

FOSTERING ENVIRONMENTAL AND ECONOMIC RESILIENCE THROUGH CATFISH FLOSS PRODUCTION IN WEST JAKARTA

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ABSTRACT

This community empowerment program seeks to stimulate economic growth in Meruya Selatan, West Jakarta, by promoting the production of catfish floss, a product that aligns with both environmental sustainability and market expansion goals. The initiative capitalizes on locally available catfish, promoting sustainable practices by minimizing waste and offering an alternative to conventional protein sources. The program is designed to train participants in key areas such as efficient production methods, preserving product quality, packaging, and marketing strategies, all aimed at making catfish floss a competitive product in both local and regional markets. The main objectives include boosting household income, increasing consumer awareness of fish-based products, and fostering the growth of local businesses through skill development. The project employed a comprehensive approach involving initial surveys, educational seminars, hands-on training, and ongoing monitoring to ensure the effectiveness of the training. As a result, participants have gained valuable food processing skills, contributing not only to their economic well-being but also to local food security and sustainable business practices. This initiative successfully demonstrates the potential for community-driven efforts to support both economic development and environmental stewardship.

Keywords: environmental sustainability, catfish floss, community empowerment, market expansion

INTRODUCTION

Food, as a primary human necessity, often requires innovation in its processing to enhance consumption variety and enrich nutritional and economic value. Diversifying food processing not only opens opportunities to improve the quality of community consumption but also effectively utilizes existing natural resources. Efficient land use for various economic activities such as livestock and fisheries demands careful management to ensure social and ecological benefits are maintained. Fisheries, a vital aspect of the economy—particularly in protein production—can have their benefits expanded through innovative processing of fish products. Catfish is a freshwater fish rich in nutrients such as amino acids, proteins, and high unsaturated fatty acids, which are essential for children's growth and brain development (Maulidya & Handayani, 2024). Despite its nutritional benefits, the consumption of freshwater fish like catfish remains low, and its processing is often limited to frying methods. Transforming catfish into value-added products like fish floss not only enhances its economic value but also improves children's nutritional intake, significantly impacting their development.

To support and meet the continuously increasing fish consumption needs, significant opportunities exist in processing fish into high-value products like catfish floss. The government, through the Ministry of Marine Affairs and Fisheries (KKP), has targeted aquaculture production of 9.4 million tons by 2024, with over 60% from freshwater aquaculture (Kementerian Kelautan dan Perikanan, 2023). Aquaculture activities—including the cultivation, rearing, and breeding of fish and the harvesting of their results in controlled environments—have great potential not only on large land areas but also in limited urban spaces through efficient and environmentally friendly methods. This approach opens opportunities for urban communities to actively participate in producing catfish floss, responding to protein needs and creating new economic opportunities.

Catfish, in particular, presents an ideal solution due to its adaptability to small-scale urban farming and high protein content (Primaningtyas et al., 2015). Processing catfish into floss not only meets nutritional needs but also utilizes catfish from existing or easily integrated cultivation systems into urban life with limited land. Indonesian consumers are already familiar with beef and chicken floss, popular as side dishes or snack ingredients, but fish floss remains less common. Introducing catfish floss can diversify food options and provide a nutritious and affordable alternative for consumers.

Community empowerment initiatives that focus on processing catfish into fish floss have proven successful in various regions. For instance, in Cokrobedug Hamlet, Sidoarum Village, residents—particularly women from the Family Welfare Program (PKK)—actively participated in training to process freshwater fish into fish floss, leading to productive economic activities and the establishment of home industries (Antriyandarti & Madina, 2024). This approach optimized the potential of local fish resources and provided an alternative household income, especially

important as farming income declined due to land conversion. Similarly, in Sambora Village, the diversification of fish processing into products like catfish floss has effectively improved community income and empowered women's groups (Hadinata et al., 2023). Leveraging the abundant local fish resources and the presence of freshwater fish farmer groups, household industries began producing fish crackers and catfish floss. These examples demonstrate that processing catfish into fish floss is a viable strategy for community economic development, making it an ideal choice for our community project.

Higher education institutions, with their resources and expertise, play a key role in providing practical solutions to society, particularly in Meruya Selatan. Through empowerment programs that include training in processing catfish into floss, these institutions aim to equip the community with food processing skills that not only increase the economic value of catfish but also promote the consumption of quality food. Furthermore, the activities are enriched with training in business management and simple bookkeeping, with the ultimate goal of improving family economies and strengthening food security.

In collaboration between Kelurahan Meruya Selatan and Universitas Mercu Buana, the primary focus is on economic improvement through innovation in agriculture and fisheries, with one specific initiative being the processing of catfish into catfish floss. Lecturers and students collaborate to provide training, assistance, and guidance, while students gain hands-on learning opportunities. This partnership enables the application of innovations developed by higher education institutions to support local communities in facing current economic challenges.

Meruya Selatan faces significant challenges in increasing household incomes and strengthening family economies due to several factors. The community struggles with limited land availability, which hampers the development of agricultural activities that could enhance income. Much of the existing land is utilized for residential and industrial purposes, leaving insufficient space for meeting the increasing food needs. Additionally, many residents lack the necessary knowledge and skills for efficient and productive aquaculture and fish processing techniques, which restricts their ability to engage in profitable agribusiness ventures. Capital constraints also present a major barrier to initiating or expanding activities such as catfish cultivation and catfish floss processing, as residents lack sufficient funding to invest in essential resources and equipment. Moreover, marketing challenges arise due to limited access to markets and a lack of effective marketing strategies for innovative products like catfish floss. Even if quality products are produced, reaching potential consumers and establishing a customer base can be difficult. Finally, there is a lack of social awareness about affordable food options based on nutritional content. Although fish is recognized as a nutritious option, the idea of fish floss—particularly from catfish—is not widely known or accepted within the community. Educating consumers on the benefits and versatility of catfish floss is crucial to overcome this challenge.

These issues necessitate environmentally sustainable production methods and market opportunities for locally produced catfish floss to enhance household incomes and food security. By addressing the lack of skills and knowledge, providing access to capital and markets, and increasing social awareness, the community can overcome these challenges.

The primary goal of this paper is to promote sustainable practices in food production and enhance market expansion opportunities for catfish floss by empowering the Meruya Selatan community through training and skill development. The specific objectives of the program include providing training on catfish processing, equipping the community with skills to process catfish into catfish floss, thereby adding economic value without requiring additional land. This training covers techniques for efficient production, quality preservation, and effective packaging. Another objective is to enhance entrepreneurial skills by offering training in business management and simple bookkeeping, helping residents manage small home-based enterprises and improving their ability to operate sustainable businesses that contribute to household incomes. Additionally, the program aims to improve access to markets by developing marketing strategies and providing assistance in accessing local and regional markets. This includes educating residents on market research, customer engagement, and promotional activities. Promoting nutritional awareness is also a key objective, involving education on the nutritional benefits of catfish and catfish floss, integrating health education into entrepreneurship training, and emphasizing the importance of protein-rich diets and safe food handling practices. Lastly, the program supports environmental sustainability by encouraging the use of locally cultivated catfish, minimizing waste, and reducing dependence on traditional protein sources, which aligns with broader environmental goals and promotes responsible resource use.

Through this initiative, it is expected that not only will residents' incomes increase, but there will also be an improvement in the quality of life through the consumption of sustainable local products. By leveraging the collaboration between the community and higher education institutions, the program aims to address economic and nutritional challenges, contributing to the overall development of Meruya Selatan.

METHOD

The community empowerment program was designed to actively engage the Meruya Selatan community through comprehensive activities, including environmental assessments and market surveys. Initial environmental assessments were conducted to understand the local context, particularly the limited land availability and the economic challenges faced by residents. Market surveys were implemented to gauge consumer interest in catfish floss, identify potential market opportunities, and understand competitive dynamics. Intensive dialogues with local partners—such as catfish farmers and prospective local entrepreneurs—were held to tailor the program effectively to the community's needs. These engagements aimed to ensure that the solutions provided were environmentally sustainable and economically viable.

Previous community empowerment initiatives have demonstrated that conducting a series of seminars and training sessions is an effective methodology for enhancing community knowledge and skills in fish processing. Amar et al. (2022) implemented planning, socialization, counseling, training, and mentoring methods to assist catfish farming groups and women's groups in Curug Village. This approach significantly increased the knowledge and skills of participants by approximately 70%, particularly in processing catfish into value-added products like fillets, meatballs, and crackers. Similarly, Martana et al. (2021) emphasized that socialization, training, and mentoring contributed to the successful development of processed catfish products, promoting community independence and welfare. Ferdiansyah et al. (2022) highlighted the importance of providing understanding and assistance through training to micro, small, and medium enterprises (MSMEs) in fish product processing, which led to effective outcomes and positive impacts on business legality, product labeling, and promotion strategies. Additionally, Vidina et al. (2024) utilized workshops involving socialization and training to educate community health workers and mothers on processing catfish into nutritious food to prevent stunting in children. These studies support the choice of seminars and training as effective methods for transferring knowledge, enhancing skills, and empowering communities in fish processing activities.

The program was introduced to the target community through socialization events to present the initiative, gather feedback, and refine the implementation plan based on community input. Intensive dialogues with partners helped identify the most effective solutions to be applied. Practical activities were carried out to support community empowerment. Participants received comprehensive training on producing catfish floss, covering the entire production process—from selecting raw materials to processing techniques and adhering to food safety standards. Necessary equipment was provided to participants within the prepared budget. Hands-on practice sessions were conducted under the guidance of instructors. Additionally, training on packaging and marketing was offered to help participants create attractive packaging and apply effective marketing strategies. Regular monitoring and mentoring were conducted to ensure production quality and to assist participants in establishing robust marketing networks.

The program's overall success was measured through continuous evaluation. Feedback was collected from participants and partners regarding the program's beneficial aspects and areas needing improvement. Ongoing monitoring ensured that best practices taught during training were consistently applied. An economic impact analysis was performed to assess how the program affected participants' incomes and the local economy.

Qualitative methods were employed to gather community feedback on consumer perceptions of catfish floss. This included collecting testimonials during training sessions, conducting interviews, and organizing focus group discussions with participants and potential consumers. These methods provided insights into preferences, acceptance levels, and suggestions for product improvement.

RESULTS AND DISCUSSION

The community empowerment program yielded significant outcomes through a series of production activities and training sessions aimed at developing and promoting catfish floss as a novel, sustainable product. The implementation encompassed four production trials and four comprehensive training sessions conducted between July and August 2024.

Four production trials were conducted on July 10, July 29, August 16, and August 22, 2024, each focusing on different aspects of the catfish floss production process to refine and optimize the product.

First Production Trial (July 10, 2024): The initial trial focused on testing the basic recipe for catfish floss. The team experimented with the composition of spices and processing techniques to achieve the desired texture and flavor

profile. This foundational work provided critical insights for subsequent refinements. Second Production Trial (July 29, 2024): Building on the first trial, the team successfully produced two flavor variants: curry seasoning and rendang seasoning. These variations were developed to offer consumers a wider range of choices and to demonstrate the product's innovative potential in taste diversification. The success of this trial marked a significant milestone in achieving consistent implementation of the refined recipes. Third Production Trial (August 16, 2024): The focus shifted to improving production efficiency by testing the use of catfish fillets instead of whole catfish. The aim was to streamline the process in terms of time and cost. However, evaluations revealed that using whole catfish was more cost-effective, despite initial considerations that fillets might expedite production. Fourth Production Trial (August 22, 2024): The final trial concentrated on the packaging of the finished product. The catfish floss was packaged in airtight pouches and sealed using a sealing machine, resulting in a market-ready product. This packaging approach was designed to preserve the quality and extend the shelf life of the catfish floss, enhancing its marketability.



Figure 1. Catfish floss production, training, and product

The cumulative results of these production trials demonstrated significant improvements in production efficiency, product quality, and readiness for market entry. The iterative process allowed the team to refine techniques and solidify a production model suitable for scaling. Four training sessions were conducted to empower participants with the necessary skills and knowledge for producing and marketing catfish floss.

Training Session 1 (July 12, 2024): Held at RPTRA Mahkota Kelurahan Meruya Selatan, this session was attended by 27 participants, including local leaders and university representatives. The session featured opening remarks by the village head and the Head of LPPM UMB, followed by presentations from external speaker Mr. Ahmad Sugiarto on business diversification. The session aimed to introduce participants to the potential of catfish floss production as a viable business opportunity.

Training Session 2 (August 2, 2024): Conducted at RPTRA Meruya Selatan with 33 participants, this session focused on the calculation of production costs. Presentations were delivered by Ms. Putri Andari Ferranti and Dr. Nurul Hidayah, emphasizing the importance of understanding the cost structure to ensure profitability and sustainable business practices.

Training Session 3 (August 16, 2024): Held at RPTRA Manuver Kelurahan Meruya Selatan, 27 participants attended this session. External speakers Ms. Puspitaningrum Pratiwi and Mr. Yana Rahmatullah presented on processing various types of catfish and catfish cultivation techniques. The session provided participants with in-depth knowledge of raw material sourcing and production methods.

Training Session 4 (August 23, 2024): The final session took place at RPTRA Menara Kelurahan Meruya Selatan with 31 participants. Dr. Daru Asih presented on product exhibition strategies, guiding participants on how to effectively showcase their products to attract consumers and investors.



Figure 2. Training seminars

Throughout these sessions, participants engaged actively, acquiring valuable skills in production techniques, financial management, marketing, and business operations. The high attendance rates reflected strong community interest and commitment to the program. An evaluation was conducted through a satisfaction survey involving 31 participants to assess the program's effectiveness. The program significantly increased participants' knowledge, with 90.3% of respondents strongly agreeing that the training was useful in developing their understanding. A majority (83.9% strongly agree) found the materials beneficial as learning resources, indicating the content was relevant and practical. Participants expressed a strong willingness to apply the knowledge gained, suggesting a positive outlook toward engaging in catfish floss production.

The program was deemed potentially effective in increasing participants' income, aligning with the objective of enhancing household economies. Collaboration with the program team was highly valued, with participants acknowledging the program met their expectations and provided substantial benefits. The positive feedback underscores the program's success in achieving its goals of knowledge transfer, skill development, and community empowerment. The program's outcomes highlight the effectiveness of a structured, community-based approach to developing sustainable economic opportunities through innovative food production. The sequential production trials allowed for iterative refinements in the catfish floss production process. Initial focus on recipe development ensured a high-quality product that met taste preferences. The introduction of flavor variants like curry and rendang expanded the product's appeal, catering to diverse consumer tastes and enhancing market competitiveness.

Exploring the use of catfish fillets versus whole fish provided practical insights into cost-efficiency. While fillets offered potential time savings, whole catfish proved more economical, an important consideration for small-scale producers aiming to maximize profits. The emphasis on packaging in the final trial addressed critical aspects of product preservation and presentation. Utilizing airtight pouches and sealing technology not only extended the product's shelf life but also improved its market readiness, crucial for consumer acceptance and trust.

The training sessions were instrumental in equipping participants with comprehensive skills required for successful production and entrepreneurship. Covering topics from technical production methods to financial management and marketing strategies, the sessions ensured participants were well-prepared to undertake catfish floss production as a viable business. Active participation and high attendance indicated strong community engagement. The inclusion of local leaders and experts fostered a collaborative learning environment, enhancing the credibility and impact of the training.

The positive reception and high satisfaction levels from the survey reflect the program's alignment with the community's needs and aspirations. By addressing knowledge gaps and providing practical skills, the program empowered participants to pursue new economic opportunities.

The potential for increased income through catfish floss production suggests a meaningful economic impact. As participants begin to apply their skills, the community may experience improved household incomes, contributing to broader economic resilience.

The program's success demonstrates a sustainable model of community empowerment that leverages local resources and addresses specific challenges, such as limited land availability. The collaborative approach between the university and the community serves as a replicable model for similar initiatives in other regions facing comparable challenges. Digital marketing has emerged as a crucial tool for the further evaluation and marketing of fish floss products. By leveraging social media platforms, businesses can significantly enhance the visibility and reach of their products to a wider audience. Frigiyanto et al. (2023) demonstrated that assisting micro, small, and medium enterprises (MSMEs)

in creating social media promotions—such as establishing Instagram business accounts—substantially increased the awareness and customer engagement for fish floss products. The community service program they conducted provided training on product photography to attract buyers and helped set up social media accounts, making the product more accessible and effectively communicating its nutritional value and taste, which led to positive sales growth. These digital marketing efforts were instrumental in enhancing market presence and consumer awareness of their diversified product offerings, including variations in product names, categories, compositions, flavor variants, and packaging (Gustyningrum et al., 2020). These studies underscore that incorporating digital marketing can be key to effectively evaluating market responses and expanding the reach of fish floss products, ultimately contributing to the sustainability and growth of such community-based enterprises.

CONCLUSION

The community program in Meruya Selatan, which focused on processing catfish into floss, has significantly enhanced the quality of life for participants. By acquiring new knowledge and technical skills, residents produced high-quality catfish floss that led to increased incomes and contributed to local economic growth. This initiative demonstrates how community-based food processing can empower individuals and strengthen economic independence. To sustain and maximize these benefits, ongoing support in marketing, distribution, and product innovation is essential to reach broader markets.

To ensure the program's sustainability and expand its impact, collaboration with various stakeholders is crucial. Enhancing marketing efforts through branding and promotions can boost product visibility, while expanding market access by partnering with retailers and online platforms will reach a wider customer base. Continuous product innovation and ongoing training will keep participants' skills up-to-date and products competitive. Forming cooperative structures can facilitate collective marketing and resource sharing. Seeking external support from government agencies and organizations can provide necessary funding and technical assistance. Regular monitoring and evaluation will help maintain the program's effectiveness and allow for necessary adjustments. By adopting these measures, the program can achieve greater sustainability and scalability, extending its benefits to more community members and fostering long-term economic growth through sustainable catfish floss production.

ACKNOWLEDGMENT

We, as the PKM team, would like to express our deepest gratitude to all parties who have contributed to the implementation of this program, particularly the Ministry of Education, Culture, Research, and Technology, as well as the internal parties of Universitas Mercu Buana through the 2024 PKM Grant Program, the Community Service Institute of Universitas Mercu Buana, and the partners from Kelurahan Meruya Selatan who were willing to be implementation partners. We hope that this program will continue to grow and provide even greater benefits in the future.

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