

Increasing production capacity through diversification of mangrove processing

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ABSTRACT

The Mina Karya Fishery Product Marketers Processing Group (Poklahsar) is a business group in Tambaklorok, Semarang, that processes marine products. It currently faces limitations in product processing and diversification, marketing, and finance. This group has the potential to grow and reach a broader market. PKM activities aim to increase POKLAHSAR 'Mina Karya' capacity to diversify processed mangroves and optimize marketing and financial management capabilities. Activity methods include training, assistance in using appropriate technology related to mangrove-processed diversification, and finance and marketing management skills. The results of PKM activities are an increase in the capacity of Poklahsar Mina Karya in diversifying processed mangrove production and the ability of the results of PKM activities to increase the capacity of Poklahsar Mina Karya in production, marketing, and finance. Spinner machine assistance accelerates the draining process to only 10 minutes and durability for three months. The disc mill flouring machine technology helped diversify products and increase Marketing and finance training, helped partners expand market reach to a national scale, and optimized business management, creating new economic opportunities.

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1. INTRODUCTION

Semarang is a maritime city with a 21-kilometer-long, 4-mile-wide coastline in the north that directly faces the Java Sea. Along the city's coast are several neighborhoods where most residents depend on marine products for a living. Among these areas, Tambaklorok Village, located on the Banjir Kanal Timur and Banger River's banks, is Semarang's largest fishing settlement. The village, which falls under the administration of Tanjung Mas Sub-district, North Semarang, is directly adjacent to the Java Sea and Banger River on the north side. With an area of 84.48 hectares, it is flanked by the Tambak Mulyo Subdistrict on the west and the Tambak Rejo Subdistrict on the east. The total population living in this area is recorded at 10,503 people (Dimitra & Yuliastuti, 2012).

People in the Tambaklorok area mostly make a living as fishermen, traders, small industries, and household industries related to fishing, so their livelihoods are highly dependent on marine resources. This area is also known as a fishermen's settlement. Most people come from various regions that lack

skills, so they work as fishermen or laborers with economic limitations and low income (Anita, 2020). The potential in the Tambaklorok area includes marine resources and mangrove ecotourism development.

Mina Karya Fishery Product Processing and Marketing Group (local term: *Kelompok Pengolahan dan Pemasaran Hasil Perikanan*), hereinafter referred to as Poklahsar, is one of the business groups initiated by mothers, wives of fishermen, and non-fishermen from Tambaklorok Village, Semarang City. The group was established in 2010, initially consisting of 25 members, with business activities focused on processing fish crackers, salted fish, shrimp paste, presto milkfish, and fresh fish marketing. Over time, the group has also grown to produce processed fish products such as anchovy crispy, spicy anchovy, and mangrove crispy as a source of additional income for the family. Product processing carried out by the Mina Karya group still uses simple tools, so the number of products produced is still limited to fulfilling orders and exhibitions. The production of various processed fish products is still very limited, only through ordering products, participating in exhibitions, and providing processed products at local markets.

The business has excellent potential to be developed and marketed, but partners face several problems and limitations. The issues faced by Poklahsar Mina Karya are in production, marketing management, and financial management. In production, Poklahsar Mina Karya only processes various fish and mangroves in the form of chips. On the other hand, residents have not utilized the potential availability of abundant mangrove fruit as a product. Based on the potential in the Tambaklorok area, the surrounding community has not utilized the abundance of mangrove plants as an alternative food source. The utilization of mangroves as a food source is minimal and less diverse (Sarofa et al., 2018). The abundance of *lindur* mangrove plants (*Brugulera Gymnorhiza*) in the Tambaklorok area has the potential to be processed into local food sources. Current conditions: the community in the Tambaklorok area processes mangrove leaves and fish into chips using simple equipment. This process takes a long time, and the resulting product still contains a lot of oil.

Poklahsar Mina Karya's problem is the limited marketing reach, i.e. when there are orders and during exhibitions of superior products. This is because the products produced have not yet received PIRT certification, so they cannot be sold in retail stores, minimarkets, or souvenir centers. In the field of financial management, Poklahsar Mina Karya members have not planned it well, related to recording money out and in and still mixing business finances with family finances. This will have an impact on the lack of optimal monitoring of how much profit or loss the business makes.

This community service activity provides solutions to Poklahsar Mina Karya related to various production and management problems. In the production aspect, partners are given knowledge related to the utilization of mangrove fruit in the form of processed mangrove fruit diversification. Mangrove fruit has a high carbohydrate content and can be utilized as an essential ingredient for making mangrove flour to be blessed into various types of food (Hamzah et al., 2022). Flour made from *lindur* fruit has fulfilled the criteria for flour worthy of consumption. The moisture, ash, carbohydrate, and fiber content in *lindur* fruit flour meet SII standards. The flour is safe for consumption as the limiting factors of *lindur* fruit, such as tannins and HCN, are significantly reduced during processing. *Brugulera Gymnorhiza* can also be used for various types of food preparations. These include rice, flour, crackers, *cireng*, mangrove syrup, and porridge (Sabana, 2014), so the results of mangrove fruit can be utilized as food processing diversification. Local food-based diversification can create new jobs, increase the income of food processing entrepreneurs, and ultimately improve the regional economy (Triyanti et al., 2023). Mangrove fruit will have high economic value and improve the welfare of people in an area through the diversification of mangrove-processed products (Sugianto, 2019). In this activity, partners were trained to process mangrove fruit into mangrove flour through the facilitation of a disc mill and training in making cookies. Diversification of mangrove fruit processing into flour and then processing into various

food products is a solution to increase sales (Asia & Wijayanti, 2022; Baderan et al., 2015; Hidayat et al., 2013; Kartika et al., 2024; Sarofa et al., 2018). The facilitation of production tools, training, and business management knowledge are important steps in increasing production capacity (Arthana et al., 2017). In addition, to increase the durability of the processed products, partners are also introduced to the technology of draining using a spinner.

Regarding the marketing aspect, partners are given information related to how to apply for PIRT. Through PKM activities, partners are expected to have PIRT and be able to market their products in retail stores and have a wider marketing reach. In the financial aspect, partners are given training on how to make a cash book related to recording incoming and outgoing finances and to always be orderly in keeping business records.

This community service activity aims to educate partners about diversifying processed mangroves into useful products through the introduction of technology. It also aims to improve marketing skills so that products have a wider market reach and improve business financial management skills for Poklahsar Mina Karya.

2. METHODS

Community service activities for the Mina Karya group in Semarang to increase production capacity through diversifying mangrove processing. The location of the implementation of community service activities is in the Tambaklorok fishing village, Tanjungmas Semarang Village, with the target Poklahsar Mina Karya which has 25 members. In this activity, partners are introduced to technology in the form of a spinner machine, which is used to speed up the process of draining oil in processed chips. Poklahsar Mina Karya is introduced to a flouring machine (disc mill), later to be used to make mangrove flour for the diversification of processed food. Partners with marketing limitations will be introduced to how to obtain PIRT and market using the marketplace. Partners do not yet have business financial records, so in this activity, they are trained on how to record finances using a cash book.

This community service activity is carried out through an asset-based community development approach prioritizing empowerment, with the community as the target of empowerment. As a community, the community can improve living standards and social welfare. This method requires a facilitator role to identify opportunities and connect them with other resource systems to collaborate in capacity building (Al-Kautsari et al., 2019). The method of implementing community service activities is through training and mentoring in using technology in diversifying processed mangroves. Evaluation of the success of the program, among others, is carried out with indicators of an increase in the number and type of mangrove-based products produced before and after the program, a reduction in production process time with the use of spinner machines, and a comparison of product durability before and after using spinner technology. Increase in the number of products marketed through retail stores and marketplaces. Percentage of partners who apply financial records after training.

Service activities are divided into seven stages, namely the preparation stage, coordination of activities, facilitation of tools, training, and practice of using tools, training and practice of mangrove-processed diversification, training and practice of online marketing and bookkeeping, and evaluation of activities. The stages and methods of implementing activities are presented in Table 1.

3. RESULTS AND DISCUSSION

Community service activities at Poklahsar Mina Karya were carried out for 6 months and were divided into five parts, namely, assistance with production equipment, training in mangrove processing

diversification, training in PIRT management and financial management, mangrove-based raw material processing practices, and activity evaluation. The series of PKM (community service activity, hereinafter referred to as PKM) activities can be explained as follows.

Table 1. Activity implementation stage

Stage 1. Preparation	
Activity	- Preliminary survey of Poklahsar Mina karya - Discussion with Poklahsar members
Objective	- Identification of Poklahsar Mina Karya's problems in production capacity and management. - Preparation of activity plan for problem-solving
Implementation	Second week of March 2024
Stage 2. Coordination of Service Activities	
Activity	Coordination and Preparation of Service Activities
Purpose	- Preparing the date of activity implementation - Preparing a place for training activities and planning the placement of tools
Implementation	First - second week of August 2024
Stage 3. Technology Facilitation	
Activity	Handover of facilitation tools to Poklahsar Mina Karya, spinners, disc mill and display cases.
Implementation	Third week - August 2024
Stage 4. Training and Practical Use of Technology	
Activity	- Training to use spinners - Training to use the flouring machine (disc mill) and make mangrove flour
Implementation	Second week of September 2024
Stage 5. Training and Practice of Mangrove Processed Diversification	
Activity	Train partners to process mangrove flour into cookies
Implementation	Fourth week of September 2024
Stage 6. Management Training and Practice Online Marketing and Financial Report	
Activity	- Provide partner literacy related to making PIRT and its advantages - Provide online marketing literacy - Providing literacy related to making a cash book and the importance of financial records
Implementation	Second week of October 2024
Stage 7. Activity Evaluation	
Activity	Discussion, question and answer, and overall evaluation
Implementation	First week of November 2024

Stage 1. Preparation

This stage begins with a preliminary survey to identify problems in the Mina Karya group, namely limited knowledge and production capacity in processing mangroves as potential superior products. In addition, limited management skills in business management by all members of Poklahsar Mina Karya resulted in suboptimal business management.

Stage 2. Coordination of activities with partners

After knowing the existing problems, the next step is for the team to develop an activity plan as an effort to solve the problem by coordinating the planning and implementation of the program and compiling a schedule of community service activities from start to finish.

Stage 3. The Facilitation of Technology

At this stage, the PKM team provides facilitation in the form of supporting devices for diversifying mangrove-processed products and joint business activities that have been running so that the Mina Karya group can be more productive. To increase partner capacity related to production problems and product diversification capabilities, partners are given literacy in applying appropriate technology and facilitation of mangrove flour machines and spinners (oil drainer). The purpose of this activity is to increase the ability of partners to use production equipment to increase quantity and quality and to enhance the diversity of production results. This service activity provides training and facilitation of Spinner machines with SPIN-3.5 Spinner Machine specifications. The oil-draining machine (spinner) functions to reduce the remaining oil in fried food so that the quality and weight are maintained. This machine works with the centrifugal force method, where the oil separates as the machine rotates. The machine can drain up to 4.27 percent of the oil in cassava chips in 5 minutes at 967 rpm. It also reduces the moisture and oil content of fish and mangrove chips by about 5 percent each. Using ergonomic spinner machines can increase efficiency up to 100 percent (Dewi et al., 2023). Minimum residual oil in food products will undoubtedly make them look more attractive because no excess oil sticks, even a little stagnant in the packaging

The dedication activity also provides facilitation of mangrove flour machines, namely the Dry Special Disc Mill (flouring machine). The disc mill machine serves to crush the mangrove after it goes through the drying process. The SY2200 Disc Mill Machine is used to process dry food ingredients into flour. Traditionally, the process of making flour from dry foodstuffs is done by pounding. Some community groups still use pestles and mortar to pound rice into rice flour (Andasuryani et al., 2023). The working principle of pounding and milling has now been applied in a more efficient and appropriate technology. This machine has a milling capacity of about 30-50 kg per hour and measures 55 x 26 x 43 cm with a speed of 1420 rpm. The Disc Mill machine can be used for repeated product grinding for soft/fine results with a fineness level of 20 to 100 mesh.



Figure 1. Facilitation of spinner

Figure 2. Facilitation of disc mill machine

Stage 4. Training on the Use of Tools

At this stage, partners are trained to use a spinner and flouring machines. Participants are trained to use spinner machines to drain fish chip products, which are the result of Poklahsar Mina Karya production. Partners are also introduced to the stages of making mangrove flour through training in the use of flouring machines (disc mill). The process of making flour from mangrove raw materials was explained at this stage. The steps of making mangrove flour are stripping, boiling, soaking, and drying (Rini et al., 2018). At the stage of fruit peeling and cleaning, it begins with peeling the fruit before

processing. By peeling the fruit, the pulp is separated from the skin, which will only become powder in the fruit section. Once the fruit is peeled, it is cut and washed. The skin and dirt attached to the fruit flesh are cleaned with clean water. Next comes the boiling and soaking stage. After cleaning, the fruit is soaked for two days and two nights in plain water. Every day, the soaking water is changed to help the fruit release its sap. This is done to reduce the sour or bitter taste of the fruit. To release the sap quickly and effectively, a portion is placed in water and brought to a boil (Figure 3).



Figure 3. Mangrove cleaning and soaking process

The purification process is carried out using a blender. This process aims to speed up the drying in the next stage. The next stage is drying. The fruit that has turned into pulp will be dried using sunlight. The purpose of drying is to remove water from the fruit's pulp. The moisture content should be measured both before and after drying. Once dried, the process of milling into flour will be more straightforward. The final stage is milling or refining. The grinding process is done with a disc mill until the flour is ready for use (Figure 4).



Figure 4. Grinding process with a disc mill into flour

Stage 5. Diversification Training of Mangrove

The partners were trained to make cookies using mangrove flour. The stages of making mangrove-based cookies, as described by [Sarofa et al. \(2018\)](#), include the preparation of ingredients, mixing, grinding, and printing and baking. The preparation stage begins with weighing the ingredients, including mangrove flour, wheat flour, powdered sugar, baking soda, gram salt, and margarine. Mixing is done by mixing sugar and eggs with a high-speed mixer until the dough becomes fluffy. Then, mangrove flour and wheat flour are added and stirred at a low speed until smooth and homogeneous. Next, the dough is rolled out, molded, and baked in an oven for 15 minutes at a temperature of 180°C. All participants were actively involved in the process of making cookies from mangrove raw materials (Figure 5).



Figure 5. Training and practice of making mangrove cookies

Stage 6. Management Training

At this stage, partners are given PIRT management training, training in the use of online marketing, and financial management training. At the PIRT management training stage, partners were explained some of the benefits of PIRT-certified products ([Kurniaji, 2023](#)): (1) Products are declared fit for sale; (2) Products can circulate freely; (3) Product safety and quality are guaranteed; (4) Increased consumer confidence; (5) Increased product professionalism; (6) Increased product selling value; (7) Entry into large retail markets. Entry into the large retail market. Some of the requirements for PIRT standardization according to the Food and Drug Administration Regulation (2012) are: (1) Location and Production Environment; (2) Buildings and Facilities; (3) Production Equipment; (4) Water Supply Facilities or Water Supply Facilities; (5) Hygiene and Sanitation Facilities and Activities; (6) Employee Health and Hygiene; (7) Employee Maintenance and Sanitation Hygiene Program; (8) Storage; (9) Process Control; (10) Supervision by responsible parties; (11) Labelling and Product Information; (12) Supervision by responsible parties; (13) Recording and Documentation; and (14) Employee Training. Next, the PIRT requirements were explained to the Mina Karya group. Here, they were asked to fill in the PIRT permit application form, attend food safety counseling to obtain a certificate, receive the recommendation results of the inspection of household industry food production facilities, explain the types of food allowed to obtain SPP-IRT and attach a draft ([Rahmadi & Curatman, 2023](#)).

Furthermore, online marketing training. At this stage, participants have explained the importance of online marketing. Some of the benefits of online marketing include being able to expand its marketing reach. MSMEs need to be more flexible and responsive to form closer relationships with customers. Digital marketing is conducted by using digital media or the internet to sell products to customers. Social media is the most widely used tool by people from various types of businesses and is the most effective tool for marketing because it allows small and medium enterprises to offer products at a very affordable cost ([Septiningrum et al., 2020](#)). Training activities include increasing knowledge and explaining the

importance of using digital marketing to market MSME products and explaining the advantages of using social media and providing training and practice in using social media through a marketplace. This training is carried out using social media through marketplaces as a means of selling by opening accounts, uploading products offered as advertisements, and using various menus in the marketplace.

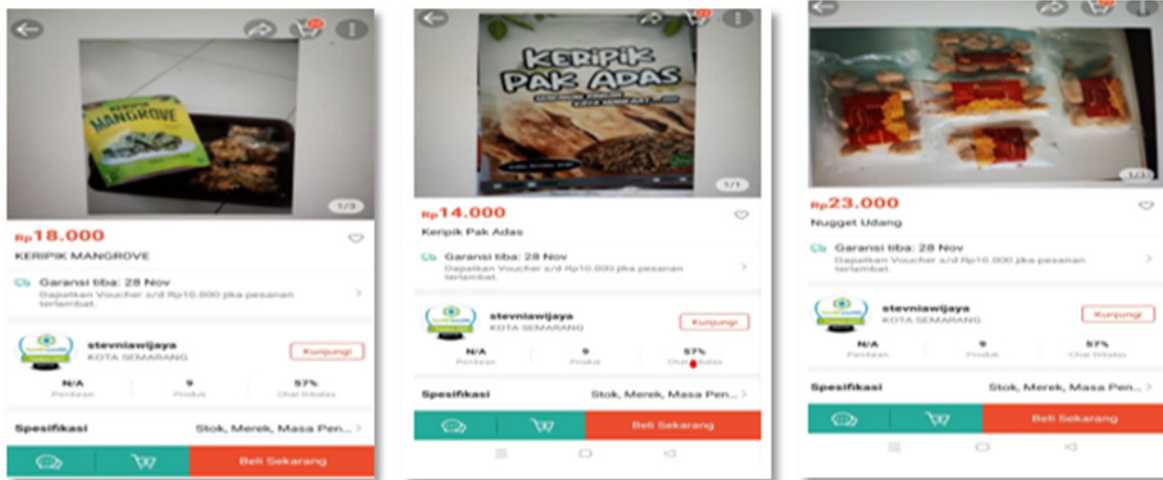


Figure 6. Product sales on the Shopee marketplace

In the financial management training phase, the target group was given literacy on several essential points regarding the separation between household and business finances. After this explanation, the partners were also instructed on how to record cash inflows and outflows (Sari et al., 2022).

Tanggal	Uraian	Nama akun	debit	Kredit	Saldo
Saldo			15.000.000		
01/09/2024	membeli Teri medan 3 kg @ 85.000	Beban bahan baku		255.000	14.745.000
01/09/2024	membeli bandeng 5 kg			225.000	14.520.000
01/09/2024	membeli ikan sembilang 5 kg @35000	Beban bahan baku		175.000	14.345.000
01/09/2024	plastik	Beban overhead		50.000	14.295.000
02/09/2024	Tenaga kerja langsung 3 @ 50000	Beban tenaga kerja langsung		150.000	14.145.000
02/09/2024	Air Galon 4 @5000	Beban bahan pembantu		20.000	14.125.000
02/09/2024	Listrik , air dan telpon	Istrik, air, telepon		150.000	13.975.000
03/09/2024	gas 4 x @25000	Beban overhead		100.000	13.875.000
04/09/2024	bawang merah	Beban bahan pembantu		50.000	13.825.000
04/09/2024	bawang putih	beban bahan pembantu		50.000	13.775.000
04/09/2024	Tepung terigu	beban bahan pembantu		15.000	13.760.000
04/09/2024	penyedap rasa	Beban bahan pembantu		50.000	13.710.000
04/09/2024	garam Minyak goreng	Beban overhead		25.000	13.685.000
04/09/2024	Teri jengki 3 kg @ 100.000	Beban bahan baku		300.000	13.385.000
05/09/2024	tepung beras	Beban bahan baku		30.000	13.355.000
05/09/2024	tepung maizena	beban bahan baku		50.000	13.305.000
05/09/2024	Pendapatan teri krispi	Penjualan	300.000		13.605.000
05/09/2024	pendapatan kripik mangrove	Penjualan	450.000		14.055.000
05/09/2024	pendapatan bandeng presto	Penjualan	750.000		14.805.000
05/09/2024	pendapatan teri balado	Penjualan	250.000		15.055.000

Figure 7. Practice of making a cash book

Stage 7. Evaluation

This stage included discussions, questions and answers, and evaluation of understanding of PKM activities. Participants were very enthusiastic and active in the question-and-answer session for all materials. Furthermore, an evaluation of activities was carried out regarding participants' knowledge of mangrove product diversification, PIRT licensing, online marketing, and financial management training.

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Participants were given a questionnaire about understanding the PKM activity material. The evaluation results are presented in Table 1.

Table 2. Evaluation of PKM activities

Training Stages	Indicator(s)	Output	Percentage Before PKM	Percentage After PKM	Evaluation
Training and practice on the diversification of mangrove products	The production of mangrove flours	Participants can explain and practice how to make mangrove flour.	20	75	Succeed
	The production of products made from mangrove flour	Participants can explain and practice processing with mangrove flour as the main ingredient.	25	80	Succeed
Training on PIRT management	The Importance of PIRT	Participants can understand the benefits of a product with PIRT certification.	30	80	Succeed
	PIRT requirements	Participants can understand the requirements for the PIRT certificate.	20	80	Succeed
	Online Marketing	Participants can practice online marketing	25	75	Succeed
Training on financial management	Creation of a cash book	Participants can explain and practice the creation of a cash book.	25	85	Succeed

Table 2 shows an increase in the participants' ability to explain and practice how to make mangrove flour initially only 20 percent of participants knew about mangrove flour, increasing to 75 percent. In addition, there was an increase in the participants' ability to practice mangrove flour processing by 55 percent. This is expected to have an impact on all members of the Mina Karya Poklahsar so that they can produce more diverse mangrove products that are more in demand by potential consumers, and it can increase the income of all members. In PIRT management, there was a 60 percent increase in understanding of the benefits of PIRT certificates and PIRT application requirements by 60 percent. With the awareness of all members of PIRT certification, it can impact on a wider product marketing reach so that it can be sold in larger stores and be better known to the public. In terms of online marketing techniques, participants who initially did not know how to sell products online, namely 25 percent, increased to 75 percent through the direct practice of posting their products on the Shopee menu. The participant's ability in financial management also increased to 85 percent because all participants

began to realize and were willing to practice making cash books and separating business finances from household finances so that business finances became more organized. Overall, this community partnership empowerment activity was declared victorious in increasing the capacity of the Mina Karya Poklaksar in diversifying mangrove processing, gaining knowledge of PIRT permits, and developing financial management capabilities.

Table 3. Evaluation criteria for the success of community service activities

Description	Before Community Service Activities	After Community Service Activities
Introduction to disc mill machine technology	Participants are not yet familiar with disc mill technology; mangrove fruit is not utilized.	Participants are familiar with disc mill technology, and mangrove fruit is utilized to make flour.
Introduction to spinner technology	Processed fish chips are drained manually; the process takes 1 hour, and the results are less than optimal. The product lasts 1 month.	The product is drained with the help of a spinner for 15 minutes, the results are crispier and more durable. The product lasts 3 months.
Increasing the number of types of Partner Products/ diversification	Mangrove leaves are processed into chips (1 product item).	Mangrove leaves are made into chips, and mangrove fruit is processed into mangrove cookies (2 product items)
PIRT	The product is not yet PIRT-certified	The product is in the process of being submitted for PIRT
Increased marketing scale	Marketing only in the local area	Marketing on a national scale using Shopee
Number of products that have been marketed online	No products have been marketed online	8 products have been marketed using Shopee.
Improving financial management skills	Participants do not manage finances	5 members use cash book recording for their business

Community service activities generally increase Poklaksar Mina Karya's capacity in production, marketing, and finance. Before the community service activities, the Poklaksar Mina Karya group had limitations in production, both in terms of technology and product diversification. With the provision of spinner machines and flour machines (disc mills), there is an increase in efficiency in the production process. The spinner machine helps reduce the oil content in processed products, thereby increasing the quality and attractiveness of the product. The spinner machine makes the products more durable and long-lasting as originally processed fish chips were only crispy for up to one month in a closed place; with the use of a spinner, the product can last up to 3 months. The same thing was also stated by (Kusnandar et al., 2023), that the use of a spinner, can increase the durability of the chip. Meanwhile, the flour machine allows the production of mangrove flour as a basic ingredient for various food products. The training will enable partners to process mangrove fruit into flour and derivative products such as mangrove cookies. This diversification increases the added value of local resources that have not previously been optimally utilized. This also provides new economic opportunities for local communities and reduces dependence on fishery products. The PKM activity has also been carried out (Abubakar et al., 2023) which processes mangroves into coffee in Kendari, and (Hasanah et al., 2022) by processing mangroves as candy and syrup ingredients.

With the training activities, participants who initially faced marketing and financial management constraints increased their understanding of PIRT certification. Participants can also use the online media, Shopee, to market their products. This improvement allows partner products to be marketed more widely and increases their income. Community service (Gainau et al., 2024) also provides training in using websites to introduce fishery products for small businesses in Maluku. Partners also have better financial management skills so that business financial management is better recorded, and its development can be evaluated. Community service activities related to financial report preparation training also function to describe how the ongoing business is performing so that it can determine the direction of the business in the future smoothly (Putri et al., 2024). Overall, the results of community service activities are presented in Table 3.

4. CONCLUSION AND RECOMMENDATIONS

This community service activity aims to provide partners with an understanding of various innovations in processing mangroves into valuable products through technology. In addition, this activity also aims to strengthen marketing strategies so that products can reach a broader market and improve skills in business financial management for Poklahsar Mina Karya. There are seven stages in the community service activity, starting from the Preparation stage, activity coordination, tool facilitation, training and practice of tool use, training and practice of mangrove processing diversification, management training and practice of online marketing and bookkeeping, and activity evaluation. The results of the community service activities showed significant improvements in various aspects. Before the activity, participants were unfamiliar with disc mill technology but are now able to use it to process mangroves into flour. The use of spinners also increased efficiency, reducing draining time from 1 hour to 15 minutes and extending product shelf life from 1 month to 3 months. Product diversification grew from one type to two with the addition of mangrove cookies. The marketing scale increased from only local to national through Shopee, with eight products being marketed online. In addition, five members have now implemented financial records with cash books

Limitations in community service implementation are the ongoing monitoring system in the community. Lack of post-training assistance can hinder the sustainability of the business and the application of technology that has been provided to Poklahsar Mina Karya. Some suggestions from this community service activity are the need to strengthen periodic assistance and monitoring for Poklahsar Mina Karya focused on performance evaluation, product innovation, and increasing production capacity and digital marketing. The government and related agencies need to collaborate in supporting the marketing of Poklahsar Mina Karya products through facilitation and assistance with business legality. In addition, partners can develop new mangrove products, such as drinks or snacks, and strengthen the supply chain of raw materials to distribution for business sustainability and product competitiveness.

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REFERENCES

- Abubakar, S., Kadir, M. A., Subur, R., Rina, Fadel, A. H., Al Hadad, M. S., Wahidin, N., Noman Susanto, A. N., Salim, F. D., & Muksin, D. (2023). Pemanfaatan buah mangrove *Rhizophora apiculata* sebagai olahan kopi mangrove dalam upaya peningkatan ekonomi masyarakat di Desa Maitara Utara Kecamatan Tidore Utara. *Jurnal Pengabdian Magister Pendidikan IPA*, 6(2), 368–377.
- Al-Kautsari, M. M. (2019). Asset-based community development: Strategi pengembangan masyarakat. *Empower: Jurnal Pengembangan Masyarakat Islam*, 4(2), 259.
<https://doi.org/10.24235/empower.v4i2.4572>
- Andasuryani, A., Adrizal, A., & Chandra, A. R. (2023). Introduksi teknologi pengolahan gula semut pada KSU-ED Tabek, Kabupaten Solok. *LOGISTA: Jurnal Ilmiah Pengabdian Kepada Masyarakat*, 7(1), 61-66. <https://doi.org/10.25077/logista.7.1.61-66.2023>
- Arthana, I. W., Restu, I. W., Dewi, A., Pratiwi, M. A., Ekawati, R., Widiastuti, W., & Negara, K. (2017). Pelatihan pengolahan produk buah mangrove untuk mendukung pengembangan Nusa Lembongan sebagai destinasi wisata. *Buletin Udayana Mengabdi*, 16(2), 133–137.
- Asia, N., & Wijayanti, T. (2022). Analisis Nilai Tambah Buah Mangrove (*Sonneratia Ovata*) Sebagai Bahan Baku Utama Pembuatan Sirup Mangrove Di Kota Bontang (Studi Kasus Pada Kelompok Tani Hutan Daun Harum Kelurahan Tanjung Laut Indah Kota Bontang). *Prosiding Seminar Nasional Agribisnis 2022 Fakultas Pertanian Universitas Khairun Ternate*, 2(1), 1–47.
- Baderan, D. W. K., Hamidun, M. S., Lamangandjo, & Retnowati, Y. (2015). Diversifikasi produk olahan buah mangrove sebagai sumber pangan alternatif masyarakat pesisir Toroseaje, Kabupaten Pohuwato, Provinsi Gorontalo. *Prosiding Seminar Nasional Masyarakat Biodiversity Indonesia*, 1(2), 347–351. <https://doi.org/10.13057/psnmbi/m010230>
- Dewi, R. P., Saputra, T. J., & Budiono, H. S. (2023). Peningkatan kualitas produk makanan pada UKM di Kota Magelang. *Warta LPM*, 26(2), 136–145. <https://doi.org/10.23917/warta.v26i2.1043>
- Dimitra, S., & Yulastuti, N. (2012). Potensi kampung nelayan sebagai modal permukiman berkelanjutan di Tambaklorok, kelurahan Tanjung Mas. *Teknik PWK (Perencanaan Wilayah Kota)*, 1(1), 11-18.
- Gainau, P. C., Kilay, T. N., Ruban, A., & Pattiasina, G. A. (2024). Assistance in using Sipikan Website to increase sales of fishermen in Seri Village Sub-District Nusaniwe. *ABDIMAS: Jurnal Pengabdian Masyarakat Universitas Merdeka Malang*, 9(4), 1003–1016.
<https://doi.org/10.26905/abdimas.v9i4.14243>
- Hamzah, H., Yanto, S., & Fadillah, R. (2022). Analisis kandungan tepung buah mangrove jenis *lindur* (*Bruguiera* Sp) sebagai alternatif bahan pangan lokal. *Jurnal Pendidikan Tambusai*, 6(2), 16383–16391.
- Hasanah, U., Faried, A. I., & Sembiring, R. (2022). Pemberdayaan masyarakat pengolahan mangrove menjadi permen jelly dan sirup mangrove berbasis nilai jual sebagai upaya peningkatan pendapatan masyarakat Desa Kota Pari, Kecamatan Pantai Cermin. *Community Development Journal: Jurnal Pengabdian Masyarakat*, 3(2), 890-894. <https://doi.org/10.31004/cdj.v3i2.5063>
- Hidayat, T., Suptijah, P., & Nurjanah, N. (2013). Karakterisasi tepung buah *lindur* (*Bruguiera Gymnorhiza*) sebagai beras analog dengan penambahan sagu dan kitosan. *Jurnal Pengolahan Hasil Perikanan Indonesia*, 16(3), 268–277. <https://doi.org/10.17844/jphpi.v16i3.8065>
- Kartika, D., Savitri, D., Dwiningasih, K., & Khasanah, F. (2024). Diversifikasi teknologi pengolahan dan pemasaran tanaman mangrove menjadi produk unggulan desa pesisir di Pasuruan. *DIMASLOKA: Jurnal Pengabdian Masyarakat Teknologi Informasi Dan Informatika*, 3(1), 30-34.

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- Kurniaji, K. (2023). Prosedur proses sertifikasi P-IRT (Pangan-Industri Rumah Tangga) pada UMKM Pasca-Pandemi Covid 19. *Jurnal Multidisiplin West Science*, 2(3), 200–214. <https://doi.org/10.58812/jmws.v2i03.266>
- Kusnandar, K., Harisudin, M., Riptanti, E. W., Khomah, I., Setyowati, N., & Qonita, R. A. (2023). Peningkatan kualitas produk UKM “Peyek Bunder” melalui introduksi teknologi tepat guna Spinner. *Jurnal Pengabdian UNDIKMA*, 4(1), 44-55. <https://doi.org/10.33394/jpu.v4i1.6902>
- Putri, U. M., Khairiyani, K., Kurniyati, K., & Wulandari, C. P. (2024). Assistance in preparing financial reports for digital-based MSME actors in Tungal Ilir Sub-District. *Abdimas: Jurnal Pengabdian Masyarakat Universitas Merdeka Malang*, 9(2), 412-422. <https://doi.org/10.26905/abdimas.v9i2.12228>
- Rahmadi, R., & Curatman, A. (2023). Pendampingan perizinan PIRT sebagai penguatan produk di Wahana Multi Agribisnis Cirebon. *BERNAS: Jurnal Pengabdian Kepada Masyarakat*, 4(3), 2214–2220.
- Rini, C., Nuswardhani, S. K., & Ernawati, E. (2018). *Handout Potensi dan Pengolahan Mangrove Jenis Rhizopora Mucronata Menjadi Es Krim*.
- Sabana, C. (2014). Kajian pengembangan produks makanan olahan mangrove. *Jurnal Ekonomi dan Bisnis*, 14(1), 40-46.
- Sari, P. N., Oktaria, E. T., Yusda, D. D., & Wengrum, T. D. (2022). Pelatihan manajemen keuangan bagi pelaku usaha umkm didesa mekar sari kabupaten mesuji. *Jurnal Pengabdian UMKM*, 1(1), 38-42. <https://doi.org/10.36448/jpu.v1i1.10>
- Sarofa, U., Mulyani, T., & Wibowo, Y. A. (2013). Pembuatan cookies berserat tinggi dengan memanfaatkan tepung ampas mangrove (*Sonneratiacaseolaris*). *Jurnal Teknologi Pangan*, 5(2).
- Septiningrum, L. D., Sadiyah, K., Hasan, J. M., Gustiasari, D. R., & Darsita, I. (2020). Pengenalan digital marketing dalam upaya meningkatkan penghasilan ibu rumah tangga (IRT) Majlis Taklim Al Auladiyah. *Dedikasi PKM*, 1(3), 1. <https://doi.org/10.32493/dedikasipkm.v1i3.7401>
- Triyanti, R., Wijaya, R. A., Zamroni, A., Ramadhan, A., Apriliani, T., Huda, H. M., Pramoda, R., Pramono, L. H., & Koeshendrajana, S. (2023). Diversifikasi usaha mina padi mendukung ketahanan pangan dan sumber pertumbuhan ekonomi baru. In S. Widowati, & R. A. Nurfitriani (Ed.), *Diversifikasi pangan lokal untuk ketahanan pangan: Perspektif ekonomi, sosial, dan budaya*, (111-143). Penerbit BRIN.
-