

Institutional Strengthening of Mama-Mama Papua in the Development of *Ikan Asar* Businesses Based on Local Resources: A Study of the Kampung Bright Gas Program in Imbi Village, Jayapura

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Abstract. Ikan asar (smoke fish) processing industry is one of the growing local economic sectors in the coastal area of Dok 8, Imbi Village, Jayapura City. For the local community, particularly coastal women known as the “Mama-Mama Papua,” smoked fish holds not only economic value but also serves as a distinctive feature of the local community, representing food processing knowledge passed down through generations and forming an integral part of the social and cultural life of the coastal community. Although this business has been passed down through generations, its development still faces limitations in terms of institutional capacity, production standards, business pricing, and access to broader markets. This study aims to analyze the process of institutional strengthening within the group, particularly among the Mama-Mama Papua, through the Kampung Bright Gas CSR Program initiated by PT Pertamina Patra Niaga Integrated Terminal Jayapura to develop a smoked fish business based on local potential. The study employs a descriptive qualitative approach using a case study of the Dian Mahikay Group. Data collection employed a descriptive qualitative approach using the case study method, involving interviews, observations, and documentation of a business group engaged in smoked fish processing. The results of this study indicate that the empowerment process occurs gradually through building trust, providing capacity-building assistance, strengthening group cooperation-particularly to identify needs and problems, and developing businesses that leverage local potential and strengthen institutional capacity to develop businesses independently. The empowerment program contributes to strengthening the groups’ capacity and institutional structure without eroding the local identities and practices that have developed within the community.

Keywords: *Ikan Asar, Institutional Strengthening, Mama-Mama Papua, CSR, Local Potential.*

A. INTRODUCTION

The coastal community of Dok 8, Imbi Village, Jayapura City, has a social, cultural, and economic life that is closely tied to activities in the fisheries sector. In this context, developing local potential is key to strengthening the community’s economy, particularly for groups whose income depends on businesses based on local resources. This potential can serve as the foundation for empowerment when the community is positioned as the primary actor in developing the natural resources they already know well. Local resource-based empowerment positions the community’s knowledge, skills, and potential as the foundation for capacity building. It ensures that the community is not merely a beneficiary but can also manage resources independently (Annisa, 2023). This approach is particularly important, especially in the context of coastal women, as economic activities are often closely tied to the experiences, culture, and social networks that have developed within the community.

This condition is reflected among the Mama-Mama Papua or (Papuan women) in the coastal area of Dok 8, Imbi Subdistrict, Jayapura City, who have engaged in economic activities by utilizing local knowledge and cultural practices. One of the local economic practices that has developed in the fisheries sector is the processing of *ikan asar* (smoked fish). For Mama-Mama Papua, *ikan asar* is not merely an economic product but also represents a food-

processing practice that preserves local knowledge through processes passed down across generations. In the Dok 8 area, *ikan asar* production has been practiced since the 1980s and has been sustained through intergenerational production practices.

This indicates that knowledge regarding fish selection, smoking techniques, and product flavor is not formed instantaneously but develops through experience and processes of knowledge transmission within families. Evidence of such intergenerational transmission can also be observed among other *ikan asar* producers in Jayapura who have continued family businesses that have been operating since the 1970s (Jubi, 2023). Thus, *ikan asar* can be understood not merely as a processed fish commodity but also as part of the local culinary knowledge and heritage embedded in the economic and cultural life of coastal communities in Jayapura.

This business is not merely an economic activity but has become an integral part of family life and a source of livelihood. *Ikan asar* is a traditional fish product from Jayapura, generally prepared using firm-textured marine fish such as yellowtail, skipjack tuna, frigate tuna, and snapper (Indonesia Kaya, n.d.). Its preparation maintains traditional techniques by placing the fish over a wood-fire smoke source and smoking it for several hours until it is fully cooked and develops its distinctive flavor and aroma. This process is carried out based on processing knowledge that has been acquired and preserved across generations. Therefore, *ikan asar* represents not only an economic product but also the culinary identity and local knowledge of the Jayapura community (Nabilah Attyyah, Sipahutar, 2022).

Although the knowledge and skills involved in *ikan asar* processing have been passed down across generations and have become part of the economic activities of Mama-Mama Papua, the continuity of these businesses does not necessarily indicate strong institutional capacity within the group. In conducting their businesses, the Mama-Mama Papua who are members of the Dian Mahikay group continue to face limitations in developing business-related knowledge and institutional capacity. The Dian Mahikay group is a group of *ikan asar* processors located in the coastal area of Dok 8, Imbi Subdistrict, which had been engaged in *ikan asar* processing prior to the assistance provided by PT Pertamina Patra Niaga in 2023. The group serves as a platform for Mama-Mama Papua to conduct economic activities based on local potential.

The group was formed through economic activities that had been collectively undertaken by Mama-Mama Papua involved in *ikan asar* processing and subsequently became a space for them to conduct and develop their businesses. Prior to the implementation of the assistance program, their micro, small, and medium-sized enterprise (MSME) activities had already been operating through the production and sale of *ikan asar*. However, they continued to face limited access, particularly to information, production standards, business licensing, certification, and broader market opportunities. This condition indicates that the primary challenge was not a lack of production capacity, but rather limited access to and institutional support for business development.

This finding is consistent with the study conducted by Sunarli et al. (2024) on women-led MSME groups in Baubau City, which found that group vulnerability is influenced not only by internal capacity but also by limitations in establishing networks and partnerships with external stakeholders. The study emphasizes the importance of institutional strengthening as part of efforts to enhance the resilience of women's groups in developing their businesses (Sunarli et al., 2024).

These issues highlight the importance of institutional strengthening in community empowerment. Empowerment should not be limited to the provision of assistance or training but should also involve building the capacity of groups to manage resources, establish networks, access information, and participate in business development. Interventions become

more meaningful when beneficiary groups are not positioned merely as recipients or implementers of activities, but also as active subjects involved in the empowerment process (Yucky Erdiyanti, 2024). In the context of Mama-Mama Papua, strengthening such capacities is important to enable their existing experience to develop into collective capabilities for managing and developing their businesses.

Building on these conditions, PT Pertamina Patra Niaga Integrated Terminal Jayapura has demonstrated its commitment to supporting community empowerment through the CSR program, Kampung Bright Gas for *ikan asar* processing. The program was initiated and managed by Pertamina as part of its efforts to address the limitations faced by Mama-Mama Papua and to support the development of Mama-Mama Papua's *ikan asar* business group in the Dok 8 area. The primary implementer of the program is the Dian Mahikay business group, while its implementation involves various stakeholders in the processes of mentoring, capacity building, institutional strengthening, legal compliance, product development, and market access. Thus, the program is not solely directed toward sustaining production activities but also toward strengthening the group's capacity to manage its business in a more organized manner.

This strengthening approach is consistent with the view that locally based empowerment should focus on strengthening the capacities already possessed by communities rather than building capabilities from the ground up. Sulaiman et al. (2022), for instance, demonstrated the importance of developing knowledge and business management capacity in promoting the economic empowerment of Mama-Mama Papua. The empowerment process based on local resources can be pursued through enhancing knowledge and skills, providing mentoring, and promoting community participation. This perspective helps position the *ikan asar* business not as an enterprise newly established through the program, but as an existing local potential that has subsequently been strengthened through empowerment interventions (Sulaiman et al., 2022).

Therefore, this study aims to analyze the process of institutional strengthening among Mama-Mama Papua through the Kampung Bright Gas CSR Program in developing an *ikan asar* business based on local potential. The study focuses on how the group's institutional capacity, which previously faced limitations in organizational management, developed following the mentoring and support provided by the company, particularly through business legalization, product standardization, independent business development, and other mentoring mechanisms. Thus, this study examines not only the development of the *ikan asar* business but also how the institutional strengthening process supports Mama-Mama Papua in collectively developing and managing their business.

B. LITERATURE REVIEW

1. Women's Empowerment Based on Local Potential

Studies on women's empowerment based on local potential indicate that community development should begin with the resources, knowledge, and experience already possessed by the community. Empowerment based on local resources can be pursued through enhancing knowledge and skills, providing mentoring, and promoting community participation in productive activities. This approach demonstrates that local potential serves not only as an economic resource but also as a foundation for building community capacity. In the context of this study, this perspective is used to view the *ikan asar* business as an activity that has developed within the Mama-Mama Papua's community and serves as an initial asset in the empowerment process (Annisa, 2023).

This understanding of resources can be further strengthened through Kabeer's (1999) conceptual framework of women's empowerment, which examines empowerment through the interrelationship between *resources*, *agency*, and *achievements*. *Resources* encompass various

forms of resources that enable women to expand their capabilities and choices, while *agency* refers to the ability to make choices and take action, which may subsequently generate *achievements* as outcomes of the empowerment process. In the context of locally based empowerment, the knowledge, skills, experience, and resources already possessed by the community can serve as initial assets that are subsequently strengthened through mentoring and capacity-building processes. This framework is relevant for examining how Mama-Mama Papua's experience in *ikan asar* processing represents not only a long-standing economic activity but also a form of *resources* that can be developed into greater capacity to manage and develop their businesses (Kabeer, 1999).

Empowerment should therefore be understood not only in terms of individuals' ability to engage in economic activities but also in their capacity to exercise agency and engage in collective action. Namirah and Ruwaida (2024) conceptualize women's empowerment through three dimensions: *choice*, *agency*, and *participation*. Strengthening individual capacity provides a foundation for building group and institutional capacity, enabling women to participate more actively in various spaces of collective engagement. This perspective indicates that empowerment can develop from strengthening individual capabilities toward the collective capacity of groups to act and assume roles collectively (Namirah & Ruwaida, 2024).

2. Institutional Strengthening as Collective Empowerment

Women's empowerment is not limited to enhancing individual capacity but also involves their ability to build collective strength through groups. From a *collective empowerment* perspective, groups provide a space for women to develop their capacities, build solidarity, acquire knowledge, and strengthen their ability to engage in processes related to their interests. Thus, empowerment extends beyond an individual's ability to act and also encompasses the capacity to act and make decisions collectively (Diprose, 2023).

This understanding highlights the importance of groups when they function not merely as administrative entities but also as spaces where members can learn, exchange knowledge, address challenges, and build collective strength. In this process, institutional strengthening becomes an important component, as institutions can provide the structure and space necessary for members to perform their roles more actively.

Consistent with this understanding, *collective empowerment* through the dimensions of *choice*, *agency*, and *participation* developed by Namirah and Ruwaida enables women to build collective strength through joint action. This perspective demonstrates that collective empowerment involves women's ability not only to make choices for themselves but also to participate in processes taking place within their groups and broader social environments (Namirah & Ruwaida, 2024).

C. METHOD

This study was conducted among Mama-Mama Papua who are members of the Dian Mahikay Group in the coastal area of Dok 8, Imbi Subdistrict, Jayapura City, Papua. The location was selected because the Dian Mahikay Group is an *ikan asar* processing group participating in the Kampung Bright Gas Program and has undergone capacity and institutional strengthening through the implementation of the program. The object of the study is the process of empowerment and institutional strengthening of the Dian Mahikay Group, with a focus on the utilization of local potential, member capacity building, institutional development, improved business access, product development, business legality, and marketing.

This study employed a descriptive qualitative approach using a case study method. According to Sandelowski (2000), descriptive qualitative research aims to provide a comprehensive description of a phenomenon based on experiences and events as identified in

the research data. This approach was employed because the study focuses on understanding the processes of empowerment and institutional strengthening of the Mama-Mama Papua's group through the Kampung Bright Gas Program, based on the contextual conditions identified in the field (Sandelowski, 2000).

The study was designed to describe the conditions of the Mama-Mama Papua before and after the implementation of the program, the process of strengthening members' capacities, the utilization of local potential, institutional development, as well as changes in business development and marketing. The analysis employed Kabeer's (1999) conceptual framework of women's empowerment, comprising *resources*, *agency*, and *achievements*. Within this framework, *resources* are broadly understood as material, human, and social resources that can expand women's capabilities to make choices (Kabeer, 1999).

In this study, *resources* were operationalized through knowledge and skills, production facilities and equipment, access to information on business legality and product standards, packaging capabilities, and market access. *Agency* was analyzed through members' involvement in learning processes, acceptance of innovations, product development, and business development. Meanwhile, *achievements* were examined through the outcomes emerging from the empowerment process, including product diversification, improvements in production quality, compliance with legal requirements, and changes in market access.

This study utilized both primary and secondary data. Primary data were obtained through interviews and direct field observations. Interviews were conducted with individuals who had direct knowledge of and involvement in the implementation of the program or who had directly benefited from it. The interviews were used to obtain information on the group's conditions prior to the program, the mentoring process, changes in members' capacities, business development, as well as changes in marketing and product development. Secondary data were obtained from documents related to the implementation of the Kampung Bright Gas Program, program reports, activity documentation, as well as relevant scientific literature and regulations concerning women's empowerment, institutional strengthening, and MSME development.

The data were analyzed qualitatively through the stages of data reduction, data presentation, and conclusion drawing. Interview and documentation data were categorized according to the research themes and subsequently presented descriptively to illustrate the group's conditions and the changes that occurred throughout the program implementation. The data were further analyzed using Kabeer's (1999) framework, which comprises three dimensions: *resources*, *agency*, and *achievements*. For the *resources* dimension, the analysis focused on changes in the group's access to knowledge, skills, equipment, information, business legality, and markets. The *agency* dimension was used to examine members' involvement in learning processes, their acceptance of innovations, product development, and their ability to take action in developing the business. Meanwhile, *achievements* was used to assess the outcomes of these processes, including product diversification, improvements in product quality, compliance with legal requirements, and changes in marketing patterns and market access.

D. RESULT AND DISCUSSION

1. Initial Conditions Prior to Institutional Formation

The institutional strengthening of the Dian Mahikay Group originated from economic activities among coastal communities in Dok 8, Imbi Subdistrict, which had been practiced long before the implementation of the Kampung Bright Gas Program. *Ikan asar* processing in the area had developed since the 1980s. Thus, when the program was implemented in 2023, *ikan asar* processing had already been practiced for approximately three decades and had

become part of the community's intergenerational livelihood. The *ikan asar* business did not originate from corporate intervention but emerged from the economic practices of coastal communities that utilized fishery resources as a source of livelihood.

Initially, the business was operated individually by Mama-Mama Papua and was subsequently organized into the Dian Mahikay assisted group. When the program was implemented in 2023, the group consisted of eight members, the majority of whom were elderly Mama-Mama Papua, with an average age of approximately 70 years. Within the group, Mama Selvia was one of the founders and played a role as an *agent of change* by encouraging other Mama-Mama Papua engaged in similar occupations to become more receptive to the development of their *ikan asar* businesses. Over time, the number of group members gradually increased to 20. This growth indicates that the group became increasingly open as a collective space for *ikan asar* producers to participate in business development activities. This role positioned Mama Selvia as one of the *local heroes* who contributed to driving change and strengthening the management of the *ikan asar* business at the group level.

Prior to the program intervention, the operational management of *ikan asar* production still relied on traditional methods. Mama-Mama Papua continued to use firewood as the primary energy source for smoking the fish. In practice, the entire production process remained highly dependent on their skills and experience in processing *ikan asar*. Generally, production activities began in the morning with the procurement of fresh fish, followed by cleaning, seasoning, and smoking the fish for approximately 2 to 4 hours before it was sold in the Dok 8 area in the evening. Although production activities had been sustained through extensive experience accumulated over a long period, a needs assessment conducted in the field indicated that Mama-Mama Papua continued to face limitations in access to information, product standards, market development, as well as business legality and certification.

These limitations were also related to the characteristics of the group members, the majority of whom were elderly Mama-Mama Papua. Amid these conditions, the involvement of the younger generation began to emerge through April Surli, the daughter of Mama Selvia, who participated in both the business activities and the program. April served as a link between the *ikan asar* processing experience passed down from the previous generation and newer ideas for business development. She also encouraged younger *ikan asar* sellers to join the group and adapt to the use of gas as an alternative energy source.

This involvement indicates that the development of the group has begun to create space for the participation of the next generation. Thus, institutional strengthening has not only focused on enhancing the capacity of existing members but has also begun to foster continuity through the involvement of younger generations. Thus, the initial conditions of the Dian Mahikay Group provided the foundation for the institutional strengthening process. The group already possessed experience, local knowledge, and ongoing economic activities but required strengthening in institutional capacity, access to information, business legality, and broader market access. A study on MSME development indicates that limitations in business legality, business knowledge, and market access can hinder business development and competitiveness. Therefore, mentoring should be directed not only toward improving production capabilities but also toward strengthening institutional capacity and access to broader markets (Tanzaga & Kusuma, 2025). This position is important because it determines the direction of program intervention: rather than establishing an *ikan asar* business from the outset, the program seeks to strengthen the institutional structure surrounding an existing community-based business so that it becomes more inclusive and self-reliant.

2. Strengthening the Role of Mama-Mama Papua in Business Institutions

Institutional strengthening within the Dian Mahikay Group can be observed in the increasing participation of members in learning processes, problem-solving, and business development. The program began with socialization and a needs assessment conducted by PT Pertamina Patra Niaga Integrated Terminal Jayapura in collaboration with the group to identify the conditions and challenges encountered in managing their business. The findings from this assessment subsequently served as the basis for determining the form of assistance provided through the Kampung Bright Gas Program. PT Pertamina Patra Niaga Integrated Terminal Jayapura facilitated the provision of resources, technology, and supporting infrastructure tailored to the group's needs, including a *rainwater harvesting* system as an alternative water source for production sanitation and a gas-powered *smokehouse* as an alternative to firewood. In addition, the group received supporting production equipment, including a *vacuum sealer*, digital scales, a *spinner*, and a *mixer* to support improvements in production quality and standards. This facilitation was subsequently complemented by training and gradual mentoring, enabling members not only to receive the facilities but also to participate in testing, utilizing, and developing solutions based on their business needs.



Figure 1. Program Socialization Activity

Source: Field Documentation, 2024

The participation of Mama-Mama Papua in this development can be understood through the concept of community participation developed by Arnstein (2007), which positions community involvement as part of the process of determining matters related to their interests. In the case of the Dian Mahikay Group, members' involvement extended beyond participating in activities provided by the program to include identifying their needs, communicating challenges, and contributing to the development of business solutions. Product development also drew upon the knowledge and recipes already possessed by the community (Arnstein, 2007).

This can be observed in the emergence of an initiative to develop *ikan asar* into derivative products, namely Sambal Baba and shredded fish (*abon*). The initiative was driven by the involvement of Mama-Mama Papua and younger members of the group, which encouraged innovation in business development. The initiative was subsequently strengthened through company mentoring in production, quality improvement, packaging, business legality, and marketing.

Sambal Baba and shredded fish (*abon*) were developed by utilizing unsold *ikan asar* from the same day and reprocessing it into products with added value and a longer shelf life. Sambal Baba is a traditional Papuan preparation made from *ikan asar*, combining smoked tuna with a chili-based seasoning. The ingredients include *ikan asar*, red chili, onion, ginger, and other spices. The use of local ingredients and recipes passed down across generations forms part of the product's distinctive characteristics (Faisal, 2022). Product development within the Dian Mahikay Group did not originate entirely from the company's intervention but rather from the knowledge, skills, and processing practices already possessed by the Mama-Mama Papua. Through program mentoring, this knowledge was further developed to make the products more market-ready through improvements in quality, packaging, and product standardization.



Figure 2. Shredded Fish (*Abon*) Product
Source: Field Documentation



Figure 3. The Product is Sambal Baba, Packaged and Labeled as “Sambal Ikan Asar”
Source: Field documentation

In addition, the involvement of external stakeholders was reflected through collaboration with various parties. In the process of business development, the Mama-Mama Papua also interacted with several stakeholders with distinct roles, including government institutions, the subdistrict administration, technical agencies, and supporting organizations. The Imbi Subdistrict Administration provided administrative support, assisted with business legalization and institutional strengthening, and facilitated coordination between the group and

relevant stakeholders. The Fisheries and Marine Affairs Office provided technical assistance in fisheries product processing, product diversification, quality improvement, food safety, and access to development and marketing programs. Meanwhile, the Health Office supported food hygiene and sanitation and compliance with food safety requirements. The non-governmental organization Dompot Dhuafa provided institutional assistance, entrepreneurship training, business development support, as well as monitoring and evaluation in collaboration with the community.

The involvement of these various actors demonstrates that institutional strengthening does not take place solely within the group but also through the development of working relationships that enable the group to obtain support according to the respective functions of each stakeholder. From a *stakeholder* perspective, each actor possesses different forms of authority, resources, knowledge, or capacity, allowing their involvement to complement the needs of the group. In the context of Dian Mahikay, such support encompasses administrative and institutional aspects, fisheries-related technical assistance, food safety, business legality, and business mentoring. Thus, the institutional strengthening process occurs through both the enhancement of the group's internal capacity and the expansion of support networks that contribute to business sustainability. The strengthening of women's groups can be pursued through organizational capacity development, knowledge and skills exchange, and the expansion of networks with other actors (Diprose, 2023).

a. Group Development

The program intervention subsequently resulted in changes in several aspects directly related to business activities. One of the changes was the introduction of a gas-powered *smokehouse* as an alternative to firewood. Prior to the program, firewood was the primary energy source for the smoking process, with approximately 50 kg used per member each month at a cost of around IDR 500,000–800,000. Reliance on firewood for production resulted in high production costs and limited business competitiveness. In addition, the lack of support for business legality and product certification further limited access to formal markets.

In response to these needs, PT Pertamina Patra Niaga Integrated Terminal Jayapura, through the Kampung Bright Gas Program, introduced and facilitated a gas-powered *smokehouse* as an alternative to firewood. The introduction of this technology marked an initial point of change in the production process, as the traditional smoking method gradually shifted toward a more efficient production approach. This change did not occur immediately but developed through a process of introduction, mentoring, and hands-on practice in using the *smokehouse* during production activities. The transition therefore occurred gradually, from a smoking process fully dependent on firewood toward a production process that increasingly utilized gas-powered technology.

The transition to the use of a *smokehouse* required an adaptation process, as the Mama-Mama Papua had long been accustomed to using firewood and initially expressed concerns about the safety of using gas. Therefore, the adaptation process was carried out gradually through mentoring and hands-on practice with the technology during production activities. This process subsequently resulted in changes that could be directly experienced by group members in their business activities. The mentoring process lasted for nearly one year, during which the Mama-Mama Papua gradually became accustomed to the technology and began transitioning from firewood to a gas-powered smoking system.

This change was reflected in the production methods adopted by the members. Previously, the smoking process required approximately four hours when using firewood, whereas the use of a gas-powered *smokehouse* reduced the smoking time to approximately two hours. In terms of energy use, 5.5-kg LPG cylinders also reduced monthly fuel expenditure

from approximately IDR 650,000 to around IDR 300,000. Thus, the technological change involved not merely replacing the fuel source but also transforming the production process into a shorter and more efficient one.



Source: Direct Field Documentation

Figure 4. Ikan Asar Processing Using a Smokehouse

This experience became an important part of the process through which Mama-Mama Papua adopted the innovation. Initially, the use of gas was perceived as something new and required a period of adjustment. However, after Mama-Mama Papua began using the technology and experiencing its benefits in their production activities, their acceptance of the technology gradually increased. Mama Selvia Maniani, who played an active role in encouraging group members to adapt, also stated that using gas was perceived as safer, more economical, and less physically demanding than using firewood.

This process demonstrates that changes in production practices occurred through learning and direct experience in adopting the innovation. Direct involvement in using the technology enabled members not only to acquire new knowledge but also to understand its benefits and adapt its use to their business needs. Such a learning process can strengthen women's capacity to utilize technology for business development (Zhang et al., 2026).

3. Strengthening Access and Business Development Capacity

Strengthening access is an important component of the group's capacity development process. According to Kabeer's (1999) conceptual framework of women's empowerment, empowerment can be understood through three interrelated dimensions: *resources*, *agency*, and *achievements*. *Resources* encompass not only material resources but also knowledge, skills, and social resources that can expand the capacity of individuals and groups to make and exercise choices. Access to these resources can subsequently support the development of *agency*, defined as the ability to make choices and take action, which may in turn lead to *achievements* or outcomes of the empowerment process. In the context of business groups, access to information, mentoring, legal support, networks, and production resources can constitute enabling conditions that allow groups to strengthen their capacities and determine the direction of their business development (Kabeer, 1999).

In running their *ikan asar* business, Mama-Mama Papua continued to face challenges related to food safety standards, business legality and certification, as well as business development. In terms of marketing, the Mama-Mama Papua initially marketed *ikan asar*

products through direct selling to consumers. Their marketing practices remained largely traditional and were not yet connected to formal markets. As the mentoring program was implemented, market access gradually expanded to broader markets. Efforts to expand product marketing included both offline and event-based channels, such as participating in local exhibitions and bazaars, as well as supplying franchise outlets such as Alfamidi and SAGA. Marketing activities were also expanded through online channels, with the company providing training on the use of social media platforms such as Instagram and Facebook, as well as marketplaces such as Shopee, as part of the group's online marketing strategy. The company's assistance therefore not only strengthened Mama-Mama Papua's capacity to produce their products but also expanded the group's strategies for marketing and developing its business.

Strengthening efforts were also undertaken in the area of business legality. Prior to the implementation of the program, Mama-Mama Papua did not have formal business legality or product certification, which limited their marketing activities primarily to direct sales. In 2025, the company began strengthening the group's legal status through the acquisition of a Business Identification Number (NIB) and halal certification as initial steps toward accessing formal markets. In the context of MSME development, business legality is an important component because businesses are not only expected to be capable of producing products but must also meet administrative requirements and applicable regulations to operate and develop their activities within the formal economy.



Figure 5. Introducing the Business Through the East Phoria Festival

Source: Field documentation

These requirements are reflected in Government Regulation No. 5 of 2021 on the Implementation of Risk-Based Business Licensing. Under this regulation, the Business Identification Number (NIB) serves as the identity of a business operator and, for low-risk business activities, functions as a business license as well as proof of legal status for conducting business activities (Republic of Indonesia, 2021). However, for food businesses, compliance with business legality requirements does not end with obtaining an NIB. Food products must also comply with provisions concerning food safety, production, and labeling according to the type of product and scale of the business. In addition, BPOM Regulation No. 4 of 2024 provides guidelines for the issuance of the Certificate of Compliance with the Production Commitment for Household Food Industries (SPP-IRT), including provisions regarding products eligible for SPP-IRT certification and the inclusion of the PIRT number on product labels (RI, 2021).

Administrative requirements in food business development can be understood as part of the readiness of a business and its products to enter formal markets, rather than merely as a matter of document completeness. Business legality provides a formal basis for business operations, while compliance with product requirements relates to safety, quality, product

information, and other provisions applicable to the characteristics of the product. In the context of the Dian Mahikay Group, obtaining an NIB and halal certification represents an initial step toward strengthening the group's readiness to enter formal markets, while improvements in product quality and packaging complement this process.

This finding is consistent with the study conducted by Hakim et al. (2024) on the MOTEKAR MSME group in Maruyung Village. The study found that limited business legality and conventional marketing practices were barriers to expanding market access among MSMEs. Through training, business development assistance, NIB registration support, and marketing development, 9 of the 13 assisted MSMEs successfully obtained NIBs, while the remaining 4 MSMEs had already obtained NIBs prior to the program. The study demonstrates that strengthening business legality alongside marketing development can create opportunities for MSMEs to participate in more formal markets (Hakim et al., 2024).

Thus, strengthening the capacity of Mama-Mama Papua involved not only the provision of additional facilities or the fulfillment of administrative requirements but also an increase in the resources available to the group and its ability to utilize these resources for business development. The shift from previously relying on direct selling toward efforts to expand market access through exhibitions and local events indicates an expansion of the group's marketing capacity. Meanwhile, obtaining an NIB and halal certification, developing derivative products, improving product quality, and utilizing supporting equipment demonstrate the group's increased capacity to meet broader business requirements. This process indicates that mentoring contributed to expanding the group's *resources*, which subsequently created greater opportunities for Mama-Mama Papua to exercise *agency* and achieve *achievements* in the development of their *ikan asar* business.

4. Institutional Effectiveness in Promoting Self-Reliance

The mentoring process provided by the company to the Mama-Mama Papua did not develop in a short period but was implemented gradually beginning in 2023. In the initial stage, the company sought to establish communication with the Mama-Mama Papua to understand their needs and the challenges they faced. The mentoring process then addressed issues closely related to their business activities, including dependence on firewood, limitations in product standardization, certification, and marketing.

Changes began to emerge as the Mama-Mama Papua became willing to try new approaches introduced by the company during the mentoring process. One example was the introduction of gas-powered *smokehouse* technology. By 2024, the Mama-Mama Papua had begun transitioning from firewood to *smokehouses* in *ikan asar* production. The transformation introduced by the company was intended to accelerate the production process, improve cost efficiency, and encourage both Mama-Mama Papua and younger members of the Dian Mahikay Group to operate more independently and become more receptive to opportunities related to *ikan asar* business management.

In addition to strengthening production capacity, the mentoring process also focused on business development through improvements in business legality and production standards. These efforts aimed to enable *ikan asar* products to reach broader markets and become better prepared to enter formal markets. Changes were also evident in the group's marketing practices, which had previously relied primarily on direct selling. As the group's capacity developed, the Mama-Mama Papua began utilizing digital marketing and participating in exhibitions and other sales activities. This change indicates that the group experienced not only improvements in production processes but also an increasing ability to identify and utilize broader market opportunities.

This process gradually transformed the role of Mama-Mama Papua from recipients of mentoring into increasingly active actors in developing their businesses. The success of the program is reflected not only in the increase in equipment or products produced but also in members' ability to adopt innovations, participate in identifying business needs, and explore new forms of business development. These changes have also created opportunities for business continuity through the involvement of the next generation, allowing the knowledge and experience possessed by Mama-Mama Papua to be passed on and further developed in accordance with future business needs.

a. Changes in Income and Business Efficiency

Based on income data from the 20 members of the Dian Mahikay Group, differences were observed in members' income before and after the program. These differences indicate that the economic changes experienced by members did not occur to the same extent.

Table 1. Income of Dian Mahikay Group Members Before and After the Program

No.	Member Name	Before Program	After Program	Change in Income
1	Selvia Maniani	Rp4.550.000	Rp4.850.000	+Rp300.000
2	Nelce Randui	Rp0	Rp685.000	+Rp685.000
3	Lince Wanggai	Rp600.000	Rp900.000	+Rp300.000
4	Paulina Fonataba	Rp3.000.000	Rp3.000.000	Rp0
5	Thamriana Wanggai	Rp3.000.000	Rp3.000.000	Rp0
6	Melmina Karubaba	Rp3.000.000	Rp3.000.000	Rp0
7	Ruth Feibei	Rp3.000.000	Rp3.000.000	Rp0
8	Magaretha Wengge	Rp3.000.000	Rp3.000.000	Rp0
9	Andriana Wanggai	Rp600.000	Rp900.000	+Rp300.000
10	Penina Wanggai	Rp3.000.000	Rp3.000.000	Rp0
11	Jevi Korwa	Rp1.110.000	Rp1.135.000	+Rp25.000
12	Octovina Animam	Rp0	Rp25.000	+Rp25.000
13	Minggas Woru	Rp700.000	Rp725.000	+Rp25.000
14	April Wanggai	Rp666.000	Rp691.000	+Rp25.000
15	Lismina Woru	Rp700.000	Rp725.000	+Rp25.000
16	Glorida Waromi	Rp0	Rp25.000	+Rp25.000
17	Piler Woru	Rp700.000	Rp725.000	+Rp25.000
18	Yunita Randui	Rp700.000	Rp725.000	+Rp25.000
19	Minggas Wanggai	Rp700.000	Rp685.000	-Rp15.000
20	Rose Wanggai	Rp700.000	Rp725.000	+Rp25.000

Based on the table, 13 members experienced an increase in income, 6 members experienced no change, and 1 member experienced a decrease. On average, the total monthly income of the 20 members increased from IDR 29,726,000 to IDR 31,521,000. Accordingly, the average monthly income per member increased from approximately IDR 1,486,300 to IDR 1,576,050, representing an increase of approximately IDR 89,750 per member per month (6.04%). However, considerable differences in income levels were observed among members. This condition indicates that the economic benefits of the program were not distributed uniformly and may be associated with differences in members' involvement in production and sales activities. The available data do not directly measure the level of member participation; therefore, this relationship should be understood as an indication rather than as a definitive causal relationship.

In addition to changes in income, the program also resulted in greater energy-use efficiency. The following table presents changes in emission levels before and after the implementation of the program.

Table 2. Changes Before and After the Use of the *Smokehouse*

Aspect	Before Program	After Program	Result
Kayu bakar	±50 kg/orang/bulan	Beralih ke LPG	±50 kg kayu diselamatkan/bulan
Kayu bakar tahunan	±600 kg/orang/tahun	Beralih ke LPG	±600 kg kayu diselamatkan/tahun
Biaya bahan bakar	±Rp650.000/orang/bulan	±Rp300.000/orang /bulan	Hemat ±Rp350.000 (53,8%)
Emisi dari kayu	Estimasi ±0,99–1,10 ton CO ₂ /orang/tahun	Pembakaran kayu dialihkan	Potensi emisi kayu yang dihindari ±0,99–1,10 ton CO ₂ /tahun

The reduction in firewood use also contributes to reducing emissions from production activities. Before the program, each member used approximately 50 kg of firewood per month, equivalent to 600 kg per year, for the fish-smoking process. After switching to LPG through the *smokehouse*, firewood consumption decreased. Based on a carbon fraction of 45–50% in wood and the conversion of carbon mass to CO₂ using a factor of 44/12, the use of 600 kg of firewood is equivalent to an estimated 0.99–1.10 tons of CO₂ per person per year that could potentially be avoided through reduced wood burning.

The reduction in firewood use also contributes to reducing emissions from production activities. Before the program, each member used approximately 50 kg of firewood per month, equivalent to 600 kg per year, for the fish-smoking process. After switching to LPG through the *smokehouse*, firewood consumption decreased. This change resulted in cost efficiency, with fuel expenditure decreasing from approximately IDR 650,000 to IDR 300,000 per month. This represents savings of approximately IDR 350,000 per member per month, or 53.8%. These savings not only reduce production costs but also create financial space that can potentially be reallocated to business development, such as improving packaging, *branding*, promotion, and expanding sales. Research on MSMEs indicates that the management of production and marketing costs is associated with business profitability, suggesting that cost efficiency can serve as one basis for strengthening business development strategies (Kevin et al., 2022).

From an environmental perspective, the reduction in firewood use also contributes to reducing emissions generated from wood combustion. Based on a carbon fraction of 45–50% in wood and the conversion of carbon mass to CO₂ using a factor of 44/12, the use of 600 kg of wood per person per year is equivalent to an estimated 0.99–1.10 tons of CO₂ emissions per person per year that could potentially be avoided through reduced wood combustion. Thus, the transition to LPG through the use of a *smokehouse* indicates changes in cost efficiency while also offering potential environmental benefits in the *ikan asar* production process.

E. CONCLUSION

This study shows that the institutional strengthening of the Dian Mahikay Group through the Kampung Bright Gas Program took place gradually by strengthening the group's capacity, participation, and access without eliminating local knowledge and practices in *ikan asar* processing. The strengthening process was carried out through needs assessment, mentoring, provision of production facilities, and the introduction of innovations such as a gas-powered *smokehouse*. This process encouraged changes in production practices, which

previously relied on firewood, toward more efficient methods while also increasing members' involvement in adopting and developing innovations.

Further institutional strengthening was reflected in the group's increased access to product development, business legality, and marketing. The group began developing derivative products, namely sambal baba and *ikan asar abon*, obtained a Business Identification Number (NIB) and halal certification, and expanded its marketing through exhibitions, bazaars, and digital media. These findings indicate that the program not only increased the group's *resources* but also encouraged members' *agency* and generated business *achievements*. Thus, institutional strengthening contributed to enhancing the group's capacity to manage and develop its business independently while also creating opportunities for the involvement of the next generation in maintaining the sustainability of the locally based *ikan asar* business.

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