Innovation in Processing Dried Chili into Chili Powder and Chili Oil to Increase the Added Value of Agricultural Products in Bululoe Village

Meri Andriani[1], Fadhiel Pratama[2], Nur Fahira Agus[3], Luthfiah Zahirah Dahlan[4], Yuliana[5], Suci Aprilinda Saleh[6], Sri Yulandhani[7], M. Ikbal Al Furqan[8], Muhammad Ridha[9]

[1]Program Studi Akuntansi, Universitas Islam Negeri Alauddin Makassar, Indonesia
[2]Program Studi Ekonomi Islam, Universitas Islam Negeri Alauddin Makassar, Indonesia
[3]Program Studi Kimia, Universitas Islam Negeri Alauddin Makassar, Indonesia
[4]Program Studi Hukum Keluarga Islam, Universitas Islam Negeri Alauddin Makassar, Indonesia
[5]Program Studi Manajemen Pendidikan Islam, Universitas Islam Negeri Alauddin Makassar, Indonesia
[6]Program Studi Keperawatan, Universitas Islam Negeri Alauddin Makassar, Indonesia
[7]Program Studi Pengembangan Masyarakat Islam, Universitas Islam Negeri Alauddin Makassar, Indonesia
[8]Program Studi Ilmu Perpustakaan, Universitas Islam Negeri Alauddin Makassar, Indonesia
[9]Universitas Islam Negeri Alauddin Makassar, Indonesia
*Corresponding Author: andrnimeri02@gmail.com

ARTICLE INFO

Article History:

Received : 24 September 2026
Revised : 10 October 2026
Accepted : 11 October 2026

Keywords:

Added Value,
Chili Oil,
Chili Powder,
Community Empowerment,
Dried Chili

ABSTRACT

The unstable fresh chili price in Bululoe Village, Jeneponto Regency, makes some of the harvest to be dried on the ground and wasted. The community service project was done to increase knowledge and skill of partners to process the dried chili into chili powder and chili oil which are valuable. The community service project was held on September 6-11, 2026, by using Asset-Based Community Development approach; through socialization, demonstration, hands-on practice, and mentoring for 24 participants. Evaluation of the community service project was done through observation of participant's skills and questionnaire about their satisfaction. Results showed that 15 participants (62.5%) were able to complete all steps in processing the dried chili correctly, and all participants (100%) were very satisfied with the community service project. Two types of ready-to-sell products were made; namely chili powder in 100 ml shaker bottles with production costs about IDR 6,000-10,000 and suggested sales prices about IDR 12,000-18,000 per bottle; and chili oil in 35 ml cups with production costs about IDR 3,100-4,700 and suggested sales prices about IDR 6,000-9,000 per cup. Therefore, the dried chili that used to be valueless, can now be a value-added product, and therefore it is necessary to continue to provide mentoring and strengthen marketing through the village cooperative so that the benefit of this project can last long.

1. Introduction

The community of Bululoe Village, located within the Turatea District of the Jeneponto Regency in South Sulawesi Province, primarily relies upon the agricultural sector for its livelihood; using traditional agricultural practices and primarily selling their harvested produce fresh. Chili peppers are one type of horticultural commodity that many members of the community cultivate. There is a wide variety of stakeholders participating in the community service program, including farmer groups (Primary Producers), women who process food at home, youth in the village who have access to information technology and social media, and small and medium-sized businesses operating in the area. This range of stakeholders provides a great deal of social capital, which will allow the agricultural processing program to operate in a collaborative manner, from the sourcing of raw materials to the production and sale of the finished products.

Based on field observations and farmer/village official interviews done while participating in the Community Service Program (KKN), it appears that chili pepper is an important agricultural commodity for the people of Bululoe Village. Nevertheless, the possibility of maximizing the benefit from chili pepper has not been fully realized. At times of low prices for fresh chili, such as during periods of peak harvest, the price that farmers receive can be extremely volatile and often drops dramatically. In addition to being subject to price volatility, the farmers also suffer from poor access to markets, which provides them with little leverage against middlemen. An interesting observation made by the researcher was that some chili peppers were allowed to remain unharvested in the field and allowed to dry out – primarily due to either the low price that would result from harvesting and transporting them, or because of a severe drought that caused the peppers to dry faster on the vine. Interviews with farmers showed that the dried chili peppers produced by the farmers are rarely marketed and are never used as raw materials in processed products; therefore, the dried chili peppers produce almost no economic value for the farmers.

The major issues that the partners face can be identified as four points. First, the unstable pricing of fresh chili peppers, which lowers the farmers' income; Second, parts of the chili pepper harvest are not picked, but are left to dry out in the field; Third, dried chili peppers have not been used as ingredients for processed products; and Fourth, the utilization of chili peppers as a value-added product has not reached its full potential. The reasons behind these issues are divided into technical and social/economic. Technical factors include the fact that chili peppers contain a large amount of water and therefore can easily spoil after being harvested, and can only be stored for a short period of time. Zam indicated that when there is a massive amount of chili peppers harvested at once, the chili peppers will spoil rapidly and cause extreme price swings (Zam et al., 2019). Social and economic factors include the low level of knowledge and skill among members of the community about post-harvest processing technology, the absence of standard recipes and measuring tools for others to follow, and the lack of proper packaging, branding, and distribution systems. Issusilaningtyas also observed similar behaviours among farmers in Cilacap Regency, where the majority of their harvests were sold fresh instead of processed due to limited knowledge and skills in post-harvest processing of chili peppers (Issusilaningtyas et al., 2024).

The use of dried chili processing programs, such as that implemented in Bululoe Village, has been shown to be effective in reducing farmers' dependence on the price fluctuations of fresh chilies. Research by Nasution indicates that educating farmers about the process of converting dried chilies into chili powder can provide additional markets for their products and improve their economic well-being (Nasution et al., 2024). Similarly, research conducted by Amna has shown that partners who participated in training regarding chili oil processing demonstrated increased levels of knowledge and skill (Amna et al., 2023). Kasim and Bakari have identified chili powder processing training as a viable method for down streaming horticulture at the community level (Kasim & Bakari, 2025). Finally, Ramadhan have verified that both drying and grinding are methods of preserving chili products, and that they will retain high quality if processed with proper techniques (Ramadhan et al., 2024).

The solution developed from the community service program is a new way to process dried chilies into two different products at the same time: chili powder and chili oil. This method was chosen due to its ability to utilize raw materials that were formerly wasted, use equipment found in most homes, and produce products with long shelf lives, are convenient to use, and can be easily packaged. A number of methods have been used to implement the program, including outreach, demonstrations, hands-on training, and discussion of outcomes. These methods were supplemented with standard recipes and measurements, estimates of how much product will result from the process, calculations of the costs involved with producing the product, use of labelled shaker bottles, and introduction of simple ways to market products (Village Stores, Social Media, WhatsApp). Therefore, the community learns about technical aspects of the business as well as understanding what makes a business viable and what are effective marketing strategies.

Specifically, the community service program intends to: Increase partners' awareness about using dried chili peppers as an ingredient for processed food products, assessed through tangible results from participants and their assessment of the program; Develop partners' ability to produce chili powder and chili oil according to standard recipes and measurement criteria demonstrated by developing ready-to-sell finished products at each session; Enhance the economic benefit of dried chili peppers converting a product that had little or no prior value into 100 ml packages with a production cost ranging from IDR 6,000-10,000 per bottle and an advised selling price of IDR 12,000-18,000 per bottle; Establish a system for packaging and labeling products which represents the unique features of Bululoe Village; and Initiate a home-based business opportunity based on the usage of locally grown agricultural products for Farmer Groups, Housewives, Village Youth and MSME owners in Bululoe Village.

Four characteristics differentiate this program from other similar outreach programs. First, regarding the raw material used in the program, unlike many previous outreach programs that use fresh red chili as the main ingredient using drying as the first processing step, this program focuses on field-dried chilies that were originally considered "harvest waste." Therefore, this program also acts as a means to minimize post-harvest loss of agricultural produce. Second, concerning the product developed through the program, the program combines two derivative products into one production line; namely, chili powder as the main product and chili oil as a secondary product derived from the processed chili powder. This allows the partners to diversify their product offerings without needing to acquire additional equipment or raw

materials. Third, with respect to the mentoring methodology employed by the program, the program does not simply provide technical demonstration; rather, it offers a complete set of measurable indicators including standardized recipes, estimated yields, shelf-life projections, and calculations for production costs and profit margins) which enable the partners to objectively evaluate the feasibility of establishing a business prior to making a commitment to mass-producing. Fourth, with respect to the implementation strategy adopted by the program, the products produced through the program are promoted as signature products of the village and feature labeling identifying them as "Khas Desa Bululoe" (Bululoe Village Specialties) and are supported by a development plan focused on the village cooperative, thus guaranteeing the long-term sustainability of the program irrespective of the ongoing participation of the outreach team. By logically linking the partners' current situation, the problems encountered, the suggested solutions, the objectives of the program, and the innovative features of the program, it is anticipated that this initiative will significantly contribute to enhancing the value added to agricultural produce and improving the well-being of the inhabitants of Bululoe Village.

2. Method

This Community Service activity was implemented in Bululoe Village, Turatea District, Jeneponto Regency, South Sulawesi Province, through the KKN (Student Community Service) program or Student Community Service program of the State Islamic University of Alauddin (UIN) Makassar. There were 3 phases to this activity; phase 1 occurred on September 6th, 2026 (Harvesting and Drying Chili), phase 2 occurred from September 7th-10th, 2026 (Drying Chili), phase 3 occurred on September 11th, 2026 (Socialization and Direct Practice with The Local Community). This location was chosen purposely because Bululoe Village produces a large quantity of chili, however there are many parts of the harvested chili that are not used because of the instability of the price of chili. The primary activities were done at the Bululoe Village Office, with participation from the Village Government Officers, as intermediaries between the Service Team and the Local Community.

The residents of Bululoe Village, who are composed of farmers groups, housewife groups, village youth groups, and small business operators (MSMEs) with a total of 24 participants; participate in this activity. They have experience in chili farming due to being an agricultural community, however, they do not have enough knowledge about how to process chili after it is harvested, how to standardize the production of chili products, how to package them and how to market the processed chili products. The selection criteria used to choose the participants was based upon whether or not they were directly involved in the production of chili, and if they were willing to participate in all parts of the activity, so that the results of the training would be able to continue on their own after the completion of the activity, and possibly expand on their own as well.

The systematically conducted activities progressed in different steps. At the first stage, needs identification, the team observed preliminarily the condition of chili farming and conducted semi-structured interviews with chili farmers and village authorities to find out what was happening post-harvest mainly about dried chilies, which before this project had not been economically used. From these results, the community service team worked together with

village authorities to develop outreach materials and practical sessions on dried chili processing that fit with the community's resources and abilities. The activities occurred during September 6-11, 2026; they included chili harvesting and drying, an introduction to processing methods, and practical experience working with the community to transform dried chilies into value added products. During the practical sessions, the team guided participants through each step of production so that participants correctly applied their knowledge and skill. The program ended by monitoring and evaluating, which consisted of directly observing participants' involvement and accuracy while doing the practical works, and completing satisfaction evaluation forms.

The method of this activity is based on an ABCD (Asset-Based Community Development) approach, which combines with Service-Learning principles and participatory learning. This ABCD approach was chosen due to the fact that it uses existing local assets, such as the dried chili peppers, previously thought to be worthless, the basic food processing abilities of local housewives, and the presence of village institutions (Farmer Groups, Village Cooperatives) that can provide a platform for developing businesses. In addition to being able to practice what they learn, KKN (Student Community Service) students will also be able to observe real life community problems as they implement their plans. Participatory learning will take place through the direct participation of each participant throughout each stage of the production process. To carry out this project, several techniques will be used including participant observations, interviews, Focus Group Discussions (FGD), dissemination, demonstrations, hand-on practices, and mentoring.

Data collection was achieved through the use of various methods: observation sheets to capture initial chili farming conditions and evaluate participant participation and correctness based on a skills checklist; semi-structured interview guides to determine needs; satisfaction evaluation forms with a four-point Likert scale (From "Very Disagree" to "Very Agree") to assess material suitability, delivery clarity and activity value; and additional sources such as photographs and field notes as supplemental evidence. The data was analysed using a mixed-methods approach. Satisfaction data was analysed using descriptive statistics (Percentage Responses Per Category), whereas practical skill assessment data was analysed by determining the percentage of participants who correctly completed all aspects of the production process. Qualitative data collected from observations, interviews and field notes was analysed descriptively during the stages of data reduction, data display and conclusion making. Ultimately, the results of the quantitative and qualitative analyses were combined to provide an overall view of what was achieved through the program, in terms of both skill acquisition and community-wide reactions and program durability.



Figure 1. The Illustration of Student Community Service Program

3. Results and Discussion

Prior to this activity, it had been identified through conversations with the partner organizations that although residents of Bululoe Village have been cultivating chili for years, they do not possess the necessary knowledge and/or expertise to convert raw chili into value-added products such as dried chili. In addition, observations and interviews showed that chili that is harvested and left to dry in the field was not used by the community. Furthermore, the community was unaware of standardized recipe development, processing methods, and/or packaging and marketing of processed chili products. The activity ran from September 6th - 11th, 2026. This activity began with harvesting and drying of chili followed by a training session and practical application with the community on September 11, 2026, at the Bululoe Village office. There were twenty-four (24) participants who attended this training. These participants included members of Farmer Groups, Housewives, Village Youth, and MSME owner.

A skills checklist was utilized to determine the number of participants who successfully completed each stage of production. Of the 24 participants, 15 (62.5%) were able to successfully complete all of the stages of production, whereas the other 9 participants (37.5%) have not been able to master the actual process. It was observed that most of the successful participants were housewives. These results support those of a chili farmer empowerment program in Tana Toraja where women farmer groups were found to be better at packaging and processing fresh chili into chili powder than were the male participants (Lestari et al., 2025; Zam et al., 2019).

Table 1. Participants' Practical Skills Observation Result's

No	Participant Activity's	Amount	Percentage
1	Manage to Complete All Steps Correctly	15 People	62,5 %
2	Unable to Complete All Steps Independently	9 People	37,5 %
Total		**24 People**	**100 %**

Sources: Prepare By The Author

Program evaluation was performed by having respondents rate their agreement with the four areas evaluated which is analysing material relevance, clarity of presentation, usefulness of the activity and interest in continuing to participate in similar future activities, with each area rated on a five-point Likert scale. Results showed that all participants (100%) rated as "strongly agree" each of the four areas being assessed. The high levels of participant satisfaction

found in this study are consistent with findings from a chili powder downstreaming program in Lomaya Village, Gorontalo, where all panelists had very positive reactions to the processed chili product developed, particularly in terms of taste, color, texture, and aroma (Kasim & Bakari, 2025). The results of this study are also consistent with those from a program designed to optimize chili oil production within a Women Farmers' Group in Japanan Hamlet, Yogyakarta, where comprehensive improvement was observed in the participants' knowledge and skill development across the entire production process, from selecting the raw materials to packaging (Ramadhan et al., 2024; Reza et al., 2025).

Table 2. Participant's Satisfactory Evaluation Result

No	Indicators	Category
1	Suitability of Material	100
2	Clarity of Delivery	100
3	Benefits of The Activity	100
4	Interest to Participate in Similar Activities	100

Sources: Prepared By The Authors

This program created two product types chili powder and chili oil, each of which has unique attributes as detailed below: Each kilogram of dried chilies produces approximately 850-900 grams of pure powder (Enough to fill roughly 18-20 shaker bottles with 100 ml capacities). Production costs range from IDR 6,000 to IDR 10,000 per bottle, while suggested retail prices vary from IDR 12,000 to IDR 18,000 (a margin of +/- 50-70%). Chili oil is developed based on a common recipe consisting of 100 ml of cooking oil combined with approximately 20 grams of chili powder, minced garlic, salt, sugar, and cinnamon. The ingredients are then cooked together under low heat until the aromatic components have been fully developed and the chili powder has been completely dissolved into the cooking oil. Every 100 ml of the oil/spice combination generates approximately 2-3 units of 35 ml chili oil. Production costs range from IDR 3,100 to IDR 4,700 per unit, while recommended retail prices vary from IDR 6,000 to IDR 9,000 (a margin of +/- 60-90%). There are also differences in the longevity of these products. Chili powder packaged in shaker bottles may be stored for approximately 3-6 months at room temperature as long as it is kept dry; however, chili oil packaged in 35 ml flip top cups can only be stored for approximately 2-4 weeks, preferably in the refrigerator. Similar programs have shown that developing different types of dried chili products allows individuals to create profitable home-based businesses from dried chilies that previously had no commercial value. An example of this is the creation of "bon cabai" (Chili Sprinkles) as an alternate way to process chili when there is a decline in chili prices (Akhmadi & Dyah, 2021; Nasution et al., 2024).

The difficulties experienced resulted from differences in the baseline abilities of the participants, especially for the males. The males had little experience with home-based food processing operations; therefore, they needed more assistance in the seasoning and packaging phases of the process. This same type of result was also found in a chili farmer empowerment project in Tana Toraja. In that project, female farmers demonstrated better chili processing and packaging skills than male farmers (Zam et al., 2019), which corresponds to what occurred in the current activity. Additionally, because the practical phase of the training lasted for only

one day, many of the participants could not perform the production steps again without assistance. However, this problem was somewhat addressed through individual assistance provided by members of the community service team.

The reasons why this program was successful include the participants' excitement during each of the sessions, the involvement of village leaders who served as bridges between the community service team and the rest of the community, and the large amount of dried chili peppers available at the household level. In addition, the alignment of the training materials with the participants' knowledge and experience in growing chilies also contributed to the success of the Asset-Based Community Development method of empowering communities based on their own resources and capabilities (Maulana et al., 2025). A similar finding regarding the importance of hands-on, practice-oriented training and aligning the needs of the partners with those of the program were found in the chili oil optimization program in Japanan Hamlet (Reza et al., 2025).

The sustainability of the program is indicated by the participant response to the activity. Participants did not just indicate satisfaction with the execution of the activity but also indicated that they would like to develop additional products. The interest in developing more products matches the local identification branding strategy for "GON-Cabe," a product made from chili powder processed downstream in Lomaya Village (Kasim & Bakari, 2025). Additionally, the interest in developing chili sprinkle products as an alternative at the household level that adds value shows the possibility of establishing sustainable local commodities (Akhmadi & Dyah, 2021). The interest in Bululoe Village was translated into a desire to register the product with the National Agency of Drug and Food Control (BPOM), sell the product through the village cooperative as a signature product, and therefore, create the opportunity for the sustainability of the program's benefits independently from the continued support of the community service team.



Figure 2. Student Community Service Program Documentation



Figure 3. The Output of Student Community Service Program

4. Conclusion

The community service program in Bululoe Village showed that dried chili—which had been left in the field could be processed into chili powder and chili oil by using an Asset-Based Community Development (ABCD) method that included participants in the practical application. Most of the goals of the program were achieved: 15 out of 24 participants (62.5%) were able to complete every stage of the process; every participant (100%) was satisfied with the activity; two products were produced that were ready for sale on the market, and were found to be viable based on projected production cost and suggested selling price. The results show that using local resources along with structured guidance provides farmers with another option to minimize post-harvest loss and rely less on the fresh chili market price. However, some of the participants (37.5%) have not yet become self-reliant, and there is no measure of the economic impact of the program. It is therefore recommended to continue to support the participants, assist them in obtaining licenses and conducting quality control testing for their products, enhance the marketing strategies of the village cooperative, and monitor the income of the partners on an ongoing basis. This model can be replicated in areas with similar post-harvest issues and potential for chili production.

Acknowledgement

The author expresses appreciation to Alauddin State Islamic University Makassar via LP2M (Institute for Research and Community Service) for supporting and facilitating the Student Community Service (KKN) program. Authors also appreciates the Field Supervisor's guidance during the implementation of the activities and in preparing this article. Additionally, the authors is grateful to the government of Bululoe Village, Turatea District, Jeneponto Regency for being a facilitator and liaison with the local community; to the chili farmers for providing dried chili raw materials; and to all residents of Bululoe Village, especially the farmer groups, housewives, village youth, and MSMEs (Micro Small and Medium Enterprises), for actively participating in order to successfully implement the activities.

References

Akhmadi, H., & Dyah, P. S. (2021). Bon Cabai Sebagai Alternatif Produk Olahan Cabai dan Peningkatan Pendapatan Petani di Saat Pandemi Covid-19. *PengabdianMu: Jurnal Ilmiah Pengabdian Kepada Masyarakat*, *6*(4), 391–399. https://doi.org/10.33084/pengabdianmu.v6i4.1857

Amna, A., Subhan, A., Dewi, R., Syahidin, S., Amru, B. A., Khadijah, K., Hairunnas, H., & Kamarudin, A. P. (2023). Upaya Peningkatan Kesejahteraan Masyarakat melalui Pelatihan Pengolahan Chili Oil. *Jurnal Abdidas*, *4*(6), 545–553.

Issusilaningtyas, E., Ernawati, L., Hendrawan, A., Sarwa, S., Rochmah, N. N., Kurniawati, M., Susanti, S., Yulianto, A. N., Astaruddin, R., Farabi, M. F., & Yogawati, N. S. D. (2024). Empowerment Of Local Potential Of Karanganyar Farmers In Adipala District, Cilacap Regency Through The Processing Of Red Chili. *Proceedings of UNAIC National Conference*, *2*(1), 526–538.

Kasim, R., & Bakari, Y. (2025). Pemberdayaan Masyarakat Desa Lomaya Melalui Pelatihan Pengolahan Bubuk Cabai Sebagai Strategi Hilirisasi Hortikultura. *Jurnal Pengabdian Masyarakat Teknologi Pertanian*, *4*(2), 159–169.

Lestari, M., Gina, Q. S., Fitriani, S. D., Atika, E. A., Anggraeni, N. N., Sari, A. D., Zahrina, A. N., Dirgantarawan, M. J., Huanza, M., & Putri, N. E. (2025). Inovasi Pengolahan Cabai Merah Keriting Menjadi Chili Oil Sebagai Upaya Peningkatan Kesejahteraan Petani di Desa Tanjung Seteko. *Inovasi Sosial : Jurnal Pengabdian Masyarakat*, *2*(4), 231–241. https://doi.org/10.62951/inovasisosial.v2i4.2527

Maulana, A. A., Purnomo, F. A., Karunia, A., Khoerunnisa, S. L., Budiati, A., & Kamal, M. A. M. (2025). Inovasi Pengolahan Cabai Bubuk Sebagai Strategi Peningkatan Nilai Jual Hasil Panen Petani di Desa Wonosari di Tengah Penurunan Harga Cabai Segar. *SERVIS: Jurnal Pengabdian Dan Layanan Kepada Masyarakat*, *3*(2), 40–46.

Nasution, S., Zahra, S. S., & Ponidi, P. (2024). Edukasi dan Pelatihan dalam Mengubah Cabai Kering Menjadi Cabai Bubuk untuk Meningkatkan Kesejahteraan Petani di Desa Tanah Itam Ilir. *Journal Of Human And Education (JAHE)*, *4*(5), 1066–1070.

Ramadhan, M. R., Erika, D. R., & Dahlan, A. (2024). Pengaruh Berbagai Metode Pengeringan Terhadap Fisikokimia Bubuk Cabai: Studi Pustaka. *Jurnal Sains Dan Teknologi Pangan*, *9*(5), 7846–7854.

Reza, M. A., Dwi N, M. Z., Nur'azkia R, N., Zakariya, H., Alianda W, N., Yuri Is, M., Dilla, D. F., Putri, I., Aditya, M. I., Lestari, W. T., & Juhari, J. (2025). Optimalisasi Pengolahan Cabai Menjadi Chili Oil Untuk Meningkatkan Pendapatan Kelompok Wanita Tani. *Prosiding Seminar Nasional Program Pengabdian Masyarakat*, *5*(1), 1015–1022.

Zam, W., Ilyas, I., & Syatrawati, S. (2019). Penerapan Teknologi Pascapanen Untuk Meningkatkan Nilai Jual Cabai di Tanatoraja. *Jurnal Dedikasi Masyarakat*, *2*(2), 92–100.