessed not only by the size of the budget but also by the system's capacity to translate resources into timely assistance that farmers can use. Cahyono and Tokuda (2024) showed that accessibility and regional characteristics are associated with food-security conditions in East Kalimantan. Agustian et al. (2026) emphasized the importance of production and supply-chain planning for maintaining food supplies. Akbar et al. (2025) found that budget constraints, supply-chain disruptions, and weak institutional synergy can limit food-security systems. Bulkis et al. (2026) likewise identified infrastructure damage, distribution disruptions, budget delays, and weak interagency coordination as major obstacles in vulnerable areas. These findings align with Astuti et al. (2026), who highlighted coordination across levels of government as an important factor in food governance.

Adequacy

Adequacy assesses whether policy support sufficiently addresses the main problems faced by farmers. All informants stated that the assistance provided was insufficient. Existing support addressed only some needs, while problems relating to water, pests, and fertilizers persisted. Frequently mentioned unmet needs included irrigation, agricultural and milling equipment, support for selling prices, and more regular assistance.

"It is insufficient ... irrigation, agricultural and milling equipment, selling prices, regular assistance." (R4, interview, 29 September 2026)

These findings indicate that the adequacy criterion has not been met. Seed or fertilizer assistance can be beneficial, but without water, post-harvest equipment, distribution access, and guidance, the program's capacity to resolve underlying problems remains limited. Kuntariningsih et al. (2023) demonstrated the importance of the relationship between program support and local actors' capacity in food-reserve policy. Meliala and Djameluddin (2024) emphasized the role of agricultural fiscal support, while Yanfika et al. (2024) showed that extension services help farmers adopt more sustainable practices. Specifically for rice, Effendy et al. (2023) found that the performance of agricultural extension institutions is associated with increased rice production and sustainable food security.

Equity

Equity concerns the distribution of policy benefits across beneficiaries and areas. Informants explained that beneficiary selection begins with village proposals, followed by verification at the subdistrict level and the preparation of a beneficiary list. Although an administrative mechanism exists, all five informants considered assistance not yet fully equitable. Some believed that individuals with relatively less need had received assistance while other groups had not benefited sufficiently.

"Some have received assistance, while others have not; some people with less need have received it." (R1, interview, 21 September 2026)

These findings suggest that equity remains suboptimal, with the principal problem relating to the accuracy of benefit distribution. Alwi et al. (2025) emphasized the importance of policy entrepreneurs and changes in policy design to make food programs more responsive to local needs. Adi Pratama et al. (2025) identified public trust and transparent governance as foundations for sustainable food institutions, while Syaputra (2025) showed that actor configurations, coordination, and power relations can shape benefit distribution in food-policy networks.

Responsiveness

Responsiveness concerns the government's capacity to receive, understand, and follow up on the needs of target groups. Informants stated that the government had previously received and acted upon farmers' complaints or proposals. However, informants still described the program as "less effective," and communities expected it to continue and better address farmers' actual needs.

"We hope this program will continue to support food security for residents, particularly farmers." (R5, interview, 29 September 2026)

These findings suggest that responsiveness is moderate but inconsistent. Channels for submitting proposals are an important starting point, but responsiveness becomes meaningful only when followed by changes in assistance, distribution, or services. Astuti et al. (2026) emphasized actor engagement and adaptive coordination in food governance. Alwi et al. (2025) showed that food-policy change requires actors who can connect local needs with

government support, while Suwarlan et al. (2025) highlighted the role of coordination forums and leadership in sustaining food-security collaboration.

Appropriateness

Appropriateness assesses whether a policy is suited to the nature of the problem, the area, and the target group. Informants viewed the substance of the program positively. Seeds and fertilizers were considered suitable for dryland conditions, while wetland development was also regarded as necessary for the community. The predominance of dryland makes upland rice development relevant to local characteristics. However, beneficiary targeting remains a concern because some recipients were perceived as not fully matching the level of need.

"Yes, it is highly appropriate to local conditions; dryland predominates, and residents greatly need the planned wetland development." (R3, interview, 29 September 2026)

Substantively, the policy can be considered appropriate, although beneficiary targeting remains suboptimal. Antriyandarti et al. (2023) showed that dryland agricultural development must consider resource constraints and farmers' environmental conditions. Nurlaily et al. (2026) emphasized the importance of policies that account for differences in food-security characteristics across East Kalimantan, while Assajjad et al. (2026) showed that local-resource utilization strategies should reflect ecological conditions and land-use pressures.

Table 2. Synthesis of Policy Evaluation Findings Based on William N. Dunn's Criteria

Criterion	Evaluation Focus	Key Findings	Assessment
Effectiveness	Achievement of program objectives and outcomes	Dryland rice cultivation is under way and planting targets have largely been achieved; however, harvests remain suboptimal and wetland development is at an early stage.	Moderately effective; not yet optimal
Efficiency	Budget, labor, time, facilities, and distribution	High transport costs, damaged roads, limited personnel, and lengthy procedures cause delays.	Not yet efficient
Adequacy	Ability of assistance to meet farmers' needs	Assistance is insufficient; needs remain for irrigation, fertilizer, pest control, milling equipment, selling-price support, and regular assistance.	Inadequate
Equity	Distribution of beneficiaries and benefits	Proposal and verification mechanisms exist, but benefits are not comprehensive and some recipients may have been inappropriately selected.	Not yet equitable
Responsiveness	Government response to needs and complaints	Proposals have been received and followed up, but farmers still expect a more effective and sustainable program.	Moderately responsive
Appropriateness	Program alignment with local conditions and target groups	The assistance is considered appropriate to land conditions; the policy is relevant, but beneficiary targeting requires improvement.	Substantively appropriate; targeting remains suboptimal

Source: Interviews with R1–R5; compiled by the researchers, 2026.

Table 2 indicates that the principal policy challenges lie not in the overall relevance of the program but in implementation quality and support capacity. The policy aligns with local production characteristics, yet its outcomes are constrained by accessibility, distribution, inadequate facilities, and inequitable targeting. This pattern reinforces the argument that regional food security requires a combination of production policies, infrastructure, institutions, and adaptive service mechanisms. Suwarlan et al. (2025) highlighted the importance of institutions and coordination in regional food policy, while Astuti et al. (2026) showed that program sustainability requires alignment among levels of government and community actors.

CONCLUSION

The evaluation of dryland and wetland rice development policy in Mahakam Ulu Regency, based on a case study in Matalibaq Village, indicates that the policy is highly relevant to local characteristics but has not yet been implemented optimally. Effectiveness is moderate because dryland rice cultivation has been implemented and planting targets have largely been achieved, although harvested areas remain affected by rainfall and wetland development is still at an early stage. Efficiency is constrained by high freight costs, road conditions, limited personnel, and distribution procedures. Assistance remains inadequate because needs relating to irrigation, fertilizers, pest control, agricultural and milling equipment, selling-price support, and regular assistance have not been fully met.

Equity is also suboptimal. Although proposal and verification mechanisms exist, informants identified imbalances in benefit distribution and indications that some beneficiaries were not selected according to need. Government responsiveness is moderate because farmers' proposals have previously been received and followed up, but more consistent action is needed. In terms of appropriateness, the policy aligns with the predominance of dryland and the need to develop wetland cultivation, although beneficiary targeting requires improvement. Policy strengthening should therefore prioritize needs-based beneficiary verification, improved distribution, irrigation and post-harvest facilities, stronger extension services, and annual data-driven monitoring.

Implications and Study Limitations

In practical terms, local governments should link production assistance with infrastructure and post-harvest needs. Seed and fertilizer assistance should be accompanied by irrigation, processing equipment, pest control, market access, and distribution arrangements adapted to local geography. Beneficiary selection should use regularly updated farmer-group data and multilayered verification to improve targeting. Village-level evaluation forums could also serve as feedback channels to strengthen government responsiveness.

This study is limited by its reliance on interviews with five local stakeholders in Matalibaq Village; it did not include DKPP officials, extension workers, or direct farmer beneficiaries. Consequently, the findings should be understood as

a case-based evaluation of local experiences rather than a statistical representation of Mahakam Ulu Regency as a whole. Future research should include informants from additional villages and government agencies and incorporate verified production, budget, and assistance-disbursement data to strengthen triangulation.

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