



Increasing the Productivity of Fried Shallot "Emak" Kediri MSMEs with Appropriate Technology and Business Management Assistance

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Abstract

The grand harvest of shallots is a time when almost all shallot farmers harvest simultaneously, resulting in an abundant supply of shallots and a plentiful supply of fried shallot ingredients at low prices. In contrast, during the lean season, shallot prices become expensive, leading to inflation (price fluctuations of shallots). This has a direct impact on the 'Emak' Fried Shallots MSMEs located in Kediri Regency. Another problem faced by partners is that the production process is carried out using small-capacity machines, and premium fried shallots are produced manually, so the production process requires a lot of labour, time and production costs. With the implementation of PKM and the application of Appropriate Technology (red onion/shallot slicing machine), it is hoped that the production process can be accelerated and the output of MSMEs increased. The tangible results have been delivered in the form of two Appropriate Technology machines to MSME partners, for the production of premium and Grade A/B/C fried shallots, with a production increase of 10 minutes per kg and a daily production of 40 kg. Based on data from the Fried Shallots MSMEs, the average profit increase over three months reached 118.04% (equivalent to 14.36 million rupiah). The highest profit increase was achieved in September 2024, reaching 125% (equivalent to 15.9 million rupiah). The lowest value in October 2024 reached 80.51% (equivalent to 12.26 million rupiah). This difference in value was mainly due to the fluctuating price of shallots as a raw material and market demand, which increased when prices fell and decreased when the price of fried shallots rose, thereby affecting the profits of MSMEs.

Keywords: *Fried Shallot, Technology Application, Productivity Improvement, Business Management.*

A. PENDAHULUAN

Shallots or red onion (*Allium cepa* L. Var. *aggregatum*) is one of the world's main cooking spices, originating from Iran, Pakistan and the mountains to the north, but later spreading to various parts of the world, both subtropical and tropical. It comes in the form of a tuber that can be eaten raw, used as a cooking spice, pickled, used in traditional medicine, as a colouring agent, and in vegetable mixes. The main onion-producing regions in Indonesia are Brebes, Probolinggo, Tegal, Nganjuk, Cirebon, Kediri, Bandung, Malang, and Pematang.

Kediri Regency is one of the regions located in East Java Province, which borders Nganjuk Regency, Jombang Regency, Blitar Regency, Tulung Agung Regency and Malang Regency. Kediri Regency has a lot of potential, ranging from agricultural land, industrial areas, and tourist areas. The main agricultural commodities in Kediri

Regency are rice fields, secondary crops and shallot fields. Meanwhile, the shallot cultivation centres are located in Plemahan, Kunjang, Pare Tarokan, and Grogol subdistricts. In Grogol subdistrict, several shallot processing businesses have been established, utilising raw shallots from Nganjuk Regency and several subdistricts in Kediri Regency. The shallot processing business has great potential, given the abundant availability of raw materials. In addition, the existence of this fried red onion processing business also helps the marketing circulation for farmers in both regencies. The fried red onion MSMEs in Grogol Subdistrict account for approximately 15% of the population of Grogol Subdistrict, most of whom are farmers, one of which is Fried Shallot "EMAK" MSMEs are one of the many businesses that utilise fried shallot processing.

The shallots harvest is a time when almost all shallots farmers harvest their crops simultaneously, resulting in an abundant supply of shallots. This makes fried shallots ingredients very easy to obtain at low prices.

In contrast, during the lean season, red onion prices become expensive, leading to inflation (price fluctuations of red onions). This issue significantly impacts onion processing businesses, particularly small and medium-sized enterprises (MSMEs) specialising in fried shallots production, as it affects the declining price of shallots. Production costs also vary for each production, where in one month, 37.5 to 45 quintals of raw shallots (priced at 10-30 thousand) can be produced, while the wage for shallot cleaning labour is valued at 65 thousand rupiah per day (6-8 hours) operated by 1 person. then the wages for slicing are 75 thousand rupiah per day (6-8 hours) operated by 1 person, and the cooking/frying process requires 2 workers per frying with wages of 70 thousand per person and 1 person for draining with a cost of 55 thousand rupiah per day. So the average labour costs incurred in one day are approximately 350 thousand rupiah. Financial management at Pangan Alam MSMEs is still considered inadequate because the owner focuses on production and cash flow, leading to hesitation in business investments. Therefore, business management has not yet fully understood and implemented proper practices.



Figure 1. Photo of manual shallot slicing.

This community service activity refers to several previous activities carried out by community service workers in the fields of shallots, shallot processing, shallot technology, financial management assistance and business assistance. The following is a description of several relevant references to support and facilitate this community service activity, both from books and national journals, as described below.

In the 2020 community service journal by Fauziyah et al., it is stated that farmers' knowledge of shallot processing is also lacking. The PPPUD programme will create red onion processing technology to produce high-quality local shallots products in Nganjuk Regency. This will enable

Nganjuk to become a producer of high-quality regional products from upstream to downstream. The implementation methods in the PPPUD programme are: (1) Creating shallot processing technology by making machines: shallots leaf cutters, shallots slicers, shallots peelers, shallots cleaners, shallots slicers and shallots fryers, and fried shallots strainers. The results achieved in the first year of this PPPUD programme include: Appropriate technology equipment that has been used to process shallots into various products, product quality has increased by 60%, production capacity has increased by 50%, turn over has increased by 55%, the number of workers has increased by 100%, from being done by the partners themselves to now involving 7 people.

The 2021 community service journal by Fauziyah et al. has yielded benefits; through this community service activity, a technology has been created to process raw shallots into Nganjuk's signature shallot products. This has established Nganjuk as a producer of Regional Premium Products from upstream to downstream. This community service activity has created/developed the Diversification of Nganjuk's signature processed shallots.

Fauziyah et al. in 2021, with the title Implementation of Technology for Processing Raw Shallots into Superior Shallot Products, found that this community service activity diversified the processing of Nganjuk's signature shallots into products such as: (1) Herbal and vegetable shallot chips, (2) Rainbow shallot crackers with natural colourings, namely turmeric for yellow, pandan leaves for green, dragon fruit for red/pink, (3) Rich shallot paste, (4) Shallot flour/powder, (5) Shallot floss.

Then, from the results of Hana et al.'s 2019 community service related to financial management assistance for honey bee farmers, it was found that the assistance in preparing financial reports enabled honey bee farmers to create simple financial reports, whereas previously honey bee farmers did not have neat financial records and had not separated their personal assets from their business assets.

B. METHODE AND IMPLEMENTATION

The community service method implemented in this Community Partnership Programme (PKM) uses several references combined in an appropriate technology application method in the form of a "fried shallots slicing machine (vertical and horizontal system)" accompanied by the implementation of partner assistance related to production management and financial management, the progress of which is then measured by distributing questionnaires to all MSME employees. This method is a combination of several references developed by the implementation team from several journals on community service activities and supporting books related to shallot

yield management and business empowerment, such as the article ‘National Seminar by Kahuripan Susanto, et al. in 2020, on the Application of Shallot Leaf Cutting Technology in Nganjuk Regency’. It also refers to a book entitled ‘Increasing the Productivity of Loceret Nganjuk Honey Beekeepers’ published by Bintang Pustaka. Bintang Pustaka Madani, authored by Hana, et al. in 2020. It also refers to a book entitled ‘Various Processed Shallot Products’ in 2019, published by Indomedia Pustaka. It also refers to a journal published last year by the author entitled ‘Increasing the productivity of MSMEs processing herbal medicine with appropriate technology for choppers and grinders’ in *Abdimas: Journal of Community Service*, Merdeka University, Malang. The Community Partnership Programme for Increasing the Productivity of Fried Shallot MSMEs in Kediri Regency is divided into eight stages, as illustrated in the following diagram:

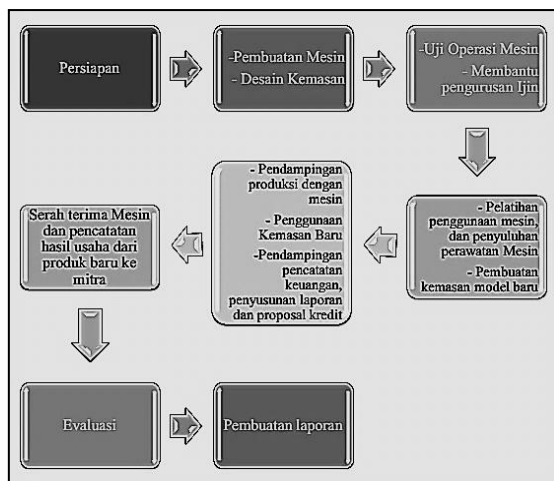


Figure 2. Stages of Implementation of the Community Partnership Programme

The following are the steps for implementing this method:

1. Preparation Stage
 - a. Formation of an implementation team consisting of a financial management and business management team (from the D3 Accounting Study Programme) and a machine manufacturing team (from Polinema PSDKU Kediri), partners, and technical implementers (Students)
 - b. Coordinating between the proposing team and partners in terms of problem formulation observation.
2. The stage of developing the technology/machine for slicing and drying fried shallots and designing the packaging for fried shallots, including: (Susanto et.al, 2020)
 - a. Procuring materials to build the slicing and drying machine
 - b. Designing packaging for fried shallots in several sizes for sale.
 - c. Construction of the slicing and drying machine for fried shallots.
3. Machine Operation Testing and Product Licensing Assistance
 - a. At this stage, the machines to be provided to target partners are tested.
 - b. The results of the testing are analysed to determine the maintenance requirements for the machines.
 - c. Assistance is provided with obtaining business product licences from the relevant authorities.
4. Machine Operation Training, Maintenance Guidance, and New Packaging Design:
 - a. At this stage, training is provided to employees on how to operate the chopping machine and the fried shallot processing machine.
 - b. During the machine maintenance guidance phase for the chopping machine and the fried shallot processing machine, employees are accompanied throughout the machine maintenance process.
 - c. Packaging is produced after permit is issued, using new packaging/labels designed by the implementation team.
5. Assistance and training in machine operation and maintenance: (Susanto, et.al., 2023)
 - a. The proposing team assists employees during production using the machines.
 - b. The proposing team monitors employees during the machine maintenance process.
 - c. At this stage, guidance is provided on the importance of separating business and personal income for entrepreneurs and employees, and training is provided on financial record-keeping, from recording transactions and cash flow to preparing financial reports and credit application proposals.
6. Handover and recording of business results, Handover of fried shallot processing machine technology to partners, as well as providing an analysis of business results during financial management assistance.
7. Evaluation
 - a. After providing assistance for the programme implemented, the proposing team observed the results of the fried shallot extraction and packaging machine and addressed the obstacles faced by partners.
 - b. The proposing team compares the results of fried onions before and after the assistance.

- c. The proposing team corrects the accuracy of the financial report preparation and credit application proposal.
- 8. Report Preparation, After completing the above stages, the proposing team prepares a report and fulfils the deliverables as promised in the table above.

C. DISCUSS AND RESULT

Result

The process of making the frame and hopper includes cutting L-shaped iron used in the frame, cutting stainless steel for the hopper, welding the frame and hopper using SMAW electric welding with 80A DC current and using additional welding materials in the form of 2.6 mm RB electrodes for the frame and 2 mm diameter E308-16 stainless steel electrodes for the hopper.

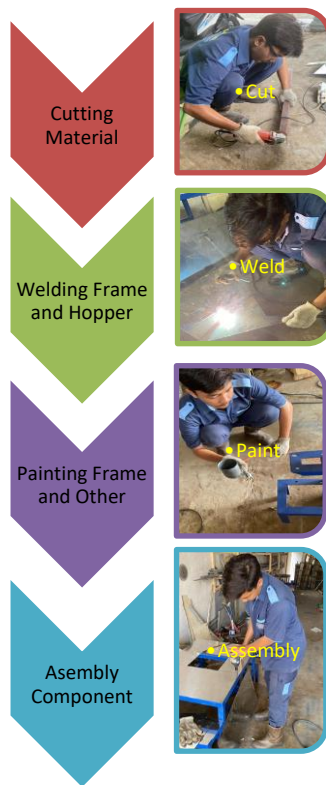


Figure 3 Process of Making Appropriate Technology Machines

In Figure 3. This is followed by drilling the mounts on the electric motor, the mounts on the hopper, the mounts on the crankshaft, and the mounts on the blade frame. Next is the finishing process, which includes smoothing, filling, and painting. After the paint has dried, the machine components are assembled, including the frame and frame cover components, starting with the installation of the electric motor, transmission, and blade frame.

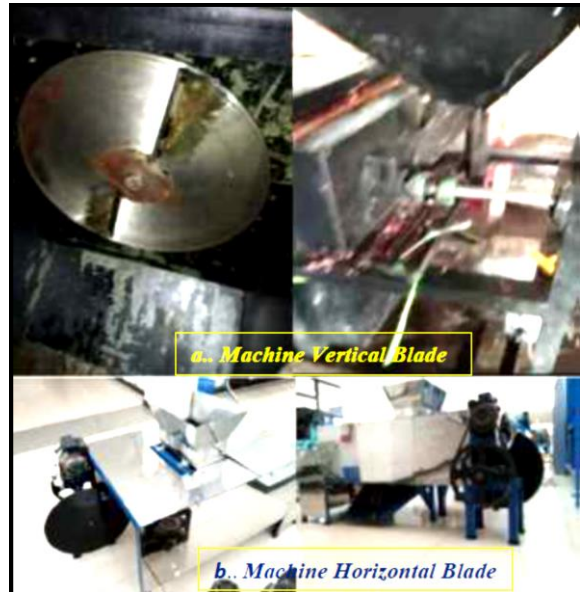


Figure 4. a. Grade A/B/C Product Slicer Machine and b. Premium Product Slicer Machine

Assembled machines. This activity produced two machines as output: the first is a vertical slicing machine with a capacity of 100 kg per hour for grade A/B/C fried shallots products, and the second is a horizontal slicing machine for premium fried shallots products with a capacity of 40 kg per hour.

Appropriate Technology Machine Operation Testing Process, Machine performance testing aims to determine whether the design can function as planned. Activities carried out include data collection to determine the form of production capacity obtained from the machine's work process. This testing stage uses shallots as test material. The results of the grinding can be seen in the image below;

Table 1. Slicer Style with Horizontal Blade Machine Test

Electric motor rotation	Cutting speed	Cutting material	Cutting results
1400 Rpm	183,36	Red Onion	0,29 kg

The production process can process 150 kg of raw shallots, which will produce approximately 45 kg of fried shallots. This fried shallot processing process requires 8 workers and 2 final sorters. This processing takes approximately 6-8 hours, starting with cleaning the shallots using a 20 kg raw shallots cleaning machine (so that the cleaning process is carried out 6-7 times a day), with each process taking approximately 15 minutes. This is followed by slicing the clean shallots with a slicing machine, which takes 3-4 hours for 150 kg. After slicing, the

shallots are ready to be fried in a large frying pan with a diameter of 1.25 m, which can fry 40 kg of shallots per frying. This frying pan uses a heating system fuelled by firewood because firewood can provide a more uniform heating temperature and heat up faster compared to gas fuel. The frying process using this fire heat can be done for 25 minutes per frying. After the frying process is complete, the fried onions are drained, which takes a relatively long time, approximately 60 minutes after the frying process.



Figure 5. Assistance to MSMEs by the Community Service Team together with students

Therefore, when calculating the effectiveness and efficiency of the production process, it is still not optimal, especially in the draining and chopping processes. This is because the draining process is still done manually without a draining machine, and the chopping process is not optimal because it uses a small chopping knife with a diameter of 30 cm. It would be faster if the diameter was larger, 50-60 cm.



Figure 6. Emak Fried shallots MSME Partner and PKM Community Service Team

This community service activity also serves as an important means of continuous promotion and demonstrates the existence of higher education institutions through various activities. Higher education institutions should be committed to serving the community. This activity is also strongly supported by study programmes that have adequate facilities and infrastructure to support the Community Partnership Programme.

Discussions

Benefits Obtained (Outcome)/Economic and Social Impact, After carrying out activities organised as part of Community Service (PKM), there was an increase in the productivity of partners in terms of both economic and social aspects, with the following conditions:

Increase in Knowledge and Skills of MSME Employees, In the PKM activity on the Productivity of the 'Emak' Natural Food SME in Sonorejo Village, Grogol District, Kediri Regency, an assessment was conducted on the 'Emak' Natural Food MSMEs before and after the implementation of training and assistance in the use of TTG machines. This assessment was carried out through a questionnaire given to the Fried shallots MSMEs, as shown in the Figure:

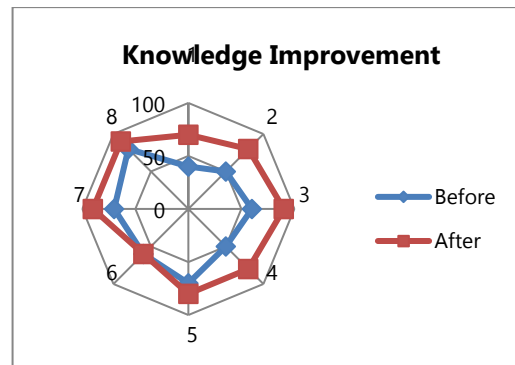


Figure 7. Graph showing the increase in knowledge of employees at Emak Fried shallots MSMEs regarding the use and maintenance of appropriate technology machinery

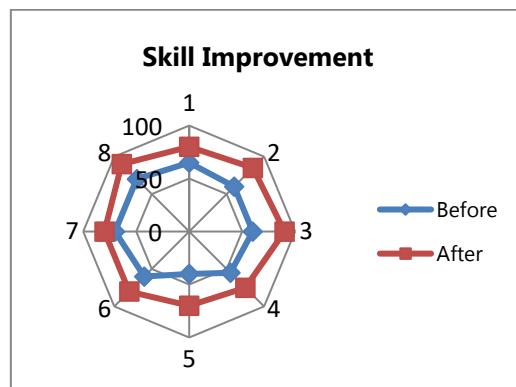


Figure 8. Graph showing the increase in skills of employees at Emak Fried Shallots MSMEs regarding the use and maintenance of appropriate technology machinery

In Figure 8. The graph above shows that the knowledge and skills of employees at the Pangan Alam MSME (Emak Fried Shallots) in Sonorejo Village, Grogol Subdistrict, Kediri Regency, increased by an average of 20%. This value was obtained from the assessment of 8 employees, with only 1 employee not experiencing an increase in knowledge. This assessment shows that with guidance on the use of Appropriate Technology Machines, the knowledge of MSME employees can be improved. Meanwhile, the assessment of the improvement in skills in operating the Appropriate Technology Vertical Slicer and Horizontal Slicer machines among employees of the ‘Emak’ Fried shallots MSME in Sonorejo Village, Grogol Subdistrict, Kediri Regency showed an increase of 21% from 8 employees who participated in the assistance and implementation of the slicer machine.

Increase in Business Production, MSME Production Capacity, The increase in the number of products can be seen from the increase in production volume and capacity after the mentoring, resulting in products with packaging and labels as shown in Figure 9 below, as part of the community service activities at the ‘Emak’ Natural Food MSMEs in Sonorejo Village, Grogol Sub-district, Kediri Regency. Below are images of ‘Emak’ Natural Food products before and after the mentoring activities.

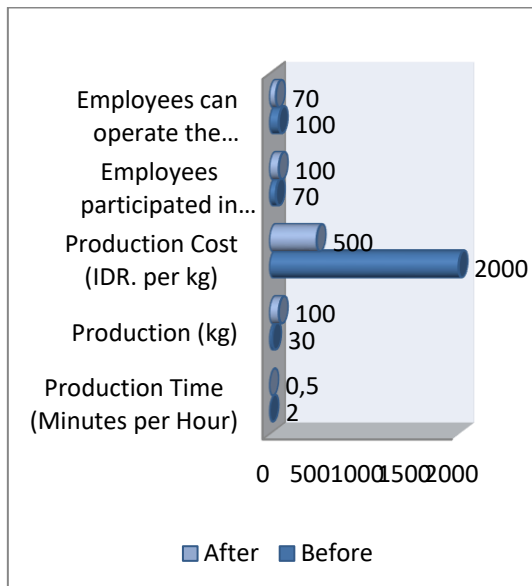


Figure 9. Production capacity of Emak Fried Shallots MSMEs after the activity

In this PKM activity, the increase in production capacity can be seen from the increase in the number of fried shallots products produced and the supply of labelled fried shallots to be sold directly to customers. The difference between the products before and after the activity can be seen in Figure 8 below.



Figure 10. Production of Premium Fried Shallots from the TTG Horizontal Machine (Products before and after PKM)

Increase in MSMEs Profits, The increase in profits earned by the ‘Emak’ Natural Food MSMEs after and before community service is shown in Figure 11. The increase in profits can be seen from the sales results from August to October 2023 compared to the results from August to October 2024.

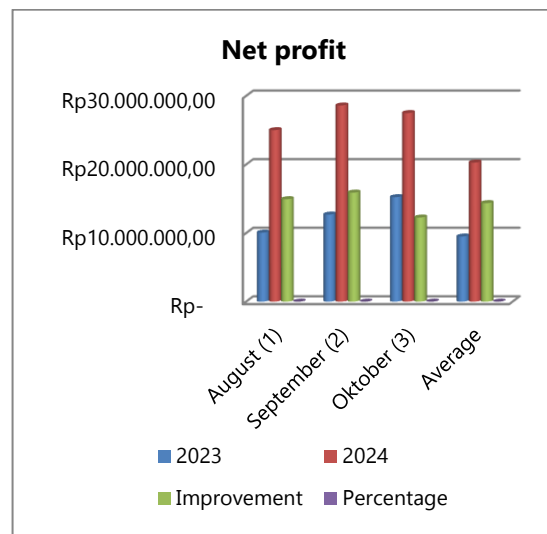


Figure 11. Increase in profits (net profit) of Fried Shallots MSMEs

In Figure 11 shows the profit increase data based on data owned by the ‘Emak’ Natural Food MSME, which is an average of 118.04%, while the average increase in prices is 14.36 million rupiah (between August 2023 and October 2024). The highest profit increase occurred in September 2024, reaching 15.9 million rupiah. This increase was due to the optimal use of machines produced by the community service programme, along with increased marketing as the demand for “Emak” fried shallots in the market grew. This was evident in the increase in the months following the implementation of the PKM (2024), compared to the months prior to the implementation of the PKM (2023). Meanwhile, the low value in

October was 12.26 million rupiah with a percentage of 80.51 per cent, which was caused by the increase in the price of onion raw materials, thereby reducing business profits.

D. CLOSING REMARKS

Conclusion

Based on the discussion, the following conclusions were drawn from this community service project: The appropriate technology of the onion slicing machine implemented in the 'Emak' fried shallots MSME is one of the solutions provided to the community as a result of the work of the Community Service Team, which was carried out from March 2024 to October 2024. In general, the problems faced by MSME partners include production capacity (vertical and horizontal chopping processes) which is still small, and the fact that premium onions are processed manually, so the production process requires considerable labour, time and production costs. With the appropriate technology/onion chopping machine, both vertical and horizontal, it is hoped that the production process can be accelerated and production increased. The tangible results of this community service activity include an increase in productivity, as demonstrated by an increase in production output (previously, manual production took 20 minutes per kilogram, yielding 20 kilograms of product per day). With the introduction of appropriate technology machinery, PKM production has increased (production time is now 10 minutes per kilogram, yielding 40 kilograms per day). Based on data from the Fried Shallots MSME, the average profit increase in 3 months reached 118.04% (equivalent to 14.36 million rupiah). The highest profit increase was in September 2024, amounting to 15.9 million rupiah with a percentage of 125%. The lowest increase was in October 2024, amounting to 12.26 million rupiah with a percentage of 80.51%. This difference in value is mainly due to the fluctuating price of shallots raw materials and market demand, which increases when prices fall and decreases when shallots prices rise, thereby affecting the profits of MSMEs.

Recommendation

The recommendations from this community service programme that need to be developed in the future include: testing the technology in terms of its functionality, which has been created and implemented, is very important in order to obtain high-quality technological/machine performance results. Assistance in the use and maintenance of technology is also very important in order to keep the machine in optimal condition. Recommendations from the partner as the owner

of the 'Pangan Alam' MSMEs: it is hoped that these community service activities will continue in the future so that they can be beneficial for increasing production and business in the community/MSMEs.

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