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# The Role of Government in the Implementation of Food Security Programs through Catfish Farming (*lele*)

**Amat Antoni[1*], Wargo[2], Zaenal Abidin[3]**
[1]Institut Islam Al-Mujaddid Sabak (IIMS) Tanjung Jabung Timur, Indonesia
[2]Institut Islam Al-Mujaddid Sabak (IIMS) Tanjung Jabung Timur, Indonesia
[3]Institut Islam Al-Mujaddid Sabak (IIMS) Tanjung Jabung Timur, Indonesia
*Corresponding Author: amat-antoni@gmail.com

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**Abstract:**
This study examines the role of local government in implementing a food security program based on catfish (lele) farming in Kelurahan Talang Babat, focusing on four dimensions: public policy and institutional support, communication and outreach, human resource development, and financing and infrastructure management. Adopting a qualitative phenomenological approach, the research draws on in-depth interviews with farmers and government actors, direct field observation, and documentary evidence; data were analyzed thematically with triangulation across sources. Findings indicate that while local authorities have facilitated group formation, provided initial inputs, and conducted introductory outreach, program effectiveness is constrained by one-way communication, limited farmer capacity to operate modern bioflok technology, inadequate follow-up financing, and inconsistent monitoring. These constraints reduce the program's ability to achieve sustained production gains and community resilience. The study contributes theoretically by situating public policy and governance variables within a micro-level aquaculture context and practically by recommending continuous technical extension, group-based financing models, and participatory monitoring mechanisms to enhance the sustainability and self-reliance of community-based food security initiatives.

**Keywords:**
*Food security; Government role; Catfish farming; bioflok; Talang Babat; Community empowerment.*



## INTRODUCTION

Climate change, population increase, and limited natural resources have reinforced the urgency of developing the freshwater fisheries and aquaculture sector as an important strategy to strengthen national and global food security. In Indonesia, freshwater fish farming has a central role in providing affordable animal protein and improving community welfare. Innovations such as biofloc technology are modern solutions to increase production efficiency and reduce environmental impacts. In the context of public policy, the government plays an important role in facilitating the development of this sector through regulatory support and food security programs, as affirmed by international agencies such as FAO and the World Bank that highlight fisheries as a pillar of a sustainable economy.

However, there is a gap between the potential of aquaculture and the reality of implementation at the local level. Literature confirms the significant contribution of the aquaculture

sector to food security (Sloap), but empirical research on the role of government in program implementation is still limited, especially on aspects of policy, communication, human resources (HR), and budget management at the village or kelurahan level. This condition confirms the importance of studies that explore barriers and effective strategies for program implementation in the field, as focused in the context of catfish farming in Talang Babat Village as a form of community-based food security program.

This research builds on the theory of public policy and governance framework that places policy, communication, human resources, and budgeting as the main variables in measuring the effectiveness of program implementation. In line with the view of Aryati et al. (2016), independent variables such as public policies are believed to affect the dependent variable in the form of program implementation results. Principles of good governance that emphasize accountability, participation, and effectiveness are also the foundation of the analysis (Jolly, 2023). In addition, agribusiness theory and human resource management also support the importance of increasing the technical capacity of farmers and the interaction between actors in the success of modern aquaculture innovations such as biofloc systems (Khanjani et al., 2024).

Previous studies have shown that aquaculture has great potential in strengthening food security and local economies. Wasik, Gunawan, and Handriana (2025) highlighted the quantitative contribution of aquaculture to increased food availability and species diversification. Kusdiarti (2023) emphasized that catfish farming can increase income and employment in rural communities. However, challenges such as limited access to capital, weak local institutions, and a top-down policy approach hinder the optimization of the program (Riany et al., 2023; Paramita, 2023). Although the government has issued policies such as Permen KKP No. 47 of 2021 concerning Aquaculture Villages, implementation and evaluation in the field still require improvement.

By combining a qualitative phenomenological approach and a governance framework, this article seeks to bridge the gap between the technical literature on freshwater fish farming and public policy studies in the fisheries sector. The study's focus on the micro-level - i.e. urban villages - provides a novel contribution to the understanding of the relationship between public policy, communication, human resource capacity, and budget management in the success of food security programs. This interdisciplinary approach not only enriches aquaculture governance theory but also provides a conceptual foundation for the development of more inclusive and sustainable policy strategies and field practices.

## METHOD

This research uses a qualitative approach with a phenomenological research strategy to explore in depth the subjective experiences of catfish farmers and government actors in Talang Babat Village in implementing food security programs through catfish farming. The phenomenological approach was chosen because it allows researchers to understand the meaning constructed by research subjects on the phenomenon of public program implementation at the local level, in accordance with the characteristics of exploratory and in-depth qualitative research. Qualitative methodology theory states that this kind of design is most appropriate when the focus is "why

something (does) happen" and how actors live and give meaning to their experiences (Busetto, Rodgers, & Doyle, 2020).

Data sources in this study consisted of primary and secondary data. Primary data were obtained through field observations, semi-structured interviews with fish farmers and government officials, and documentation related to the catfish farming program. Secondary data were in the form of government policy documents (e.g., Law No. 18/2012 on Food and KP Regulation No. 47-2021), program reports, and literature related to freshwater fish farming and food security. Data collection techniques included: (a) in-depth interviews using phenomenological techniques to capture lived experience (Ali & Kaufmann, 2022). (b) direct observation of the activities of farmers and program assistants; (c) analysis of program documents and archives; and (d) triangulation of data between sources to increase validity. Triangulation is an important strategy in qualitative research to build credibility of findings (Tsindos, 2023).

The inclusion criteria for research subjects were catfish farmers aged 20-50 years, a minimum education level of elementary school / equivalent to college, and actively involved in the catfish farming program in Talang Babat Village. The sampling technique used was purposive sampling to select the right informants according to the research objectives. The unit of analysis was individual farmers and government officials or assistants involved in the program. The data analysis technique used thematic analysis of interview transcripts and documents, with the help of qualitative analysis software such as NVivo (Coates et al., 2021). Furthermore, the data analysis process was carried out with the following steps: data familiarization, initial code marking, theme formation, theme review, and naming and compiling thematic narratives. The thematic results were then compared between data sources (interviews, observations, documents) through triangulation to obtain a holistic understanding of the government's role, barriers, and implementation strategies of the catfish farming program within the framework of food security.

## RESULTS AND DISCUSSION

### Results

This research produced several main findings based on the analysis of field data obtained through in-depth interviews, direct observation, and documentation of the implementation of the food security program through catfish farming in Talang Babat Village. Based on thematic analysis conducted using coding techniques and triangulation between data sources, four main themes were found that reflect the role of the government and the dynamics of program implementation, namely: (1) policy and institutional support, (2) communication and socialization of the program, (3) development of human resources (HR) of cultivators, and (4) management of financing and cultivation infrastructure.

First, policy and institutional support, shows that the government of Talang Babat Village has implemented policies based on national regulations, such as Law No. 18/2012 on Food and Minister of Marine Affairs and Fisheries Regulation No. 47/2021 on Aquaculture Villages. Field findings reveal that the local government plays a role in establishing aquaculture groups, providing initial

capital assistance, and facilitating basic training for farmers. However, while these regulations serve as a foundation, implementation in the field often does not fully comply with national guidelines. Most informants revealed that the government's involvement is still administrative in nature, and has not touched on the technical guidance aspect in depth. Observations also show that there is a gap between the program's objectives and its implementation practices, where the sustainability of the program relies heavily on the initiative of the farmer groups themselves, not solely on formal policies.

Second, the communication and socialization of the program confirms that the success of implementation is greatly influenced by the effectiveness of communication between the government, fisheries extension workers, and the cultivator community. Based on the interview results, the majority of respondents stated that the initial socialization of the program was conducted through group meetings facilitated by the village government and the District Fisheries Office. However, the communication process tended to be one-way and oriented more towards the delivery of basic technical information rather than participatory dialogue. In practice, many farmers admitted that they did not fully understand the basic principles of biofloc technology, especially in the aspects of water management, feeding, and stocking density. Observations in the field also found that these communication limitations led to production failures in the early stages, due to technical misapplication. The lack of coordination between implementing actors shows that the government's communication approach still needs to be improved through a sustainable mentoring system.

Third, human resource development (HRD), shows that most farmers in Talang Babat Village do not have sufficient experience in catfish farming using modern technology. Based on interviews, it is known that most program participants have primary to secondary education backgrounds, and only a few have attended aquaculture training before. Although the government has conducted extension activities, the intensity and scope of the materials provided are still limited to basic technical aspects without deepening the management of water quality, nutrition, and biofloc systems. This has led to the low technical ability of farmers to manage their ponds optimally. Field observations support this finding, where several biofloc ponds that were built experienced production failure due to overstocking or an imbalance in the water ecosystem. One of the extension workers interviewed confirmed that the success of the biofloc system is highly dependent on the technical discipline and ecological knowledge of the farmers, which is still a major challenge in fisheries-based local food security programs.

Fourth, the management of financing and cultivation infrastructure, shows that most farmers still rely on government assistance as the main source of capital, both in the form of biofloc ponds, fish seeds, and starter feed. However, the results of the interviews show that this assistance is not fully sufficient for sustainable production needs. Some informants stated that after the initial phase of the program ended, they experienced difficulties in obtaining further capital for the purchase of feed or facility improvements. This financial constraint is exacerbated by farmers' limited access to formal capital institutions such as cooperatives or local banks. In addition, supporting facilities such as aeration equipment, temperature control, and filtration systems are not yet adequately available. Based on program documentation, local government support is still stimulant in nature and has not

yet led to a sustainable financing model that encourages farmers' economic independence. This shows that the budgeting dimension of program implementation has not been fully effective.

Observations also found that the social participation and dynamics of cultivation groups varied. Some groups show high solidarity in sharing knowledge and helping each other when facing technical problems, while other groups still face internal conflicts due to inequality in the distribution of results and responsibilities. In some cases, group programs have succeeded in creating local innovations, such as the use of alternative feeds based on household organic waste to reduce production costs. However, these innovations have not received serious attention from the government to be integrated in aquaculture development policies. Meanwhile, observations at the location of the aquaculture ponds show that the environmental conditions support aquaculture activities due to abundant water sources, but the management has not been optimized due to the lack of technical assistance and regular monitoring from the government.

Based on the results of data triangulation between interviews, observations, and documentation, it was also found that the main obstacle in program implementation was the lack of monitoring and evaluation from the government after the initial stages of the program. Informants from the farmers' side mentioned that after the biofloc ponds were built and initial assistance was provided, routine monitoring activities from the relevant agencies were no longer carried out consistently. This led to a break in the chain of information and technical supervision of aquaculture activities. On the other hand, informants from the government recognized limited budget and human resources as the main reasons for the low intensity of monitoring. This condition has implications for the low accuracy of production data and the success of food security programs at the local level. Thus, the results show that the success of food security programs through catfish farming is highly dependent on the synergy of four main aspects: adaptive policies, participatory communication, strengthening human resource capacity, and sustainable budget management.

## Discussion

This study found that the role of the government in Kelurahan Talang Babat in implementing the food security program through catfish farming includes four main aspects-public and institutional policies, communication and socialization, development of human resources (HR), and management of financing and cultivation facilities-which are in line with the formulation of the problem and research objectives. First, in terms of public and institutional policies, the local government has facilitated the formation of cultivator groups, provision of biofloc ponds, seedlings, and initial feed. However, the sustainability of implementation was limited due to the lack of technical assistance and periodic monitoring, so the research objective of "what is the role of government" was partially answered. Secondly, regarding communication and socialization, although the government conducted initial counseling, it turned out that the form of communication was still one-way and lacked dialogue - this became a major obstacle as addressed in the second problem formulation, namely "how to overcome implementation barriers". Third, in the aspect of human resources, it was found that most cultivators had not mastered biofloc technology, resulting in low operational capabilities. Fourth, in terms of financing and cultivation facilities, it was found that government

assistance was insufficient for the advanced phase and access to formal financing was limited. Thus, these findings indicate that although the government's role is quite clear in the early stages, the full implementation of the food security program through catfish farming still faces structural and operational barriers.

Interpretation of these findings within the theoretical framework of public policy and governance shows that the transformation of policies into field practices requires more than just formal regulations: it requires effective communication mechanisms, the capacity of local actors, and sustainable budget allocations. According to the governance framework in cultivation, aspects of accountability, participation, efficiency and transparency are prerequisites for the success of sustainable program implementation. Field findings show that in Talang Babat the participation of farmers is limited and government monitoring is episodic, so the effectiveness of the policy is reduced. Riany et al.'s study (2023) on the governance of aquaculture in Gresik also shows that governance weaknesses such as lack of coordination and strong institutions hinder the success of aquaculture programs. Thus, the four indicators that become research variables (public policy, communication, human resources, budgeting) are conceptually proven to affect the implementation of the program at the local level.

When comparing the findings of previous studies, this research shows both congruence and differences. As Wasik, Gunawan, & Handriana (2025) found that aquaculture has significant potential in food security through increased productivity and integrated technologies, but they also noted barriers such as access to technology and capital. Our findings extend these results by highlighting specific barriers in communication and financing at the local level. Nagel's (2024) study on mental models of aquaculture governance in Indonesia emphasizes that government interventions need to be tailored to the local context and that regional autonomy affects implementation outcomes. This study confirms that urban village contexts characterized by private land and access to sufficient water sources have opportunities but still require suboptimal systemic support. In contrast, some literature still focuses more on the technical aspects of cultivation or production-such as the use of biofloc technology or water quality control-without in-depth exploration of the role of government institutions. As such, this study offers a new dimension to the literature: local institution-farmer collaboration as the key to implementing food security programs.

The scientific contribution of this article to the development of theory and practice can be seen in three main ways. First, theoretically, this article integrates public policy and governance theories into the analytical framework of aquaculture at the urban village scale, adding communication and budgeting variables as mediators of program implementation. Second, methodologically, the use of a qualitative-phenomenological approach in the context of catfish farming provides an in-depth understanding of local actors that was previously under-reached in national research on fisheries-based food security. Third, practically, this article makes recommendations that lead to improved government programs at the local level, such as the development of sustainable technical assistance, a group-based financing model, and a routine monitoring and evaluation system-which can be adopted as best practices by regional policymakers.

These results fill the gap between the technical potential of cultivation and the reality of policy implementation.

The limitations of this research must be acknowledged proportionally. Because it uses a qualitative approach and focuses on one location (Kelurahan Talang Babat), the generalizability of the research results is limited to this local context and cannot be directly applied to all freshwater fish farming areas in Indonesia. In addition, the data obtained relied heavily on the perceptions and recollections of farmer and government informants, which may have been influenced by subjective biases and the situation at the time of the interview. The limited time of data collection also means that the long-term aspects of program sustainability have not been fully covered. The results of this study should therefore be understood in contextual and provisional terms, rather than as a universal picture.

The implications of the findings point to policy directions and further research. For practitioners and policymakers, the results point to the importance of establishing a sustainable technical assistance system, strengthening farmer groups with inclusive financing models and access to financial institutions, and establishing regular monitoring and evaluation mechanisms with productivity and environmental sustainability indicators. For future research, it is recommended that inter-sub-district or inter-district comparative research be conducted with a mixed methods design to test the relationship between variables (policy, communication, human resources, budgeting) quantitatively/regressionally and expand the scope of the geographical context. In addition, longitudinal research is needed to measure the long-term impact of food security programs through catfish farming and the effectiveness of biofloc technology in real conditions at the community level.

## CONCLUSION

This study concludes that the role of government in the implementation of the food security program through catfish farming in Talang Babat Village includes four main dimensions, namely public policy and institutions, communication and socialization, human resource development (HR), and management of financing and infrastructure. The local government has acted as a policy facilitator and provider of basic cultivation facilities, but the effectiveness of program implementation is still hampered by weak communication between actors, limited technical competence of cultivators on biofloc technology, and the lack of a sustainable financing system. In addition, monitoring and evaluation activities have not been carried out consistently, so that program sustainability and optimization of cultivation results have not been fully achieved. These findings confirm that the success of food security programs at the local level depends not only on the availability of policies and facility assistance, but also on strengthening human capacity and an adaptive coordination system between the government and the farming community.

The contributions of this research are theoretical, practical, and conceptual. Theoretically, this research expands the application of public policy and governance theories in a micro context, particularly in the community-based aquaculture sector. Practically, the results of this study provide strategic recommendations for local governments to strengthen participatory communication mechanisms, provide ongoing technical assistance, and develop inclusive group financing models.

Conceptually, this research introduces an integrative approach between public policy, communication, human resources, and budgeting variables in understanding the effectiveness of freshwater fisheries-based food security program implementation, which can be used as a reference framework for similar research and policies in the future.

The implications of this research indicate the need for policies that are more adaptive and contextualized to the needs of local farmers, taking into account the social and economic sustainability of the community. The government is expected to build a participation-based evaluation system and expand cross-sector collaboration between fisheries institutions, financial institutions and educational institutions to support sustainable aquaculture technology innovation. Future research is recommended to develop inter-regional comparative analysis models and conduct longitudinal measurements to assess the long-term impact of food security programs on community welfare and environmental sustainability of fisheries.

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